U Res. J. 1996. 22 (1) : 51-55

Chemical Control of Aphids (*Aphis gossypii* Glover) on Coriander*

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ABSTRACT

Studies were conducted at the College Farm, College of Agriculture, Junagadh, during *rabi* season of 1990-91 to determine the relative efficacy of different insecticides for the control of aphids of coriander. The results of eleven insecticides showed that the treatments of methyl-o- demeton 0.03 per cent, dimethoate 0.03 per cent, monocrotophos 0.036 per cent and endosulfan 0.07 per cent gave excellent mortality of *A. gossypii* on coriander. The higher yield of coriander seeds was also recorded from the plots treated with methyl-o-demeton 0.03 per cent (432.0 kg/ha), followed by dimethoate 0.03 per cent (412.5 kg/ha), endosulfan 0.07 per cent (402.5 kg/ha) and monocrotophos 0.036 per cent (363.5 kg/ha).

(Received on 14th June, 1995)

INTRODUCTION

The aphid, *Aphis gossypii* Glover was reported as pest of coriander for the first time under Gujarat conditions (Ghetiya and Butani, 1995). However, it has been reported as pest of cumin under Rajasthan conditions (Anonymous, 1970) and as a pest of umbeliterous crop under Indian conditions (Blackman and Eastop, 1984). Owing the high rate of reproduction of this pest and continuous desapping of the flowers, the grain formation is very much affected. In case of severally infested umbels, the seeds are poorly developed. Secondly, they excrete honey dew like substance which led to the growth of sooty mould and inhibit the photosynthetic activity of the plants. Thus, it poses a threat to coriander production under Gujarat conditions. The present investigation was, therefore, carried out to know the efficacy of different insecticides against aphid and yield of coriander.

MATERIALS AND METHODS

The investigation was carriedout on chemical control of aphids at College Farm, College of Agriculture, Junagadh during *rabi* season of 1990-91. The trial was conducted in a randomized block design, raplicated four times in a plot size of 5.0 m X 3.6 m. The variety used was Gujarat-1. Insecticides were applied with the help of knapsack sprayer fitted with a high volume nozzle. Spraying was initiated when the aphids started to build up their populations. The second spray was given 20 days after the first spray. The check plot was sprayed with water only. The population of aphids was estimated by adopting zero to four grade through the observations made on

*Part of M. Sc. (Agri.) thesis submitted by senior author to Gujarat Agricultural University, Sardar Krushinagar.

leaves, twigs and umbles. The following indices were fixed for estimation of population.

Indices	Description
0	Plant free from aphids
1	Aphids present but colonies did not build up. (No injury due to pest apparent on the plant)
2	Small colonies of aphids were present
3	Large colonies of aphids were present on tender parts
4	Entire plants were covered by aphids

The average aphid grade was worked out by the following formula :

$$\text{Average aphid} = \frac{0N + 1N + 3N + 4N}{\text{Total number of plants observed grade per plant}}$$

Where 0, 1, 2, 3, 4 are the aphid indices

N = Number of plants showing respective aphid index

The coriander seeds harvested from net plot (4.00 x 1.80 sq. m.) were weighed. The yield was converted on hectare basis. The per cent increased in yield over control was calculated by using the following formula :

$$\text{Yield increase over control (\%)} = \frac{T - C}{C} \times 100$$

Where T = Yield of respective treated plots (kg/ha)

(C = Yield of check plot (kg/ha)

Similarly, the effect of different insecticides on weight of 300 seeds was also worked out. The 300 seeds were randomly selected from each of the treatments and weighed with the help of electrical balance.

RESULTS AND DISCUSSION

The results of the sprayings of different insecticides tested against aphids on coriander showed that the treatments of methyl-o-demeton 0.03 per cent, dimethoate 0.03 per cent, monocrotophos 0.036 per cent and endosulfan 0.07 per cent were proved more effective for the control of *A. gossypii* on coriander as compared to rest of the insecticides. The treatments of thiometon and quinalphos both at 0.05 per cent were found moderately effective for the control of population of aphids. Synthetic pyrethroids applied at the normal doses had little effect on aphid population. The botanical pesticides *viz.*, neem guard and repelin were proved ineffective against aphids on coriander (Table 1).

The monocrotophos 0.02 per cent (Singh *et al.*, 1974) and monocrotophos 0.05 per cent (Sontake *et al.*, 1990) were found to be the most effective against the *A. gossypii* on cotton. David and Kumaraswami (1982) reported that spraying of demeton-o-methyl 0.025 per cent, dimethoate 0.03 per cent and monocrotophos 0.04 per cent gave effective control of *A. gossypii* on cotton. Tiwari and Moorthy, (1982) claimed that all the synthetic pyrethroids were less effective against *A. gossypii* were as endosulfan was found superior. Thus, the present findings are in close agreement with the work of earlier scientists.

TABLE 1

Comparative efficacy of different insecticides against *A. gossypii* on coriander crop.

