Journal of Crop and Weed, 5(1): 221-223 (2009)

Efficacy of a new fungicide 'Trifloxystrobin 25% + Tebuconazole 50%' 75WG against sheath blight (*Rhizoctonia solani* Kühn) of rice

M. K. BAG

Rice Research Station,
Chinsurah – 712 102, West Bengal.

ABSTRACT

Sheath blight of rice caused by Rhizoctonia solani Kühn is one of the most devastating diseases in West Bengal. Due to widespread cultivation of susceptible variety Swarna (MTU 7029), the disease has spread in large scale and sometimes cause severe damage even 100% crop loss also occur. Cultural practices combine with spraying fungicides is the most common practice to manage the disease. An attempt was made to evaluate the efficacy of a new fungicide – a combination of two systemic fungicides viz., Trifloxystrobin 25% (Strobilurin compound) and Tebuconazole 50% (Triazole compound) alongwith two other commercially available fungicides Hexaconazole and Validamycin under challenge inoculation condition. The new fungicide was most effective in decreasing disease severity (37.61% lower over control) and increasing grain yield (50% higher over control). The same fungicide was also proved as best or at par with leading triazole compound to manage the sheath blight disease of rice at several centre under All India Coordinated Rice Improvement Programme during the year 2006 and 2007.

Key Words: Rice, sheath blight, trifloxystrobin and tebuconazole.

Sheath blight of rice caused by *Rhizoctonia solani* Kühn is one of the most devastating diseases in West Bengal during *Kharif* (wet) season. Now the disease is also appearing in various part of West Bengal during *Boro* (summer) season also which was not so common in earlier period. Among various varieties grown 'Swarna' (MTU 7029) usually cover major part of West Bengal during *Kharif* season. This variety is most popular to the farmers of Bengal for its high milling percentage as well as high yield potential but yield is much below expectation due to high susceptibility to sheath blight. Yield loss of rice varies from 5.2 – 50% (Kannaiyan and Prasad, 1978, 1984) and 1.6 – 48.4% (Rajan, 1987) depending on disease severity. There is positive relation between increasing disease severity percentage and decreasing yield. Various attempts were taken to develop sheath blight resistant variety but till date only a few variety were released with lower level of tolerance. Various cultural practices combined with use of fungicides are the most common option of managing the disease. But during the wet season when the disease spread at faster rate, then repeated spray of fungicide in 7 – 10 days interval is the only way of minimizing the disease. Foliar sprays of various fungicides have already been reported (Arunyanant *et al*., 1986). Repeated use of same fungicides in the same field or plot sometimes become less or not effective, may be due to development of resistance recombinant of the sheath blight pathogen. Therefore, an attempt was made to evaluate a new fungicide 'Trifloxystrobin 25% + Tebuconazole 50% 75WG' – a combination of two systemic fungicides like strobilurin compound 'Trifloxystrobin' and triazole compound 'Tebuconazole' alongwith two effective commercial fungicides viz., Hexaconazole 5EC and Validamycin 3L.

E mail : manas.bag@gmail.com

MATERIALS AND METHODS

Field experiment was conducted during *Kharif* season of two consecutive years (2006 and 2007) at Rice Research Station, Chinsurah on rice. The experimental design was RCB with four replications and four treatments viz., 'Trifloxystrobin 25% + Tebuconazole 50%' 75WG, Hexaconazole 5EC, Validamycin 3L and untreated plot was taken as control. Plot size was 2 x 5 m and distance of 1.2 m was kept between replications and 90 cm between plots. The high yielding most widely cultivated variety 'Swarna' (MTU 7029) which is also susceptible to sheath blight was taken for the experiment. Standard agronomic practices were followed except the fertilizer dose which was $N:P_2O_5:K_2O$ @ 120:50:30 kg ha^{-1}. For getting better result artificial inoculation with virulent strain of sheath blight pathogen *R. solani* were done following 'Straw-bit' method (Rao & Kannaiyan, 1973) during active tillering stage. Fungicides were sprayed thrice at an interval of 10 days starting from the initial appearance of the disease. The final disease incidence was recorded 15 days after last spray from 20 randomly affected hills in each treatment and the plants were assessed individually using SES scale (0-9 scale) (Anon., 1996) using the formula:

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

Where $N_0 – N_9$ = No. of tiller/hill classified as 0-9 grades respectively according SES (0-9) for rice.

The grain yields was recorded on plot basis and converted to t/ha. Statistical analysis was done on

mean of two years data both for disease severity (%) and grain yield separately.

RESULTS AND DISCUSSION

Perusal of data (Table-1) revealed that all the three fungicides were effective in decreasing the disease and increasing the grain yield. Disease severity (DS) was as high as 84.33% and yield was as low as 0.4 t ha^{-1} in untreated plot. 'Trifloxystrobin 25% + Tebuconazole 50%' 75WG - which is combination of strobilurin compound 'Trifloxystrobin' and triazole compound 'Tebuconazole' was most effective in reducing disease severity over control (37.61%) but at par with another commercial antifungal antibiotic compound Validamycin 3L (38.3%). But grain yield percentage was higher (0.6 t/ha) in 'Trifloxystrobin 25% + Tebuconazole 50%' 75WG treated plot compared to Validamycin 3L (0.57 t/ha).Yield increase percentage in 'Trifloxystrobin 25% + Tebuconazole 50%' 75WG treated plot was 50% higher over untreated (control) plot whereas in Validamycin 3L treated plot 42.5% over untreated plot (Fig-1).

