

Efficacy of some insecticides and fungicides as tank mix against rice blast and whorl maggot

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ABSTRACT

Two fungicides viz., tricyclazole (Sivic 75 WP) and iprobenphos (Kitazin 48 EC) @ 0.06 % and 0.2%, respectively and two insecticides viz., indoxacarb (Indoxacarb 15 EC) and cartap hydrochloride (Caldan 50 SP) @ 0.006% and 0.08%, respectively were evaluated as separate treatments as well as in all fungicide – insecticide combinations for their efficacy against blast and whorl maggot and to investigate their compatibility as tank mix application for the purpose of reducing the application cost in the event of simultaneous occurrence of blast and whorl maggot. Insecticides viz., cartap hydrochloride (Caldan 50 SP) and indoxacarb (Indoxacarb 15 EC) were effective against whorl maggot and fungicides viz., tricyclazole (Sivic 75 WP) and iprobenphos (Kitazin 48 EC) were effective against rice blast. There was no reduction in the efficacy of these insecticides and fungicides when used as tank mix combination and phytotoxicity symptoms were not observed in any of the treatments. Thus all the insecticides and fungicides used in the present investigation are compatible with each other and can be safely used as tank mix combinations for the control of rice pests.

Key words: Insecticides, fungicides, compatibility, whorl maggot, rice blast

Occurrence of diseases and insect pests together demands the necessity of fungicidal and insecticidal application at the same place and time. In many endemic areas, blast, whorl maggot and leafhopper occur at the same stage of crop growth. Therefore, a combined application of effective blasticides and insecticides is a practical necessity. In view of this, an experiment was constituted with effective Fungicides like tricyclazole (Sivic 75 WP) and iprobenphos (Kitazin 46 EC) (Joshi and Mandokhot, 2002) alongwith the effective insecticides like cartap hydrochloride (Caldan 50 SP) and indoxacarb (Indoxacarb 15 EC) (Sachan et al., 2006) to find their efficacy on blast and insect pests like whorl maggot, as well as the compatibility of the test fungicides and insecticides.

The experiments were conducted during the wet seasons of 2006 and 2007 in Randomized Block Design. Two fungicides viz., tricyclazole (Sivic 75 WP) and iprobenphos (Kitazin 48 EC) @ 0.06% and 0.2%, respectively and two insecticides viz., indoxacarb (Indoxacarb 15 EC) and cartap hydrochloride (Caldan 50 SP) @ 0.006% and 0.08%, respectively were included as separate treatments. In addition, the

fungicides and the insecticides in all fungicide – insecticide combinations were also involved as independent treatments. An untreated control was also maintained for comparison. All the nine treatments were replicated thrice. The test variety was HPR 957. The transplanting was done during third week of July and crop was sprayed at 30 DAT, 50 DAT and 70 DAT depending upon the initial disease symptoms/ insect damage and the subsequent pest pressure. The data on leaf blast and incidence of whorl maggot were recorded by following standard procedures during 10th to 12th September and observations on neck blast were recorded on 8th to 10th October. The infestation of insect pests and disease prevalence data were subjected to statistical analysis after square root transformation.

During wet season 2006, the leaf blast incidence data revealed that the two fungicides recorded significantly lower leaf blast incidence (6.7 and 11.7%) than the untreated control (36.7 %) (Table 1). Dubey, 2000 reported that the spray schedule Beam (tricyclazole, 0.03%)- Indofil M-45 (mancozeb, 0.2%)-Beam (0.03%) proved more efficacious with minimum neck blast and node infection and disease intensity.

Table 1. Efficacy and compatibility of some insecticides, fungicides and their tank mix combinations against rice blast and whorl maggot.

