Journal of Crop and Weed 6(2)78-79: (2010)

Evaluation of botanicals and biopesticides against sheath rot disease of rice

M. K. BAG, U. K. ROYCHOUDHURY AND B. ADHIKARI

Rice Research Station,
Government of West Bengal,
Chinsurah R. S. – 712 102

Key words: Biopesticide, resistance, yield loss

Sheath rot disease caused by *Sarocladium oryzae* and also by *Fusarium moniliformae* (Bhargava *et. al.*, 1978) emerged as one of the major disease of rice (Biswas, 2000). The disease has spread in all the rice ecosystem of all agro climatic zone of West Bengal except himalayan hill and subhimalayan region (Reddy, 1993; Biswas, 2000). Damage caused by this disease ranges from 3 – 20%; sometimes as much as 85% and yield loss 9.6 – 26.0% (Ou, 1985). Estimated yield loss due to this disease is 10 – 70% also reported (Gannon, 1996).

Management of any disease mainly aims at prevention of outbreak through the use of host plant resistance and chemical pesticides. The persistent, injudicious use of chemical has toxic effect on non target organisms and cause undesirable changes in the environment. Large scale and long term use of resistant cultivar is likely to result in significant shifts in the virulence characteristics of pathogens, culminating in resistance breakdown. Biological control gaining importance and becoming popular in integrated disease management (Jagtap and Nikam, 2010). Use of various bio-control agents viz. *Trichoderma* spp., *Pseudomonas* spp. and plant extracts (botanicals) for plant disease management has been reported by several workers (Ansari, 1995; Levy *et. al.*, 1992). Thus present effort was given for evaluation of new commercially available botanicals and biopesticides against sheath rot of rice under West Bengal situation.

The experiment was conducted at Rice Research Station, Chinsurah, during *Kharif* 2006 and 2007 with six treatments including untreated check. Rice variety Swarna (MTU7029) was sown in a Randomized Block Design (RBD) with three replications. Standard agronomic practices were followed with fertilizer dose ($N:P_2O_5:K_2O$ @ 120:50:30 kg ha^{-1}). All the plants, except border lines were artificially inoculated by 'grain-inoculation' method during advance booting stage. Six treatments were botanicals viz., Biofer (organic, plant lipids, bioproducts made from natural plant molecules containing triterpene C30, 6 isoprene) and Defender (natural plant derived product from *Cinnamomum zylanicum*); biopesticides viz., Florezen-P (baterial product from *Pseudomonus fluorescence,* cfu $2x10^6$) and Trichozen-T (fungal poduct from *Trichoderma viride* cfu $2x10^6$) with one check fungicide (carbendazim) and one control (untreated).

Fungicides, biopesticides (except Trichozen-T) and botanicals were sprayed thrice at an interval of 10 days starting from the initial appearance of the disease. First symptom appeared 7- 8 days after artificial inoculation; subsequently first spraying was done. But Trichozen-T was mixed with soil during final land preparation. Nothing was sprayed in control plot. The disease incidence was recorded 10 days after the last spray.

Appropriate statistical analysis using Analysis of Variance technique was applied after ARCSIN transformation of disease incidence (%) data. The grain yields were recorded after harvest on plot basis and were converted to kg ha^{-1} for statistical analysis. Analysis of data (Table 1) revealed that all the treatments reduced the disease incidences, increased grain yield as compared to control (untreated) plot. Disease pressure was as high as (58.9%) in untreated (control) plot.

Among the treatments, carbendazime 50WP was best in resulting minimum disease incidence (32.6%) and maxiumum yield (2823.5 kg ha^{-1}) but the biopesticides Florezen P resulted disease incidence (34.7%) and yield (2722 kg ha^{-1}) was also statistically at par with it. Disease incidence was reduced by 41.1% and 20.7% respectively in Florezen-P and Defender treated plot over control plot where disease incidence was 58.9%. Yield was also increased by 43.4% and 30.7% respectively in Florezen-P and Defender treated plot over control plot (1898 kg ha^{-1}).

Application of Florezen-P was found effective in reducing other rice diseases such as leaf blast, brown spot, sheath blight, false smut etc. (Annonymous, 2007). Florezen-P and Defender also found better after carbendazim in managing sheath rot disease in other All India Coordinated Rice Improvement Project (AICRIP) centre like

Email:manas.bag@gamil.com.
Short communication

Siruguppa, Patna, Marateru, Coochbehar, during *Kharif* 2006 and 2007 (Anon., 2007, 2008).

