

Efficacy of Foliar and Water-Surface Application of Insecticides in the Control of Rice Leaf Folder, *Cnaphalocrocis medinalis* Guenee

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Results of three field experiments revealed that foliar sprays of fenitrothion, fenitrothion+DDT, (Folithion combi), carbaryl, carbaryl+molasses (Sevimol) and monocrotophos and granular application of carbosuran are effective in reducing the incidence of the rice leaf folder.

The rice leaf folder, *Cnaphalocrocis medinalis* Guenee is considered serious since it ravages the foliage, making the leaves devoid of chlorophyll and thereby indirectly reducing the yields of rice. Abraham (1958) reported 50 per cent reduction in grain yield due to the infestation of rice leaf folder. Because of the importance of the pest, several insecticides were evaluated against the pest earlier (Chelliah and Subramanian, 1974; Mani and Jayaraj, 1976). Further to these earlier investigations, in the present study certain insecticides were evaluated under field conditions as foliar and granular applications and the results are reported in this paper.

MATERIALS AND METHODS

Three field experiments were laid out in a randomised block design with three replications and the variety Co. 36. In the experiment during August to November, 1973, foliar application of dusts of BHC, DDT and carbaryl and sprays of carbaryl, fenthion and fenitrothion were evaluated in plots of size

4 x 3½ m. The plot size was 5 x 4 m in the two experiments of June to September 1974. In one of these experiments, foliar applications of dusts of BHC, DDT and trichlorphon and sprays of chlorfenvinphos, trichlorphon, carbaryl + molasses (Sevimol), monocrotophos and fenitrothion + DDT (Folithion combi) were evaluated. In the other experiment, granular insecticides of lindane, disulfoton, carbofuran, phorate, chlorfenvinphos, endrin + parathion (Agro-nule), trichlorphon, AC 92100 and diazinon were studied for their efficacy. An untreated control was maintained in all the experiments for comparison. The insecticidal treatments were given four times at 20 days interval starting from 15th day after planting in the experiments with foliar insecticides and two times on 20th and 50th day after planting in the experiment with granular insecticides.

The assessment of incidence was based on the percentage of damaged leaves. In each plot ten hills were selected at random and total number

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of leaves and infested leaves were recorded and percentage worked out. These observations were recorded at weekly intervals starting from a week after first insecticidal treatment. The data on percentage incidence were transformed into corresponding angles ($\text{Arc } \sqrt{\text{Sine percentage}}$) for statistical analysis. The grain yields were also recorded as kg/plot in all the experiments.

RESULTS AND DISCUSSION

Fenitrothion and carbaryl sprays were found to be effective recording 53.3 and 45.0 per cent reduction in the incidence respectively in the experiment during August–November, 1973. In the other experiment conducted during June–September, 1974, foliar sprays of monocrotophos and carbaryl + molasses were found to record respectively 68.7

TABLE. Efficacy of foliar and water surface application of insecticides against rice leaf folder, *Cnaphalocrocis medinalis* Guenee

FIELD EXPERIMENT I (August to November, 1973)			FIELD EXPERIMENT II (June to September, 1974)			FIELD EXPERIMENT II (June to September, 1974)		
Treatments	% leaves damaged	Grain yield (kg/plot)	Treatments	% Leaves damaged	Grain yield (kg/plot)	Treatments @ 1.5 kg a. i/ha	% leaves damaged	Grain yield (kg/plot)
BHC 10% Dust @ 25 kg/ha	17.72 (24.93)	4.53	BHC 10% Dust @ 25 kg/ha	23.21 (28.81)	9.06	Lindane 5%	14.18 (22.18)	9.33
DDT 5% Dust @ 25 kg/ha	17.41 (24.67)	4.17	DDT 5% dust @ 25 kg/ha	22.32 (28.11)	7.43	Disulfoton 5%	17.16 (24.50)	10.17
Carbaryl 5% Dust @ 25 kg/ha	16.56 (24.10)	4.01	Trichlorphon 5% Dust @ 25 kg/ha	24.55 (29.69)	5.27	Carbofuran 3%	8.75 (17.24)	12.93
Carbaryl 0.1%	11.08 (19.43)	5.08	Carbaryl + molas- ses (Sevimol) @ 2.5 kg/ha	8.96 (17.19)	10.53	Phorate 10%	17.58 (24.41)	12.83
Fenthion 0.05%	14.46 (22.39)	5.50	Trichlorphon 0.05%	20.15 (26.67)	7.50	Chlorfenvin- phos 10%	14.49 (22.41)	10.57
Fenitrothion 0.05%	9.41 (17.83)	5.20	Fenitrothion + DDT @ 3 l/ha	10.19 (18.60)	11.63	Endrin 3% + parathion 1%	20.91 (27.23)	6.77
Control (Untreated)	20.17 (26.69)	3.92	Monocrotophos 0.1%	8.66 (17.19)	11.30	Trichlorphan 5%	20.85 (27.16)	5.33
			Phosphanidan 0.1%	18.91 (25.79)	7.53	AC 92100 5%	21.96 (28.03)	6.83
			Chlorfenvinphos 0.05%	17.77 (24.85)	9.83	Diazinon 5%	11.45 (19.81)	13.53
			Control (Untreated)	28.02 (32.01)	5.17	Control (Untreated)	26.97 (31.34)	5.13
Level of sig- nificance	0.05	0.05		0.01	0.01		0.05	0.05
C.D. (P=0.05)	2.27	0.89		3.36	1.45		3.63	1.20

