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Insecticidal Control of Stem Borer and Gall Midge of Rice

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ABSTRACT

Two experiments were conducted with four granules and eight foliar sprays of insecticides for controlling rice stem borer and gall midge. Among the granular insecticides mephosfolan 0.75 and 0.50 kg a.i./ha applied twice at 25 and 45 days after transplanting were effective in gall midge control. Among the foliar sprays four rounds of either phosphamidon 0.50 kg or endosulfan 0.25 kg a.i./ha controlled the rice stem borer effectively.

INTRODUCTION

Amomg the pests of rice the stem borer, *Tryporyza incertulas* Wlk. and the gall midge, *Pachydiplosis oryzae* Wood-Mason, are considered to be very serious in most of the rice growing areas. In recent years, granular formulations and foliar sprays of pesticides have been reported to protect the crop against these pests. (Pathak, 1967; Ramakrishnan *et al.*, 1972., Chelliah *et al.*, 1975). Some granular and foliar insecticides were tested against the pests in the persent study.

MATERIALS AND METHODS

Two field experiments were conducted at the All India Co-ordinated Rice Improvement Project, Aduthurai with IR 8 rice variety during *kharif* 1973. The treatments included four granules *viz.*, mephosfolan, quinalphos, carbofuran and chlorfenvinphos @0.25, 0.50 and 0.75 kg a.i./ha applied at 25 and 45 DAT. In another experiment, the spray formulations consisting of eight insecticides *viz.*, chlorpyriphos, quinalphos, fenitrothion, leptophos, Mipcin, chlorfenvinphos, phosphamidon and endosulfan each applied at 0.25 and 0.50 kg a.i./ha. The spray formulations were applied four times at fortnightly intervals commencing from 12 DAT. In each experiment, there were three checks: (1) a maximum protection treatment (seedling dip for 14 hr in carbofuran 0.02 per cent followed by the application of mephosfolan at 1 kg a.i./ha at 20, 40 and 60 DAT, (2) local practice spray (parathion at 0.40 kg a.i./ha applied at 18 days after sowing, and 21, 42 and 63 DAT and (3) an untreated control. The treatments were replicated twice. The observations on the incidence of dead hearts, white ears and silver shoots were made based on stratified area sampling technique re-

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TABLE I. Effect of granular insecticides in the control of rice stem borer and gall midge

Treatments	Dose kg a.i. /ha	Mean incidence (Transformed values)							Mean grain yield kg/ha
		Stem borer				Gall midge			
		30th day	50th day	White ear	Mean	30th day	50th day	Mean	
Mephosfolan	0.75	4.74	8.38	10.57	7.90	4.05	3.63	3.84	5701
—do—	0.50	5.88	8.80	12.20	8.96	5.06	6.28	6.12	5496
—do—	0.25	2.85	10.19	14.25	9.09	6.28	7.86	7.07	4246
Quinalphos	0.75	4.22	14.72	12.14	10.36	4.96	20.52	12.74	3951
—do—	0.50	6.54	12.90	12.60	10.68	6.24	18.62	12.43	3919
—do—	0.25	8.82	13.49	14.36	12.24	4.82	22.63	17.72	3760
Carbofuran	0.75	6.03	13.16	12.40	10.53	7.16	19.84	13.50	5173
—do—	0.50	5.44	12.36	12.72	10.17	5.98	20.94	13.46	4930
—do—	0.25	4.38	13.08	13.56	10.67	7.15	25.13	16.14	4370
Chlorfenvinphos	0.75	4.55	7.81	11.11	7.82	7.92	19.95	13.93	4313
—do—	0.50	4.38	13.31	15.92	11.20	7.21	23.88	15.54	4727
—do—	0.25	5.88	10.72	10.36	8.99	3.15	21.03	12.09	4705
Maximum protection	—	4.22	8.10	10.56	7.62	7.26	7.21	7.23	5695
Local practice spray	—	6.42	12.25	10.18	9.62	6.89	24.29	15.59	1189
Untreated control	—	6.42	13.64	10.60	10.22	4.03	22.98	13.50	3882
C.D. for stage (P=0.05)					—			1.35	—
C.D. for treatment					—			3.69	629.0

TABLE II Effect of spray applications in the control of rice stem borer and gall midge

Treatment	Dose kg a.i./ ha	Mean incidence (Transformed values)							Mean grain yield in kg/ha
		Stem borer				Gall midge			
		30th day	50th day	White ear	Mean	30th day	50th day	Mean	
Chlorpyriphos	0.50	5.41	16.58	15.15	12.38	5.96	27.92	16.14	4661
—do—	0.25	0.57	15.64	17.32	11.18	4.96	25.96	15.46	3620
Quinalphos	0.50	3.21	15.28	18.17	12.42	4.21	32.43	18.32	3848
—do—	0.25	6.08	15.51	20.24	13.61	7.90	25.77	16.83	5656
Fenitrothion	0.50	4.25	10.50	14.23	9.66	7.18	20.08	13.67	4018
—do—	0.25	5.41	13.87	19.91	16.07	7.30	31.10	19.20	3228
Leptophos	0.50	5.33	13.51	15.20	11.35	7.50	32.30	19.90	3345
—do—	0.25	4.38	11.23	11.33	8.98	6.92	31.88	19.40	4219
Mipsin	0.50	2.28	13.44	14.37	10.22	7.58	24.83	16.21	4125
—do—	0.25	3.63	13.21	18.11	11.65	5.57	22.56	14.07	4741
Chlorfenvinphos	0.50	2.10	12.90	14.53	9.85	8.16	27.83	17.99	3407
—do—	0.25	4.38	13.37	19.90	12.55	6.20	28.69	17.44	3213
Phosphamidon	0.50	4.21	11.64	7.13	7.66	4.58	22.70	13.64	4145
—do—	0.25	5.54	14.53	13.23	11.15	4.96	21.83	13.39	3545
Endosulfan	0.50	6.31	11.79	17.22	11.77	5.54	21.96	13.75	4646
—do—	0.25	2.10	17.60	9.86	9.85	7.78	20.97	14.38	5779
Maximum protection	—	4.38	19.81	10.78	8.99	6.15	21.31	13.73	5724
Local practice spray	—	2.10	12.75	9.18	8.27	6.02	29.46	17.74	4070
Untreated control	—	5.77	12.98	12.57	10.44	6.15	24.94	15.55	3481
C.D. for stage (P=0.05)					1.59			2.14	—
C.D. for treatment (P=0.05)					3.48			—	1493

presenting 2 per cent of the plant population. The stem borer and gall midge incidence were recorded at 30 and 50 DAT while the white ear incidence was recorded at the time of harvest. The grain yields in each plot were recorded.

RESULTS AND DISCUSSION

There was no significant difference among the granular treatments in reducing the stem borer incidence. However they were effective in controlling the gall midge incidence. On 30th day the lowest incidence was recorded in chlorfenvinphos 0.25 kg a.i./ha while the effect was more pronounced on 50th day in mephosfolan 0.50 kg a.i./ha treatment (Table I). The overall effect of mephosfolan was more pronounced indicating the effectiveness both at 0.75 and 0.50 kg a.i./ha. With regard to yield, mephosfolan 0.75 kg a.i./ha recorded the maximum yield which was also on a par with its 0.50 kg a.i./ha dose.

Among the foliar sprays phosphamidon 0.50 kg a.i./ha recorded the lowest incidence of stem borer and was on a par with leptophos 0.25 kg a.i./ha (Table II). There was no significant difference between the treatments with regard to the gall midge incidence. Endosulfan 0.25 kg a.i./ha recorded the highest yield although it was on a par with other treatments.

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