ACKNOWLEDGEMENT

Grateful thanks are due to the Director of Agriculture, West Bengal, Additional Director of Agriculture (Research), West Bengal and Joint Director of Agriculture (Rice Development), West Bengal for their keen interest in the subject and providing necessary facilities.

REFERENCES

Anonymous. 2008. Progress Report, 2007,. Entomology and Pathology, AICRIP, DRR (ICAR), Hyderabad, India, p.129 –47.

Anonymous. 2007. Progress Report, 2006, Entomology and Pathology, AICRIP, DRR (ICAR), Hyderabad, India, p.136 - 57.

Ansari, M. M. 1995. Control of sheath blight of rice by plant extracts. *Ind. Phytopath.* **48**: 268-70.

Bhargava, S. L., Shukla, D. N., Singh, N. K. and Singh, N. 1978. *Fusarium moniliformae* – causing panicle rot of rice. *Ind. Phytopath.* **31**: 367-69.

Biswas, A. 2000. Changing trends of rice disease in West Bengal, *J. Mycopath. Res.* **38**: 33 - 36.

Gannon, R. 1996. Possible new disease found. *Rice J.* **99:** 20.

Jagtap, G. P. and Nikam, P. S. 2010. Bioefficacy of Tricoguard (*Trichoderma viride*) against seedling / nursery diseases of brinjal. *Pestology* **34**: 11 – 14.

Kang, M. S. and Kaur, S. 1989. Sheath rot of rice in Punjab. *J. Res. Punjab Agric. Univ.* **26:** 57- 61.

Levy, E., Gough, F. J., Berlin, K. D., Guina, P. M. and Smith, J. T. 1992. Inhibition of *Septoria tritici* and other phytopathogenic fungi and bacteria by *Pseudomonas fluorescens* and its antibiotics. *Pl. Path.* **41**: 335 – 41.

Murulidharan, K. 2007. Disease management in hybrid rice cultivation and seed production. In: *Training on Hybrid Rice Production Technology, Sept. 18-22, DRR, Hyderabad.* p. 134-43.

Ou, S. H. 1985. *Rice Disease* (2nd Ed.) Commonwealth Mycological Institute, Kew, U.K., p. 272.

Reddy, A. P. K. 1993. Current status of rice diseases in India and their management Appendix 2. *In report of an INGER disease resistance monitoring visit to Indonesia and Philippines* (20-27 February, 1993), Los Banos, IRRI. p 13 - 27.

Table 1: Performance of botanicals and biopesticides against sheath rot disease of rice during *Kharif*, 2006 and 2007.

Fungicides	Doses litre^{-1} of water	Disease incidence (%)			% Disease reduction over control	Yield (Kg.ha^{-1})			Increase % in yield over control
		2006	2007	Pooled		2006	2007	Pooled	
Biofer	1.5 ml	46.3 (42.9)	53.3 (46.9)	49.8 (44.9)	15.5	1610	3087	2348.5	23.7
Defender	2.5 ml	47.6 (43.6)	45.7 (42.5)	46.7 (43.1)	20.7	1564	3397	2480.5	30.7
Florezen-P	2.5 g	35.4 (36.5)	33.9 (35.6)	34.7 (36.1)	41.1	1888	3556	2722.0	43.4
Tricozen-T	*5 kg ha^{-1}	52.6 (46.5)	49.4 (44.6)	51.0 (45.6)	13.4	1440	3307	2373.5	25.0
Carbendazim$	1.0 g	34.2 (35.7)	30.9 (33.7)	32.6 (34.8)	44.7	1919	3728	2823.5	48.7
Control	-	59.3 (50.4)	58.5 (49.9)	58.9 (50.1)	-	1327	2469	1898.5	-
LSD (0.05)		**2.99**	**2.56**	**0.42**	-	**127.4**	**194.3**	**1.56**	-
CV(%)		**4.8**	**4.0**	**1.2**	-	**5.2**	**4.0**	**0.04**	-

**Figures in the parentheses are the angular transformed values*

$ 50 %WP