

SHORT COMMUNICATION

Control of Sugarcane Termites with Some New Organophosphate Insecticides

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Sugarcane (*Saccharum officinarum* L.) is one of the most important sugar crop in Bangladesh. It's also grown as cash crop by the farmers. Among the different insect pest termite is one of the deleterious pest. There are five species of termite have been identified destructive to sugarcane in Bangladesh (Alam and Miah, 1997). Termite lives in the soil and damage sugarcane by excavating through the cane setts, leading to the death of buds and young shoots (Koto *et al.*, 2000). Termite may attack any part of sett, but in the hard-rinded varieties, they prefer to attack the ends, eye buds and root bands (Choudhary *et al.*, 1986 and Mill, 1992). 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 and through out the India and may be abroad also. As may as 13 species of termites are reported to cause damage to sugarcane in India. The species which cause most frequently damage are *Odontotermes obesus* and *Microtermes obesi* and they are major species in various sugarcane growing parts of country (Chhotani, 1967). Singh and Kishan (1946), Teotia *et al.* (1963) and Roonwal (1981) reported 30-60% destruction of buds due to termites, while Avasty (1967) reported it to be 40%, which results in an yield loss of 33 percent. Miah *et al.* (1983) recommended heptachlor 30EC @ 1.5 kg a.i./ha and heptachlor 20G @ 2 kg a.i./ha against sugarcane termites. Mia *et al.* (1986) reported that dieldrin 40WP and heptachlor 50WP @ 2.0 kg a.i./ha might be quite suitable for termite control of sugarcane field. Kundu *et al.* (1987), reported that dieldrin 40WP @ 2.0 kg a.i./ha and dieldrin 20EC @ 2.0 kg a.i./ha provided 81.60% and 81.35% control. The main purpose of this study was to find out the effectiveness of organophosphate against termite instead of long residual organochlorinated hydrocarbon. Organochlorinated insecticides are detrimental to the environment due to their long residual effect. It is accumulated in fatty tissues of insects and other living organisms including mammals which results in resistance to insect and fatal to human (Cremllyn, 1979).

The experiment was conducted in a farmer's field at Sreepur, Gazipur during 2004-05 cropping season following RCBD and replicated three times. It was conducted to identify the cheapest and effective insecticides against termite population in sugarcane field. The variety misrimala planted in 6mx5m plot. Line to line distance was 1m and plot to plot distance was 2 m. Two budded sett was prepared and placed in trenches. Then insecticides were applied and then setts were covered with soil. Data was collected on termite population. Also data were collected on growth and yield parameter i.e. tillers, millable cane and yield of sugarcane. Intercultural operation like weeding, earthing up, mulching, and irrigation were done as usual. To study the efficacy of applied insecticides data on termite population was taken thrice. First in month of April 2005 when most of the setts are attacked, then September 2005 and finally January 2006 when matured canes are attacked. At this time five clumps per plot were uprooted with the help of spade. The uprooted setts/ stools were placed on a thick polythene paper then splitting with a

knife and counted termite population. Data were transformed in needed for analysis. Statistical analysis was done and treatment means were compared with the control following LSD value. Percent efficacy of insecticides was also calculated by the following formula:

$$\frac{\text{Population in untreated} - \text{Population in treated}}{\text{Population in untreated}} \times 100$$

Population in untreated

The following treatments are included in the experiment:-

T₁- Chemicide 20EC @ 2.25 kg a.i. ha⁻¹

T₂- Nokoban 20 EC @ 2.25 kg a.i. ha⁻¹

T₃- Pyriban 20 EC @ 2.25 kg a.i. ha⁻¹

T₄- Kishan 20 EC @ 2.25 kg a.i. ha⁻¹

T₅- Lorsban 15 G @ 2.25 kg a.i. ha⁻¹

T₀-Untreated (control)

