GAU Res. J. 1993. 19 (1) : 52-55

Evaluation of Granular Insecticides Against Sugarcane Leaf Hopper, *Pyrilla perpusilla* Wlk. on Sugarcane*

D. R. Patel, M. B. Patel and C. B. Patel**

Department of Entomology, N. M. College of Agriculture, Gujarat Agril. University, Navsari Campus, Navsari-396 450

ABSTRACT

Field cum laboratory trial was conducted at the Department of Entomology, N. M. College of Agriculture, G.A.U., Navsari during the year 1990, to evaluate the different granular insecticides against pyrilla adults on sugarcane. The results indicated that carbofuran 3G, Cartap hydrochloride 4G, phorate 10G each @ 1 kg a.i./ha and sevidol 4.4 G @ 1.5 kg a.i./ha were found effective in reducing pyrilla population in sugarcana. The efficacy of all the granular insecticides increased fourteen days after insecticidal application while it was decreased 21 days after insecticidal application.

(Received on 28th Febru., 1992)

INTRODUCTION

Amongst the sucking insects attacking sugarcane, the leaf hopper, *Pyrilla perpusilla* Wlk. is a serious pest found in almost all the sugarcane growing states and now becoming a regular menace to the sugarcane growers. In India, various pesticides have been tested against the pest. Shah *et al.* (1979) reported that endosulfan, moncorotophos and carbaryl were the most effective for the control of pyrilla. Joshi and Sharma (1975) recommended granular insecticides *viz.*, thiodemeton, phorate and carbofuran in furrows in the month of August for the control of this pest. Gajare and Hapase (1981) reported treatments of endosulfan, fenitrothion and methyl demeton to be effective in controlling pyrilla on sugarcane in aerial spraying programme. Rajput *et al.*, (1985) studied the efficacy of granular insecticides *viz.*, aldicarb 10G, carbofuran 3G, phorate 10G, dimethoate 2G and disulfoton 10G and reported that all the granular insecticides were found effective in reducing pyrilla population. Sajjan *et al.* (1985) found monocrotophos, carbaryl, enobsufan and trichlorphon as_effective to control pyrilla. As reported by Om Prakash (1986), fenitrothion, phosalone, quinalphos and endosulfan were the effective for the control of pyrilla. Looking to these reports, very little information is available on chemical control of this pest through granular insecticide, therefore a laboratory cum field was conducted to evaluate some granular insecticides against pryilla in sugarcane.

MATERIALS AND METHODS

Field cum laboratory experiment using randomized block design with seven treatments

*Part of M. Sc. thesis submitted to Gujarat Agricultural University, Sardar Krushinagar, Dist. Banaskantha by first author.
**Address for communication : Professor and Head, Department of Entomology, N. M. College of Agriculture, GAU, Navsari,-396 450.

TABLE 1

Effect of granular insecticides on adults of *Pyrilla perpusilla* Wlk.

Sr. No.	Treatment	Per cent mortality days after insecticidal treatment								
		7			14			21		
		Feeding period (days)			Feeding period (days)			Feeding period (days)		
		1	3	6	1	3	6	1	3	6
1.	Quinalphos 5G 1.0 kg a.i./ha	00.00 (9.1)	6.67 (15.32)	40.00 (39.15)	30.00 (33.00)	50.00 (45.00)	73.33 (59.00)	0.00 (9.10)	10.00 (18.43)	33.33 (35.22)
2.	Phorate 10G 1.0 kg a.i./ha	20.00 (26.07)	36.67 (37.22)	73.33 (59.00)	36.67 (37.14)	73.33 (59.00)	80.00 (63.93)	6.67 (15.32)	20.00 (26.07)	46.67 (43.07)
3.	Cartap hydrochloride 1.0 kg a.i./ha.	23.33 (28.78)	40.00 (39.15)	90.00 (71.97)	66.67 (54.78)	86.67 (69.25)	93.33 (74.68)	6.67 (15.32)	23.33 (28.28)	43.44 (41.07)
4.	Sevidol 4.4 G 1.5 kg a.i./ha	20.00 (26.07)	43.33 (41.15)	83.33 (66.14)	60.00 (50.85)	83.33 (66.14)	86.67 (68.86)	3.33 (12.21)	16.67 (23.86)	36.67 (37.22)
5.	Carboturan 3G 1.0 kg a.i./ha	26.66 (30.99)	53.33 (46.92)	86.67 (68.86)	70.00 (57.00)	90.00 (71.96)	96.67 (77.79)	13.33 (21.14)	33.33 (35.22)	43.33 (41.15)
6.	Neemark 15 G 3.0 kg a.i./ha	16.67 (28.86)	36.67 (37.22)	76.77 (61.22)	20.00 (26.07)	30.00 (33.00)	60.00 (50.85)	10.00 (18.43)	33.00 (33.21)	46.67 (43.07)
7.	Control	00.00 (9.10)	3.33 (12.21)	16.67 (23.86)	13.33 (21.14)	20.00 (26.57)	26.67 (30.99)	0.00 (9.10)	10.00 (18.43)	23.33 (28.48)
	S. Em. ±	(2.85)	(2.49)	(2.52)	(3.56)	(3.91)	(3.11)	(1.86)	(2.97)	(2.48)
	C. D. at 5%	(8.78)	(7.67)	(7.77)	(10.97)	(12.05)	(9.59)	(5.74)	(9.15)	(7.66)

Figures in parentheses are transformed values = Arc sin $\sqrt{x percentage}$.

replicated three times was conducted at the Department of Entomology, N. M. College of Agriculture, G.A.U., Navsari during the year 1990. Different granular insecticides as shown in table 1 were applied in the soil to eight months old sugarcane crop grown in the field. Laboratory glass jar, having 15 cm. diameter and 20 cm height, was used for pyrilla rearing. The bottom of the jar was filled with 4 to 5 cm thick layer of sterilized moist sand. The leaves of treated plants were brought to the laboratory 7, 14 and 21 days after treatment. About 10 cm long leaf-cut, 6 to 7 per jar, were vertically thrust in the sand layer of the glass jar to keep them succulant and counted number (ten each) of field collected pyrilla adults were fed on the leaves. Mortality of the adults was recorded 1, 3 and 7 days after feeding in each case.

