J. Mycopathol. Res. **43**(1) : 141-142 (2005)

Evaluation of some commercially available fungicides against sheath blight disease of rice

A. BISWAS
Rice Research Station, Chinsurah 712102, West Bengal, India

Field trails were conducted during *kharif* (wet) season of 2001-2003 to evaluate the relative efficacy of some commercially available fungicides against sheath blight disease of rice caused by *Rhizoctonia solani*. Two sprays of propiconazole 25 EC (Tilt / Result) 0.10% were highly effective in reducing sheath blight severity and improving grain yield over other fungicides.

Key words : Rice, sheath blight, *Rhizoctonia solani*, Commercially available fungicides, control

INTRODUCTION

Sheath blight caused by *Rhizoctonia solani* Kuhn in one of the most important fungal diseases of rice during the *kharif* (wet) season in West Bengal as well as in almost all rice growing states of India (Reddy and Reddy, 1986 ; Biswas, 2000). Yield losses due to the disease are estimated from 5.2 to 50.0%, depending on environmental conditions, crop stage at which the disease appears, cultivation practice and cultivars (Kannaiyan and Prasad, 1978 ; Rajan, 1987). There is also strong relationship between symptom severity and yield reduction (Marchetti and Bollich, 1991). Presently no commercial resistant cultivars are available to the farmers and so, management practices of which fungicidal control is the only practical solution to mitigate the disease in order to achieve ful yield potential of the crop. The work on chemical control is in progress in India from early seventies. With the aim of evolving sutiable fungicides for controlling the disease, some commercially available fungicides are evaluated.

MATERIALS AND METHODS

A field experiment was conducted for three consecutive crop seasons (2001-2003) during *kharif* (wet) seasons at Rice Research Station, Chinsurah (elevation — 8.62 m above mean sea level, latitude — 22°52' N, longitute — 88°24' E) West Bengal under the 'All India Coordinated Rice Improvement Programme' (AICRIP). Thirty days old seedlings of sheath blight susceptible cultivar Swarna (MTU 7029) were transplanted with 15 × 15 cm spacing in a randomized complete block design with three replications (plot size was 3 m × 1.5 m). An uniform fertilizer dose of both basal and split 120 kg N, 50 kg P_2O_5 and 30 kg K_2O ha^{-1} was applied in all the plots and standard agronomic practices were followed to raise the crop.

Nine treatments comprising of eight commercially available fungicides viz, antracol 75 WP (propineb), bavistin 50 WP (carbendazim), baycor 25 WP (bitertanol), benlate 50 WP (benomyl), contaf 5 EC (haxaconazole), kitazin 48 EC (iprobenphos), saaf 75 WP (carbendazim 12% + mancozeb 63%) and Tilt / Result 25 EC (propiconazole) were tested in order to evaluate the efficacy of commercially available fungicides against sheath blight disease. Antracol and kitazin tested only during 2003 whereas benlate was not tested during 2003. One untreated check was also maintained. During active tillering stage, all the plants (except the border ones) were inoculated with ten days old highly virulent isolate of the pathogen by the 'straw-bit' method (Rao and Kannaiyan, 1973). Fungicides were sprayed twice at an interval of ten days starting from the initial

appearance of the disease. Ten days after the last spray, final disease incidence was recorded from ten randomly affected plants in each treatment and the plants were assessed individually using SES 0-9 scale (IRRI, 1996). Disease severity (%) was calculated using this formula :

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

Where N_0–N_9 = no. of tillers/hills, classified as 0-9 grades respectively, according to SES (0-9) scale for rice. Dry grain yield recorded on plot basis were converted to kg ha^{-1} for statistical analysis.

RESULTS AND DISCUSSION

All the fungicides significantly reduced the sheath blight infection over untreated check (Table 1). Tilt / Result was the best effective fungicide in checking sheath blight infection and increasing grain yield by more than 15 q ha^{-1} over untreated check. In order of efficacy, Tilt/Result 25 EC (0.10%), was followed by contaf 5 EC (0.20%) and saff 75 WP (0.15%) having 9.3, 9.5 and 10.2 percent disease severity respectively. A maximum increase of 134.1 percent in grain yield was achieved with Tilt/Result 25 EC (0.10%), followed by contaf 5 EC (0.20%) with an increase of 123.7 per cent and saaf 75 WP (0.15%) with an incrase of 114.8 per cent over the untreated check.