Sr. No.	Treatment	Concentration (%)	Population of A. gossypii (Grade/plant)									
			First spraying					Second spraying				
			1	3	5	9	15	1	3	5	9	15
1.	Dimethoate	0.03	0.788	0.225	0.188	0.500	0.800	0.975	0.350	0.225	0.438	0.700
2.	Methyl-o-demeton	0.03	0.825	0.175	0.150	0.487	0.788	1.000	0.388	0.200	0.425	0.662
3.	Monocrotophos	0.036	0.638	0.275	0.200	0.537	0.825	0.650	0.325	0.275	0.563	0.725
4.	Endosulfan	0.07	0.775	0.288	0.255	0.550	0.838	0.937	0.325	0.325	0.663	0.775
5.	Thiometon	0.05	0.638	0.325	0.325	0.587	0.875	0.613	0.325	0.325	0.700	0.813
6.	Quinalphos	0.05	0.637	0.300	0.313	0.562	0.888	0.825	0.425	0.325	0.725	0.850
7.	Cypermethrin	0.002	0.550	0.213	0.375	0.662	0.938	0.575	0.213	0.438	0.937	0.912
8.	Fenvalerate	0.012	0.650	0.300	0.375	0.675	0.925	0.775	0.300	0.462	1.025	1.025
9.	Fluvalinate	0.02	0.575	0.200	0.350	0.637	0.913	0.612	0.200	0.325	0.825	0.900
10.	Neemguard	0.5	0.950	0.665	0.425	0.787	1.250	1.225	1.150	0.975	1.050	1.075
11.	Repelin	0.5	0.838	0.537	0.412	0.737	1.100	1.225	1.200	0.975	1.000	1.025
12.	Control	—	0.962	0.750	0.850	1.100	1.463	1.613	1.575	1.675	1.825	1.450
	S. Em. ±		0.03	0.035	0.02	0.04	0.03	0.04	0.03	0.04	0.05	0.06
	C.D. at 5%		0.096	0.101	0.050	0.118	0.096	0.118	0.096	0.102	0.13	0.158
	C.V. %		9.11	12.05	9.98	9.69	12.54	9.017	12.32	13.18	10.84	12.16

TABLE 2

Effect of different insecticidal treatments on the yield of coriander.

Sr. No.	Treatment	Con-centration (%)	Yield kg/ha	Yield increase over control (%)	Weight of 300 seeds (gms)	Weight increase over control (%)
1.	Methyl-o-demeton	0.03	432.000	300.00	5.386	63.41
2.	Dimethoate	0.03	412.500	281.94	5.287	60.41
3.	Endosulfan	0.07	402.500	272.69	5.026	52.49
4.	Monocrotophos	0.36	393.500	264.35	5.237	58.89
5.	Thiomethon	0.05	351.750	225.69	4.662	41.44
6.	Quinalphos	0.05	342.000	216.67	4.501	36.56
7.	Fluvalinate	0.02	290.750	169.21	4.082	23.85
8.	Cypermethrin	0.002	285.250	164.12	3.930	19.28
9.	Fenvalerate	0.012	280.000	159.26	4.087	24.00
10.	Repelin	0.5	188.250	74.31	3.814	15.72
11.	Neemguard	0.5	174.000	61.81	3.651	10.77
12.	Control	Water spray only	108.000	—		
	S. Em. ±		14.98		0.128	
	C. D. at 5%		48.825		0.369	
	C. V. %		9.82		10.06	

On the basis of yield data recorded (Table 2) it was found that all the treatments proved to be highly significant over control and the treatments of methyl-o-demeton (432.00 kg/ha), dimethoate (412.50 kg/ha), endosulfan (402.50 kg/ha) and monocrotophos (393.50 kg/ha) were found to be superior over other treatments. According to Narke and Suryawanshi (1987), the maximum yield of okra fruits was recorded from the plots treated with monocrotophos 0.04 per cent (7.30 t/ha) and endosulfan 0.05 per cent (6.434 t/ha).

The results of weight of 300 seeds of coriander (Table 2) showed that the methyl-o-demeton 0.03 per cent recorded the

highest weight of 300 seeds of coriander (5.386 g) followed by dimethoate (5.287 g), monocrotophos (5.237 g) and endosulfan (5.026 g). The weight of 300 seeds of coriander was increased by 63.41 per cent in the treatment of methyl-o-demeton followed by dimethoate, monocrotophos, endosulfan, thiometon, quinalphos, fenvalerate, fluvalinate, cypermethrin, repelin and neemguard.

The information on the effect of different insecticides on weight and quality of coriader seeds through control of aphids is lacking. Thus present findings become a source of information for further investigations on control of aphids on coriader to get higher yield of good quality seeds.

ACKNOWLEDGEMENT

The authors are thankful to campus Director, Junagadh Campus. G.A.U., Junagadh and The Principal, College of Agriculture, Junagadh for providing necessary facilities to carry out the investigation. They are also grateful to Common Wealth Institute of Entomology, London for identification service.

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