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Compatibility of insecticides and fungicides for the control of whorl maggot, *Hydrellia philippina* Ferino and rice blast, *Pyricularia oryzae*

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ABSTRACT

Field experiments conducted during 2007 indicated that flubendiamide and spinosad were effective against whorl maggot with 11.04 and 12.38 percent damaged leaves as compared to 24.0 percent in the untreated control. Similarly during 2008, the leaf damage by whorl maggot was 8.98% in flubendiamide treated plots and 8.20% in spinosad treated plots as against 23.07% in untreated control. The whorl maggot damage in fungicidal treatments viz. isoprothiolane and carpropanid was 17.47 and 21.00% respectively and at par with untreated control (23.07%DL). Fungicides viz., isoprothiolane and carpropamid significantly reduced the leaf blast severity to the tune of 4.74 and 4.06 percent, respectively during 2007. Similar trend was also observed during 2008. The reduction in percent leaf blast severity was highly significant in fungicide and insecticidal combinations.

***Key words**: efficacy, compatibility, insecticides, fungicides, rice blast, whorl maggot*

In a number of rice growing areas in Himachal Pradesh, the incidence of blast, whorl maggot and leaf folder is observed at the same stage of crop growth. The occurrence of insect pests and diseases together demands the necessity of fungicide and insecticide applications at the same time. Therefore, a combined application of effective fungicides and insecticides is a practical necessity. The present investigation was undertaken to find out the efficacy as well as the compatibility of insecticides and fungicides for the control of rice pests.

The experiments were conducted on rice cv. HPR 1068 in randomized block design with three replications during 2007 and 2008 at Rice and Wheat Research Station, Malan to work out the efficacy of insecticides viz., flubendiamide 20 WDG @ 25 g a.i. ha^{-1} and Spinosad 45 SC @ 56 g a.i. ha^{-1} against whorl maggot and two fungicides viz., isoprothiolane 40 EC @ 300 g a.i.ha^{-1} and carpropamid 45 EC @ 225 g a.i. ha^{-1} for rice blast under field conditions. The combinations of insecticides and fungicides were also included in the experiments. The foliar spray of all the treatments at above mentioned doses was done at 10 and 18 days after transplanting (DAT) during 2007 and 2008, respectively depending upon the first appearance of whorl maggot.

During 2007, the damage by whorl maggot was significantly lower in the insecticide and insecticide-fungicide combination treatments. Flubendiamide 20 WDG @ 25 g a.i. ha^{-1} and Spinosad 45 SC @ 56 g a.i. ha^{-1} resulted in 11.04 and 12.38 percent damaged leaves as compared to 24.0% in the untreated control. Similarly during 2008, the leaf damage by whorl maggot in flubendiamide treated plots was to the extent of 8.98% and 8.20% in spinosad treated plots as against 23.07% in untreated control (Table 1). The whorl maggot damage in fungicidal treatments viz. isoprothiolane 40 EC @ 300 g a.i. ha^{-1} and carpropamid 45 EC @ 225 g a.i. ha^{-1} was 17.47 and 21.00%, respectively which was at par with untreated control (23.07%). The present study indicated that the insecticide treatments as well as insecticide-fungicide combination treatments significantly reduced the damage by whorl maggot.

Application of fungicides viz., isoprothiolane and carpropamid significantly reduced the leaf blast severity to the tune of 4.74 and 4.06 percent, respectively during 2007. The reduction in blast severity was 1.67 and 1.40 percent in isoprothiolane and

Table 1. Influence of different insecticides, fungicides and their combination treatments on whorl maggot infestation and blast severity.

Insecicide/ Fungicide	Dosage (g a.i. ha^{-1})	Whorl maggot (% damaged leaves)		Blast (% disease severity)		Grain yield (t ha^{-1})	
		2007	2008	2007	2008	2007	2008
Flubendiamide RIL 038 20 WDG	25	11.04 (3.45)	8.93 (3.15)	16.34 (4.16)	10.17 (3.34)	3.91	4.63
Spinosad 45 SC	56	12.38 (3.65)	8.20 (3.03)	16.79 (4.22)	10.43 (3.38)	4.16	4.52
Isoprothiolane 40 EC	300	19.44 (4.52)	17.47 (4.28)	4.03 (2.24)	1.67 (1.63)	3.91	4.77
Carpropamid 45 EC	225	19.43 (4.52)	21.00 (4.69)	4.74 (2.75)	1.40 (1.55)	3.77	4.44
Flubendiamide + Isoprothiolane	25 + 300	13.00 (3.74)	10.40 (3.37)	4.06 (2.23)	1.10 (1.44)	4.11	4.63
Flubendiamide + Carpropamid	25 + 225	16.13 (4.14)	10.83 (3.42)	4.54 (2.34)	1.27 (1.51)	4.05	4.69
Spinosad + Isoprothiolane	56 + 300	16.10 (4.13)	11.23 (3.48)	5.11 (2.42)	1.50 (1.58)	4.05	4.69
Spinosad + Carpropamid	56 + 225	13.77 (3.83)	11.93 (3.59)	5.94 (2.62)	1.33 (1.52)	3.91	4.69
Untreated control	-	24.00 (4.99)	23.07 (4.90)	20.31 (4.61)	10.97 (3.46)	3.36	4.33
CD (5%)	-	(0.44)	(0.52)	(0.35)	(0.15)	NS	0.24

Figures in parentheses are square root transformed values.

carpropamid treated plots, respectively during 2008 (Table 1). The reduction in percent leaf blast severity was highly significant in fungicide and insecticidal combinations. However, the leaf blast severity in insecticidal treatments was quite high and comparable to the severity in untreated control i.e. 20.31 and 10.97 percent during 2007 and 2008, respectively. The yields in all the insecticidal and fungicidal treatments were higher as compared to untreated control during 2007 and 2008. Ali and Bhat (2005) found that seed treatment with isoprothiolane and tricyclazole was effective and the crop in such treated plots was not infected by rice blast up to 35 days of sowing. Dubey (2005) observed that carpropamid was the most effective fungicide for blast management, with minimum neck (1.1%) and node infections (1.7%).

The results indicated that tank mixing of fungicides with insecticides involved in the present study did not reduce the efficacy of insecticides against whorl maggot and fungicides against rice blast indicating their compatibility.

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