

Chemical Control of Blue Leafhopper *Typhlocyba* (*Zygina*) *maculifrons* (M.) in Rice

By

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ABSTRACT

Twelve insecticides were tested as foliar sprays in the control of rice blue leafhopper. Parathion (0.05 per cent), dicotophos (0.05 per cent), monocrotophos (0.10 per cent), orthene (0.30 per cent) and methyl demeton (0.005 per cent) as seed and seedling-dip treatments were effective in combating the jassid.

INTRODUCTION

Leaf hoppers are important pests of rice causing severe damage to high yielding varieties. The blue jassid, *Typhlocyba maculifrons* (M.) assumed serious proportions in recent years. The leaf hopper punctures and sucks the chlorophyll from the lamina, with the result, the infested leaves show transparent wavy lines, (Israel and Misra, 1968). In the present investigation twelve insecticides as foliar application and six insecticides as seed and seedling-dip treatments were evaluated for the control of the blue jassid on rice variety IR 8 under field conditions.

MATERIALS AND METHODS

Two field experiments were conducted, the first during (June—September and the second during (October—January) in 1973–1974 to test the efficacy of insecticides as foliar sprays. The trials were laid out in randomised block design with three replications. The insecticides used

were fenthion, parathion, fenitrothion methyl parathion + DDT, dicotophos, toxaphene + DDT, phosphamidon, quinalphos, endrin, endosulfan, orthene 75 SP (Acephate, Ortho 12420), monocrotophos and fentrothion + DDT. The first round of spraying was given 20 days after transplanting and the other three rounds at fortnightly intervals thereafter. Orthene soluble powder was mixed with sand and applied in between rows of plants on 20th and 60th days after planting. Five weekly counts were made commencing from 20 days after planting.

One field experiment each for seed treatment and seedling-dip treatment was conducted with six insecticides viz., dicotophos, phosphamidan, dimethoate, monocrotophos and methyl demeton each at one concentration, and orthene at 0.1, 0.2 and 0.3 per cent concentration.

In the case of seed treatment, rice seeds were soaked for 24 hours in insecticide solution of specified

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concentrations and sown. In the seedling-dip method, roots of 21 days old seedlings were dipped in specified concentrations of insecticides for 24 hours and transplanted in fields.

RESULTS AND DISCUSSION

Foliar application with pesticides: Although most of the insecticides reduced the population, foliar

sprays of parathion and dicotophos controlled the insect more effectively in the first season of 1973-'47 recording 90.5 and 90.0 per cent reduction in population from control (Table 1). Orthene at 0.3, 0.225 and 0.15 per cent and fenitrothion 0.05 per cent were also effective in minimising the population. The experiment conducted in the second crop season

TABLE 1. Effectiveness of foliar insecticides on the population of Blue leafhopper

FIRST SEASON 1973-1974			SECOND SEASON (1973-1974)		
Treatments	No. of leafhopper 5 sweeps	% decrease from control	Treatments	No. of leafhopper 5 sweeps	% decrease from control
Fenthion 0.10 %	3.00 (1.72)	81.4	Fenthion 0.10%	2.67 (1.72)	66.1
Fenitrothion 0.05 %	2.47 (1.56)	84.7	Fenitrothion + DDT 1 lit./ac	2.54 (1.61)	67.7
Methyl parathion + DDT lit/ac	2.87 (1.72)	82.2	Monocrotophos 0.10%	1.33 (1.14)	83.1
Dicotophos 0.05%	1.60 (1.28)	90.0	Endosulfan 0.05%	2.67 (1.74)	66.1
Toxaphene + DDT 1 lit/ac	4.73 (2.01)	70.7	Parathion 0.05%	1.20 (1.14)	84.8
Phosphamidon 0.10%	4.40 (1.98)	72.7	Orthene 0.15%	2.27 (1.66)	71.2
Parathion 0.05%	1.53 (1.26)	90.5	Orthene 0.225%	2.07 (1.48)	73.7
Quinalphos 0.04%	3.53 (1.78)	78.1	Orthene 0.30%	1.93 (1.43)	75.5
Orthene 0.15%	2.20 (1.49)	86.4	Application in between rows of plants.		
Orthene 0.225%	2.07 (1.43)	87.2	Orthene 0.5 kg a. i/ac	2.07 (1.52)	73.7
Orthene 0.30%	2.07 (1.43)	87.2	Orthene 0.75 ..	2.07 (1.50)	73.7
Control	16.13 (3.98)	—	Orthene 1.0 ..	1.93 (1.46)	75.5
C. D. (P = 0.05)	0.34	—	Control	7.87 (2.93)	—
			C. D. (P=0.05)	0.19	—

(Figures in paranthesis are transformed values)

indicated that parathion and monocrotophos were significantly superior to all other treatments in reducing the population by 84.8 and 83.1 per cent, respectively. Orthene at all concentrations also gave good control (Table 1). Rathinasamy (1972) reported that dicrotophos and methyl demeton sprays were effective against *Typhloeyba maculifrons*. Effectiveness of orthene spray against potato leaf hopper *Empoasca fabae* (Harr.) has also been reported (Anonymous, 1973).

Seed treatment with systemic insecticides: Among the chemicals included, methyl demeton 0.005 per cent and orthene 0.3, 0.2 and 0.1 per cent recorded the mean population of 10.70, 12.25, 13.17 and 13.85 compared to 34.60 in the untreated check. Dimethoate and dicrotophos were also useful while others were less effective (Table 2). These findings on the efficacy of methyl demeton and dicrotophos are in agreement with those reported by Rathinasamy (1972).

