J. Mycopathol, Res, ***51(1)*** *: 189 - 191,* 2013; (ISSN 0971-3719)

An integrated approach to manage Sheath Blight of rice

RINI PAL*, DIPANKAR MANDAL[1] AND M. K. MISHRA
All India Co-ordinated Rice Improvement Project, Regional Research and Technology Transfer Station, O.U.A.T, Chiplima, Sambalpur, Odisha, India.
[1]R.R.T.T.S, Chiplima, Sambalpur, Odisha, India, Pin-768025.

Received : 16.10.2012 Accepted : 06.02.2013 Published : 29.04.2013

Sheath blight of rice caused by *Rhizoctonia solani* is an economically important disease affecting rice production. Field experiments were carried out during *Kharif* seasons of 2009-10 and 2011-12 at the experimental site of All India Coordinated Rice Improvement Project, Chiplima, to manage the disease in an integrated way taking varietal resistance, different doses of nitrogen fertilizer and number of sprays of an effective fungicide as parameters. Swarna and Pratikshya were used as susceptible and resistant varieties respectively. Nitrogen at the local recommended dose (100 kg/ha) and at 2/3rd of the recommended dose were applied. Two to three fungicidal sprays were given when disease severity reached economic threshold level. From the experiment, it was found that sheath blight can be managed to a great extent by using resistant variety (Pratikshya) and moreover management of nitrogen fertilizer (2/3rd of the recommended dose) along with need based number of sprays of an effective fungicide (Hexaconazole @ 2 ml/l) can significantly reduce the disease even in a susceptible variety with higher grain yield.

Key words: Rice, sheath blight, integrated management

Sheath blight disease of rice incited by *Rhizoctonia solani* Kühn; the imperfect stage of *Thanatephorus cucumeris* (A.B.Fronk) Donk is one of the most important fungal diseases of rice in almost all rice growing states of India (Biswas, 2000). The disease was first reported in Japan in 1910 and was soon well established in many Asian countries (Lee and Rush, 1983). It's occurrence in India was reported by Paracer and Chahal (1963) from Gurdaspur in Odisha it is regarded as one of the most widely distributed diseases of rice. The disease appears both on sheath and laminar portion of leaf. Some farmers' practice aims at higher yield very often lead to higher sheath blight incidence. Sheath blight disease at high severity levels causes reduction in yield mainly due to empty earheads. Yield losses due to this disease is reported to range from 5.2 to 50% depending on environmental conditions, crop stage at which the disease appears, cultivation practices and cultivars (Rajan, 1987; Sharma and Teng, 1996). High densities of sowing as well as nitrogen doses higher than the recommended dose have resulted in higher disease incidence. Various workers supported the higher yield due to disease control efficiency of the respective chemicals (Lore *et al.*, 2005; Biswas, 2002). The present experiment has been carried out to manage the disease in an integrated way taking varietal resistance, different doses of nitrogen fertilizer and number of sprays of an effective fungicide as parameters.

Field experiments were conducted during *Kharif* seasons of 2009-10 and 2011-12 at the experimental site of All India Coordinated Rice Improvement Project, Chiplima, Sambalpur, Odisha. Thirty days old seedlings of sheath blight susceptible variety Swarna (T_1-T_6) and resistant variety Pratikshya (T_7) were transplanted following Randomized Block Design with four replications. Phosphorus and potash were applied in all the plots as per local recommendations but nitrogen was applied at the rec-

*Email ID: rinipatho@gmail.com

Table 1: Effect of integrated management practices against sheath blight severity and yield of rice

Treatments		Percent disease severity			Disease control (%)	Yield (q/ha)			Yield increase over control (%)
No.	Name	2009-10	2011-12	Pooled mean		2009-10	2011-12	Pooled mean	
T1	L.P.S.V+ 100% RDN	14.80 (4.0)*	24.50 (4.98)	19.70 (4.46)	-	25.9	20.0	23.0	-
T2	L.P.S.V+ 2/3 of RDN	15.66 (4.01)	20.70 (4.56)	18.16 (4.31)	7.82	24.8	23.0	24.0	4.35
T3	L.P.S.V+ 100% RDN+ A single spray of an effective fungicide	13.67 (3.68)	18.30 (4.30)	15.98 (4.04)	18.88	25.7	24.5	25.1	9.13
T4	L.P.S.V+2/3rd of RDN+ A single spray of an effective fungicide	13.50 (3.70)	13.90 (3.73)	13.68 (3.74)	30.56	23.9	27.0	25.5	10.87
T5	L.P.S.V+ 100% RDN + Need based no. of sprays of an effective fungicide	5.24 (2.35)	6.20 (2.54)	5.72 (2.46)	70.96	25.3	30.5	27.9	21.30
T6	L.P.S.V+2/3rd of RDN + Need based no. of sprays of an effective fungicide	4.33 (2.17)	3.20 (1.89)	3.76 (2.05)	80.91	23.5	35.5	29.5	28.26
T7	Resistant variety + 100% RDN	3.72 (1.98)	1.6 (1.42)	2.66 (1.74)	86.50	22.0	30.0	25.9	12.61
SE(m)±		0.35	0.26	0.22		0.97	1.48	0.67	
CD(0.05)		1.04	0.78	0.66		2.88	4.40	2.00	
CV%		22.53	15.72	13.54		7.93	10.90	5.20	

