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## Efficacy of some commercially available fungicides on grain discolouration (Gd) disease of hybrid rice seed

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M. K. BAG AND A. BISWAS\*

Rice Research Station, Chinsurah 712 102, West Bengal.

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Like other hybrid seed, seed production of hybrid rice is also a tedious job and costly too. Cost of hybrid rice seed reduced due to infection of pathogen causing grain discolouration (Gd) of rice. Attempt was made to manage grain discolouration of rice by application of commercially available fungicides in the seed production field. Out of seven fungicides, Carbendazim 50WP was found to be best in reducing grain discolouration disease severity and increasing yield followed by Hexaconazole 5EC and Mancozeb 75WP.

**Key words:** Grain discolouration (Gd) disease, hybrid rice seed, pathogen, carbendazim

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Grain discolouration (Gd) disease is becoming an important disease of rice in all the rice growing areas. The cause of grain discolouration of rice is mainly due to various pathogenic infection especially fungi viz., *Drechslera* spp., *Sarocladium* spp., *Curvularia* spp., *Fusarium* spp. etc. before or after harvesting of rice grains (Bag, 2007). It causes significant reduction in yield as well as seed quality. Discoloured seeds are reported to cause loss of viability and germination (Sharma *et al.*, 1987; Zulkifl and Castano 1991). Germination of discoloured grain reduces by 3 – 40.4% and grain weight reduces by 3.8 – 23.8% over healthy grain of rice (Bag, 2007). Grain discolouration is a serious problem in hybrid rice seed production plots. This might be due to the clipping of flag leaf and foliar application of GA3 to encourage pollination and to obtain higher hybrid seed set in CMS (Cytoplasmic Male Sterile) female parental lines (Murulidharan, 2007). It directly reduces the market value of the rice seeds. Major problem of identifying the disease by symptom is that the disease cannot be observed at the initial stage. When it is observed then it is already established in the seeds. Management of grain discolouration by application of different chemicals at different stages of flowering has been done (Arunyanant

*et al.*, 1981). Per cent seed germination of discoloured seeds has been found to improve by best control (Sharma *et al.*, 1992; Karthikeyan *et al.*, 2007). Therefore, a field experiment has been conducted to evaluate the efficacy of some commercially available fungicides on grain discolouration disease of rice in hybrid rice seed.

Field experiment was conducted for three consecutive crop season (*Kharif*) (2002 – 03 to 2004 – 05) in the CNRH-3 hybrid rice seed production field at Rice Research Station, Chinsurah, West Bengal under 'All India Co-ordinated Rice Improvement Programme' (AICRIP) in Randomised Complete Block (RCB) design with three replications. The standard hybrid rice seed production procedure was followed. Standard agronomic practices were followed except the dose of fertilizer. The fertilizer dose was N: P<sub>2</sub>O<sub>5</sub> : K<sub>2</sub>O @ 120: 50: 30 kg ha<sup>-1</sup>. Eight treatments comprising of seven fungicides were evaluated and untreated plot was taken as control. Fungicides were sprayed twice at an interval of 10 days starting from the initial appearance of the disease. Ten days after the last spray, final disease observation data were recorded from random samples on the basis of

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\*Present address : Rice Research Station, Bankura 722101, West Bengal.

per cent panicle affected with discoloured grains/spikelets. Number of spikelet with grain discoloration per panicle per sq. m. and grain yield in each treatment were recorded. Statistical analysis of the data was done.

All the fungicides evaluated were found statistically significant in reducing the disease and increasing the grain yield over untreated check plot. Among the fungicides Carbendazim 50 WP (Bavistin) was found to be the best in reducing panicle infection (48.14%) and spikelet infection (27.2%) followed by Mancozeb 75WP (Diathane M-45) and Hexaconazole 5EC (Contaf) (Table 1). But these two fungicides were at par in reducing the disease and increasing the grain yield. Among the seven fungicides, Carbendazim 50WP proved to be outstanding as it increased

highest yield (87.4%), highest reduction of panicle infection (18.9) and spikelet infection (52%) over untreated check plot. Whereas all other fungicides were below 35.9% in increasing grain yield over control and reducing spikelet infection by 32.4% to 37.5% over control. Under AICRIP, these commercially available fungicides were also evaluated at several other locations of India during *Kharif* of 2002-03 and 2003-04. Carbendazim 50WP was proved to be highly effective in reducing grain discolouration disease and increasing grain yield of rice at Chinsurah, Kaul and Titabar during 2002-03 and at Chinsurah, Kaul and Mandya during 2003-04 (Anonymous, 2003, 2004). Therefore, Carbendazim 50WP can be used for managing grain discolouration disease followed by Hexaconazole 5EC and Mancozeb 75WP.

**Table 1 :** Efficacy of some commercially available fungicide on Grain discoloration disease of hybrid rice seed

Sl. No.	Treatments	Dose /L water	Panicle infection		Spikelet infection		Yield	
			Infected Panicle (%)	Disease control (%) over check	Infected spikelet (%)	Disease control (%) over check	Yield (Kg/ha)	Yield increase over check
T1	Carbendazim 50WP (Bavistin 50WP)	1.0 g	48.14	18.9	27.20	52.0	2074.08	87.4
T2	Bitertanol 25WP (Baycor 25WP)	1.0 g	57.4	3.4	36.78	35.1	1422.70	28.5
T3	Hexaconazole 5EC (Contaf 5EC)	2.0 ml	54.68	7.9	37.62	33.6	1504.88	35.9
T4	Iprobenfos 48EC (Kitazin 48EC)	2.0 ml	57.84	2.6	38.29	32.4	1428.87	29.1
T5	Carbendazim 64% + Mancozeb 8% (Saaf 75WP)	1.5 g	57.45	3.3	35.70	37.0	1456.37	31.6
T6	Propiconazole 5EC (Tilt 5EC)	1.0 ml	54.55	8.1	35.58	37.2	1322.77	19.5
T7	Mancozeb 75WP (Diathana M-45 75WP)	2.0 g	53.81	9.4	35.42	37.5	1457.78	31.7
T8	Check (Untreated)	—	59.39	—	56.66	—	1107.02	—
	SED	—	1.11	—	1.64	—	63.78	—
	CV (%)	—	6.27	—	14.3	—	15.3	—
	LSD (0.05)	—	4.52	—	6.71	—	130.25	—
	LSD (0.01)	—	6.08	—	9.04	—	175.38	—

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