Treatments	Dosage/ L Water (% Conc.)	2006						2007						Grain Yield (kg ha ⁻¹)	
		Leaf blast severity(%)		Neck blast incidence (%)		Whorl maggot % DL		Leaf blast severity(%)		Neck blast incidence (%)		Whorl maggot % DL			
		ST	O	ST	O	ST	O	ST	O	ST	O	ST	O		
Sivic 75 WP (0.06%)	0.6 g	2.7	6.7	2.4	5.9	4.3	18.2	4343	2.5	5.7	1.4	1.5	4.3	17.7	3685
Kitazin 48 EC (0.2%)	2.0 ml	3.5	11.7	2.3	5.4	4.3	18.4	4639	3.7	13.3	1.8	2.9	4.4	18.5	3009
Indoxacarb 15 EC (0.006%)	0.4 ml	5.0	25.0	3.9	15.0	3.4	11.4	4657	6.4	40.0	3.6	12.8	3.4	10.9	3796
Caldan 50 SP (0.08%)	1.6 g	5.7	31.7	3.9	15.4	3.6	13.1	4519	6.0	35.0	3.6	12.5	3.6	12.4	3213
Sivic 75 WP + Indoxacarb 15 EC (0.06%)+ 0.4 ml (0.006%)	0.6 g	2.7	6.7	2.2	5.0	3.5	11.9	4694	2.3	5.0	1.5	1.7	3.6	12.6	3472
Sivic 75 WP + Caldan 50 SP (0.06%)+ 1.6 g (0.08%)	0.6 g	3.2	10.0	2.2	4.7	3.7	13.7	4824	2.8	7.7	1.5	1.8	3.7	13.2	4009
Kitazin 48 EC + Indoxacarb 15 EC (0.2%)+ 0.4 ml (0.006%)	2.0 ml	3.9	15.0	2.2	4.7	3.6	13.4	4537	3.9	15.0	1.9	3.3	3.8	13.6	3852
Kitazin 48 EC + Caldan 50 SP (0.2%)+ 1.6 g (0.08%)	2.0 ml	4.1	16.7	2.1	4.2	3.5	12.4	4543	3.7	13.3	1.8	2.8	3.5	11.9	3963
Check	Un-treated	6.1	36.7	4.1	17.7	4.6	21.5	4102	6.5	41.7	3.7	13.6	4.9	23.9	3176
CD (P=0.05)	-	0.99	0.54	0.40	ns	0.68	0.69	0.13	993.3						

Dubey, 2005 observed KTU- 3616 to be most effective fungicides for blast management followed by Beam (tricyclazole). The insecticide treatments exhibited leaf blast incidence (25.0 and 31.7 %) similar to untreated control. The combination treatments with Sivic 75 WP + Indoxacarb 15 EC (6.7 %) and Sivic 75 WP +Caldan 50 SP (10 %) were at par with Sivic 75 WP (6.7 %) , while Kitazin 48 EC + Indoxacarb 15 EC (15%) and Kitazin 48 EC + Caldan 50 SP (16.7 %) exhibited the leaf blast incidence similar to independent Kitazin 48 EC treatment (11.7 %) and significantly better than untreated control (36.7 %). The results on neck blast incidence also showed more or less similar trend. This confirms that the fungicides and the insecticides involved in the trial are compatible in all fungicide insecticide combination from the point of blast management.

The whorl maggot data revealed that the two insecticides Indoxacarb and Caldan recorded significantly lower whorl maggot incidence (11.4 to 13.1 %) than untreated control (21.5 %). The treatments involving fungicide spray only recorded whorl maggot incidence (18.2 to 18.4 %) similar to untreated control (21.5 %). However, the combination treatments also registered whorl maggot incidence (11.9 to 13.7 %) at par with insecticide treatments (Table 1). This revealed that the insecticides and fungicides utilized in this trial are compatible for the management of insect pests. Phytotoxicity symptoms were not observed in any of the treatments which indicated the positive compatibility of the chemicals evaluated. Prajapati et al., 2005 found that insecticide triazophos (20 EC @ 0.02%) alone or tank mixed with fungicides carbendazim (50 WP @ 0.05%) and tricyclazole (75 WP @ 0.04%) was effective in controlling leaf folder damage as compared to untreated control. They were at par and compatible with each other.

During wet season 2007, leaf blast severity was moderate (41.7%), while incidence of neck blast was low (13.6%). Sivic and Kitazin recorded 5.7 to 13.3% leaf blast and 1.5 to 2.9% neck blast compared to untreated control (41.7% leaf blast and 13.6% neck blast) revealing that the fungicides were clearly effective against both the stages of blast. The combination treatment involving the fungicides and the insecticides recorded 5.0 to 15.0% leaf blast and 1.7 to 3.3% neck blast (Table 1), revealing that the combinations did not in any way lower the effectiveness

of the fungicides against leaf blast and neck blast.

Whorl maggot damage was moderate (23.9% damaged leaves) at this location. The insecticide treatments recorded (10.9 to 12.4% damaged leaves). The combination treatments were also as effective as insecticide treatments registering 11.9 to 13.6 % damaged leaves compared to 23.9% damaged leaves in untreated check plots. Thus, the effectiveness of the two insecticides viz, Indoxacarb and Caldan did not in any way get hindered by mixing with the fungicides. The differences in grain yield are statistically significant and fungicide-insecticide combinations were superior to untreated control.

The overall results revealed that tank mixing of fungicides with insecticides involved in the present studies did not reduce the efficacy of the fungicides against rice blast and that of insecticides against whorl maggot. Hence, they are compatible with each other for spray application to control the rice pests. These findings are in conformity with the findings of Bhatnagar (2004) that the combination of cartap (Padan 50 WP) and tricyclazole (Beam 75 WP) was effective in reducing the damage by rice leaf folder and blast and was found to be compatible.

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