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Efficacy of different insecticides against mustard aphid, *Lipaphis erysimi* (Kalt.) on mustard under field conditions

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ABSTRACT
Studies on the efficacy of nine insecticides against mustard aphid, *Lipaphis erysimi* (Kalt.) on mustard cv. Varuna as foliar spray were carried out at Meerut, Uttar Pradesh during *rabi* season of 2003-2004. Studies revealed that after 1 and 3 days of spray, oxydemeton methyl 25 EC @ 0.025% (88.0% and 96.7%, respectively) proved most effective against mustard aphid. However, on seventh day, imadacloprid 17.8 SL @ 0.0178% (99.6%) gave most effective control. On seventh day after spray, the order of efficacy was imadacloprid 0.0178% > oxydemeton methyl 0.025% > monocrotophos 0.036% > dimethoate 0.03% > chloropyriphos 0.05% > malathion 0.05% > endosulfan 0.07% > cypermethrin 0.01% > neemarin, respectively.

Key words : *Lipaphis erysimi*, Insecticides, Efficacy, Mustard aphid.

INTRODUCTION

Mustard aphid, *Lipaphis erysimi* (Kalt.) is one of the most serious pest and is considered to be the limiting factor in the successful cultivation of rapeseed-mustard. The colonies of mustard aphids feed on the new shoots, inflorescence and under side of leaves. Loss in yield up to 91.3 % (Singh and Sachan, 1994; Sharma and Kashyap, 1998) and oil contents up to 15 % (Verma and Singh, 1987) has been reported in this crop. It is therefore, essential to keep this pest under control so as to reap profitable harvest. To control this pest, different insecticides have been evaluated and recommended by many workers like Bakhetia *et al*. (1986), Srivastava *et al*. (1991), Misra (1993), Choudhury and Pal (2005). However, in the present studies some new insecticides have been evaluated along with the already recommended insecticides for the control of mustard aphid.

MATERIALS AND METHODS

The experiment was conducted at, Meerut, Uttar Pradesh during *rabi* season of 2003-2004. The mustard variety Varuna was sown in the third week of October in the study year, in plots of size 5m X 2m with a row to row and plant to plant spacing of 30 cm and 15 cm, respectively. The experiment was laid out in randomized block design (RBD) with four replications. The crop was raised under all the recommended agronomic practices except plant protection measures. Foliar sprays of all the insecticides were given @ 600 liters/ ha with the help of a knapsack sprayer. The insecticides included in the study were oxydemeton methyl 25 EC (0.025%), monocrotophos 36 EC (0.036%), malathion 50 EC (0.05%), chloropyriphos 20 EC (0.05%), dimethoate 30 EC (0.O3%), cypermethrin 10 EC (0.01%), endosulfan 35 EC (0.07%), imadacloprid 17.8 SL (0.0178%), neemarin 0.03% (1 ml/ l) and an untreated check.

The population of mustard aphid was recorded from 10 cm top portion of the terminal shoot of 10 randomly selected and tagged plants from each plot. Pre-treatment counts of the aphids were made 24 hours prior to insecticide application while post-treatment counts were made at 1, 3 and 7 days after the spraying. Per cent aphid mortality at each interval after spray was calculated .The data were subjected to analysis of variance for interpretation of results.

RESULTS AND DISCUSSION

The pre-treatment aphid population during 2003-2004 crop season was 396.8 to 416.6 aphids / 10 cm terminal shoot (Table 1). This variation in aphid population was non-significant indicating homogenous distribution of aphid population in the experimental field. All the treatments decreased the aphid population significantly than control even after 7th day of spraying. One day after spraying, oxydemeton methyl 0.025%, monocrotophos 0.036% and dimethoate 0.03% were most effective with 88.0%, 87.6% and 87.0% aphid mortality, respectively, and statistically at par, and significantly higher than rest of the treatments. Chloropyriphos 0.05% (84.0%), malathion 0.05% (83.6%) and imadacloprid 0.0178% (80.7%) resulted in higher mortality than endosulfan 0.07% (70.0%) and neemarin (25.0%). Three days after the spray, the maximum

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Table 1 : Comparative efficacy of some insecticides against *L. erysimi* (Kalt.) on mustard

Treatment	Dose/ Conc.	Pre-count/ 10cm terminal shoot	Aphid mortality (%) days after treatment		
			1	3	7
Chloropyriophos 20 EC	0.05%	412.4	84.0(66.4)	93.6(75.3)	96.3(78.9)
Dimethoate 30 EC	0.03%	400.2	87.0(68.9)	96.0(78.5)	97.0(80.0)
Oxydemeton methyl 25 EC	0.025%	398.6	88.0(69.7)	96.7(79.5)	98.4(82.7)
Monocrotophos 36 EC	0.036%	404.8	87.6(69.3)	96.2(78.7)	97.9(81.7)
Malathion 50 EC	0.05%	400.0	83.6(66.1)	93.7(75.5)	94.8(76.8)
Imadacloprid 17.8 SL	0.0178%	396.8	80.7(63.9)	95.4(77.6)	99.6(86.4)
Endosulfan 35 EC	0.07%	409.0	70.0(56.8)	77.7(61.8)	79.4(63.0)
Cypermethrin 10 EC	0.01%	416.6	35.7(36.7)	74.9(59.9)	78.0(62.0)
Neemarin 0.03%	1ml/l	399.0	25.0(30.0)	2.0(8.1)	0.0(0.0)
Control	-	410.6	0.0(0.0)	0.0(0.0)	0.0(0.0)
CD at 5%		NS	2.8	2.4	3.0

Figures in parenthesis are angular transformed values

suppression of the aphid was evident in oxydemeton methyl 0.025% (96.7%) followed by monocrotophos 0.03% (96.2%), dimethoate 0.03% (96.0%) and imadacloprid 0.0178% (95.4%), all being statistically at par , but superior than chloropyriphos 0.05%, malathion 0.05%, endosulfan 0.07% and cypermethrin 0.01% (Table 1).

A perusal of the data revealed that seven days after the spray, aphid mortality ranged between 78.0% (cypermethrin 0.01%) to 99.6% (imadacloprid 0.0178%). However, mortality in imadacloprid 0.0178% (99.6%), oxydemeton methyl 0.025% (98.4%), monocrotophos 0.036% (97.9%) and dimethoate 0.03% (97.0%) were at par and significantly higher than all other treatments. The order of efficacy of these treatments was imadacloprid 0.0178% > oxydemeton methyl 0.025% > monocrotophos 0.036% > dimethoate 0.03% > chloropyriphos 0.05% > malathion 0.05% > endosulfan 0.07% > cypermethrin 0.01% > neemarin, respectively. The effectiveness of the aforesaid insecticides in mustard aphid control is in close conformity with the findings of Bakhetia *et al*.(1986), Arora and Sidhu (1991), Upadhyay and Agarwal (1993), Prasad (1997), Vekeria and Patel (2000), Rohilla et al. (2004) and Choudhury and Pal (2005).

As rapeseed and mustard crops are consumed as vegetables in some parts of the country and these also provides edible oils for humans and cakes for cattle, the application of these insecticides on these crops should be need-based on the basis of economic threshold levels (ETL).

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