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APPRAISE A COMBINATION OF FUNGICIDES AGAINST BLAST AND SHEATH BLIGHT DISEASES OF PADDY (*Oryza sativa* L.)

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ABSTRACT

In present study various fungicides were screened against blast (leaf and neck) and sheath blight disease of rice. Among them, Conika 50% WP (Kasugamycin 5% + Copper Oxychloride 45% WP), Dhanucop Team (Tricyclazole 75% WP) and RIL-068/F1 48 WG (Kresoxim methyl 40% + Hexaconazole 8% WG) were found effective against blast diseases. While, the seed treatment fungicide Isotianil SC 200 and its combination with Trifloxystrobin 500 SC were found least effective against leaf and neck blast diseases. However, in case of sheath blight, Thifluzamide 24% SC, RIL-068/F1 48 WG (Kresoxim methyl 40% + Hexaconazole 8% WG), Propiconazole 25% EC (Tilt), Tricyclazole 75% WP (Beam) and a new combination fungicide, Fluxapyroxad 62.5 g/l + Epoxiconazlle 62.5 g/l EC (Adexar w/v EC) were found effective.

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1 Introduction

Rice (*Oryza sativa* L.) is an important target to provide stable food and food security to millions population of the world and is one of the main foodstuffs in Asia. The population stress in rice consuming countries hassle to sustainable rice production in Asia. Rice affected by quite a lot of diseases among them blast is the most frequent and ferocious disease in irrigated rice of both temperate and subtropical areas of East Asia (Bonman et al., 1991) and which appeared at all stages of vegetative growth.

Blast disease caused by *Pyricularia grisea,* is an infectious disease which significantly reduces quality and seed production of rice (Pasha et al., 2013). Pathogens attacks on stem nodes, leaves and all portions of the panicle and grains of maize (Chin, 1974). Blast epidemic causes the complete defeat of seedling (Chaudhary et al., 1994) at the nursery and in field condition (Teng et al., 1991) and accomplish up to 80% of total yield fatalities (Chaudhary 1999; Koutroubas et al., 2009). Seeds before sowing treatment with systemic fungicides are effective in reducing blast disease (Chaudhary & Sah 1998; Chaudhary 1999). Sheath blight, caused by *Rhizoctonia solani* Kunh., is a soil borne disease of rice occurs in all rice production regions of the world (Ou 1985; Teng et al., 1990; Savary et al., 2000; Savary et al., 2006). In India a modest estimation of losses due to the sheath blight disease alone has been up to 54.3% was reported (Rajan 1987; Roy 1993) and yield losses of 5-10% in susceptible variety have been estimated in Asia (Savary et al., 2000).

Chemical restraint of the blast and sheath blight diseases is successful at filed level in majority of the cases (Venkata Rao & Muralidharan 1983; Varie et al., 1993; Kandhari & Gupta 2003; Bhuvaneshwari & Raju 2012; Kumar et al., 2013). Fungicidal control is largely practiced for blast disease in temperate or subtropical rice cultivation, primarily in Japan, China, South Korea, Taiwan and, increasingly, Vietnam (Kumar et al., 2013).

In the former years, copper and mercury compounds were recommended against blast, but were found not suitable because of phytotoxicity and mammalian toxicity. Current major products are mainly systemic with a residual action of at least 15 days, although older organophosphorous products such as edifenphos are still widely used. The modern rice fungicides include Isoprothiolane, Probenazole, Pyroquilon, Tricyclazole (Filippi & Prabhu 1997) and most of the other fungicides like Benomyl, Carbendazim, Chloroneb, Captafol, Mancozeb, Zineb, Edifenphos, Iprobenphos, Thiophanate, Carboxin, Kitazin, Flutolanil, etc. have been found effectual for the mastery of the sheath blight under filed conditions (Varma & Menon 1977; Araki 1985; Dash & Panda 1984; Kannaiyan & Prasad 1984; Singh & Sinha 2004). Out of those fungicides Benomyl, Carbendazim, Edifenphos and Iprobenphos were the most effective chemicals (Roy, 1993). Fungicides have been used successfully to control blast, but the efficiency of particular fungicides could vary from place to place or from dosage to dosage. Farmers are advised to revolve the fungi toxicants used to prevent the infectious fungus form rising resistance against those fungicides (Tangdiabang & Pakki 2006). Therefore, information about efficient fungicides with different modes of action should be offered to farmers. In this view, the present exploration was undertaken to appraise the efficacy of commercially available fungicides at different doses against blast and sheath blight diseases under field conditions.

