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Research Article

Evaluation of newer molecules against sucking pests of cucumber

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ABSTRACT

A field experiment was carried out during post rainy season, 2009-10, at MARS, Agriculture College, Raichur, to evaluate the efficacy of some new insecticides against sucking pests of cucumber. The results revealed that acephate 75 SP exerted the superior control of aphids and whiteflies followed by clothianidin 50 WDG as foliar spray and imidacloprid 600 FS @ 4.66 ml/kg seeds with good control upto 30 DAS as seed dressing chemical compared to chek.

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INTRODUCTION

Cucumber (*Cucumis sativus*), is an important vegetable crop, which is used for culinary as well as salad purpose. Production of cucumber is severely affected by the aphids, *Aphis gossypii* Glover, whiteflies, *Bemicia tabaci* Gennadius, and thrips *Frankliniella schultzei* Tryborn. Among the sucking pests, aphids are known to cause severe damage to cucumbers.

Thrips, aphids and whiteflies damage at feeding sites include initial penetration, destruction of cells around the penetration site, and sometimes wrinkling of the leaves occur, whereas, feeding by thrips on young fruits results in curving of fruits. Cucumber being a vegetable crop is to be harvested at regular intervals and hence there is a need for identifying the effective and safer pesticides. Hence, the present investigation was carried out to elucidate the most effective insecticides against sucking pests of cucumber.

MATERIALS AND METHODS

The experiment was conducted on popular variety of cucumber *viz.,* Dharwad green by adopting randomised block design with eight treatments including control replicated thrice at MARS, Agricultural College, Raichur during post rainy season of 2009-10. The crop was planted with a spacing of 1.8 m between the rows and 0.9 m between the plants. Out of eight treatments, three treatments were foliar spray and other was seed dressing including control. Insecticides were sprayed with a Knapsack sprayer at 10 days interval. The population count was made on five randomly selected plants in each plot before spraying, three and seven days after spraying and plants were tagged for observation. In treatments having seed dressing, observations were made at 29, 33, 37, 43, 47, 53 and 57 days after sowing. The freshly harvested fruits were weighed, separated damaged fruits and data were recorded and subjected to statistical analysis to determine the least significant difference between treatments.

RESULTS AND DISCUSSION

The results obtained from the present investigation have been discussed in the following sub heads :

Aphids:

The data obtained (Table 1) reveal that aphids at 33 DAS showed that acephate 75 SP @ 1g/l was the most effective treatment in reducing aphid population which recorded 15.17 aphids/cm^2 over untreated control and the next best treatment

was clothianidin 50 WDG (0.2 g/l) which recorded 17.86 aphids/cm^2 followed by imidacloprid 17.8 SL (0.3 ml/l) which showed moderate effectiveness by recording 19.15 aphids/cm^2. However, at 7 DAS after first spraying, similar trend was followed but efficacy of acephate 75 SP and clothianidin 50 WDG reduced which recorded 13.48 aphids/cm^2 and 16.43 aphids/cm^2, respectively. At three days after second spray, again acephate 75 SP was effective followed by clothianidin 50 WDG and imidacloprid 17.8 SL which recorded 10.63 aphids/cm2, 12.33 aphids/cm^2 and 16.27 aphids/cm^2, respectively. Similarly, at 7 DAS after second spray again acephate 75 SP (8.64 aphids/cm^2) and clothianidin 50 WDG (9.67 aphids/cm^2) continued to record the lowest aphid population. Similar trend was continued in third spray where acephate proved to be superior followed by clothianidin and imidacloprid. In treatment have seed dressing, at 29 days after sowing, imidacloprid 600 FS (4.66 ml/kg seeds) recorded lowest populations of aphids (19.60 aphids/cm2) followed by imidacloprid 70 WS (4.00 g/kg seeds), imidacloprid 600 FS (3.33 ml/kg seeds) and imidacloprid 70 WS (2.85 g/kg seeds) with 21.17, 22.67, 22.84 aphids/cm^2, respectively providing effective control upto 30 DAS and thereafter, efficacy reduced. These observations are in coordination with Ottsawa and Watanabe (1987) and Balakrishnan *et al.* (2004).

Whiteflies:

The data regarding the whiteflies (Table 2) proved that acephate 75 SP was the most effective treatment which

Table 1 : Evaluation of insecticides against melon aphid, *Aphis gossypii* Glover

Sr. No.	Treatments (Seed treatment)	Dosage g/ml/kg	No. of aphids/cm^2 29DAS	33DAS	37DAS	43DAS	47DAS	53DAS	57DAS
1.	Imidacloprid 600 FS	3.33	22.67^{b}	24.17^{bc}	24.67^{b}	26.20b^{bc}	27.00^{bc}	27.47^{b}	28.30^{b}
2.	Imidacloprid 600 FS	4.66	19.60^{c}	23.00^{c}	24.53^{b}	25.10^{c}	26.00^{c}	27.50^{b}	28.31^{b}
3.	Imidacloprid 70 WS	2.85	22.84^{b}	25.27^{b}	25.41^{b}	27.13^{b}	28.00^{b}	28.03^{b}	29.40^{b}
4.	Imidacloprid 70 WS	4.00	21.17^{bc}	23.20^{c}	24.12^{b}	25.17^{c}	26.20^{c}	27.00^{b}	28.67^{b}
	Treatments	g/ml/l	Pre count	1st spray		2nd spray		3rd spray	
	(Spray)			3DAS*	7DAS*	3DAS*	7DAS*	3DAS*	7DAS*
5.	Imidacloprid 17.8 SL	0.30	48.87^{a}	19.15^{d}	17.80^{c}	16.27^{d}	13.12^{d}	11.43^{c}	9.17^{c}
6.	Clothianidin 50 WDG	0.20	48.05^{a}	17.86^{d}	16.43^{c}	12.33^{e}	9.67^{e}	11.40^{c}	8.47^{c}
7.	Acephate 75 SP	1.00	49.17^{a}	15.17^{e}	13.48^{d}	10.63^{f}	8.64^{e}	7.12^{d}	6.48^{d}
8.	Untreated check	-	49.67^{a}	50.34^{a}	51.64^{a}	52.00^{a}	53.00^{a}	53.00^{a}	54.00^{a}
	S.E. ±		1.39	0.82	0.84	0.77	0.87	0.94	0.91
	C.D. (P=0.05)		4.21	2.56	2.54	2.33	2.64	2.85	2.77

