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Bio-Efficacy of Insecticides Against Mustard Sawfly *Athalia lugens proxima* Klug

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ABSTRACT

Field experiments were conducted with various insecticides *viz.*, monocrotophos 0.036%, acephate 0.075%, methyl-o-demeton 0.025%, quinalphos 0.025%, formothion 0.025%, endosulfan 0.035%, methyl parathion 0.05%, quinalphos 1.5%, dust @ 25 kg/ha and endosulfan 2% dust @ 25 kg/ha for three consecutive rabi seasons i.e. 1987-88, 1988-89 and 1989-90 to control mustard sawfly, *Athalia lugens proxima* Klug. Need based one application of quinalphos 0.025% emulsion spray as ETL two larvae/900 sq.cm area gave quick, effective and economical control of sawfly infesting the mustard crop.

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INTRODUCTION

Mustard, *Brassica juncea* Coss is an important oil seed crop which is generally found heavily infested with mustard sawfly, *Athalia lugens proxima* during the early stage. Sometimes in severe infestation, farmers have to resow the crop. Several workers have reported the use of insecticides as spray or granule or seed treatment for the control of sawfly (Rai *et al.* 1978, Patel *et al.* 1971 and Pareek and Gupta 1977). However, for effective and economical management of mustard sawfly need based application of insecticide is very important. Since no information on this strategy is available, this study was undertaken to find out the effective and economical insecticide for the control of this pest.

MATERIALS AND METHODS

Field experiments were conducted in randomized block design at Gujarat Agricultural University, Anand Campus, Anand with 4 replications using mustard var. Varuna during rabi seasons of 1987-88 to 1989-90. The plot size was 5.0 x 3.6 m. The row to row 30 cm and plant to plant 15 cm distance was maintained. Nine insecticide formulation were tested (Table 1). All the insecticides were applied on mustard crop only once when sawfly larval population reached to ETL i.e. two larvae/900 sq. cm area. The pre-treatment and post-treatment observations were recorded by observing randomly selected 5 spots each of 900 sq. cm. area in each plot prior and after 24, 48, 72 h and 1 week of application. The data were subjected to analysis of variance and are presented in the Table 1.

RESULTS AND DISCUSSION

The larval populations of mustard sawfly. *A. lugens proxima* (Table 1) reveal the effectiveness of all the insecticides tested as compared to control. However, among the insecticides, application of quinalphos 1.5%

TABLE 1

Bio-efficacy of various insecticides against mustard sawfly *A. lugens proxima* Klug infesting mustard crop (Pooled 1987-88 to 1989-90).

Insecticide	Average number of larvae/900 sq. cm. area					Total quantity of insecticide (g a.i./ha)	Cost of insecticide used (Rs/ha)	Total cost of plant protection (Rs/ha)
	Before Spray	spray 24 h	After 48 h	72 h	1 week			
1. Monocrotophos** 0.036%	2.14* (4.13)	0.72* (0.03)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	108	60	93
2. Acephate 0.075%	2.10 (3.97)	0.82 (0.18)	0.74 (0.05)	0.71 (0.00)	0.71 (0.00)	225	135	168
3. Methyl-o-demeton 0.025%	2.03 (3.72)	0.92 (0.37)	0.72 (0.02)	0.71 (0.00)	0.71 (0.00)	75	50	83
4. Quinalphos 0.025%	2.09 (3.90)	0.75 (0.07)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	75	48	81
5. Formothion 0.025%	1.99 (3.50)	1.09 (0.75)	0.97 (0.50)	0.96 (0.47)	0.72 (0.03)	150	47	80
6. Endosulfan 0.035%	2.04 (3.73)	1.14 (0.92)	1.08 (0.75)	1.06 (0.72)	0.84 (0.23)	105	36	69
7. Methyl parathion 0.05%	2.00 (3.52)	0.06 (0.28)	0.81 (0.17)	0.71 (0.00)	0.71 (0.00)	150	50	83
8. Quinalphos 1.5% dust @ 25 kg/ha	2.00 (3.52)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	375	260	293
9. Endosulfan 2% dust @ 25 kg/ha	1.97 (3.41)	0.76 (0.08)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	500	200	233
10. Control	2.14 (4.13)	2.24 (4.60)	2.11 (4.02)	2.28 (4.77)	1.63 (2.20)			
S. Em. ±	0.05	0.08	0.08	0.07	0.06			
C. D. at 5%	NS	0.25	0.24	0.22	0.20			
C. V. %	8.79	15.38	10.62	11.75	7.23			

* $\sqrt{x+0.5}$ transformed values

** One spray dust was applied

labour charge Rs. 33/ha/treatment

Figures in parentheses are original values.

dust @ 25 kg/ha at ETL two larvae/900 sq. cm. area gave cent per cent mortality of mustard sawfly larvae within 24 h of application and showed significant superiority to formothion 0.025% and endosulfan 0.035% whereas, after 48 h endosulfan 2% dust, quinalphos 0.025% and monocrotophos 0.036% sprays gave cent per cent larval mortality and showed superiority to formothion and endosulfan. The mustard crop sprayed with methyl parathion 0.05%, acephate 0.075% and methyl-o-demeton 0.025% had cent per cent larval control after 72 h of application and they showed their significant superiority to formothion and endosulfan. Formothion and endosulfan could not give cent per cent larval control even after one week of their application. However, they were at par to rest of the insecticides tested and showed significant superiority to control after one week of application.

Looking to the cost and effectiveness of insecticides spray of quinalphos 0.025% emulsion should be made on mustard crop infested with sawfly at ETL two larvae/900 sq. cm. area.

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