2 Materials and Methods:

2.1 Seed varieties, Fungicides and field preparation for planting

The experiment was conducted in red sandy loam soils with unique soil properties consist of pH 5.9 to 6.2, 0.30 % organic matter, 25.0 kg ha^{-1} of available N, 24.23 kg ha^{-1} of P_2O_5 and 215.55 kg ha^{-1} of available K_2O. The experimental plots were swamped with water and ploughed until any soil aggregates were wrecked up. Excess water was drained out, and the field was partitioned into several blocks based upon the prerequisite for the experiment. In the present investigation, Conika 50% WP, RIL-068/F1 48 WG, RIL-068/F1 and Tricyclazole against blast disease, Thifluzamide 24% SC, RIL-068/F1 48 WG and Adexar 125 g/l w/v EC fungicides against sheath blight of rice were screened and two varieties viz., Jaya and Mandya Vijaya were used at different dates of sowing.

2.2 Experimental design and treatments in the field

The experiment was set out in a randomized complete block design (RCBD) each with seven treatments replicated four times. The uniform plant population was sustained throughout the plot, with the spacing of 20x10 cm between rows and plants. Treatments consisted of a rice plant sprayed with different dosages of various fungicides against the blast and sheath blight diseases. Three sprays of chemical with desired concentration were given on 50th, 65th and 80th days after planting (DAP). The first spray was given as a prophylactic spray (prophylactic trails fungicides were sprayed before the disease appearance) at jointing stage and second spray was applied as curative sprays when the third to fourth leaf from the top start to show's symptoms (curative trials were taken at 37.5 per cent disease incidence). Record the data after the second spray. In the present exploration few fungicides were evaluated for two years.

2.3 Preparation of pathogen inoculums

The causal organism was artificially cultivated/grow at tillering stage using the fresh disease infected bits on the rice seedlings of different diseases by placing between the tillers just above the water line at 38 DAP.

Table 1 Efficiency of Conika 50% WP (Kasugamycin 5% + Copper Oxychloride 45%) against leaf and neck blast disease of Rice during *Kharif* 2011 and 2012.

