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CHEMICAL CONTROL OF THE RICE LEAF ROLLER *CNAPHALOCROCIS MEDINALIS* GUEN

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The Rice Leaf roller, *Cnaphalocrocismedinalis,* has assumed the status of a major pest capable of inflicting heavy damage to the rice crop. High yielding dwarf varieties are relatively more susceptible to leaf roller infestation. In the absence of resistant or tolerant varieties the pest is brought under control by applying insecticides. Investigations on the relative efficiency of a wide range of foliar insecticides in controlling *Cnaphalocrocis medinalis* have been carried out by several workers (Abraham, 1958; Das and Nair, 1974; Das and Nair 1976 a, b; Mathan *et al* 1975; Rajamma and Das 1969). The present contribution reports the relative field efficiency of some of the newer insecticides against the leaf roller when applied on a schedule basis.

Materials and Methods

These experiments were conducted in the Rice Research Station, Pattambi during the autumn (June-September) and winter (October-January) seasons of 1974-75 and 1975-76. The treatments included ten insecticides and an unprotected control (Table 1), the design being randomised block with three replications. The test variety was 'Jaya' a medium duration dwarf *Indica* rice. The experimental fields were fertilised with a basal application of N, P and K each at 50 kg per hectare. A spacing of 20 cm x 15 cm was provided between hills. N at 50 kg per hectare was given as top dressing in two split doses at tillering stage and panicle initiation stage. The insecticides were applied twice. The first application was done on the fifteenth day after planting and the second application was carried out at the boot-leaf stage on schedule basis.

The efficiency of the insecticides was evaluated by estimating the percentage of leaves affected in a sample of twenty randomly selected hills during the flowering period which is the hiphly susceptible stage. The data on productive tillers per hill, test weight of 1000 grains and grain yield were also collected and analysed statistically.

Results and Discussion

The results are presented in Table 1. The intensity of incidence of the leaf-roller reached its zenith at the flowering stage of the crop damaging 18.2 per cent of the leaves under unprotected conditions, Leptophos, monocrotophos, quinalphos, ethylparathion, dicrotophos, and carbaryl were equally effective in

controlling the pest, the corresponding infestation percentage values being 1.7, 4 8, 5.4, 6.2 and 6.4 respectively. The protection provided by phosphamidon, fenthion, fenitrothion and BHC was of a lower magnitude and the least effective among these was BHC.

The field efficiency of ethylparathion, carbaryl and leptophos in brining about more than sixty per cent reduction in the fourth instar larval population of C *medinalis* has been reported earlier. Quinalphos and monocrotophos were rated as moderately effective, the extent of larval population reduction being 45—60 percent only (Das and Nair, 1976 a) The present findings are generally in conformity with the previous results. The inefficiency of BHC and phosphamidon against C. *medinalis* is in agreement with the previous findings reported by Rajamma and Das 1959. This is explicable on the basis of, weaker contact action of organochlorines and systemic organo-phosphorous compounds against *C. medinalis* moths (Das and Nair, 1974).

Fenitrothion and fenthion which were found to be effective against the pest (Das and Nair 1976 a) did not reveal appreciable efficiency in the present experiments. In the present experiments, the insecticides were applied on a schedule basis at fifteen days after planting and once again at the booting stage and the percentage infestation was recorded at the flowering stage. It is, therefore, possible that the initial contact toxicity of these two insecticides is reduced at a faster rate due to field weathering of the residues. Das and Nair 1976 b, have already reported the low level of persistence of fenthion and intermediate level of persistence of fenitrothion against first instar larvae of *C. medinalis*.

Leaf roller incidence had no significant influence on productive tillers per hill. It, however, adversely affected the test weight of 1000 grains and grain yield. The unprotected control consistently produced the lowest yield obviously due to reduction in leaf area. Under all the insecticidal treatments the grain yields were significantly higher than under unprotected condition, the mean increment in yield being 24.65 per cent. Leptophos produced the highest yield in all the four seasons recording on an average 35.41 per cent increase over the control. The treatments with monocrotophos, ethyl parathion, quinalphos. and phosphamidon were on par with leptophos in grain yield. The quantum of increase in yield over control recorded by these chemicals were 34.73, 29.53, 28.85 and 27.45 per cent respectively. Fenthion, benzene hexachloride and fenitrothion registered significantly lower yields compared to rest of the chemicals.