The data obtained on the percentage mortality of pyrilla were statistically analysed after arc sin ($Sin^{-1}\sqrt{x}$) transformation.

RESULTS AND DISCUSSION

The data in terms of mortality when leaves of treated plants fed to the pyrilla 7, 14 and 21 days after insecticidal application are presented in Table 1.

When leaves fed 7 days after treatment, difference in percentage mortality of pyrilla adults one day and three days after feeding was significantly superior to control in all the treatments except quinalphos in which the difference was at per with control. Among the various treatments, carbofuran had given the highest percentage mortality 26.66% and 53.33% on one day and three days after feeding respectively. After six days feeding cartap hydrochloride gave the highest percentage mortality of pyrilla adults (90.0%) which was significantly superior to other treatments except carbofuran 3G (86.67%) and sevidol 4.4 G (83.33%). The trend of performance of various treatments based on per cent mortality of pyrilla adults after six days feeding in decending order was : cartap hydrochloride 4G (90%) > carbofuran 3G (86.67%) > sevidol 4.4G (83.33%) > neemark 15G (76.67%) > phorate 10G (73.33%) > quinalphos 5G (40%) > control 16.67%).

When leaves fed fourteen days after insecticidal application, all the treatments except neemark had given significantly higher mortality of pyrilla adults as compared to control after one day and three days of feeding. Among the various treatments carbofuran had given the highest percentage of mortality of pyrilla but it was at per with cartap hydrochloride and sevidol after one day and three days of feeding. Similar trend was observed six days after feeding. The trend of performance of various treatments on the basis of per cent mortality six days after feeding in descending order was : carbofuran — 3G (96.67%) > cartap hydrochloride 4G (93.33%) > sevidol 4-4G (86.67%) > phorate 10G (80.0%) > quinalphos 5G (73.33%) > neemark 15G (60.0%) > control (26.67%). The mortality of pyrilla in all the insecticides except neemark was increased when leaves fed fourteen days after insecticidal application. This indicated that efficacy of insecticides increased fourteen days after application.

Twenty one days after insecticidal application, all the treatments were significantly superior to control except quinalphos 5G and sevidol 4:4G after one day and three days of feeding. Maximum per cent mortality was recorded in the treatments of carbofuran 3G one day and three days after feeding. The trend of performance of various treatments on the

basis of per cent mortality six days after feeding in descending order was : phorate 10G (46.67%) > neemark 15G (46.67%) > carbofuran 3G (43.33%) > cartap hydrochloride 4G (43.33%) > sevidol 4.4G (36.67%) > quinalphos 5G (33.33%) > control (23.33%). Efficacy of all the granular insecticides *viz.*, quinalphos, phorate, cartap hydrochloride, sevidol, carbofuran and neemark was decreased twenty one days after insecticidal application as comapred to that seven and fourteen days after insecticidal application as thay gave lower percentage mortality of pyrilla adults. Rajput *et al.*, (1985) reported that aldicarb 10%, carbofuran 3%, phorate 10%, dimethoate 2% and disulfoton 10% each @ 2 kg a.i./ acre gave 100%, 92%, 84%, 84% and 64% mortality of pyrilla nymphs, respectively. Similarly Marwat and Khan (1987) reported that the disulfoton and carbofuran gave best control of *Pyrilla perpusilla* Wlk. The present investigation is also close agreement with the above reports if compared with the efficacy fourteen days after insecticidal application.

REFERENCES

Gajare, B. P. and Hapase, D. G. (1981). Efficacy of aerially sprayed insecticides against pyrilla on sugarcane. *Pestology*, **5** (9) : 17-19.

Joshi, R. K. and Sharma, S. K. (1975). Effect of different granular insecticides in the control of pyrilla. *Rajasthan J. Pestic.* **2** : 84-86.

Marwat, G. N. K. and Khan, A A (1987). Using granules against sucking insect pest of sugarcane. *Pakistan J. Agri. Res.* **8** (1) : 57-60.

Om Prakash, (1986). Biotic and abiotic factors affecting pyrilla multiplication. *Annual Report*, 1987. IISR, Lucknow, 67 pp.

Rajput, S. G.; Mali, A. R. and Mogal, B. H. (1985). Efficacy of granular systemic insecticides against sugarcane pyrilla (*Pyrilla perpusilla* Wlk.). *Pesticides*, **19** (3) : 44-45.

Sajjan, S. S.; Sekhon, S. S. and Kantu, U. (1985). Efficacy of some important insecticides against *Pyrilla perpusilla* Wlk. (Lophopidae : Homoptera) infesting maize. *J. Entomol. Res.*, **9** (1) : 43-45.

Shah, A. H.; Patel, M. B.; Patel, G. M. and Purohit, M. S. (1979). Field evaluation of different insecticides for the control of sugarcane leaf hopper, *Pyrilla perpusilla* Wlk. on sugarcane. *Indian J. Pl. Prot.*, **7** (5) : 56-58.