Tr. No.	Treatments	Dose (gm or ml/ha)	*Kharif* - 2012			Dose (gm or ml/ha)	*Kharif* - 2011		
			Percent Disease Index (%)		Yield kg/ha		Percent Disease Index (%)		Yield kg/ha
			Leaf Blast	Neck Blast			Leaf Blast	Neck Blast	
T1	Conika 50% WP (Kasugamycin 5% + Copper Oxychloride 45% WP)	250	18.51 (25.48)	17.03 (24.37)	3500.00	500	10.37 (18.70)	17.77 (24.93)	3352.22
T2	Conika 50% WP (Kasugamycin 5% + Copper Oxychloride 45% WP)	300	17.03 (24.37)	15.55 (23.22)	3588.88	600	8.14 (16.55)	14.81 (22.54)	3844.44
T3	Conika 50% WP (Kasugamycin 5% + Copper Oxychloride 45% WP)	350	14.18 (22.63)	12.59 (20.78)	3744.44	700	7.40 (15.75)	12.59 (20.76)	3847.22
T4	Conika 50% WP (Kasugamycin 5% + Copper Oxychloride 45% WP)	700	13.33 (21.41)	14.07 (22.03)	3961.11	-	-	-	-
T5	Kasu B (Kasugamycin 3% SL)	25	19.25 (26.03)	20.74 (27.09)	3338.88	833	16.29 (23.76)	22.22 (28.10)	3188.88
T6	Kasu B (Kasugamycin 3% SL)	30	27.40 (31.56)	17.03 (24.37)	3527.77	1000	14.81 (22.59)	25.92 (30.60)	3271.66
T7	Kasu B (Kasugamycin 3% SL)	35	27.40 (31.56)	21.48 (27.61)	3138.88	1167	15.55 (23.19)	22.22 (28.06)	3677.77
T8	Dhanucop (Ccopper Oxychloride 50% WP)	225	19.25 (26.03)	22.22 (28.12)	3066.66	450	25.18 (30.11)	22.96 (28.60)	3426.66
T9	Dhanucop (Copper Oxychloride 50% WP)	270	17.77 (24.93)	22.96 (28.63)	3022.22	540	23.70 (29.09)	26.66 (31.09)	3245.27
T10	Dhanucop (Copper Oxychloride 50% WP)	315	16.29 (23.80)	26.66 (31.09)	3011.11	630	20.00 (26.56)	27.40 (31.56)	2924.72
T11	Dhanucop (Copper Oxychloride 50% WP)	500	17.77 (24.93)	22.22 (28.12)	2950.00	1000	19.25 (26.02)	26.66 (31.09)	3561.94
T12	Dhanucop Team (Tricyclazole 75 % WP)	235	14.81 (22.63)	12.59 (20.78)	3722.22	225	6.66 (14.82)	11.11 (19.41)	3947.77
T13	Fujione (Isoprothiolane 40% EC)	300	14.81 (22.63)	15.55 (23.22)	3563.88	300	14.07 (22.02)	17.03 (24.34)	3539.16
T14	Control (Untreated)		46.66 (43.08)	45.18 (42.23)	2722.22	-	30.37 (33.40)	51.85 (46.06)	2919.44
	S.Em.±		**1.33**	**1.419**	**137.21**		**1.06**	**1.02**	**140.02**
	C.D. at 5%		**3.87**	**4.11**	**398.62**		**3.12**	**2.98**	**408.71**
	C.V.%		**8.62**	**9.02**	**7.26**		**7.96**	**6.26**	**7.05**

Figures in parenthesis are arcsin transformed.

Table 2 Efficacy of Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG) against blast of rice (*Kharif* 2011).

Tr. No.	Treatments	Dosage/L	Percent Disease Index (%)		Yield kg/ha
			Leaf Blast	Neck Blast	
T1	Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG)	1.0 ml	24.44 (29.62)	19.44 (26.15)	3679.37
T2	Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG)	0.75 ml	30.55 (33.54)	22.77 (28.47)	3441.66
T3	Hexaconazole 5 SC (Contaf)	2.0 ml	43.88 (41.48)	29.44 (32.86)	2891.66
T4	Propiconazole 25 EC (Tilt)	1.0 ml	33.33 (35.24)	27.22 (31.42)	3486.04
T5	Tricyclazole 75 WP (Beam)	0.6 g	23.88 (29.24)	17.77 (24.89)	3789.16
T6	Carbendazim (12%) + mancozeb (63%) (Saaf)	1.5 g	37.77 (37.91)	26.11 (30.71)	2383.95
T7	Control (Untreated)		75.55 (60.43)	67.77 (55.42)	2705.62
S. Em.+			**0.91**	**0.81**	**109.0**
C.D. at 5%			**2.71**	**2.43**	**323.73**
C.V.%			**4.78**	**4.98**	**6.82**

Figures in parenthesis are arcsin transformed.

Table 3 Efficacy of fungicide premixture, Kresoxim-methyl 40% + Hexaconazole 8% WG (RIL-068/F1) against blast diseases of paddy (Summer – 2011).

