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SHORT COMMUNICATION

Screening of Some Short Residual Insecticides in Controlling Sugarcane Termites

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In Bangladesh the attack of termite (Termitidae: Isoptera) can be seen on almost all field crops, vegetables and fruit trees also, not only in a specific region but through out the country. Five species of termite viz. *Odontotermes parvidens* Holm and Holm, *Odontotermes* probobly *lokanardi* Chaterjee *et.al.* Thakur, *Microtermes* sp. and *Microtermes obesi* Holm. have been destructive to sugarcane in Bangladesh (Alam and Miah, 1997) are reported to cause damage to sugarcane in Bangladesh (Anon., 1979). The genus, which cause damage most frequently, are *Odontotermes* and *Microtermes* (Chhotani, 1980). Termite lives in soil and damage sugarcane by burrowing through the cane setts, leading to the death of buds and young shoots (Kolo *et.al.* 2000). They also feed on underground portion of the sugarcane plant, resulting in stunted growth of the plant and in severe attacks, desiccation of leaves and deteriorated cane stalks occurred. Termite may attack any part of sett, but in the hard-rinded varieties, they prefer to attack the ends, eye buds and root bands (Chaudhary *et al.*, 1986). Their early attack to setts cause failure in germination and may cause as high as 33% loss in yield (Ananthanarayana and David, 1986). Subtantial loss is caused due to their attack in later stages. 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 effective, as well as less hazardous insecticides to control termites. So, it is a demand driven research to find out effective and cheaper substitute(s) of chlorinated hydrocarbons. With this aim in view some Organophosphate insecticides were selected for trial against termites like Ducord 17EC, Sulban 20EC, Sikoban 20EC, Hitachlor 25WP, Tricel 20EC, Cyren 15G, Regent 3GR and Regent 50SC. It is also reported that residual effects of test chemicals are less than chlorinated hydrocarbon and thus friendly to the environment (Alam, *et al.*, 2001).

The experiment was conducted in 3 Agro-Ecological Zones (AEZ) viz., i). Akandabaria farm, Carew & Co., Darsana, Chuadanga (AEZ-11); at grower's plots, ii). Boroichara, Ishurdi, Pabna (AEZ-11) and iii). Sreepur, Gazipur (AEZ-28) during the cropping season 2003-2004 against termites to find out the effectiveness of organophosphate insecticides like Ducord 17EC, Sulban 20EC, Sikoban 20E, Hitachlor 25WP, Tricel 20EC, Cyren 15G. These chemicals were applied @ 2.25 kg a.i. ha^{-1}. Regent 3GR and Regent 50SC were applied @ 0.050 kg a.i. ha^{-1}. Lorsban 15G (standard) @ 2.25 kg a.i. ha^{-1} was used for comparison. Regent 3GR and Regent 50SC were applied in trenches only once during plantation while other test chemicals were applied thrice at planting, in March and in May. Granular insecticides were applied by broadcasting and EC and WP chemical were applied in mixing with water through watering can/sprayer. March and May applications were done in furrows on both sides of cane rows and

then covered with soils. The experiment was laid out in RCBD (Randomised Complete Block Design) with 3 replications having 10 treatments including one check plot. Block to block distance was 2 m and within block were 1m. Variety Isd 16 was used in Akandabaria farm; variety Isd 34 was used in Boroichara, Ishurdi site while at Sreepur site the most popular local variety Misrimala was used. Data on termite population were collected from randomly selected 5 clumps/plot and termite population was counted placing the setts/clump with soils on plastic sheet ($1m^2$) in the field. First data were collected from Sreepur at May while at Akandabaria and Boroichara in June. The final data were collected in November 2004 from Boroichara and in December from Sreepur and Akandabaria experimental plots. The data were analysed statistically and compared by using Lsd at 5% level for interpretation.

