

Field evaluation of new insecticides and combinations against rice whorl maggot, *Hydrellia philippina* and leaffolder, *Cnaphalocrocis medinalis*

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ABSTRACT

The efficacy of new insecticides and combinations viz., Bifenthrin (10 EC), Flubendiamide 36% + Fipronil 30% (66 WG), Imidacloprid 40% + Ethiprole 40% (80 WG) and Monocrotophos (Check) (36 WSC) @ 10, 33, 100 and 500 g a.i. ha⁻¹, respectively against major insect pests of paddy viz., whorl maggot and leaffolder during wet seasons of 2007 and 2008 evaluated at the Rice and Wheat Research Centre, Malan revealed that Flubendiamide + Fipronil @ 33g ai ha⁻¹ was found to be effective for the control of leaffolder with 1.95 % damaged leaves (DL) as against 10.66 % DL in untreated control. Bifenthrin was found promising against whorl maggot (3.21 % DL) followed by Imidacloprid + Ethiprole (3.41 % DL) and Flubendiamide + Fipronil combination (3.58 % DL) as compared to untreated control (13.65 % DL).

Key words: rice, whorl maggot, leaffolder field evaluation, insecticides

The insect-pests viz., whorl maggot, *Hydrellia philippina*, leaffolder, *Cnaphalocrocis medinalis* and hispa, *Dicladispa armigera* are the major pests of rice in Himachal Pradesh. As the use of insecticides to control the insect-pests in times of sudden outbreaks is one of the components of IPM, some of the newer compounds were evaluated for their efficacy against different insect-pests.

Field experiments in randomized block design were laid out to investigate the efficacy of new insecticides against major insect pests of paddy viz., whorl maggot and leaf folder during wet seasons of 2007 and 2008 at Rice and Wheat Research Centre, Malan. The experiments were conducted involving five treatments including untreated control in three replications. The insecticides and combinations viz., Bifenthrin(10 EC) @ 50g a.i. ha⁻¹, Flubendiamide 36% + Fipronil 30% (66 WG) @ 33g a.i. ha⁻¹, Imidacloprid 40% + Ethiprole 40% (80 WG) @ 100g a.i. ha⁻¹, and Monocrotophos (Check) (36 WSC) @ 500g a.i. ha⁻¹ were evaluated for their efficacy against paddy pests. These insecticides were sprayed at 15 days after transplanting (DAT) and thereafter, at 45 DAT. The data on number of total leaves and whorl maggot damaged leaves in 10 randomly selected hills per plot were recorded after 20 days of first spray whereas

similar data on leaf folder damaged leaves and total leaves were recorded after 20 days of second spray. The data so obtained were statistically analyzed.

The results indicated that the damage by leaf folder and whorl maggot was significantly reduced in all the insecticide and combination treatments as compared to untreated control (Table 1). Bifenthrin proved to be the most effective insecticide for the control of whorl maggot with 2.19 and 4.23 % damaged leaves (DL) during 2007 and 2008, respectively as compared to 11.41 and 15.90 % DL in untreated control. Flubendiamide+Fipronil was found to be the most efficacious insecticide for the control of leaffolder with 1.71 and 2.19 % DL as against 10.65 and 10.67 % DL in untreated control during 2007 and 2008, respectively followed by Bifenthrin (2.29 and 2.34 % DL).

The pooled data is supported by the findings of the individual seasons. Flubendiamide+Fipronil @ 33g ai/ha was found to be effective for the control of leaf folder (1.95 % DL) as against 10.66 % DL in untreated control followed by Bifenthrin (2.34 % DL), Imidacloprid+Ethiprole (2.77 % DL), and Monocrotophos (3.68 % DL). Confidor Ultra 100 EC (imidacloprid 50 g + beta-cyfluthrin 50 g) @ 30 g a.i. ha⁻¹ and Bulldock 025 SC (beta-cyfluthrin) @ 12.5 g

Table 1. Effect of insecticide treatments on incidence of insect pests

| Common Name | Doseg a.i. ha ⁻¹ | Whorl maggot % damaged leaves | | | Leaffolder % damaged leaves | | | Grain yield (t ha ⁻¹) | | |
|---|--------------------------------|-------------------------------|-----------------|-----------------|-----------------------------|-----------------|-----------------|-----------------------------------|------|------|
| | | 2007 | 2008 | Pool | 2007 | 2008 | Pool | 2007 | 2008 | Pool |
| Bifenthrin (10 EC) | 50 | 2.19 (1.78) | 4.23 (2.29) | 3.21 (2.03) | 2.39 (1.79) | 2.29 (1.81) | 2.34 (1.80) | 3.83 | 4.70 | 4.26 |
| Flubendiamide 36% + Fipronil 30% (66 WG) | 33 | 2.43 (1.84) | 4.73 (2.39) | 3.58 (2.12) | 1.71 (1.64) | 2.19 (1.78) | 1.95 (1.71) | 3.87 | 4.89 | 4.38 |
| Imidacloprid 40% + Ethiprole 40% (80 WG) | 100 | 2.38 (1.83) | 4.43 (2.33) | 3.41 (2.08) | 2.91 (1.97) | 2.63 (1.90) | 2.77 (1.93) | 3.81 | 4.65 | 4.23 |
| Monocrotophos (Check) (36 WSC) | 500 | 2.77 (1.94) | 5.67 (2.58) | 4.22 (2.26) | 4.23 (2.29) | 3.13 (2.03) | 3.68 (2.16) | 3.86 | 4.76 | 4.31 |
| Untreated control | - | 11.41 (3.52) | 15.90 (4.11) | 13.65 (3.82) | 10.65 (3.41) | 10.67 (3.41) | 10.66 (3.41) | 3.58 | 4.42 | 4.00 |
| CD (P=0.05) | | 0.28 | 0.14 | 0.14 | 0.39 | 0.21 | 0.20 | NS | 0.26 | 0.22 |

%DL = per cent damaged leaves; LF= Leaffolder; WM= Whorl maggot
Figures in parentheses are square root transformed means

a.i. ha⁻¹ have been reported equivalent in efficacy compared to Nuvacron @ 500 g a. i. ha⁻¹ against leaf folder by Sharma (2008). Bifenthrin was found promising against whorl maggot (3.21 % DL) followed by Imidacloprid + Ethiprole (3.41 % DL) and Flubendiamide + Fipronil combination (3.58 % DL) as compared to untreated control (13.65 % DL)(Table 1). Kalita (2007) reported that imidacloprid (Confidor 200 SL) @ 25g a.i. ha⁻¹ was at par with standard check monocrotophos in reducing population of whorl maggot. Fipronil was reported to be effective against leaffolder by Huang *et al.*, 2005.

The insecticides and combinations of insecticides evaluated in the present studies proved statistically at par with the check insecticide, monocrotophos but were significantly superior to the untreated control for the control of whorl maggot and leaffolder. Therefore, these newer compounds viz., Bifenthrin (10 EC) @ 50g a.i. ha⁻¹, Flubendiamide 36% + Fipronil 30% (66 WG) @ 33g a.i. ha⁻¹, and Imidacloprid 40% + Ethiprole 40% (80 WG) @ 100g

a.i. ha⁻¹, being effective against whorl maggot and leaffolder can be used for the successful control of these rice insect pests.

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