Tr. No.	Treatment	Formulation /ha	Percent Disease index (%)		Yield kg/ha
			Leaf Blast	Neck Blast	
T1	Kresoxim-methyl 40% + Hexaconazole 8% WG	400 g	9.25 (17.72)	10.59 (18.98)	5428.66
T2	Kresoxim-methyl 40% + Hexaconazole 8% WG	500 g	8.51 (16.96)	8.35 (16.78)	5742.00
T3	Kresoxim-methyl 50% SC	320 ml	24.44 (29.63)	10.37 (18.78)	4998.63
T4	Kresoxim-methyl 50% SC	400 ml	19.25 (26.03)	11.11 (19.47)	5298.63
T5	Kresoxim-methyl 50% SC	500 ml	17.03 (24.37)	10.37 (18.78)	5345.34
T6	Hexaconazole 5% SC	640 ml	25.18 (30.12)	31.11 (33.90)	4871.63
T7	Hexaconazole 5% SC	800 ml	25.92 (30.60)	28.88 (32.51)	4964.96
T8	Hexaconazole 5% SC	1000 ml	22.96 (28.63)	30.37 (33.44)	4931.59
T9	Tricyclazole 75% WP	300 g	11.85 (20.13)	13.33 (21.41)	4908.74
T10	Control (Untreated)	--	33.33 (35.26)	37.77 (37.92)	4444.44
S. Em.+			**0.687**	**1.422**	**69.853**
C.D. at 5%			**2.039**	**4.224**	**207.452**
C.V.%			**4.31**	**9.60**	**2.36**

Figures in parenthesis are arcsin transformed.

Table 4 Effect of Tricyclazole seed treatment on severity of leaf blast during summer and *Kharif* 2011 (Var. Jaya and Mandya vijaya).

Tr. No.	Treatment	Dose ml/gm / kg of seed	Variety : Jaya						Variety : Mandya Vijaya					
			Leaf Blast Severity (%)			Healthy seedlings (%)			Leaf Blast Severity (%)			Healthy seedlings (%)		
			Summer 2011	*Kharif* 2011	Mean	Summer 2011	*Kharif* 2011	Mean	Summer 2011	*Kharif* 2011	Mean	Summer 2011	*Kharif* 2011	Mean
T1	Untreated Control	-	97.40	97.80	97.6	26.8	39.6	33.23	26.16	52.66	39.41	47.20	64.10	55.66
T2	Isotianil SC 200 Seed Treatment	10	76.60	86.60	81.6	26.4	49.8	38.10	21.16	36.30	28.73	70.20	82.60	76.40
T3	Isotianil SC 200 Seed Treatment	15	91.20	89.40	90.3	33.6	54.0	43.80	20.66	30.80	25.73	61.40	83.60	72.50
T4	Isotianil SC 200 + Trifloxystrobin 500 SC	10 + 1.6	58.40	64.80	61.6	54.2	58.6	56.40	21.00	39.00	30.00	71.80	93.00	82.40
T5	Carbendazim	4	62.60	54.80	58.7	49.6	63.4	56.50	21.50	34.80	28.15	67.60	85.20	76.40
T6	Tricyclazole 75% WP	3	37.40	11.80	24.6	67.8	70.9	69.36	10.50	20.16	15.33	73.60	98.40	86.00
S. Em.±			**2.17**	**0.76**	**3.01**	**0.99**	**1.77**	**2.04**	**0.81**	**0.37**	**1.45**	**0.55**	**1.09**	**1.13**
C.D. at 5%			**6.84**	**2.40**	**8.78**	**3.12**	**5.57**	**5.94**	**2.55**	**1.19**	**4.23**	**1.74**	**3.46**	**3.30**
C.V.%			**5.33**	**1.95**	**10.7**	**3.98**	**5.47**	**10.09**	**6.96**	**1.84**	**12.76**	**1.47**	**2.25**	**3,71**

Table 5 Effect of new fungicide Thifluzamide 24% SC against rice sheath blight disease and yield.

