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Evaluation of fungicides against fungal diseases in rice under filed conditions of Kashmir

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ABSTRACT

Field trials conducted under irrigated conditions during wet season of 2003 and 2004 in Kashmir to get an effective for fungicides in the control of leaf blast, neck blast and sheath blight revealed that four spays of Hexaconazole 5 EC, Carbendazim + Mancozeb 75WP, Carbendazim 50 WP were found most effective in controlling the above pests respectively and increased grain yield. Highest control of neck blast (56.9%) and suppression of glume discolouration (47.1%) was observed when Carbendazim + Mancozeb 75WP @ 0.563 kg a.i. ha^{-1} was applied. However, maximum leaf blast control (49.6%) was recorded in Hexaconazole 5EC treated plots while Carbendazim 50 WP reduced the sheath blight severity (42.4%) to a maximum extent.

Key words: *Fungicides, location specific diseases, rice, temperate*

Rice is the staple food of the people of Kashmir and it is cultivated during the months of May to September (Bhat and Anwar, 2002). The crop is prone to different biotrophic constraints which affect the production of rice in Kashmir. Commercial high yielding varieties of rice occupying the maximum rice cultivated area were reported to be susceptible (Anwar *et al*., 2003) to diseases like blast (*Magnaporthe grisea*), sheath blight (*Rhizoctonia solani*) and glume discolouration (biotic complex) (Clarke *et al*., 1969). The majority of the commercial varieties in Kashmir are severely attacked by these diseases when grown at high levels of nitrogen. Many fungicides have been reported effective against various rice diseases under different agro-ecological situations (Clarke *et al*., 1969). However, most of the recommended fungicides often fail to provide adequate control of dreaded complex of diseases that appear in the hill of Kashmir. Fungicides spray schedule have been standardized based on the weather, host conditions and on epidemiological aspects of the diseases (Muralidharan and Venkatarao, 1983) but meagre work on disease management has been done in temperate zones of Kashmir. Therefore, six fungicides were evaluated against the effect of fungal diseases of rice.

An experiment was carried out under irrigated condition at Rice Research and Regional Station of SKUAST-K, Khudwani, Anantnag, Jammu and Kashmir, India at 1560 metres elevation, latitude 32^{o}N, longitude 73^{o}E and 7.00 pH of soil an endemic area of disease incidence during wet seasons of 2003 and 2004. A susceptible rice variety, K-39 was used in this trial. Recommended agronomical practices were followed for raising a healthy crop. No artificial inoculations were made, as natural inoculum was sufficient to cause diseases. Treatments were Propineb 75 WP at 1.125 kg a.i ha^{-1}, Hexaconazole 5 EC at 0.025 lit a.i ha^{-1}, Iprobenphos 48 EC at 0.48 lit a.i ha^{-1}, Carbendazim 50 WP at 0.250 kg a.i. ha^{-1}, Bitertanol 25 WP at 0.125 kg a.i ha^{-1}, Carbendazim + Mancozeb 75 WP at 0.563 kg a.i ha^{-1} and Propiconazole 25 EC at 0.125 lit a.i/ha applied at complete tillering stage, 50% boot leaf stage, 80% heading stage and more than 50% dough stage of crop. Only water was sprayed for the untreated control. Leaf blast evaluations for each treatment were made 50 days after planting through the standard evaluation system on a 0-9 scale (IRRI, 1988). Per cent neck blast was determined by assessing 50 plants excluding border rows of each treatment. Severity of sheath blight was assessed on 0-9 scale (IRRI, 1988) and glume discolouration percentage were also recorded. The grain yield at 14% moisture was recorded for each sampling

unit and, data were analysed statistically.

Leaf blast, neck blast, sheath blight and glume discolouration appeared with moderate pressure during wet season 2003 and 2004. There was a visible difference between the treated and untreated plots where four sprays of fungicides were given at different crop stages. Fungicides viz., Hexaconazole 5 EC @ 0.025 lit a.i. ha^{-1}, Bitertanol 25 WP @ 0.125 kg a.i ha^{-1} and Propiconazole 25 EC @ 0.125 lit a.i ha^{-1} were more effective in controlling the leaf blast severity per cent of 9.9, 12.0 and 12.1 respectively when compared to 35.00 per cent in untreated plot. Propiconazole 25 EC @ 0.125 lit a.i. ha^{-1} has given 48.7 per cent neck blast control followed by Bitertanol 25 WP @ 0.125 kg a.i. ha^{-1}, Carbendazim 50 WP at the rate of 0.250 kg a.i ha^{-1} and Carbendazim+Mancozeb75WP at the rate of 0.563 kg a.i. ha^{-1} when applied at tilleraing, booting, and dough stages of the crop. Saifulla (1993) observed that application of fungicidal spray at tillering and heading stages of crop controlled the neck blast significantly. Carbendazim 50 WP @ 0.25 kg a.i ha^{-1} was found most effective in controlling sheath blight with 10.5% severity resulting in a reduction of 42.4%, over the check treatment. Venkatarao and Muralidharan (1983) confirmed that Carbendazim 50 WP was superior to Mancozeb in checking the spread of blast disease.

Table 1. Effect of fungicides against fungal diseases in temperate rice

Fungicides	Dose a.i. ha^{-1} ($kg\ lit^{-1}$)	Leaf blast severity (%)			Neck blast incidence (%)			Sheath blight severity (%)			Glume discolouration (%)			Grain yield ($t\ ha^{-1}$)	
		T	O	Suppression (%)	T	O	Suppression (%)	T	O	Suppression (%)	T	O	Suppression (%)	O	Increase (%)
Propineb 75 WP	1.125	20.6	12.4	43.4	11.1	3.7	43.7	23.1	15.4	30.6	11.7	4.1	38.7	4.9	25.6
Carbendazim 50 WP	0.250	22.3	14.5	38.6	9.4	2.7	52.3	18.9	10.5	42.4	10.8	3.5	43.5	5.4	38.4
Bitertanol 25 WP	0.125	20.3	12.0	44.1	9.5	2.8	51.8	26.0	19.2	21.9	10.3	3.2	46.1	5.5	40.96
Carbendazim + Mancozeb 75 WP	0.563	26.1	19.4	28.1	8.5	2.2	56.9	20.5	12.2	38.4	10.1	3.1	47.1	5.8	48.6
Hexaconazole 5 EC	0.025	18.3	9.9	49.6	11.0	3.7	44.2	23.7	16.2	28.8	11.8	4.2	38.2	4.8	25.6
Iprobenphos 48 EC	0.480	23.0	15.3	36.6	11.0	3.6	44.2	22.1	14.2	33.6	12.6	4.7	34.1	4.8	25.6
Propiconazole25 EC	0.125	20.3	12.1	44.1	10.1	3.1	48.7	25.0	17.9	24.9	11.6	4.0	39.3	4.4	12.6
Check/untreated	-	36.3	35.0	-	19.7	11..5	-	33.3	30.2	-	19.1	10.7	-	3.9	-
CD (P=0.05)		1.05			2.35			1.16			1.17			0.96	
Cv (%)		2.6			11.9			2.8			5.5			0.07	

O = Means of original values; T= Arcsine transformed means

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