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SHORT COMMUNICATION

Efficacy of fungitoxicants against Sheath Rot disease of rice

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Sheath Rot disease of rice caused by *Sarocladium oryzae* (Sawada) Gams and Hawks is one of the most important diseases of rice in West Bengal. Keeping in view of the economic importance of the disease, field experiment was conducted during *kharif* (wet) season, 2012 and 2013 to evaluate the relative efficacy of some fungitoxicants in controlling the disease under artificially inoculated condition. Significant reduction in disease severity and increased grain yield were obtained from the plots treated separately with Kresoxim methyl 44.3 SC and Azoxystrobin 25 SC during both the years.

Key words: Rice, sheath rot disease, fungitoxicants, efficacy

Rice (*Oryza sativa* L.) plays a unique role in providing calories to the majority of Indians. The prevalence of diseases and pests has been dignosed as a major problem for decreased productivity in rice. Among the fungal diseases of rice , sheath rot caused by *Sarocladium oryzae* has gained losses ranging 3-85 % (Reddy,1991). Across ecosystem of West Bengal, sheath rot is one of the major production constrains in irrigated, rainfed upland (red and laterite tract), rainfed lowland (shallow and deep water) area and also during drought (Biswas,2000). Many workers have suggested the effectiveness of certain fungicides against sheath rot disease of rice (Patra, 2012; Patra and Biswas, 2010).Detailed field experiments are hence required to find out the effectiveness of new fungicidal formulations for management of sheath rot disease of rice.Keeping this in view, the efficacy of different groups of new fungicidal formulations has been evaluated in the management of sheath rot disease of rice.

Field trials were conducted during the *kharif* (wet) season, 2012 and 2013 with the susceptible cultivar *Swarna* (MTU 7029) at Rice Research Station ,Chinsurah West Bengal under the All India Coordinated Rice Improvement Programme (AICRIP).Seedlings were transplanted having 15 cm x 15 cm spacing in a randomized complete block (RCB) design with four replications (plot size 1.2m x1.5 m). Uniform fertilizer dose of both basal and split of 120 kg N, 50 kg P_2O_5 and 30 kg K_2O ha^{-1} were applied in all the plots and standard agronomic practices were followed to raise the crop.

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Table 1: Relative efficacy of different fungicides on Sheath rot disease of rice during *Kharif* 2012 and 2013

Name of fungicides	Dosage/ L	*Kharif* 2012		*Kharif* 2013		Mean % Disease Severity
		% Disease Severity	% Reduction over control	% Disease Severity	% Reduction over control	
Trifloxystrobin 25% + Tebuconazole 50%	0.4 g	37.47 (37.6)	47.48	41.24 (39.93)	42.96	38.10
Kresoxim methyl 44.3 SC	1.0 ml	21.20 (27.4)	70.28	19.15 (25.95)	71.80	20.17
Azoxystrobin 25 SC	1.0 ml	25.77 (30.4)	63.88	24.17 (29.47)	64.41	24.97
Tricyclazole 75 WP	0.6 g	43.41 (41.1)	39.15	45.18 (42.25)	33.48	44.29
Carbendazim 50 WP	1.0 g	29.48 (32.8)	58.68	31.12 (33.90)	54.18	30.30
Propiconazole 25 EC	1.0 ml	27.90 (31.9)	60.89	26.49 (30.98)	60.99	27.19
Check	Untreated	71.35 (58.1)	-	67.92 (55.49)	-	69.63
CD (0.05)	-	2.1		5.49		
CV(%)	-	14.6		10.00		

Figures in parcutheses are angular transformed values, statistics applied to them

Table 2: Relative efficacy of different fungicides on yield (Kg/ha) of rice during *Kharif* 2012 and 2013

Name of fungicides	Dosage/ L	*Kharif* 2012		*Kharif* 2013		Mean Yield (Kg/ha)
		Yield (Kg/ha)	% increase over control	Yield (Kg/ha)	% increase over control	
Trifloxystrobin 25% + Tebuconazole 50%	0.4 g	3440.66	30.06	4673.61	33.53	4057.13
Kresoxim methyl 44.3 SC	1.0 ml	4362.33	64.90	5819.44	66.26	5090.88
Azoxystrobin 25 SC	1.0 ml	4084.66	54.41	5472.22	56.35	4778.44
Tricyclazole 75 WP	0.6 g	2973.33	12.40	4500.00	28.57	3736.66
Carbendazim 50 WP	1.0 g	3794.00	43.42	4652.78	32.93	4223.39
Propiconazole 25 EC	1.0 ml	3838.33	45.09	4972.22	42.06	4405.27
Check (Untreated)	-	2645.33	-	3500.00	-	3072.66
CD (0.05)	-	1040.9		1155.0		
CV(%)	-	16.10		16.21		

Figures in parentheses are angular transformed values and statistics applied to them

Seven treatments comprising three new fungicides, namely Kresoxim methyl 44.3 SC (1 ml l^{-1}), Azoxystrobin 25 SC (1 ml $^{-1}$) and Trifloxystrobin 25% + Tebuconazole 50% (0.4 g l^{-1}) with three (3) standard check fungicides namely Propiconazole 25 EC (1 ml l^{-1}),Carbendazim 50 WP (1 g l^{-1}) and Tricyclazole 75 WP (0.6 g l^{-1}) were evaluated. One untreated check was also maintained.

During the panicle initiation stage , all the tillers (except the border ones) were inoculated by " Grain Inoculation Method" (Mukherjee and Singh,1980). A single grain of of rice was placed inside the leaf sheath enclosing the panicle of each plant. Fungicides were sprayed twice at an interval of 15 days starting from the initial appearance of disease after ten days of artificial inoculation depending upon

the disease development and weather condition.

Ten days after last spray, final disease incidence was recorded from ten randomly affected plants in each plot and the plants were assessed individually using SES (0-9) scale (IRRI, 1996).

Disease severity was calculated using the formula: where N_0-N_9 = No. of tillers, classified as 0-9 grades respectively, according to SES (0-9) scale of rice. Dry grain yield recorded on individual plot basis were converted to kg ha^{-1} for statistical analysis.

$$\frac{0(N_0) + 5(N_1) + 10(N_3) + 30(N_5) + 50(N_7) + 100(N_9)}{\text{Total No. of tillers observed}} \times 100$$

All the fungicides significantly reduced the sheath rot infection and increased grain yield over untreated check (Table 1 and 2). However, among the fungicides, two foliar sprays of Kresoxim methyl 44.3 SC and Azoxystrobin 25 SC were highly effective in causing maximum reduction of sheath rot disease followed by Propiconazole 25 EC. Regarding grain yield also maximum increase was achieved with Kresoxim methyl 44.3 SC, followed by Azoxystrobin 25 SC and Propiconazole 25 EC.

Under AICRIP, these new fungicides were also evaluated at several other locations of India during *Kharif* 2012 and 2013.More or less similar results was also obtained at most of the locations (Anonymous, 2012; Patra, 2012).

Thus, it may be concluded that the new molecules, Kresoxim methyl 44.3 SC and Azoxystrobin 25 SC have great potential as they have been found effective against many diseases of rice including sheath rot.

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