Tr. No.	Treatments	Dosage/L	2005		2006		2009		% Mean Disease Severity	Mean Yield kg/ha
			% Disease severity	Yield kg/ha	% Disease severity	Yield kg/ha	% Disease severity	Yield kg/ha		
T1	Thifluzamide 24% SC	0.5 g	14.50 (22.38)	3967	18.75 (25.66)	4451	17.44 (24.68)	4642	16.90 (24.27)	4353.33
T2	Thifluzamide 24% SC	0.62 g	14.50 (22.38)	4094	11.75 (20.05)	5002	10.88 (19.25)	4870	12.38 (20.60)	4655.33
T3	Thifluzamide 24% SC	0.75 g	11.00 (19.37)	4105	10.00 (18.43)	4843	9.13 (17.58)	5043	10.04 (18.47)	4663.67
T4	Thifluzamide 24% SC	1 g	8.50 (16.95)	4138	9.00 (17.46)	5379	8.31 (16.76)	5212	8.60 (17.06)	4909.67
T5	Validamycin 3% L (St.I)	2.5 g	10.50 (18.91)	3797	10.00 (18.43)	5010	11.63 (19.94)	4997	10.71 (19.10)	4601.33
T6	Hexacomazole 5 EC (ST.II)	2 g	10.50 (18.91)	3627	10.00 (18.43)	4740	11.94 (20.21)	4970	10.81 (19.20)	4445.67
T7	Untreated control	-	31.00 (33.83)	3145	40.00 (39.23)	4179	42.06 (40.43)	4342	37.69 (37.87)	3888.67
S.Em.±			**1.5**	**124.43**	**0.67**	**123.9**	**0.61**	**100.1**	**1.02**	**116.14**
C.D. at 5%			**4.41**	**369.55**	**1.98**	**367.8**	**1.8**	**308.6**	**3.14**	**348.65**
C.V.%			**13.78**	**6.48**	**5.93**	**5.2**	**5.37**	**3.6**	**7.90**	**5.09**

Figures in parenthesis are arcsin transformed.

2.4 Seed treatment

Before sowing, the seeds were dressed with either a dry formulation or wet treated with a slurry or liquid formulation. Earthen pots can be used for mixing fungicides with seed or seed can be spread on a polythene pane and required quantity of fungicides can be strewn on seed lot and mixed thoroughly. In the present investigation, Isotianil SC 200, Isotianil SC 200 + Trifloxystrobin 500 SC, Tricyclazole and Carbendazim fungicides were used for seed treatment.

2.5 Disease assessment

Fourteen days after the fungicide application disease assessment was carried out and in each trial, two observations were registered. The first observation was made instantly after prophylactic spray and second after curative spray. For disease scoring, the disease severities were subjected in 0-9 scale using a typical assessment system for rice developed by the International Rice Research Institute (SES, 2002). Further, the disease severity was calculated using the following recipe. Subsequently, the data on disease severity and yield parameters were collected and subjected to appropriate statistical analysis.

Disease Scale:

0 - No infection
1 - Vertical spread of the lesions up to 20% of plant height
3 - Vertical spread of the lesions 21 - 30% of plant height
5 - Vertical spread of the lesions 31 - 45% of plant height
7 - Vertical spread of the lesions 46 - 65% of plant height
9 - Vertical spread of the lesions > 65% of plant height

$$\text{Disease severity \%} = \frac{\text{Sum of disease grades X No. of infected tillers/ hill}}{\text{Total No. of Tillers X Maximum disease grades X No. of tillers assessed}} \times 100$$

3 Results and Discussion

A new combination of antibiotic and copper fungicide Conika 50 % WP (Kasugamycin 5% + Copper Oxychloride 45%WP) @ 700 g/ha and 350 g/ha was found effective against leaf blast with disease severity 13.33% neck blast with disease severity and 12.59% for respectively. However, least disease severity and highest yield was recorded in Tricyclazole treatment which was found on par with Kasugamycin 5% + Copper Oxychloride 45% WP @ 700 g/ha. Untreated check recorded 46.66% leaf blast and 45.18% neck blast severity during *Kharif* 2012. In *Kharif* 2011, the same combination treatment was found effective against leaf blast with disease severity of 7.40% and 12.59% for neck blast severity. However, least disease severity and highest yield was recorded in Tricyclazole treatment which was found superior with Kasugamycin 5% + Copper Oxychloride 45% WP @ 700 g/ha. Untreated check recorded 30.37 % leaf blast and 51.85% neck blast severity (Table – 1).

Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG) @ 1ml/l was effective against leaf blast (24.44 %) and neck blast (19.44%). However, standard check Tricylazole @ 0.6 g/l was reported very effective with least disease severity of leaf blast (23.88%) and of neck blast (17.77%). Highest yield was recorded in Tricylazole treatment with 3789 kg/ha and it was on par with Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG) @ 1ml/l (3679 kg/ha) (Table – 2). Application of Kresoxim methyl 40% + Hexaconazole 8% WG @ 500 g/ha formulation was recorded as best treatment and the optimum dosage for the management of leaf (8.51%) and neck blast (8.35%) diseases of rice besides also increased the yield (5742 kg/ha) of rice during summer 2011 (Table – 3).

A new seed treatment fungicide Isotianil SC 200 @ 10 and 15 ml/kg of seed and a combination of Isotianil SC 200 + Trifloxystrobin 500 SC @ 10 + 1.6 ml/kg of seeds were tested during summer 2011 and *Kharif* 2011 for its efficacy against leaf blast in nursery with the standard fungicides Carbendazim @ 4 g/kg and Tricyclazole 75 WP @ 3 g/kg of seeds. The tested fungicides were not found effective in controlling the blast disease. However, Tricylazole was found very effective in reducing the blast disease severity of 37.4, 11.8, 10.5 and 20.16 per cent frequency at 30 days after sowing. While the disease frequency was reported 97.40, 97.8, 26.16 and 52.66 from untreated check and it was not differ than the test chemical Isotianil @ 15 ml/kg of seeds recorded 91.20, 89.4, 20.66 and 30.8 % blast frequency at different dates of sowing in Jaya and Mandya vijaya varieties respectively.

There were no significant differences with respect to seed germination and seed vigor among the treatments (Table – 4). Three season data revealed that application of Thifluzamide 24% SC @ 1.0 and 0.7 g/L was found extremely efficient in controlling sheath blight (8.60% and 10.04%) as fine as in increasing the grain yield (4664 and 4910 kg/ha) when compared to the untreated check (37.69% and 3889 kg/ha). In addition to its efficacy and increasing yield at higher dosage was found to have phytotonic effect with appreciable green with luxuriant growth (Table – 5).

Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG) @ 1ml/l was effective against sheath blight (11.11%). Propiconazole @ 1 ml/l was found effective against sheath blight (7.77% and 3486.04 kg/ha). Highest grain yield was recorded in Tricylazole treatment with 3789 kg/ha and it was on par with Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG) @ 1ml/l (3679 kg/ha). Application of Kresoxim methyl 40% + Hexaconazole 8% WG@ 200 + 40 g.a.i./ha was found to be the best treatment (6.81%, 5742 kg/ha) and the optimum dosage for the management of sheath blight disease of rice during summer 2011. A new combination fungicide Fluxapyroxad 62.5 g/l + Epoxiconazlle 62.5 g/l EC (Adexar w/v EC) @ 625, 750 and 825 ml/ha was effective in controlling sheath blight disease and was on par with Hexaconazole 5 EC @ 1000 ml/ha and Propiconazole 25 EC @ 500 ml/ha and also superior compared with untreated check (Table – 6).

Table 6 Efficacy of Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG) and Fluxapyroxad 62.5 g/l + Epoxiconazole 62.5 g/l EC (Adexar 125 g/l w/v EC) against sheath blight of rice (summer 2011 and *Kharif* 2011 - 2012).