(Figures in parantheses are transformed values)

and 68.0 per cent reduction in incidence from control, followed by fenitrothion + DDT which recorded 63.6 per cent reduction. In the experiment with granular insecticides, carbofuran recorded lowest incidence of 8.75 per cent as against 26.97 in the untreated control. Diazinon, lindane and chlorfenvinphos were also found to be effective recording 11.45, 14.18 and 14.49 per cent incidence, respectively.

The superior efficacy of foliar sprays of carbaryl, carbaryl + molasses, fenitrothion + DDT and monocrotophos in controlling the pest, as revealed from the experiments was found to corroborate with earlier findings (Balasubramanian *et al.*, 1973; Chelliah and Subramanian, 1974; Mani and Jayaraj, 1976). Among the granular insecticides the superior efficacy of carbofuran against rice leaf folder has been reported earlier by Chandramohan and Jayaraj (1976) and Jayaraj *et al.* (1976). The efficacy of chlorfenvinphos has also been reported earlier (Rao *et al.*, 1976).

The results of the experiments reveal that foliar applications of fenthion fenitrothion, fenitrothion + DDT, carbaryl, carbaryl + molasses, chlorfenvinphos and water surface applications of granules of diazinon, carbofuran and phorate increase the grain yields significantly (Table). The increase in grain yields can also be attributed to the control of other major pests of rice. Such cases of increased grain yields due to foliar sprays and water surface application Pathak *et al.*, 1970; Dyck 1974) of these insecticides have been reported earlier.

REFERENCES

- ABRAHAM, E. V. 1958. The rice leaf roller *Cnaphalocrocis medinalis* G. and its control. *Madras agric. J.* 45 : 273-74.
- BALASUBRAMANIAM, G., M. SARAVANA-BHAVANANDAM, and T. R. SUBRAMANIAM. 1973. Control of rice leaf roller, *Cnaphalocrocis medinalis* G. *Madras agric. J.* 60 : 425-27.
- CHANDRAMOHAN, N. and S. JAYARAJ. 1976. Evaluation of certain granular and foliar insecticides against Rice leaf roller, *Cnaphalocrocis medinalis* G. *Madras agric. J.* 63 : 264-66.
- CHELLIAH, S. and A. SUBRAMANIAN, 1974. Efficacy of certain new pesticides in the control of rice leaf folder, *C. medinalis* G. *Pesticides B* : 43-44.
- DYCK, V. A. 1974. Recent advances in the integrated control of insect pests of rice. Paper Presented at International Rice Research Conference at IRRI, Philippines. 12pp.
- JAYARAJ, S., N. CHANDRAMOHAN and R. SANKARANARAYANAN. 1976. Control of stem borer, leaf roller, gall midge through water surface application of granular insecticides. *Madras agric. J.* 63 : 308-11.
- MANI, M. and S. JAYARAJ. 1976. Evaluation of newer insecticides for the control of rice leaf roller *Cnaphalocrocis medinalis* Guenee *Indian J. Pl. Prot.* 4 : 35-39.
- PATHAK, M. D., CALDERAN, I. JOSE and ELYMER VEA. 1970. Insecticidal control of the common insect pests of the rice plant. *IRRI Los Banos Laguna, Philippines.* 56pp.
- RAO, P.R.M., R.C.DANI and P.S. PRAKASA RAO, 1976. Recent studies on the chemical control of rice pests. *Madras agric. J.* 63: (in Press).