*Figures in parentheses indicate square root transformed values.
LPSV= Local popular susceptible variety (Swarna), RDN= Recomended dose of nitrogen fertilizers

ommended dose i.e, 100 kg/ha on T_1, T_3, T_5 and T_7 and at 2/3rd of recommended dose i.e, 67 kg/ha on T_2, T_4 and T_6. The adequate supply of nitrogen was ensured through split application as basal and top dressing and standard agronomic practices were followed to raise the crop. Natural occurrence of the disease was permitted. The first spray of an effective fungicide i.e, Hexaconazole @ 2 ml/l was done on T_3, T_4, T_5 and T_6 when disease severity reached economic threshold level. A second or third spray of the same was given depending on the disease severity. Three sampling units of one sq.m area were fixed in each plot at random for observation of disease severity. Disease severity was recorded ten days after each spray and terminal disease severity was recorded at heading stage. The grain yield of each plot was recorded at the time of harvest and converted to q/ha. Both the data on disease severity as well as grain yield were analysed statistically.

The initial disease symptoms appeared during September in both the years. Two to three fungicidal sprays were given in T_5 and T_6 when disease severity reached economic threshold level. Data in Table 1 represents the terminal disease severity (recorded at heading stage) as well as grain yield (q/ha) of different treatments. The disease was moderate and the severity had gone up to 25% in the untreated plot (T_1 in Table 1). Nitrogen management @ 2/3 rd of recommended dose of Nitrogen (RDN) was found significantly effective against the disease as compared to 100% RDN in all the cases. Roy (1978) reported that, the application of high doses of nitrogen fertilizer favour the disease development. In fungicidal treatments, need based number of sprays (2-3) of an effective fungicide Hexaconazole @ 2 ml/l in T_5 and T_6 had shown a high degree of efficacy in reducing disease severity as compared to a single spray in T_3 and T_4. The resistant variety Pratikshya (T_7 in Table 1) was found superior than all the treatments showing least disease severity throughout the experiment (86.5% disease control) though Pratikshya showed lesser grain yield than the susceptible variety Swarna especially in fungicide treated plots. Groth (2005) also found that the spread of sheath blight is largely dependent on varietal resistance. The grain yield was significantly higher in the plots where need based number of sprays of an effective fungicide were given.

The authors are thankful to the Project Director, All India Coordinated Rice Improvement Project for providing financial assistance and chemicals for the experiment.

REFERENCES

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

Biswas, A. 2002. Evaluation of new fungicidal formulations for sheath blight control. *J. Mycopathol. Res.* **40**: 9-11.

Groth, D.E. 2005. Azoxystrobin rate and timing effects on rice sheath blight incidence and severity and rice grain and milling yields. *Plant Dis.* **89**: 1171-1174.

Lee, F.N. and Rush, M.C. 1983. Rice sheath blight: A major rice disease. *Plant Dis.* **67**: 829-832.

Lore, J.S; Thind, T.S. and Mohan, C. 2005. Performance of some new fungicide formulations against sheath blight of rice. *Pesticide Res. J.* **17**: 49-51.

Paracer, C.S. and Chahal, D.S. 1963. Sheath blight of rice caused by *Rhizoctonia solani* kuhn. A new record of India. *Curr. Sci.* **32**: 328-329.

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

Roy, A.K. 1978. Note on screening on rice culture against sheath blight. *Indian J. Agric. Sci.* **48**: 259-260.

Sharma, N.R. and Teng, P.S. 1996. Rice sheath blight: effect of crop growth stage on disease development and yield. *Bangladesh J. Pl. Pathol.* **12**: 43-46.