

Effect of Quinalphos and Certain other Granular Insecticides on Pests of Rice

By

M. DALASUBRAMANIAN¹ and R. K. P. M. MICHAEL²

ABSTRACT

Four granular insecticides were field tested for their efficacy in controlling whorl maggot, stem borer, green leafhopper, leaf roller and brown planthopper on Kannagi rice variety. Quinalphos and Carbofuran were equally effective in controlling green leafhopper, brown planthopper and leaf roller whereas, SAN 155 I 5G 06 was exceptionally good in controlling stem borer. Carbofuran and SAN 197 I 5G 06 were superior in controlling whorl maggot. The grain and straw yields were also increased due to pesticide application.

INTRODUCTION

Granular insecticides are being used to control various pests on crops. To control rice pests, water surface application of granules has been tried by many workers. Pathak *et al.* (1967) found that phorate granule was effective against green leafhopper, brown planthopper and zig-zag leafhopper. Granules of parathion, carbaryl and diazinon were used to control sap feeders on rice (Israel *et al.*, 1968). Carbofuran was found to be very effective in controlling green leafhopper, white leafhopper (Pathak *et al.*, 1970; Venkataraman and Abraham, 1973; Narayanasamy, 1974). Ve'ayutham *et al.*, (1973), Jayaraj *et al.*, (1973) and Rajagurupandian (1975) found that phorate

granules were effective in controlling whorl maggot and stem borers. Since no information is available about the efficacy of quinalphos as granule to control rice pests, a field trial was conducted at Annamalai University Experimental Farm during 1975 with quinalphos (Ekalux 5G) and two other candidate pesticides along with carbofuran (Furadan 3G).

MATERIALS AND METHODS

The insecticides used were quinalphos (Ekalux 5G) at 0.5 kg and 1.0 kg a.i./ha, SAN 155 I 5G 06 at 0.5 kg and 1.0 kg a.i./ha, SAN 197 I 5G 06 at 0.5 kg and 1.0 kg a.i./ha and carbofuran at 1.0 kg a.i./ha against whorl maggot, *Hydrellia sasakii* Yuasa and Isnitani,

1. Professor and Head, Department of Entomology, Tamil Nadu Agricultural University, Coimbatore-641 003. 2. Post-graduate student in Plant Protection, Faculty of Agriculture, Annamalai University, Annamalaiagar-608 101.

stem borer, *Tryporyza incertulas* Walk., green leafhopper, *Nephotettix virescens* Distant, leaf roller, *Cnaphalocrosis medinalis* Guen. and brown planthopper, *Nilaparvata lugens* Stal.

Twenty-three days old Kannagi rice seedlings were transplanted at 2 seedlings per hill at 15 X 10 cm spacing. The trial was conducted on a simple randomized block design of four replications with the plot size of 4 X 5 m.

Assessment of stem borer incidence in per cent was calculated as done by Kamran and Baros (1968). The per cent damage of whorl maggot was estimated in ten hills per plot. Green leafhopper was assessed by a standard net sweeping for five times in each plot. The per cent damage of the leaf roller was estimated as in the case of whorl maggot. Visual observations were made on ten hills to find out the average number of brown planthopper per hill. All observations were made from the tenth day after first insecticidal application. The grain and straw yields were also estimated.

RESULTS AND DISCUSSION

The per cent reduction of whorl maggot infestation from control due to the granular treatments ranged from 18.52 to 61.67 (Table). The maximum reduction was registered with Carbofuran followed by SAN 197 I 5G 06 at 1.0 kg level. SAN 155 I 5G 06 at 1.0 kg level registered 37.84% reduction from control. Except SAN 155 I 5G 06 at 0.5 kg level, all the other treatments significantly reduced the infestation.

All the treatments tried significantly brought down the damage due to stem borer (Table). The per cent reduction from control varied from 42.45 to 87.05. The maximum reduction was observed with SAN 155 I 5G 06 at 1.0 kg level, followed by the same insecticide at 0.5 kg level. Carbofuran at 1.0 kg level reduced the infestation to 56.12% whereas, in quinalphos 5G the per cent reduction varied from 42.45 to 53.24.

