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Short Note

Evaluation of some new fungicides for the management of neck blast in rice (*Oryza sativa* L.)

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Abstract

A field experiment to know the efficacy of some new fungicides against neck blast was conducted at Rice and Wheat Research Centre, Malan (HP) during *Kharif* 2014. New combination product of tricyclazole 18% + mancozeb 62% (MERGER) was found quite effective resulting in 72.6 per cent reduction in disease incidence over control, while application of tricycalzole 75 WP alone reduced neck blast incidence by 69.2 per cent. Another combi-fungicide, ICF-110 (tricyclazole 45% + hexaconazole 10% WG) also resulted in significant reduction (67.8%) in neck blast incidence over control. Also, the new molecules i.e. MERGER and ICF-110 significantly enhanced the grain yield as compared to rest of the fungicides with 192.5 and 176.1 per cent increase in grain yield over control.

Key words: Neck blast, incidence, evaluation, fungicides, rice.

Rice blast disease caused by *Magnaporthe oryzae* (anamorph: *Pyricularia oryzae*) is the most serious constraint in all the rice ecosystems of the country. In Himachal Pradesh also, it has been observed in moderate to severe forms (POS, 2001-2015) in humid temperate areas and mid hills incurring huge losses to the yield. Of the two phases of blast disease, neck blast is the most destructive phase throughout globe and is more detrimental to rice yield (Laha *et al.* 2016). Keeping in view high variability in the pathogen and existence of several races across the country (Muralidharan 2006), identifying sources of resistance will remain an unending task besides risk of fungicides resistance. Hence, continuous efforts are required to identify effective and safe molecules to combat ravages caused due to this disease. The present study was, therefore, undertaken to evaluate new molecules effective against neck blast.

A replicated field trial was conducted during kharif 2014 in randomized block design using a susceptible variety 'HPU 2216'. Fungicides namely, ICF-110 (tricyclazole 45% + hexaconazole 10% WG), MERGER (tricyclazole 18% + mancozeb 62% WP), Beam (tricyclazole 75 WP), Hexaconazole 5% EC, Mancozeb 75% WP , Companion (mancozeb 63% + carbendazim 12% WP) and Bavistin (carbendazim 50 WP) including untreated control were evaluated for their efficacy against neck blast. Fertilizers were applied as per CSKHPKV recommendations except nitrogen which was supplied in excess (120 kg/ ha) to ensure higher blast incidence. In all, two sprays were applied on 2nd and 17th September, 2014 at booting and milk stages, respectively. Observations on neck blast incidence were recorded a week before harvest by counting the infected over total panicles from 3 sampling units of 1 x 1 m area in each plot in case of neck blast. The grain yield was recorded on plot basis and was converted to q/ha.

A perusal of the data revealed that all the fungicides significantly reduced the disease as compared to control during kharif 2014 (Table 1). Of these, MERGER (tricyclazole 18% + mancozeb 62% WP) resulted in maximum (72.6 %) reduction in neck blast with 21.6% incidence and was followed by Beam (tricyclazole 75 WP; standard check fungicide) and ICF-110 (tricyclazole 45% + hexaconazole 10%) resulting in 69.2 and 67.8 reduction in neck blast incidence, respectively. Carbendazim (41.1%) was next in order of efficacy. Hexaconazole 5% EC, Mancozeb 75% WP and Companion (mancozeb 63% + carbendazim 12% WP) showed poor efficacy against neck blast but were

significantly superior over control. Significantly highest grain yield (19.6 q/ ha) of rice was recorded with the application of MERGER (tricyclazole 18% + mancozeb 62% WP) followed by ICF-110 (tricyclazole 45% + hexaconazole 10%; 18.5 q/ ha) resulting in 192.5 and 176.1 per cent higher yield, respectively as compared to the control which gave significantly lowest yield (6.7 q/ ha). Of the other fungicides tested, Beam (tricyclazole 75 WP) and Bavistin (carbendazim 50 WP) performed better, both giving grain yield of 16.7 q/ ha which was 149.2 per cent higher than the control. Efficacy of tricyclazole, carbendazim and strobilurins against blast has also been reported earlier (Singh *et al.* 2004 & 2010; Srinivas Prasad *et al.* 2011, Upmanyu and Rana 2012). Efficacy of these two new combination products is due to tricyclazole as one of the constituents. Use of tricyclazole, a melanin biosynthesis inhibitor has been advocated by Yamaguchi (2004) as this is an environmentally safe fungicide and is less likely to lead to resistance development in the pathogen. The combination of tricyclazole with chemicals of different modes of action like mancozeb and hexaconazole may further reduce the risk of resistance development in the pathogen besides being more effective than tricyclazole alone.

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Table 1. Evaluation of fungicides for the management of neck blast of rice

Fungicide	Dose / L	Neck blast Incidence (%)	Per cent Reduction over control	Grain Yield (q/ha)	Per cent Increase over control
ICF-110 (tricyclazole 45% + hexaconazole 10% WG)	1 g	25.4 (30.2)	67.8	18.5	176.1
MERGER (tricyclazole 18% + mancozeb 62% WP)	2.5 g	21.6 (27.6)	72.6	19.6	192.5
Beam (Tricyclazole 75 WP)	0.6 g	24.3 (29.5)	69.2	16.7	149.2
Hexaconazole 5% EC	2.0 ml	68.2 (55.5)	13.6	11.1	65.7
Mancozeb 75% WP	2.0 g	74.7 (59.8)	5.3	11.8	76.1
Companion (mancozeb 63% + carbendazim 12% WP)	1.5 g	64.2 (53.2)	18.6	15.6	132.8
Bavistin (Carbendazim 50 WP)	1 g	41.1 (39.8)	47.9	16.7	149.2
Control	-	78.9 (62.6)	-	6.7	-
CD (P=0.05)		(1.2)	-	0.9	-

Figures in parentheses are arcsine transformed values

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