TABLE 2. Effect of seed Treatment with systemic insecticides on the incidence of Blue leafhopper (Second season, 1973 - 1974)

Treatments	No. of leafhopper / five sweeps				Mean
	Days after treatment				
	P 1 (7)	P 2 (15)	P 3 (22)	P 4 (30)	
Orthene 0.30%	3.3 (1.9)	5.7 (2.5)	8.3 (3.0)	31.7 (5.7)	12.25 (3.27)
Orthene 0.20%	3.7 (2.0)	5.7 (2.5)	8.3 (3.0)	35.0 (5.9)	13.17 (3.35)
Orthene 0.10%	3.7 (2.0)	6.7 (2.6)	10.0 (3.2)	35.0 (5.9)	13.85 (3.42)
Dicrotophos 0.05%	5.7 (2.5)	6.7 (2.7)	8.7 (3.0)	43.3 (6.6)	16.10 (3.70)
Phosphamidon 0.10%	9.0 (3.1)	8.3 (3.0)	12.3 (3.7)	62.7 (7.8)	23.07 (4.40)
Dimethoate 0.02%	7.0 (2.7)	12.7 (3.6)	10.3 (3.8)	36.7 (6.1)	16.70 (4.05)
Methyl demeton 0.005%	3.0 (1.8)	4.0 (2.1)	8.0 (2.9)	27.7 (5.3)	10.70 (3.02)
Monocrotophos 0.02%	7.0 (2.7)	10.7 (3.2)	14.3 (3.8)	61.7 (7.9)	23.40 (4.40)
Control	16.3 (4.1)	12.0 (4.0)	14.3 (3.8)	95.7 (9.8)	34.60 (5.40)
Mean	6.52 (2.54)	7.96 (2.89)	10.52 (3.35)	47.71 (6.67)	—

Between treatments : Significant at 1% level. C. D. (P = 0.05) = 0.36

Between periods : Significant at 1% level. C. D. (P = 0.05) = 0.27

Intracation between periods and treatments : Significant at 1% level. C. D. (P=0.05) = 0.91.

(Figures in paranthesis are transformed values)

Seedling-dip with systemic insecticides: A reduction of 69.2 per cent in the population was noticed in the methyl demeton treatment. Orthene at 0.3, 0.2 and 0.1 per cent and

dicotophos 0.05 per cent also provided satisfactory control of the leafhopper (Table 3). The efficacy of dicotophos and methyl demeton in seedling-dip against blue leafhopper (Rathinasamy,

TABLE 3. Effect of seedling-dip with systemic insecticides on the population of Blue leafhopper (Second Season, 1973—74)

Treatment	No. of leafhopper / 5 sweeps				Mean
	Days after planting				
	P1 (7)	P2 (15)	P3 (22)	P4 (30)	
Orthene 0.30 per cent	3.0 (1.8)	6.3 (2.6)	11.0 (3.4)	13.0 (3.7)	8.32 (2.87)
Orthene 0.20 per cent	3.7 (2.0)	7.0 (2.7)	12.0 (3.5)	13.7 (3.8)	9.10 (3.00)
Orthene 0.10 per cent	4.0 (2.1)	7.3 (2.7)	14.3 (4.1)	14.3 (3.9)	9.97 (3.20)
Dicrotophos 0.05 per cent	3.3 (1.9)	8.1 (2.9)	10.7 (3.3)	11.0 (3.3)	8.27 (2.85)
Phosphamidon 0.10 per cent	6.7 (2.6)	8.3 (3.0)	21.0 (4.7)	21.0 (4.6)	14.25 (3.82)
Dimethoate 0.02 per cent	6.3 (2.5)	6.3 (2.6)	19.7 (4.5)	11.3 (3.4)	10.90 (3.50)
Methyl demeton 0.005 per cent	3.0 (1.9)	3.3 (1.8)	7.0 (2.7)	10.7 (3.3)	6.00 (2.42)
Monocrotophos 0.02 per cent	11.3 (3.4)	10.0 (3.2)	18.3 (4.3)	20.3 (4.6)	14.90 (3.87)
Control	11.7 (3.5)	12.3 (3.6)	34.0 (5.6)	20.0 (5.5)	19.50 (4.55)
Mean	5.89 (1.80)	7.66 (2.08)	16.63 (3.03)	15.04 (2.92)	— —

Between treatments: Significant at 1 per cent level C. D. ($P=0.05$)=0.31

Between periods: Significant at 1 percent level C. D. ($P=0.05$)=0.24

Interaction between periods and treatments: Significant at 1 per cent level C. D. ($P=0.05$)=0.72

(Figures in paranthesis are transformed values)

1972), and the systemic action of orthene through roots of rice plants against green leafhopper (Anonymous, 1972) have been reported earlier.

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REFERENCES

- ANONYMOUS, 1972. Annual report, International Rice Research Institute, Manila, Philippines. p. 70-73.
- 1973. Experimental data sheet orthene (Ornamentals, Trees and Turfgrass) Feb., 1973.
- ISRAEL, P., and B. C. MISRA. 1968. Occurrence of blue leaf hopper *Typlocyba maculifrons* Motch., on rice. *Curr. Sci.* **73**: 113.
- RATHINASAMY, R. S. 1972. Studies on the use of systemic insecticides in the control of two species of leafhoppers on rice. M. Sc., (Ag.) Dissertation, Tamil Nadu Agricultural University.