The same fungicides were used in the trials conducted at various other location of All India Coordinated Rice Improvement Programme during the year 2006 and 2007. 'Trifloxystrobin 25% + Tebuconazole 50%' 75WG was best compound during 2006 at Coochbehar (West Bengal), Ludhiana, Faizabad and Raipur and at par with Rhizocin at Arundhutinagar, DRR, Marateru, Moncompu and Chiplima. Whereas during 2007, 'Trifloxystrobin 25% + Tebuconazole 50%' 75WG was best at DRR (Hyderabad), Faizabad, Khudwani, Ludhiana and Varanasi and at par with Validamycin 3L at many other locations (Annonymous, 2007 & Annonymous, 2008).

ACKNOWLEDGEMENT

The authors were thankful and grateful to DAWB & EOS, Govt. of West Bengal, ADA (Res.), Dept. of Agriculture, Govt. of West Bengal and JDA (Rice Dev.), Rice Research Station, Chinsurah, West Bengal for their continuous encouragement and support.

REFERENCES

Annonymous, 1996. Standard evaluation system for rice. *International Rice Research Institute*, Manila, Phillipines. pp52

Anonymous. 2007. *Progress Report, 2006*, Vol.2. Entomology and Pathology, AICRIP, DRR (ICAR), Hyderabad, India, pp.3.104– 3.120.

Anonymous. 2008. *Progress Report, 2007*, Vol.2. Entomology and Pathology, AICRIP, DRR (ICAR), Hyderabad, India, pp. 3.94– 3.110.

Arunyanart, P., Surin A. and Rojanahasadin, W. 1986. Chemical control of sheath blight. *International Rice Res. Newsletter.* **11:** 20.

Biswas, A. 2000. Evaluation of new fungicidal formulations for sheath blight control. *J. Mycopathol. Res.* **40**: 9-11.

Kannaiyan, S. and Prasad, N. N. 1978. Seed borne nature of pathogen, *Rhizoctonia solani* in rice. *International Rice Res. Newsletter*, **3**: 10.

Kannaiyan, S and Prasad, N. N. 1984, Effect of foliar spray of certain fungicides on the control of sheath blight of rice. *Madras Agric. J.* **71**: 111 - 114.

Rajan, C. P. D. 1987. Estimation of yield loss due to sheath blight of rice. *Indian Phytopathology*. **40**: 174 – 77.

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

Table 1: Efficacy of a new fungicide 'Trifloxystrobin 25% + Tebuconazole 50%' 75WG against sheath blight disease of rice. (Pooled data)

Sl. No.	Treatments	Dose (/liter water)	Disease Severity		Yield	
			Disease severity (%)	Disease control over check (%)	Yield (t/ha)	Yield increase over check (%)
T_1	Trifloxystrobin 25% + Tebuconazole 50% 75WG	0.4 g	52.63 (46.56)	37.6	0.6	50.0
T_2	Hexaconazole 5EC	2.0 ml	62.05 (52.05)	26.4	0.53	32.5
T_3	Validamycin 3L	2.0 ml	52.05 (46.27)	38.3	0.57	42.5
T_4	Check (Untreated)	-	84.33 (70.15)	-	0.40	-
	SED	**-**	**2.37**	**-**	**0.04**	**-**
	CV (%)	**-**	**9.48**	**-**	**14.52**	**-**
	LSD (0.05)	**-**	**4.92**	**-**	**0.07**	**-**
	LSD (0.01)	**-**	**6.70**	**-**	**0.10**	**-**

Figure in parenthesis indicate angular transformed values and statistics applied to them.

\

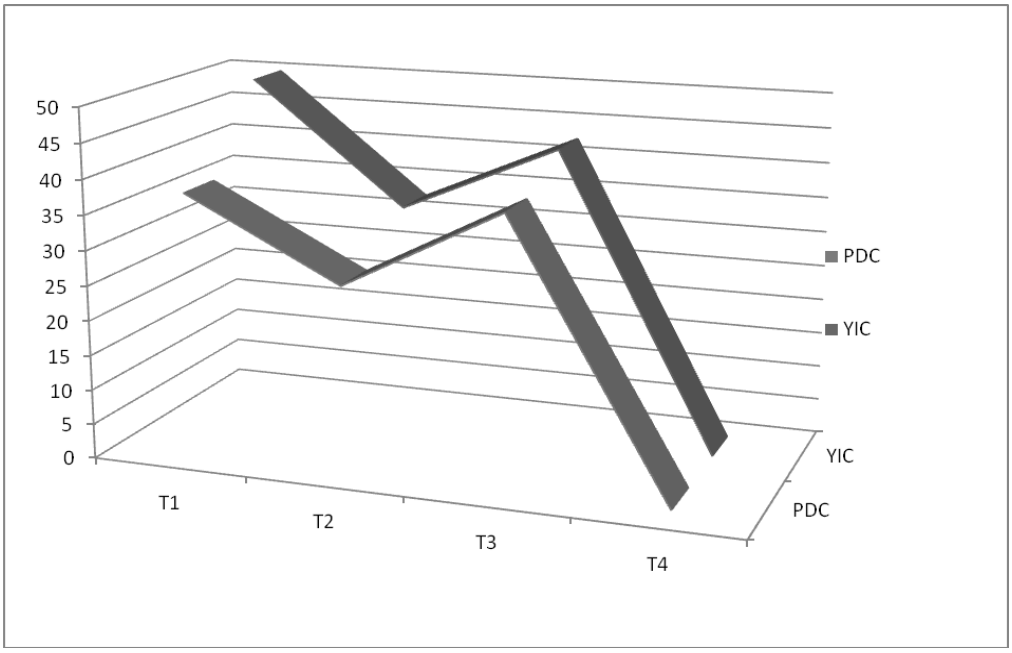

Fig.1: Graph showing percent (%) disease control and yield increase (%) over control plot