DAS: Days after sowing; DAS*: Days after spray
Values in the columns followed by same letters are non significant at P = 0.05 per cent as per DMRT

Table 2 : Evaluation of insecticides against pest whitefly, *Bemisia tabaci* Gennadius

Sr. No.	Treatments (Seed treatment)	Dosage g/ml/kg	No. of adult whitefly/leaf 29DAS	33DAS	37DAS	43DAS	47DAS	53DAS	57DAS	Yield (q/ha)
1.	Imidacloprid 600 FS	3.33	3.93^{c}	5.27^{b}	6.60^{ab}	7.40^{ab}	8.17^{a}	9.29^{a}	9.77^{a}	106.07^{d}
2.	Imidacloprid 600 FS	4.66	2.80^{e}	4.30^{cd}	5.33^{c}	6.13^{c}	6.93^{b}	7.43^{b}	8.10^{b}	108.17^{d}
3.	Imidacloprid 70 WS	2.85	3.84^{cd}	5.15^{b}	6.90^{ab}	7.40^{ab}	8.19^{a}	9.25^{a}	9.80^{a}	106.10^{d}
4.	Imidacloprid 70 WS	4.00	3.10^{de}	4.57^{bc}	6.16^{b}	6.80^{bc}	7.45^{ab}	8.16^{b}	8.80^{b}	107.20^{d}
	Treatments	g/ml/l	Pre count	1st spray		2nd spray		3rd spray		
	(Spray)			3DAS*	7DAS*	3DAS*	7DAS*	3DAS*	7DAS*	
5.	Imidacloprid 17.8 SL	0.30	7.10^{a}	3.80^{d}	5.12^{c}	3.00^{d}	4.80^{c}	3.61^{c}	4.90^{c}	128.10^{c}
6.	Clothianidin 50 WDG	0.20	6.80^{a}	3.10^{e}	4.23^{d}	2.10^{e}	4.15^{c}	3.23^{cd}	4.10^{cd}	135.00^{b}
7.	Acephate 75 SP	1.00	6.90^{a}	2.10^{f}	3.34^{e}	1.80^{e}	3.24^{d}	2.40^{d}	3.80^{d}	140.11^{a}
8.	Untreated check	-	6.80^{a}	7.30^{a}	7.43^{a}	8.10^{a}	8.32^{a}	9.40^{a}	10.20^{a}	90.30^{e}
	S.E. ±		0.18	0.16	0.22	0.21	0.22	0.30	0.27	1.96
	C.D. (P=0.05)		0.62	0.48	0.67	0.64	0.67	0.91	0.82	5.94

DAS: Days after sowing; DAS*: Days after Spray
Values in the columns followed by same letters are non significant at P = 0.05 per cent as per DMRT

recorded lowest whitefly population (2.10 whiteflies/leaf) at 3 DAS after first spray over untreated control and the next best treatment was clothianidin 50 WDG (0.2 g/l) which recorded 3.10 whiteflies/leaf followed by imidacloprid 17.8 SL (0.3 ml/l) which showed moderate effectiveness by recording 3.80 whiteflies/leaf. However, at 7 DAS after first spraying, similar trend was followed but efficacy of acephate 75 SP and clothianidin 50 WDG which recorded 3.34 whiteflies/leaf and 4.23 whiteflies/leaf. Three days after second spray again acephate 75 SP was effective followed by clothianidin 50 WDG and imidacloprid 17.8 SL which recorded 1.80 whiteflies/leaf, 2.10 whiteflies/leaf and 3.00 whiteflies/leaf, respectively. Similarly, at 7 DAS after second spray again acephate 75 SP (3.24 whiteflies/leaf) and clothianidin 50 WDG (4.15 whiteflies/leaf) continued to record the lowest whitefly population. Similar trend was continued in third spray where acephate was superior followed by clothianidin and imidacloprid. In treatment had seed dressing, at 29 days after sowing, imidacloprid 600 FS (4.66 ml/kg seeds) recorded lowest populations of whiteflies (2.80 whiteflies/leaf) followed by imidacloprid 70 WS (4.00 g/kg seeds), imidacloprid 600 FS (3.33 ml/kg seeds) and imidacloprid 70 WS (2.85 g/kg seeds) with 3.10, 3.93, 3.84 whiteflies/leaf, respectively providing effective control upto 30 DAS and thereafter, efficacy reduced.

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