All the test insecticides showed satisfactory performance in controlling sugarcane termites at all locations by test doses (Table 1). At Sreepur, data collected in May showed that all the treated plots reduced termite population giving the efficacy up to 100.00% except Sulban treated plot that gave the effectiveness 72.65%. Data collected in June at Boroichara showed that all the treated plots reduced termite population (89.03 to 100.00%) significantly over control plots though Ducord and Hitachlor treated plots could not reach the desired level (80%) of efficacy. In June data at Akandabaria farm, all the treated plots showed significant difference in reducing the termite population over untreated plots except Sikoban, Hitachlor and Tricel that showed effectiveness of 79.42, 73.52 and 74.12% respectively. In November 2004 (final data) at Boroichara, Ishurdi showed all the treated plots had significant difference in reducing termite population over control. The effectiveness ranged from 80.06 to 96.88%. At Akandabaria and Sreepur, data collected in December, 2004 showed that all the treatments had satisfactory control of termites giving the efficacy ranging from 79.62 to 100.00% at Sreepur and 96.32 to 100.00% at Akandabaria farm respectively (Table 1). The effectiveness of different treatments at 3 locations (pooled % efficacy) seemed highly satisfactory (80% or above) in reducing the termite population. As per pesticide regulatory rules in Bangladesh, minimum 80% mortality of target pest or 80% efficacy over control is the prerequisite for getting recommendation of an insecticide against the pest (PTAC, 1980). Here all the test insecticides (pooled % data) fulfilled the requirement of pesticide recommendation rules/ regulation.

Reports available (Anon. 1996a, 1996b) that 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 to 300 g a.i ha^{-1}but for controlling sugarcane stem borer and termite doses of Regent varied from 50 to 200 g a.i ha^{-1} produced satisfactory results that agreed with present findings. Alam *et.al.* (2001) reported that Regent 3GR and Regent 50SC @ 100 g a.i ha^{-1} significantly reduced sugarcane termites. Alam *et.al* (2004) also recommended some Chlorpyrifos chemicals @ 2.0 to 2.5 Kg a.i ha^{-1} against sugarcane termites. Madan and Singh (1998) found that, Chlorpyrifos 20EC @ 1.25 Kg a.i.ha^{-1} satisfactorilly controlled sugarcane termites among the tested organophosphate insecticides including Sevidol 4G and Quinalphos 5G which is in agreement with the present work.

Considering upon the results of present findings it is suggested that all the test insecticides were found effective in reducing termite population (pooled data) beyond 80% might be recommended for use against termites by the cane growers.

Table 1. Effectiveness of different insecticides in controlling sugarcane termites at different locations. 2003-2004.

Treatments	Mean Termite population/5 Clumps/Plot						Pooled % efficacy (Final)
	Boraichara,Ishurdi, Pabna.		Akandabaria Farm,Carew & Co., Darsana.		Sreepur, Gazipur		
	16.6.04	6.11.04	7.6.04	8.12.04	16.5.04	27.12.04	
Regent 50 SC @ 0.050 kg ai ha^{-1} at planting	19.67b (89.03)*	5.33b (95.01)	3.00b (94.70)	0.00 (100.00)	0.00 (100.00)	0.00b (100.00)	98.33
Regent 3GR @ 0.050 kg ai ha^{-1} at planting	0.00b (100.00)	8.00b (92.52)	6.66b (88.24)	0.00 (100.00)	0.00 (100.00)	0.00b (100.00)	97.50
Ducord 17 EC @ 2.25 kg ai ha^{-1} at planting + March +May	42.67b (76.21)	11.66b (89.10)	2.66b (95.30)	0.00 (100.00)	0.00 (100.00)	14.66b (89.45)	92.85
Sulban 20EC @ 2.25 kg ai ha^{-1} at planting + March + May	9.33b (94.80)	21.00b (80.37)	10.00b (82.35)	4.00 (96.32)	34.00 (72.65)	3.33b (97.60)	91.43
Sikoban 20 EC @ 2.25 kg ai ha^{-1} at planting + March + May	18.33b (89.78)	13.66b (87.23)	11.66b (79.42)	0.00 (100.00)	0.00 (100.00)	8.33b (94.00)	93.74
Hitachlor 25 WP @ 2.25 kg ai ha^{-1}at planting + March + May	52.67b (70.63)	21.33b (80.06)	15.00b (73.52)	0.00 (100.00)	0.00 (100.00)	14.00b (89.92)	89.99
Tricel 20 EC @ 2.25 kg ai ha^{-1} at planting + March + May	16.67b (90.70)	5.00b (95.32)	14.66b (74.12)	19.66 (81.90)	0.00 (100.00)	28.33b (79.62)	85.61
Cyren 15G @ 2.25 kg ai ha^{-1} at planting + March + May	0.00b (100.00)	3.33b (96.88)	3.66b (93.54)	0.00 (100.00)	0.00 (100.00)	25.00b (82.01)	92.96
Lorsban 15 G @ 2.25 kg ai ha^{-1} at planting + March + May (Standard)	0.00b (100.00)	3.33b (96.88)	18.66b (67.06)	0.00 (100.00)	0.00 (100.00)	41.66b (70.02)	88.96
Untreated (Control)	179.33a	107.00a	56.66a	108.66	124.33	139.00a	-
LSD 5%	80.67	4.115	21.26	-	-	77.94	-