In the case of green leafhopper, all the treatments reduced population level significantly from control. The maximum reduction of 69.97% from control was observed with quinalphos at 1.0 kg level. The per cent reduction of green leafhopper with carbofuran 3G was on par with quinalphos.

The granular insecticides applied reduced the infestation of leaf roller from 21.36 to 62.29% from the control. Carbofuran recorded the maximum reduction from control (62.29 %) followed by quinalphos at 1.0 kg level. SAN 197 I 5G 06 at 1.0 kg level reduced the infestation to 45.36% from control while, quinalphos at 0.5 kg level and San 155 I 5G 06 at 1.0 kg level reduced the infestation to 38.75% and 33.83%, respectively.

The incidence of brown planthopper (Table) was found to be significantly reduced by all the granules tried. The per cent reduction varied from 47.31 to 67.14. The maximum reduction was observed with quinalphos at both levels followed by carbofuran, SAN 155 I 5G 06 and SAN 197 I 5G 06.

TABLE. Effect of certain granular insecticides on the infestation by whorl maggot, stem borer, leaf roller, leafhopper and brown planthopper and yield in rice.

Treatment	Whorl maggot + (% incidence)	Stem borer + (% incidence)	Leaf roller + (% incidence)	Green leafhopper + (Population)	Brown plant + hopper (Population)	Grain yield (kg/plot) 20 sq. m.	Straw yield (kg/plot) 20 sq. m.
Quinalphos 5G 1.0 kg a.i./ha	11.58 (18.98)	0.65 (4.39)	2.76 (9.22)	1.00 (1.16)	1.16	5.55	14.13
" 0.5 "	11.73 (19.10)	0.80 (5.11)	3.98 (11.07)	1.25 (1.25)	1.21	7.56	13.65
San 155 I 5G 06 1.0 "	10.07 (17.50)	0.18 (1.36)	4.30 (11.63)	1.42 (1.33)	1.47	8.33	12.63
" 0.5 "	13.20 (20.27)	0.58 (3.66)	5.11 (12.65)	1.67 (1.39)	1.49	7.65	10.58
San 197 I 5G 06 1.0 "	9.20 (16.64)	0.73 (4.87)	3.55 (10.58)	1.75 (1.43)	1.76	9.20	11.48
" 0.5 "	11.06 (18.36)	0.76 (4.99)	5.03 (12.55)	2.08 (1.56)	1.86	7.18	13.48
Carbofuran 3G 1.0 "	6.21 (13.54)	0.61 (3.73)	2.45 (8.86)	1.33 (1.26)	1.27	9.13	13.53
Control	16.20 (22.65)	1.39 (6.70)	6.50 (14.18)	3.33 (1.88)	3.53	6.63	9.93
Significance	*	**	#	***	***	*	*
C. D. (P=0.05)	3.10	1.24	2.53	0.12	0.25	0.91	2.57

** Significant at 1% level

Significant at 5% level

Figures in parentheses are transformed values.

+ Mean of observations recorded on 30, 45 and 60 days after planting.

++ Mean of observations recorded on 30, 45, 60 and 75 days after planting.

All the treatments tried enhanced the yield over control. When quinalphos at 1.0 kg/ha was applied there was 28.98 per cent increase over control and it was on par with SAN 155, SAN 197 at 1.0 kg level and carbofuran.

The increase in the straw yield ranged from 6.55 to 42.29 per cent. Here again, the maximum yield of 7.65 kg/ha was registered with quinalphos at 1.0 kg level which was on par with quinalphos at 0.5 kg level, carbofuran and SAN 197 at 0.5 kg level and SAN 155 at 1.0 kg level.

The results indicate that all the granular insecticides used in this study controlled the pests of rice to a certain extent. Quinalphos and carbofuran were equally effective in controlling green leafhopper, brown planthopper and leaf roller whereas, SAN 155 I 5G 06 was exceptionally good in controlling stem borer. Carbofuran and SAN 197 I 5G 06 were superior in controlling whorl maggot. The effectiveness of carbofuran in controlling white leafhopper, green leafhopper and leaf roller has been reported earlier (Pathak *et al.* 1970; Jayaraj *et al.* 1973; Lakshmanan, 1973; Venkataraman and Abraham, 1973; Narayanasamy, 1974).

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