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FIELD AND LABORATORY EVALUATION OF INSECTICIDE SPRAYS AGAINST THE RICE LEAF-ROLLER *CNAPHALOCROCISMEDINALIS* GUENEE

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Results of field trials reported on the relative efficacy of insecticides in controlling rice leaf roller *C. medinalis* are highly varying and inconsistent (Rivera, 1956; *Calora*, 1956; Qu, 1957; Abraham, 1958; Rajamma and Das, 1969; Anon, 1970, 1971 and 1972). This may be due to the caterpillars remaining within leaf folds and escaping to varying degrees of contact with the toxicants at the time of application. In the present studies relative toxicity of various insecticidal sprays to the larvae of *C medinalis* while remaining in folds was assessed in the laboratory using a precise spraying technique and also in a field trial.

Materials and Methods

The insecticides used and their doses are given in Table 1. For laboratory evaluation of insecticides, rice seedlings were planted in 23 cm flower pots and the tillers were so thinned as to leave about 30 numbers of fully formed leaves in each pot. Thirty 4th instar caterpillars of *C. medinalis* were put on these plants and permitted to establish themselves on the leaves. The plants in the pots with caterpillars on them were then sprayed with 4 ml each of the insecticide sprays by placing the pots on the platform of a Potter's Spraying Tower. While spraying the platform was being kept revolved using a 0.5 H.P. electric motor. The sprayed plants were allowed to dry in the laboratory and then enclosed within a perforated polythene cage secured at the base of the plant with a twine and closed distally with flame sealing. Mortality counts of the larvae were taken 72 hours after spraying Each treatment was repeated thrice. Control consisted of plants bearing the larvae sprayed with water alone.

Field evaluation of the different insecticide sprays was done in a heavily infested field. The different insecticide sprays were applied in plots of 2m × 2m sepcrated from each other by 1 m wide border of unsprayed plants, The insecticides were applied with a Knapsack sprayer at the rate of 450 1. spray fluid per hectare. Screens were used to prevent drift while spraying. Effect of the spraying was assessed in terms of the reduction in the number of larvae in 200 leaf folds collected from each plot 24 hours before and 48 hours after the spraying and then calculating the reduction percentage.

Table 1

Per cent mortality of the larvae of *C. medinalis* sprayed with different insecticides in laboratory and per cent reduction in the larval population in field caused by the application of these insecticides

Insecticides and concentrations		Per cent larval mortality in Lab. evaluation		Percent reduction in larval population in field	
B. H. C.	0.2	30.24	(33.6)	44.67	(41.93)
Fndrin	0.04	19.42	(20.16)	28.84	(29.89)
Endosulfan	0.04	11.65	(19.95)	15.81	(23.33)
Ethyl parathion	0.04	75.77	(60.52)	72.53	(58.36)
Methyl parathion	0.04	76.69	(61.13)	66.79	(54.81)
Dichlorvos	0.08	42.34	(40.60)	27.54	(31.15)
Carbophenothion	0.04	74.77	(59.85)	67.64	(55.33)
Diazinon	0.04	13.48	(21.53)	20.67	(27.04)
Phenthoate	0.04	39.10	(38.72)	27.11	(31.87)
Fenthion	0.075	66.92	(54 80)	64 20	(53.25)
Malathion	0.56	22.84	(28.55)	15.30	(23.03)
1 eptophos	0.075	63.56	(52.87)	61.07	(51.39)
Acephate	0.075	59.19	(50.29)	45.97	(42.69)
Quinalphos	0.06	61.36	(51.56)	51.26	(45 73)
CarbaryS	0.20	78.76	(62.56)	69 03	(56.19)
Fenitrothion	0.04	67.26	(55.10)	62.23	(52.08)
Trichlorfon	0.10	22.77	(28.50)	24.69	(29.79)
Thiometon	0 05	69.02	(50.18)	40.78	(43.18)
Phosphamidon	0 04	64.75	(53.58)	59.04	(50.21)
Dimethoate	0.05	76.86	(61.25)	64.25	(53.28)
Monocrotophos	0.04	63.36	(52.25)	49.17	(44.53)
Formothion	0.06	71.23	(57.58)	52.44	(46.40)
Phorate	0.04	65.55	(54.06)	57.18	(49.18)
Methyldemeton	0.05	65.80	(54.21)	52.18	(41.25)
Control		Nil		10.94	(19.31)
C. D. at 0.01 per cent level		4.3		7.69	

Figures in parenthesis are angular transformations of percentages.