Summary

A field trial was conducted in the Rice Research Station, Pattambi for four consecutive seasons in 1974-75 and 1975-76 with a view to study the relative efficiency of ten insecticides against the Rice Leaf roller *Cnaphalocrocis*

Table 1

Percentage incidence of leaf roller, number of predatory spiders per hill, 1000 grain weight and grain yield corresponding to different treatments (Pooled data for 4 seasons)

Common names of insecticides	Trade names and formulations tested	Rate of appln. (Kg a.i/ha)	Percentage incidence of leaf roller*	No. of predatory spiders/hill.	1000 grain wt. (g)	Grain yield (kg/ha)	Percentage increase over control
Benzene hexachloride	BHC 50 WP	0.5	16.6 (24.01)	7.20	27.81	3644	12.78
Carbaryl	Sevin 50 WP	0.5	6.4 (14.71)	7.41	28.92	3984	23.31
Leptophos	Phosvel 34.4 EC	0.25	1.7 (7.49)	7.18	29.35	4375	35.41
Phosphamidon	Dimecron 100 EC	0.25	7.4 (15.77)	7.18	28.47	4118	27.45
Quinalphos	Ekalux 25 EC	0.25	5.4 (13.39)	7.14	29.35	4163	28.85
Monocrotophos	Nuvacron 40 EC	0.25	4.8 (12.67)	7.27	28.57	4353	34.73
Fosthiazate	Lebaycid 1000 EC	0.25	12.2 (20.41)	7.13	28.08	3878	20.02
Dicrotophos	Endrin 24 EC	0.25	6.2 (14.48)	7.15	28.33	3968	22.81
Fenitrothion	Folithion 50 EC	0.25	13.4 (21.43)	7.40	27.70	3605	11.58
Ethyl parathion	Ekalux 50 EC	0.25	5.4 (13.42)	7.24	28.69	4185	29.53
Control			18.2 (25.28)	6.39	27.43	3231	
C.D. at 5%			5.3	N.S.	0.84	324	

(Numbers in parenthesis denote angular values)

* Recorded at flowering stage.

medinalis. Leptophos, monocrotophos, ethyl parathion, quinalphos and dicrotophos applied at 0.25 kg a.i/ha and carbaryl applied at 0.5 kg a.i/ha were highly effective in checking the pest incidence.

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സംഗ്രഹം

പട്ടാമ്പി നെല്ല് ഗവേഷണകേന്ദ്രത്തിൽ 1974-75, 1975-76 എന്നീ വർഷങ്ങളിൽ ഒന്നാം വിളയിലും, rasnsoa വിളയിലും നെല്ലിന്റെ പ്രധാന കീടശത്രുവായ ഓല ചുരുട്ടി പുഴുവിന്റെ നിയന്ത്രണത്തെ ലക്ഷ്യമാക്കി പരീക്ഷണങ്ങൾ നടത്തുകയുണ്ടായി. പത്തു കീടനാശിനികൾ ഉപയോഗിച്ച് നടത്തിയ പരീക്ഷണത്തിൽ ലെപ്റ്റോഫോസ്, മോണോക്രോട്ടോഫോസ്, ഈതൈൽ പാരത്തിയോൺ, ക്വിനൽഫോസ്, ഫോസ്ഫാമിഡോൺ എന്നിവ ഹെക്ടറിന് 0.25 കി.ഗ്രാം വിഷവീര്യത്തിലും കാർബറിൽ 0.5 കി.ഗ്രാം വിഷവീര്യത്തിലും തളിച്ചാൽ ഓല ചുരുട്ടിപ്പുഴുവിനെ ഫല പ്രദമായി നിയന്ത്രിക്കാമെന്നു തെളിഞ്ഞു.

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