Table 1 : Effect of some commercially available fungicides against the mean sheath blight severity and yield of rice during *kharif* (wet) 2001-2003 at Chinsurah

Treatments	Conc. (%)	Mean disease severity (%)	Average grain yield (q ha^{-1})	Per cent yield incrase over control
Antracol 75WP	0.30	15.1 (22.8)	10.37	—
Bavistin 50WP	0.10	12.3 (20.5)	21.26	78.9
Baycor 25WP	0.10	11.3 (19.6)	24.13	103.1
Benlate 50WP	0.10	12.7 (20.9)	20.31	70.9
Contaf 5EC	0.20	9.5 (18.6)	26.58	123.7
Kitazin 48EC	0.20	11.5 (19.8)	14.07	18.4
Saaf 75EC	0.15	10.2 (18.6)	25.52	114.8
Tilt/Result 25EC	0.10	9.3 (17.8)	27.82	134.1
Check (Untreated)	—	35.6 (36.7)	11.88	—
L.S.D. (0.05)		14	438	—
C.V. (%)		3.8	10.1	—

Figures in parentheses indicate angular transformed values and statistics applied to them.

Under AICRIP, Tilt/Result 25EC (0.10%) was, also tested along with other commercially available fungicides against sheath blight in 2001-2003 *kharif* (wet) season at several locations. Tilt/Result followed by contaf were also proved highly effective at Maruteru, Titabar (Anonymous, 2001), Siruguppa (Anonymous, 2002) and Maruteru, Moncompu (Anonymous, 2003). Propiconazole and hexaconazole have been recomnded as specific fungicides for sheath blight control in West Bengal.

ACKNOWLEDGEMENT

Grateful thanks are due to Dr. D. Konar, Director of Agriculture and Ex-officio Secretary, West Bengal, Dr. S. D. Chatterjee, Additional Director of Agriculture (Research), West Bengal, and Dr. S. N. Sen, Joint Director of Agriculture (Rice Dev.), West Bengal for their interest and encouragement.

REFERENCES

Anonymous, 2001. Progress Report 2001, Volume – 2, Entomology and Pathology, All India Coordinated Rice Improvement Programme, Directorate of Rice Research (ICAR), Rejendranagar, Hyderabad, India, pp. 3.102-3.109.

Anonymous, 2002. Progress Report 2002, Volume – 2, Entomology and Pathology, All India Coordinated Rice Improvement Programme, Directorate of Rice Research (ICAR), Rejendranagar, Hyderabad, India, pp. 3.99-3.107.

Anonymous, 2003. Progress Report 2003, Volume – 2, Entomology and Pathology, All India Coordinated Rice Improvement Programme, Directorate of Rice Research (ICAR), Rejendranagar, Hyderabad, India, pp. 3.113-3.125.

Biswas, A. 2000. Changing trends of rice diseases in West Bengal, India. *J. Mycopathol. Res.* **38**(1) : 33-36.

IRRI, 1996. *Standard Evaluation System for Rice.* International Rice Research Institute, Manila, Philippines, pp. 25.

Marchetti, M. A. and Bollich, C. N. 1991. Quantification of the relationship between sheath blight severity and yield loss in rice. *Plant Dis.* **75**: 773-775.

Kannaiyan, S. and Prasad, N. N. 1978. Seed borne nature of sheath blight pathogen, *Rhizoctonia solani* in rice. *Intern. Rice. Res. Newsl.* **3** : 10.

Rajan, C. P. D. 1987. Estimation of yield loss due to sheath blight of rice. *Ind. Phytopath.* **40** : 174-177.

Rao, A. V. and Kannaiyan, S. 1973. An easy method of screening rice varieties for resistance to sheath disease. *Ind. J. Mycol. Pl. Pathol.* **3** : 106-107.

Reddy, A. P. K. and Reddy, C. S. (1986). Present. status of sheath blight disease and its control. In *Diamond Jubilee Souvenir,* Agri. Res. Stn., Maruteru, Andhra Pradesh, India pp. 118-127.

(Accepted for publication January 12, 2005)