Results and Discussion

Results of the experiments are given in Table 1. Ethyl parathion carbaryl, carbophenothion, methyl parathion, dimethoate fenthion, fenitrothion and leptophos which gave more than 60 per cent reduction of larval population in field may be treated as very effective in controlling C. *medinalis* caterpillars, the difference among these treatments being statistically insignificant. Phosphamidon, phorate, formothion methyldemeton, quinalphos, monocrotophos, thiometon and acephate which gave 45 to 60 per cent reduction of larval population may be treated as moderately effective, the difference among themselves also being statistically insignificant and the other insecticides may be treated as ineffective against *C. medinalis.*

The percentage reduction in the larval population in the field and per cent kill when sprayed in the laboratory within leaf folds showed strict correspondence while the field reduction did not correspond with the cantact toxicity of these insecticides reported earlier (Das and Nair 1974). Ethyl and methyl parathion which gave high per cent kill of the larvae in leaf folds in field had high contact toxicity also. But endosulfan, diazinon and elsan which had high contact toxicity were ineffective in the field. Carbophenothion, fenthion, leptophos, carbaryl, fenitrothion, thiometon, phosphamidon, phorate and methyl demeton which had low contact toxicity were found effeetive in killing larvae in leaf folds. Obviously the choice of insecticides for field control of *C. medina'is* can be more reliably based on the new precision spraying technique than on the usual bioassay technique.

Summary

Twenty four insecticides were evaluated against the caterpillars of *Cnaphalocrocis medinalis* Guenee in the laboratory using a new laboratory technique of spraying them within leaf folds under a Potter's Tower and in field experiment in which the per cent reduction of larval population caused by spraying was assessed. The results of the two experiments showed strict correspondence. Ethyl parathion, carbaryl, carbophenothion, dimethoate, fenthion fenitrothion and leptophos were found very effective against *C. medinalis* larvae while phosphamidon, phorate, formothion, methyl demeton, quinalphos, monocrotophos, thiometon and *acephate,* were moderately effective.

സംഗ്രഹം

നെല്ലിന്റെ ഓലചുരുട്ടിപുഴുവിനെതിരെ 24 കീടനാശിനികളും പരീക്ഷണശാലയിൽ ഒരു പുതിയ മാർഗ്ഗം അവലംബിച്ചും പാടത്തു് തളിച്ചും പരീക്ഷിച്ചതിൽ രണ്ടിലേയും ഫലങ്ങളും വളരെ സാമ്യമുള്ളതായി കണ്ടു. ഈതയിൽ പാരതയോൺ, കാർബറിൽ, കാർബോ

ഫീനോതയോൺ, മീതയിൽ പാരതയോൺ, ഡൈമിതോയേറേ്, ഫെനിട്രോതയോൺ, ലെപ്റോ ഫോസ് എന്നീ കീടനാശിനികളെ വളരെ നല്ലവയായി കണ്ടു. ഫോസ്ഫമിടാൻ, ഫോറേറേറ്, ഫോർമാതയോൺ, മീതയിൽ സെമിറോൺ, കീനാർ ഫോസ്, മോണോക്രോട്ടോഫാസ്, roicsoocDTffiooosnb, അസിഫേറേ് എന്നിവ സാമാന്യം വിഷാക്തതയുള്ളവയായും ശേഷിക്കുന്ന കീടനാശിനികളെ പ്രയോജനരഹിതമായും കണ്ടു.

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