

## Chemical Control of Blast of Rice caused by *Magnaporthe grisea* under Rainfed Direct Seeded Condition in Karnataka

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**Abstract :** Field experiments were conducted during kharif 1993-94, 1994-95 and 1995-96 to find out the effective fungicide for the control of blast of rice. All the chemicals used were found to reduce leaf and neck blast incidence significantly when compared to untreated check. Seed treatment with Carbendazim + three sprays of tricyclazole @ 0.06% gave efficient control of leaf and neck blast which was on par with pyroquilon @ 0.1%.

### Introduction

Blast caused by *Magnaporthe grisea* (Hebert) Barr (*Pyricularia grisea* Sacc) is an important disease of rice under rainfed direct seeded condition. Disease management through fungicides play crucial role as some of the popular varieties are becoming susceptible to blast disease. Chemicals have been used extensively in Japan for controlling blast disease and virtually all rice fields have been treated with chemicals in recent years (Ou, 1985). Hence, field experiments were conducted at Agricultural Research Station, Mugad, Dharwad, Karnataka to evaluate the efficiency of different fungicides and to identify the best chemical for controlling the blast of rice.

### Material and Methods

Field experiments were conducted at Agricultural Research Station, Mugad for three years in kharif 1993, 1994 and 1995. Total rainfall received during above years was 1153.2 mm in 81 rainy days, 1270.2mm in 85 rainy days and 982.8 mm in 67 rainy days respectively. The experiment was laid out in randomised block design (RBD) with seven treatments (Table-1)

and three replications. Variety used was HR-12 and gross plot size was 10 sq meter.

Different treatments included were :

1. Untreated check.
2. Seed treatment with organomercurials + 2 sprays of carbendazim @ 0.1%.
3. Seed treatment with carbendazim (2g/kg) + 3 sprays of tricyclazole (0.06%).
4. Seed treatment with carbendazim (2g/kg) + 3 sprays of carbendazim.
5. Seed treatment with carbendazim (2g/kg) + 3 sprays of pyroquilon.
6. Seed treatment with carbendazim (2g/kg) + broadcasting of pyroquilon (15 kg/ha).
7. Seed treatment with carbendazim (2g/kg) + 3 sprays of chlorothalonil.

First spray was given during tillering stage, second around 15-20 days after first spray and third spray was given during panicle initiation. Fertilizers were given at the rate of 150:50 kg N:P<sub>2</sub>O<sub>5</sub>/ha.

Table 1. Details of fungicides screened against blast of rice

Treatment details	Common name	Trade name	Dosage
1. Untreated check	--	--	--
2. Treatment control (Seed treatment with organo mercurials @ 2g/kg + 2 sprays of Carbendazim)	Carbendazim	Bavistin	1g/lit
3. S.T. with carbendazim @ 2g/kg + 3 sprays of Tricyclazole	Tricyclazole	Beam	0.6g/lit
4. S.T. with carbendazim @ 2g/kg + 3 sprays of Carbendazim	Carbendazim	Bavistin	1g/lit
5. S.T. with carbendazim @ 2g/kg + 3 sprays of Pyroquilon	Pyroquilon	Fongorene	1g/lit
6. S.T. with carbendazim @ 2g/kg + broadcasting of Pyroquilon	Pyroquilon	Coratop	15 kg/ha
7. S.T. with carbendazim @ 2g/kg + 3 sprays of Calorothalonil	Calorothalonil	Kavach	1g/lit

The plants were scored in 0-9 SES scale and per cent disease index (PDI) for leaf blast was calculated by using the following formula :

$$PDI = \frac{\text{Sum of individual ratings}}{\text{Number of leaves assessed} \times \text{Maximum disease grade}} \times 100$$

per cent neck blast was calculated by counting the number of panicles showing the typical blast symptoms in one square meter area.

$$\text{Per cent neck blast} = \frac{\text{Number of infected panicles}}{\text{Total number of panicles}} \times 100$$

### Results and Discussion

Per cent disease index for leaf blast and per cent neck blast were calculated, statistically analysed and presented in table 2 and 3 respectively. Results indicated that all chemical treatments significantly reduced leaf blast and

neck blast when compared to the untreated control during all the three years.

Leaf blast incidence was minimum in third treatment (S.T. + 3 sprays of tricyclazole) which was on par with fifth treatment (S.T. + 3 sprays of pyroquilon). Three sprays of carbendazim has reduced leaf blast incidence significantly when compared to two sprays of carbendazim (Table-2).

Neck blast incidence was minimum in third treatment which was on par with 5th treatment (Pyroquilon) during 1993, 1995 and in pooled analysis. Chlorothalonil was least effective in controlling neck blast. Many chemicals have been developed in recent years for blast control. Loekhen (1990) reported that systemic compounds like pyroquilon can be effectively used for blast. Tsuzuki *et al.* (1975) and Froyd

Table 2. Efficacy of different fungicides for the control of blast of rice

Treatment	Leaf Blast (PDI)*			Pooled
	1993	1994	1995	
1. Untreated check	44.95 (49.90)	46.48 (52.59)	48.82 (56.63)	46.75
2. Treated control	31.07 (26.67)	36.99 (36.18)	36.12 (34.91)	34.73
3. S.T. + 3 sprays of Tricyclazole	16.30 (7.90)	20.74 (12.56)	23.43 (15.81)	20.15
4. S.T. + 3 sprays of Carbendazim	20.13 (11.83)	28.88 (23.37)	31.18 (26.87)	26.73
5. S.T. + 3 sprays of Fongorene	20.74 (12.56)	22.23 (14.35)	34.10 (31.50)	25.69
6. S.T. + broadcasting of Coratop	27.22 (20.91)	21.80 (13.80)	32.30 (28.60)	27.11
7. S.T. + 3 sprays of Chlorothalonil	22.67 (14.89)	32.94 (29.56)	37.14 (36.61)	30.92
C.D. @ 5%	9.27	8.05	4.98	6.01

\* Figures in the parentheses are original values and outside are arcsin values.

Table 3. Efficacy of different fungicides for the control of blast of rice

Treatment	% Neck blast			Pooled
	1993	1994	1995	
1. Untreated check	87.44 (99.80)	64.03 (80.80)	51.68 (61.58)	67.71
2. Treated control	52.47 (62.89)	46.42 (52.45)	43.10 (46.75)	47.33
3. S.T. + 3 sprays of Tricyclazole	16.88 (8.46)	20.13 (11.89)	30.49 (25.81)	22.50
4. S.T. + 3 sprays of Carbendazim	41.31 (43.57)	43.27 (46.98)	37.36 (36.95)	40.65
5. S.T. + 3 sprays of Pyroquilon	23.43 (15.81)	30.82 (26.20)	33.30 (30.27)	29.18
6. S.T. + broadcasting of Coratop	31.81 (27.94)	53.25 (64.20)	39.72 (40.87)	42.59
7. S.T. + 3 sprays of Chlorothalonil	75.49 (93.70)	48.15 (55.80)	42.33 (45.30)	55.32
C.D. @ 5%	11.38	10.60	5.89	20.21

\* Figures in the parentheses are original values and outside are arcsin values.

et al. (1976) reported that tricyclazole (E2-291) controls the blast effectively. Okhovot (1989) and Ram Singh and Dodan (1994) reported that tricyclazole is most effective in reducing neck blast and increasing the yield.

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The results indicated that blast of rice under direct seeded condition in Karnataka, can be effectively controlled by seed treatment with carbendazim + three sprays of tricyclazole or pyroquilon.