Results showed in table 1 that data collected in first time in April 2005 there is no termite population in treated plots. So cent percent efficacy showed in every tested insecticide. In second time collected data showed above 80% efficacy against termites population. Control treatment was significantly difference from each tested insecticides. But there is no significant difference among the tested insecticides. Similarly, in third time collected data showed significant control from tested insecticides but tested insecticides insignificant to each other. Results presented in the Table 2 revealed that the number of germination is counted the highest (41.02%) in Pyriban 20 EC treatment and the lowest (34.03%) in control treatment. Data also indicated that all the treatments were significantly difference from control treatments but among the chemical treatments there is no significant difference at the 5% level of significance. Germination of cane buds increased over the control treatment from 7.73 to 20.56%. The number of tiller is the highest ($92.86 \times 10^3 \text{ ha}^{-1}$) in Pyriban 20 EC and the lowest ($84.53 \times 10^3 \text{ ha}^{-1}$) in control treatment. The control treatment is significantly difference from all the treatments and there is no significant difference among the chemical treatments at 5% level of significance. Almost all treatments produced higher tiller over control. Number of tiller percent increased over control are 7.56, 4.83, 7.12, 9.85 and 6.14% in Chemicide 20 EC, Nokoban 20EC, Pyriban 20 EC, Kishan 20 EC and Lorsban 15 G treatment, respectively. In case of millable cane production, higher number of millable cane ($65.92 \times 10^3 \text{ ha}^{-1}$) produced in Pyriban 20 EC treatment and differ significantly with control treatment and insignificant with Chemicide 20 EC, Nokoban 20EC, Kishan 20 EC and Lorsban 15 G treatment. Number of millable cane percent increased over control are 14.25, 13.66, 22.32, 10.30 and 5.83% in Chemicide 20 EC, Nokoban 20EC, Pyriban 20 EC, Kishan 20 EC and Lorsban 15 G treatment respectively. In case of cane yield production, higher cane yield (125.28 t ha^{-1}) was produced in Pyriban 20 EC treatment and differ significantly with Nokoban 20EC, Lorsban 15 G and control treatment and insignificant with Chemicide 20 EC and Kishan 20 EC treatment. Number of millable cane percent increased over control are 23.98, 21.21, 53.83, 31.04 and 17.78% in Chemicide 20 EC, Nokoban 20EC, Pyriban 20 EC, Kishan 20 EC and Lorsban 15 G treatment, respectively. Therefore, over viewing the results it can be concluded that termite population can be control effectively with Chemicide 20 EC, Nokoban 20EC, Pyriban 20 EC, Kishan 20 EC and Lorsban 15 G treatment. On the other hand, Lorsban 15 G played the most effective role among all tested insecticides. Therefore, over viewing the results it can be concluded that termite population can be controlled effectively with organophosphate insecticides. The result also revealed that organophosphate insecticides may be recommended as an alternative organochlorinated hydrocarbon for controlling termites.

Table 1. Efficacy of some new organophosphate in controlling sugarcane termites during cropping season 2004-05.

Treatments	April 2005		September 2005		January 2006	
	MTP	% Efficacy	MTP (Ln +1)	% Efficacy	MTP (Ln +1)	% Efficacy
T ₁ - Chemicide 20EC 2.25 kg a.i. ha ⁻¹	0.00	100	0.33 b (0.231)	99.82	1.33 b (0.536)	98.39
T ₂ - Nokoban 20 EC 2.25 kg a.i. ha ⁻¹	0.00	100	0.69 b (0.366)	94.74	4.00 b (0.855)	95.16
T ₃ - Pyriban 20 EC 2.25 kg a.i. ha ⁻¹	0.00	100	0.00 b (0.00)	100.00	2.00 b (0.648)	97.58
T ₄ - Kishan 20 EC 2.25 kg a.i. ha ⁻¹	0.00	100	0.00 b (0.00)	100.00	1.33 b (0.536)	98.39
T ₅ - Lorsban 15 G 2.25 kg a.i. ha ⁻¹	0.00	100	0.00 b (0.00)	100.00	0.00 b (0.00)	100.00
T ₀ -Untreated (control)	57.00	-	183.67 a (2.12)	-	82.67 a (4.402)	-

* MTP = Mean Termite Population

** The data in parentheses are transformed values

Table 2. Effect of organophosphate on growth and yield contributing characters of sugarcane.

Treatments	Germination (%)		No. of tillers ha ⁻¹ (000)		No. of millable cane ha ⁻¹ (000)		Yield (t ha ⁻¹)	
	Mean (%)	% increase over control	Mean	% increase over control	Mean	% increase over control	Mean	% increase over control
T ₁ - Chemicide 20EC 2.25 kg a.i. ha ⁻¹	39.79 a	16.92	90.92 a	7.56	61.57 a	14.25	100.97 a	23.98
T ₂ - Nokoban 20 EC 2.25 kg a.i. ha ⁻¹	38.12 a	12.03	88.61 a	4.83	61.20 a	13.56	98.72 b	21.21
T ₃ - Pyriban 20 EC 2.25 kg a.i. ha ⁻¹	41.04 a	20.56	90.55 a	7.12	65.92 a	22.32	125.28 a	53.83
T ₄ - Kishan 20 EC 2.25 kg a.i. ha ⁻¹	38.95 a	14.46	92.86 a	9.85	59.44 a	10.30	106.72 a	31.04
T ₅ - Lorsban 15 G 2.25 kg a.i. ha ⁻¹	36.66 a	7.73	89.72 a	6.14	57.03 a	5.83	92.66 b	17.78
T ₀ -Untreated (control)	34.03 b	-	84.53 b	-	53.89 b	-	81.44 b	-
LSD at 5%	6.61	-	5.22	-	10.66	-	25.21	-
CV%	9.5	-	3.2	-	9.8	-	13.7	-

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