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Fungicidal spraying for control of Bakanae disease of rice in field

S. BISWAS AND S. N. DAS

Department of Plant Pathology, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur 741 252, Nadia, West Bengal

'Bakanae' disease, caused by *Fusarium moniliforme* Sheld. [Telemorph : *Gibberella fujikuroi* (Sawada) Ito], is one of the important diseases of rice throughout the paddy growing countries of the world (Ou, 1985). The disease has been reported to cause moderate to severe losses which varied with regions and varieties grown (Heaton, 1965 ; Ou, 1985 ; Pavgi and Singh, 1964). In West Bengal the incidence of the disease has increased in the past few years causing about 10% loss in yield under field condition (Biswas and Das, 2001). This paper reports the results of two years trials on the effectivity of some fungicides for controlling rice Bakanae disease by spraying at their recommended dose.

Five fungicides, namely Carbendazim (Bavistin 50% WP,) Benomyl (Kri-Benomyl 50%WP), Ediphenphos (Hinosan 50%EC), Mancozeb (Indofil M-45 75%WP) and Ziram (Cuman-L 27%SC) were used. Field trails were conducted during the *boro* season of 1997 and 1998 at University Experimental Farm, Kalyani to evaluate the efficacy of these fungicides against Bakanae disease of rice by spraying. Variety Rasi (IET 1444), highly susceptible to the disease, was used as test variety. Thirty five days old seedlings, raised from infected seeds (collected from heavily infested rice fields), were transplanted in the puddled field, which had a history of severe disease incidence of Bakanae infestation. Transplanting was done in Randomized Block Design (RBD) with 3 replications in 3×2 m plot at 20×15 cm spacing for each treatment. Three seedlings per hill were planted. Standard recommended dose of fertilizers, irrigation and other agronomic practices were applied in raising the crop. A distance of 50 cm was kept between plots and also between blocks.

Table 1 : Effect of fungicidal spraying on the disease incidence, tiller infection and yield or rice.

Fungicide	Concentration (%)	Disease incidence (%)			Tiller infection (%) (in affected hills)			Yield		
		1997	1998	Mean	1977	1998	Mean	1997	1998	Mean
Bavistin	0.1	21.7 (27.7)	32.1 (34.4)	26.9 (31.0)*c	16.3 (23.8)	18.9 (25.7)	17.6 (24.8)c	41.2	39.8	40.5a
Benomyl	0.1	22.3 (28.1)	32.3 (34.6)	27.3 (31.4)c	16.8 (24.1)	19.1 (25.9)	17.9 25.0)c	40.6	39.5	40.0a
Hinosan	0.1	25.1 (30.0)	33.4 (35.3)	29.2 (32.6)bc	18.4 (25.3)	21.0 (27.2)	19.7 (26.3)bc	39.5	37.3	38.4ab
Indofil M-45	0.3	28.6 (32.3)	35.9 (36.8)	32.2 (34.5)ab	19.2 (25.9)	21.8 (27.8)	20.5 (26.9)b	37.9	36.4	37.1b
Cuman L	0.2	29.4 ((32.8)	37.1 (37.5)	33.2 (35.1)a	19.5 (26.1)	22.2 (28.1)	20.8 (27.1)ab	37.3	36.1	36.7b
Control	–	31.2 (33.9)	39.4 (38.8)	35.3 (36.4)a	20.9 (27.1)	25.1 (30.0)	23.0 28.6)a	36.8	35.8	36.3b
SEm±		1.00		0.71	0.76		0.53	1.00		0.71
LSD (P = 0.05)		2.9		2.1	2.2		1.6	2.9		2.1

* Figures in parentheses are angular transfromed values.
Means followed by common letters are not significantly different.

Two sprays of the test fungicides starting from 10 days after transplanting were given at an interval of 10 days, i.e., at 10 DAT and 20 DAT (DAT=Days after transplanting). The fungicides were sprayed after draining out of water from the field in such a way that the basal part of the stem and soil at the base of the plant were covered by spraying. Irrigation was introduced 3 days after spraying. Number of Bakanae infected plants were counted 15 days after last spraying in each plot and per cent disease incidence was calculated. Percentage of infected tiller per hill was recorded from nine randomly selected infected hills at the same time. Yield in each plot was also recorded.

The disease has been reported to be systemic in nature (Nisikado and Kimura, 1941). In the present study, under field condition, fungicidal spraying with Bavistin (0.1%) and Benomyl (0.1%) were found to give some control against the disease as evidenced by significant reduction in disease incidence and percentage tiller infection, as well as increase in yield significantly (Table 1). Hinosan, Indofil M-45 and Cuman-L were not at all effective. Grewal and Kang (1991) reported that percentage of intensity of *Fusarium* sheath rot caused by *F. moniliforme* was reduced most effectively by spraying with Topsin M, Derosal and Bavistin. Hajra *et al.* (1994) also reported that the disease could be controlled by spraying with Carbendazim (Bavistin 0.3%). As the pathogen being seed-borne in nature, chemical seed treatment is the most effective and economic method for controlling the disease. Spraying with fungicides gives only limiled control.

REFERENCES

Biswas, S. and Das, S.N. (2001). Incidence of Bakanae disease of rice in West Bengal and spread of the casual fungus within the host. Proceedings of the *National Symposium on Tropical Mycology in the 21st Century*, Department of Botany, Calcutta University, February 8-10. (In Press).

Grewal, S. K. and Kang, M. S. (1991). Fungicidal control of *Fusarium* sheath rot of rice. *Plant Disease Research*, **6** : 75-77.

Hajra, K. K. ; Ganguly, L. K. and Khatua, D. C. (1994). Bakanae disease of rice in West Bengal. *Journal of Mycopathological Research*, **32** : 95-99.

Heaton, J. B. (1965). A foot rot disease of rice variety Blue Bonnet in Northern Territory, Australia, caused by *Fusarium moniliforme* Sheldon. *Tropical Science*, **7** : 116-121.

Nisikado, Y. and Kimura, K. (1941). A contribution to the pathological anatomy of rice plants affected by *Gibberella fujikuroi* (Saw.) Wollenweber. I. *Bericht des Ohara Instituts fur Landwirtschaftliche Forschungen, Okayama Universitat*, **8** : 421-426.

Ou, S. H. (1985). *Rice Diseases*. CMI, Kew, Surrey, U. K. 380 pp.

Pavgi, M. S. and Singh, J. (1964). Bakanae and foot rot of rice in Uttar Pradesh, India. *Plant Disease Reporter*, **48** : 340-342.

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