

Field Evaluation of Some Insecticides Against Stem Fly, *Melanagromyza phaseoli* Coquillete Infesting Green gram, *Vigna radiata* (L) Wilczeck*

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ABSTRACT

Stem fly, *Melanagromyza phaseoli* Coq. is an important pest of green gram during early stages of the crop growth and it considerably reduces the grain yield. Field evaluation studies revealed that 4% seed treatment with carbofuran, phorate and disulfoton were effective in controlling the stem fly in green gram. Among the two granular formulations, phorate, 10G proved better than disulfoton 5G at both the dosages of 1.0 and 1.5 kg. a.i./ha during *kharif* as well as summer seasons.

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INTRODUCTION

Stem fly, *Melanagromyza phaseoli* Coq. is one of the important pests of green gram during the early stages of crop growth. In case of severe infestation, more than 10% of plants are dried up and thus the grain yield is considerably affected. It has been found that summer as well as *kharif* cultivation of this crop badly suffer if adequate plant protection measures are not taken in advance. Saxena *et al.* (1972) reported that basal application of disulfoton granules @ 1.5 kg a.i./ha at the time of sowing the crop is an effective treatment against this pest on summer *moong*. According to Verma and Pant (1975) soil application of phorate @ 1.5 kg a.i./ha at the time of sowing gave significant protection against stem fly, both in *kharif* as well as summer seasons. Ghar and Makson (1960)

reported that seed dressing with 50% phorate or disyston @ 2 and 8 lb/100 lb of seeds gave effective protection against snap bean fly, *Agromyza phaseoli* Coq. for 2-3 weeks after germination. Attempts have been made in this paper to present and discuss the results obtained with some insecticides against this pest in a field testing trial carried out at Indian Agricultural Research Institute, Delhi during 1976-78.

MATERIALS AND METHODS

Replicated experiments were carried out using disulfoton 5G and phorate 10G @ 1.0 and 1.5 kg a.i./ha, 1%, 2% and 4% seed treatments with disulfoton and phorate and 4% seed treatment with carbofuran. PS-7 variety of green gram was sown @ 15 kg/ha with row to row distance of 0.30 m. There were 6 rows of 3.5 m length and the plot size was 3.5 m x 1.8 m.

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Both disulfoton 5G and phorate 10G supplied by M/s. Bayer India Ltd. and M/s. Cynamid India Ltd., respectively were applied in furrows before sowing the seeds. Seed treatments with these chemicals were given by preparing 50% powder in laboratory from technical material received from the manufacturers and the seeds were treated by using white acacia gum as sticking agent. Carbofuran 50 SP supplied by M/s. Rallis India Ltd., was used for treating the seeds.

Total number of plants and the number of plants infested by stem fly were counted in three rows in each plot when the crop was about 4 weeks old and the percentages of plants damaged by the stem fly in various treatments were calculated. The data thus obtained

were subjected to $\text{arc} \sqrt{\sin} =$ angular transformation values and analysed statistically.

RESULTS AND DISCUSSION

Mean values of average percentages of infested plants by stem fly in various insecticidal treatments are presented in Table 1.

Perusal of the data reveals that the average percentage of infested plants by the stem fly during *kharif* 1976 ranged from 1.70 in 4% seed treatment with carbofuran to 13.49 in control. All the insecticidal treatments showed significant effect in controlling the stem fly, however, 4% seed treatment with carbofuran was the best followed by phorate 10G @ 1.5 kg a.i./ha. Soil application with phorate 10G and disulfoton 5G granules were also at par in their effect.

TABLE 1
Percentage infested plants by the stem fly, *Melanagromyza phaseoli* Coq., after 30 days of sowing. (Mean of four replications).

Treatments	Percentage infested plants by stem fly					
	Kharif			Summer		
	1976	:	1977	:	1977	1978
Disulfoton 5 G	—		—		—	8.13
@ 1.0 kg a.i./ha						(17.34)
Disulfoton 5 G	5.68		10.15		6.85	—
@ 1.5 kg a.i./ha	(14.43)		(19.59)		(13.63)	—
1% seed treatment	8.71		—		—	—
with disulfoton	(18.46)					—
2% seed treatment	—		11.58		9.23	—
with disulfoton			(21.09)		(18.30)	—
4% seed treatment	—		—		—	2.23
with disulfoton						(8.20)
Phorate 10 G	—		—		—	2.98
@ 1.0 kg a.i./ha						(10.97)
Phorate 10 G	2.89		4.92		2.19	—
@ 1.5 kg a.i./ha	(10.70)		(13.77)		(7.89)	—
1% seed treatment	6.74		—		—	—
with phorate	(15.48)					—
2% seed treatment	—		10.83		9.69	—
with phorate			(10.85)		(18.59)	2.10
4% seed treatment	—		—		—	(9.05)
with phorate						1.17
4% seed treatment	1.70		2.38		1.78	(5.55)
with carbofuran	(7.02)		(8.89)		(7.18)	12.08
Control (untreated)	13.49		14.61		11.55	(21.53)
	(22.67)		(23.19)		(20.51)	2.18
S. Em.	1.92		0.87		3.34	4.64
C. D. @ 5%	4.08		1.85		7.11	

Note: Figures in parentheses are means of angular transformed values.

Almost similar trend in the results was also observed during *kharif* 1977 but phorate 10G differed significantly with disulfoton 5G and 4% seed treatment with carbofuran.

In the experiment carried out during Summer 1977, 4% seed treatment with carbofuran was significantly superior but the treatment of soil application with phorate 10G and disulfoton 5G @ 1.5 kg a.i./ha also proved equally effective against stem fly infestation. During summer 1978, 4% seed treatment with carbofuran again showed least damage by the stem fly but it did not differ significantly with 4% seed treatment with disulfoton and phorate. There were also non-significant differences among 4% seed treatment with phorate, 4% seed treatment with disulfoton and phorate 10G @ 1.0 kg a.i./ha. Disulfoton 5G @ 1.0 kg a.i./ha and control (untreated) were at par. This indicates that the reduced dose of disulfoton was not effective against the stem fly as compared to the same dosage of phorate 10G.

The results, thus show that the treatments with 4% seed treatment of carbofuran, phorate and disulfoton were more effective in controlling stem fly as

compared to the rest of the treatments. Among the two granular formulation, phorate 10G, proved better than disulfoton 5G. The efficacy of phorate and disulfoton granules and seed treatments with these insecticides are in close agreement with such results reported earlier by various workers (Saxena *et al.*, 1972; Verma & Pant, 1975; Ghar and Makson, 1960). However, the information regarding the bioefficacy of 4% seed treatment with carbofuran, phorate and disulfoton in green gram is a new contribution in this particular field.

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