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EFFICACY OF FUNGICIDES AGAINST SHEATH ROT OF RICE UNDER FIELD CONDITION

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Abstract

Sheath rot of rice caused by *Sarocladium oryzae* (Sawada) is one of the most important fungul disease of rice and is gaining more importance due to its wide spread occurrence all over the world. In this study, the seven fungicides were tested against sheath rot of rice under field conditions. Out of seven fungicides evaluated, two foliar sprays of hexaconazole 5% + captan 70% WP followed by hexaconazole 5% EC, tricyclazole 75% WP and azoxystrobin 18.2% SC were found significantly most effective in reducing the sheath rot intensity and increased the grain and straw yield of rice.

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

Introduction

Rice (*Oryzae sativa* L.) a cereal crop of the family Gramineae extensively cultivated in warm climate, especially in East Asia, producing seeds that are cooked and used as staple food. Rice is a plant of Asian origin. The earliest record of rice in the world comes from Non Nok Tha in Thailand, where it dates back to 3500 BC. First evidence of *Oryzae sativa* is found in North Bihar dated to 2000-2300 BC as well as in Hastinapur dates back to 100-800 BC (Randhawa, 1980). No wonder, 90% of the world's area under rice is in Asia and also about 90 per cent of world rice is produced and consumed in Asia. In six countries of Asia namely Bangladesh, Cambodia, Laos, Myanmar, Sri Lanka and Vietnam 90% of people are rice eaters, while in five other countries namely Indonesia, Japan, Korea Republic, Taiwan and Thailand, the percentage of rice eaters is 70-80 per cent (De Datt, 1981). India and China, which together hold about half the world's rice area, about 63-65 per cent people are rice eaters.

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).

Development of resistance against fungicides in pathogens poses a threat to the sustainable crop production. To mitigate this problem new generation chemicals with novel mode of action have been introduced in the market in the past few years. Optimization of doses and selection of effective fungicide are the two major challenges for effective management of sheath rot disease. Hence, the present investigation was undertaken to find out the effective fungicides available against the disease.

Materials and Methods

Field evaluation of fungicides

Field experiment was carried out (during *Kharif* season 2017) at the Plant Pathological Experimental Site, AAU, Nawagam (Gujarat), India. Susceptible rice cultivar Gurjari was used. General agronomical practices were followed to raise the crop. There were 8 treatments *i.e*. Tricyclazole 75% WP, Azoxystrobin 18.2% SC, Tebuconazole 25% EC, Hexaconazole 5% EC, Tebuconazole 50% + Trifloxystrobin 25% WG, Azoxystrobin 18.2% + Difenconazole 11.4% SC, Hexaconazole 5% + Captan 70% WP including untreated (control) for each replication. Two sprays of each treatment were made, first spray at the appearance of the disease and second after 10 days of first spray.

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Table 1 : Field evaluation of fungicides against sheath rot of rice.

Treatment	Concentration (%)	DiseaseIntensity*(%)	Yield (kg/ha)	
			Grains	Straw
Tricyclazole 75% WP	0.06	27.09	6060	6223
Azoxystrobin 18.2% SC	0.10	36.41	5919	5872
Tebuconazole 25% EC	0.10	33.04	5991	6052
Hexaconazole 5% EC	0.20	22.05	7014	7172
Tebuconazole 50% + Trifloxystrobin 25% WG	0.025	29.06	6020	6177
Azoxystrobin 18.2% + Difenconazole 11.4% SC	0.10	33.52	6002	6050
Hexaconazole 5% + Captan 70% WP	0.05	20.46	7053	7210
Control	-	75.09	4265	4456
	S. Em.±	*2.14*	*318.59*	*363.20*
	C.D. at 5 %	*6.50*	*966.34*	*1101.64*
	C.V. (%)	*10.74*	*9.13*	*10.23*

*Average of three replications.

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 (Satyanarayana and Reddy, 1979). Randomly 10 panicles of each treatment plot were selected for observations. The observation for disease intensity, grain and straw yield (kg/ha) were recorded for each treatment at maturity of the crop.

Results and Discussion

The experimental results presented in table 1 showed significant differences on the per cent disease intensity (PDI), grain and straw yield.

Out of seven fungicides evaluated, two foliar sprays of hexaconazole 5% + captan 70% WP @ 0.05 per cent and hexaconazole 5% EC @ 0.2 per cent were found significantly most effective against sheath rot with least PDI 20.46% and 22.05, respectively as compared to control (75.09% PDI). The next effective treatment was tricyclazole 75% WP @ 0.06 per cent with 27.09% PDI. It remained at par with the hexaconazole 5% EC @ 0.2 per cent (22.05% PDI). Azoxystrobin 18.2% SC @ 0.1 per cent found least effective against sheath rot with 36.41% PDI. The maximum grain yield was obtained in hexaconazole 5% + captan 70% WP @ 0.5 per cent (7053 kg/ha) followed by hexaconazole 5% EC @ 0.2% (7014 kg/ha) and the maximum straw yield was obtained in hexaconazole 5% + captan 70% WP @ 0.05 per cent (7210 kg/ha) followed by hexaconazole 5% EC @ 0.2 per cent (7172 kg/ha).

This finding is in agreement with Pramesh *et al*. (2017), who found hexaconazole 5% + captan 70% WP @ 500g/l effective against sheath rot of rice and also recorded highest yield (6725 kg/ha). For sheath rot disease management, several previous reports suggested that the efficacy of solo fungicides such as hexaconazole 5 SC, tebuconazole 250 EC and carbendazim 50% WP in reducing the sheath rot severity under field condition (Venkateswarlu and Venkateswarlu, 2004; Karamkar *et al*., 1992; Vidhyasekaran and Lewin, 1987; Anonymus, 2009; Kindo and Tiwari, 2015). But in this experiment, test fungicide captan 70% + hexaconazole 5% WP recorded lowest PDI of sheath rot.

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