Tr. No.	Treatments (*Kharif* 2011)	Dosage/L	Sheath Blight Disease Severity (%)	Yield Kg/ha
T1	Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG)	1.0 ml	11.11 (19.42)	3679.37
T2	Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG)	0.75 ml	13.33 (21.27)	3441.66
T3	Hexaconazole 5 SC (Contaf)	2.0 ml	12.77 (20.93)	2891.66
T4	Propiconazole 25 EC (Tilt)	1.0 ml	7.77 (16.09)	3486.04
T5	Tricyclazole 75 WP (Beam)	0.6 g	14.44 (22.32)	3789.16
T6	Carbendazim (12%) + Mancozeb (63%) (Saaf)	1.5 g	11.66 (19.91)	2383.95
T7	Untreated control		28.33 (32.14)	2705.62
	S.Em.±		**0.80**	**109.0**
	C.D. at 5%		**2.39**	**323.73**
	C.V.%		**7.41**	**6.82**
	Summer 2011	**Dosage - g a.i./ha**		
T8	Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG)	160+32	7.77 (16.18)	5428.66
T9	Kresoxim methyl 40% + Hexaconazole 8% WG (RIL-068/F1 48 WG)	200+40	6.81 (15.14)	5742.00
T10	Kresoxim methyl 50% SC	160	24.44 (29.63)	4998.63
T11	Kresoxim methyl 50% SC	200	20.74 (27.09)	5298.63
T12	Kresoxim methyl 50% SC	250	18.51 (25.48)	5345.34
T13	Hexaconazole 5% SC	32	18.51 (25.48)	4871.63
T14	Hexaconazole 5% SC	40	13.03 (21.14)	4964.96
T15	Hexaconazole 5% SC	50	9.81 (18.25)	4931.59
T16	Tricyclazole 75% WP	225	35.55 (36.60)	4908.74
T17	Untreated control	-	37.77 (37.92)	4444.44
	S.Em.±		**1.098**	**69.853**
	C.D. at 5%		**3.260**	**207.452**
	C.V.%		**6.88**	**2.36**
	Kharif 2012	**Dose - (g or ml/ha)**		
T18	Fluxapyroxad 62.5 g/l + Epoxiconazlle 62.5 g/l EC (Adexar w/v EC)	625 ml	17.03 (24.37)	4618.09
T19	Fluxapyroxad 62.5 g/l + Epoxiconazole 62.5 g/l EC (Adexar w/v EC)	750 ml	17.03 (24.37)	5071.42
T20	Fluxapyroxad 62.5 g/l + Epoxiconazole 62.5 g/l EC (Adexar w/v EC)	825 ml	17.03 (24.37)	5352.85
T21	Fluxapyroxad 300 g/l SC	170 ml	22.22 (28.12)	4850.47
T22	Epoxiconazole 7.5% EC	750 ml	18.51 (25.48)	4685.23
T23	Hexaconazole 5% EC	1000 ml	18.51 (25.48)	4701.42
T24	Propiconazole 25% EC	500 ml	20.00 (26.5)	4833.33
T25	Untreated control	-	43.70 (41.38)	3434.28
	S.Em.±		**1.498**	**170.33**
	C.D. at 5%		**4.54**	**516.65**
	C.V.%		**9.44**	**6.29**

Figures in parenthesis are arcsin transforme.

In recent years, newer melanin biosynthesis inhibitors such as Carpropamid (Thieron et al., 1999) or broad-spectrum fungicides like Azoxystrobin (Strobilurin)(Lee & Beaty 1999) have gained favour for blast management. In the present investigation, Conika 50% WP (Kasugamycin 5% + Copper Oxychloride 45% WP), Dhanucop Team (Tricyclazole 75% WP) and RIL-068/F1 48 WG (Kresoxim methyl 40% + Hexaconazole 8% WG) were found effective against leaf blast as well as neck blast diseases. While, the seed treatment fungicide Isotianil SC 200 and its combination with Trifloxystrobin 500 SC were found not effective against these diseases. In the present investigation, Thifluzamide 24% SC, RIL-068/F1 48 WG (Kresoxim methyl 40% + Hexaconazole 8% WG), Propiconazole 25% EC (Tilt), Tricyclazole 75% WP (Beam) and a new combination fungicide i.e., Fluxapyroxad 62.5 g/l + Epoxiconazlle 62.5 g/l EC (Adexar w/v EC) were found effective in the management of sheath blight of rice.

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