* Figures in parentheses are percent effectiveness over control

REFERENCES

Alam, M. A.; Abdullah, M.; Biswas, M. M. and Rahman, M. S. 2004. Chemical Control of Termites in Sugarcane Field with Chlorpyrifos Insecticides. *Bangladesh J. Agril. Res.*, **29**(2): 267-273.

Alam, M. A.; Biswas, M. M.; Abdullah, M. and Rashid, M. A. 2001. Efficacy of Fipronil in Controlling Sugarcane Termites. *Bangladesh J.Sugarcane*, **23**: 15-18.

Alam, M. A. and Miah, M. A. H. 1997. Akher Anistakari Pokamakor (in Bangla). *In*:Bangladesher Krisher Anistakari Pokamakor Vol. 2. T. U. Ahmed and A. F. M. A. Jalil (Eds.). Bangla Acadmy, Dhaka, Bangladesh, pp.1-49.

Ananthanarayana, K. and David, H. 1986. Termites. *In*: Sugarcane Entomology in India, David, H.; Easwaramoorth, S. and Yayanthi, R.(Eds.). Sugarcane Breeding Institute, Coimbatore, Tamil Nadu, India. pp.207-231.

Anonymous, 1996a. Fipronil-Worldwide Technical Bulletin. Rhone-Poulenc. 2T.W. Alexander Drive, Research Triangle Park, NC. USA. p.20

Anonymous, 1996b. Fipronil insecticide- Bulletin, Asia-Pacific zone. Rhone-Poulenc. Agro Asia-Pacific zone. Sigapore. 18p.

Anonymous, 1997. List of sugarcane insect and mite pests. Annual Report, 1973-78 (special issue). Sugarcane Research Institute, Ishurdi, Pabna, Bangladesh, pp.137-140.

Chaudhary, J. P.; Singh, S. P.; Mrig, K.K. and Bhardwaj, S. C. 1986. Evaluation of different control schedule for the suppression of major insect pests of sugarcane pests, *Pestic. Sci*, **9**: 445-457.

Chhotani, O. B. 1980. Termite pests of agriculture in the India region and their control. Tech. Monograph, Zoo. Survey, India, **4**:87

Kolo, I. N.; Nwasu, K. I. and Basuri, L. D. 2000. Control of termites in sugarcane using insecticides. *Sugar Tech*, **2**(4): 17-20.

Madan Y. P. and Singh, M. 1998. Evaluation of some soil insecticides for termite and shoot borer control in sugarcane. *Indian Sugar*, **48** (5): 515-518.

PTAC-1980. Standards for Selection for Pesticides for Registration in Bangladesh. PTAC, Ministry of Agriculture, Bangladesh, BGP-80/81- 5151B-100.