



# EFFICACY OF FUNGICIDES FOR THE MANAGEMENT OF SHEATH ROT DISEASE IN RICE UNDER FIELD CONDITIONS

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## Abstract

Sheath rot of rice caused by *Sarocladium oryzae*. In this study, the seven fungicides were tested against *S. oryzae*. The efficacy of fungicide on sheath rot was tested under field conditions the Hexaconazole 5 SC (Contaf) treatment followed by Tebuconazole 250 EC (Folicur), Carbendazim 50% WP (Bavistin), Propiconazole 25 EC (Tilt), Saaf [Carbendazim 12% + Mancozeb 63%] and Mancozeb 75% WP (Dithane M-45) treatment significantly reduced the sheath rot intensity and increased the grain yield.

**Key words :** Sheath rot, rice, chemical control, *Sarocladium oryzae*, fungicides.

## Introduction

Rice is one of the most important staple food crops in the world, with China and India being the lead producing countries. Major rice growing states of India are West Bengal, Uttar Pradesh, Punjab, Bihar, Tamil Nadu, Madhya Pradesh and Chhattisgarh. Chhattisgarh state is popularly known as “rice bowl of India” because maximum area are covered under rice during *Kharif* and contribute for major share in national rice production. Rice is known to suffer from many biotic and abiotic stresses. Chhattisgarh state is most congenial for rice cultivation as well as also for diseases. Several disease were reported on rice and among them blast, bacterial blight, sheath rot, sheath blight and brown spot are most important for this state causing considerable economic yield losses.

Sheath rot caused by *S. oryzae* (Sawada) Games and Hawksworth has become a serious problem in most of the rice growing area of the country. In India, Agnihothrudu (1973) recorded this disease for the first time and later several workers reported the disease from different parts of the country (Ghuffran *et al.*, 1980). In Chhattisgarh, Thrimurthy *et al.* (1980) found that *S. oryzae* was associated with sheath rot infected panicles of rice and the incidence on some popular rice varieties increased the number of chaffy grains in infected panicles than healthy.

Sheath rot has gained the status as a major disease of rice (Reddy and Gosh, 1985) and yield losses varies from 9.6 to 85% depending on the weather conditions during the crop growth-period (Phookan and Hazarika, 1992). Naeimi *et al.* (2003) also reported that the Sheath rot occurs in most rice-growing regions of the world and usually causes yield losses ranging from 20 to 85%. Hence, the present investigation was undertaken to find out the effective available against the disease.

## Materials and Methods

### In field evaluation of fungicides

Field experiment were carried out (during *Kharif*-season 2011) at the Plant Pathological Experimental Site, IGKV, Raipur (Chhattisgarh), India. Susceptible rice cultivar Sawrna was used. General agronomical practices were followed for cultivation of experimental plots. There were 8 treatments *i.e.* Hexaconazole 5 SC (Contaf), Propiconazole 25 EC (Tilt), Tricyclazole 75% WP (Beam), [Carbendazim 12% + Mancozeb 63%] (Saaf), Tebuconazole 250 EC (Folicur), Mancozeb 75% WP (Dithane M-45), Carbendazim 50% WP (Bavistin) including untreated (control) for each replication.

Disease intensity was recorded at maturity of the crop in 0-9 scales by following the procedure of Standard Evaluation System of International Rice Testing Programme (IRRI, 1980). Randomly 20 panicles of each treatment plot were selected for taking the observations. The observation for disease intensity, percent disease

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**Table 1** : Efficacy of commercially available fungicides for the management of sheath rot of rice under field condition.

Tr. no.	Treatments	Dosage/litre of water	Disease intensity (%) <sup>*</sup>			% decrease over control	Grain yield (Kg/ha)
			10 DAI <sup>a</sup>	20 DAI	30DAI <sup>b</sup>		
T <sub>1</sub>	Saff [Carbendazim (12%) + Mencozeb (63%)]	1.5 gm	13.33 (3.7)	46.66	66.66 (61.19)	18.36	5100.00
T <sub>2</sub>	Tricyclazole 75% WP (Beam)	0.06 ml	11.66 (3.47)	48.33	56.66 (54.49)	30.61	6310.00
T <sub>3</sub>	Cardendazim 50 WP (Bavistin)	2.0 gm	11.66 (3.47)	38.33	55.00 (53.19)	32.64	6400.00
T <sub>4</sub>	Propiconazole 25 EC (Tilt)	1.0 ml	8.33 (2.94)	45.00	60.00 (56.59)	26.52	6112.00
T <sub>5</sub>	Hexaconazole 5 SC (Contaf)	2 ml	6.66 (2.64)	33.33	45.00 (46.76)	44.89	6500.00
T <sub>6</sub>	Tebuconazole 25 EC (Folicur)	1.5 ml	6.66 (2.64)	35.00	63.33 (58.94)	22.44	5350.00
T <sub>7</sub>	Mencozeb 75% WP (Dithan M-45)	2 gm	10.00 (3.17)	48.33	61.66 (58.22)	24.49	5700.00
T <sub>8</sub>	Control	-	15.00 (3.89)	61.66	81.66 (72.21)	-	5000.00
	<b>SEm±</b>		0.32	2.87	4.57		291.22
	<b>CD (5%)</b>		0.99	8.72	13.62		833.34

<sup>\*</sup>Average of three replications.

<sup>a</sup>Figure in parenthesis show square root transformation.

<sup>b</sup>Figure in parenthesis show Arcsine transformation.

intensity over control and yield kg/ha were also recorded for each treatment at maturity of the crop.

## Results and Discussion

### Field evaluation of fungicides

The result indicated that the foliar spray of the Hexaconazole 5 SC (Contaf) treatment was found highly effective in reducing the disease intensity (45%) and recorded in 44.89% decrease of sheath rot disease over control. The Hexaconazole 5 SC (Contaf) treatment was also statically on par with the Tebuconazole 250 EC (Folicur), Carbendazim 50% WP (Bavistin), Propiconazole 25 EC (Tilt), Saff [Carbendazim 12%+ Mencozeb 63%], Mancozeb 75% WP (Dithan M-45) treatment. The highest grain yield was also record in Hexaconazole 5 SC treatment followed by Carbendazim 50% WP (Bavistin), Tricyclazole 75% WP (Beam), Propiconazole 25 EC (Tilt), Tebuconazole 250 EC (Folicur) and Saff [Carbendazim 12%+ Mencozeb 63%] treatment.

The result obtained under the *in vivo* conditions in the study clearly revealed that all fungicides significantly reduced the disease intensity over control and increased the grain yield of rice. Among all fungicides the Hexaconazole 5 SC (Contaf) treatment was highly effective in reducing the sheath rot intensity and was statistically on at par with Tebuconazole 250 EC (Folicur) and Carbendazim 50% WP (Bavistin). Finding of several reports are in agreement with the present findings as

they had reported the efficacy of Hexaconazole 5 SC (Contaf) and Carbendazime 50% WP (Bavistin) against sheath rot of rice (Venkateswarlu and Venkateswarlu, 2004; Karamkar *et al.*, 1992; Vidhyasekaran and Lewin, 1987; Anonymus, 2009).

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