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RESEARCH ARTICLE

Evaluation of Different Modules for the Management of Sheath Blight of Rice under Field Conditions

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ABSTRACT

The present study was undertaken to evaluate the different modules for management of sheath blight of rice caused by *Rhizoctonia solani* Kuhn in field condition. The On Farm Trials (OFT) was conducted during Kharif, 2016 to evaluate various chemicals & biopesticides (Module) for management of disease. The soil drenching of Trichoderma @5.0Kg/ha with 100kg FYM(Before transplanting), Seed treatment with Vitavax @ 2.5gm/kg (During nursery sowing) & two spray of tebuconazole 25EC @ 1.0ml/lt(During vegetative phase & before panicle initiation) was found most effective module for management of sheath blight of rice and resulted in minimum 8% disease severity with 33.14% increase in yield over the check followed by module no. 02 where disease severity was 11% and 25.14% increase in yield.

Keywords: Rice, *Rhizoctonia solani, Sheath blight, Disease Severity, Yield*

INTRODUCTION

Rice is one of the most important staple food crops in the world. China & India are the lead producing countries in the world. Major rice growing states of India are West Bengal, Uttar Pradesh, Punjab, Bihar, Tamil Nadu, Madhya Pradesh and Chhattisgarh. Rice is known to suffer from many biotic & abiotic stresses. Several diseases reported on rice ie- Blast, Sheath blight, Sheath rot, BLB, Brown spot are the most important for the various states and cause considerable economic yield loss. Sheath Blight of rice caused by ***Rhizoctonia solani*** Kuhn is a serious threat in rice growing areas. A modest estimation of losses due to sheath blight disease in India approximately 54.3% (Rajan 1987, Raj 1993). The pathogen has a wide host range and can infect plants belonging to more than 32 plant families and 188 genera (Gangopadhyay & Chakraborti, 1982). The symptoms of sheath blight of rice disease in both nursery & transplanted crops. The symptoms generally appear at tillering stage on leaf sheath at water level in the lowland and at ground level in upland ecosystem. The pathogen produces elliptical or oval to irregular 1-3 cm long grayish spots on leaf sheaths and leaves. The centre of spot becomes grayish white with brown margin. Under favorable condition the infection spreads rapidly to upper leaf sheath and leaf blades of the same or adjacent tiller. Lesions on the upper parts of the plants extend rapidly coalescing with other to cover entire tiller from the water level to flag leaf. On the leaf blades, the lesions are larger and somewhat irregular in shape, greenish grey to greenish white with brown margins, ultimately causing death of leaf, tiller & plant. The pathogen has also been found to infect seedlings at nursery stage causing stunting (Naidu et al, 1983), pre & post emergence seedling blight and spotted/discoloured seed(Acharya et al., 1997, 2004) bearing regular to irregular brownish black to blackish discoloured lesions on coleoptiles, first leaf, radical, second leaf and sheath (Sivalingam et al., 2006)

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MATERIALS AND METHODS

Evaluation of modules under field condition:

On Farm Trials were conducted out (Kharif 2016) on the farmers field at district Muzaffarnagar, UP. The field size of 4000 meter squre(1.0 Acre). Susceptible rice cultivar Pusa Basmati-1 was used. General agronomical practices were followed for cultivation of trial field. There were four treatments ie Propeconazole 25EC, Tebuconazole 25EC, Vitavax, Biological control agent Trichoderma viride alongwith FYM and including untreated (control) for each replication. The following combination as modules used for management of sheath blight.

1. T1- Trichoderma @5.0Kg/ha with 100Kg of FYM(Before transplanting)+ Seed treatment with Vitavax@2.5gm/Kg (During nursery sowing)
2. T2- T1+Propeconazole 25EC @1.0ml/lt- 02 spray at vegetative stage & before panicle initiation.
3. T3- T1+Tebuconaconazole 25EC @1.0ml/lt- 02 spray at vegetative stage & before panicle initiation.
4. T4- No treatment (Control)

Percent Disease Index: Disease severity of sheath blight was recorded 10 days after the second spray. Ten sampling units of 1 meter square area were marked in each field for each replication at random. The disease score was recorded on 20 plants per sampling units by counting the number of infected tillers/leaves and degree of severity on each tiller /leaf using 0-5 scale (0=0%, 1= less than 5%, 2= 6-10%, 3= 11-25%, 4= 26-50%, 5= more than 50%)

The percentage of disease index was calculated by following formula

$$PDI = \frac{\text{Sum of all disease rating}}{\text{Total no of rating}} \times \frac{100}{\text{Maximum disease grade}}$$

RESULT & DISCUSSION:

The result indicated that the module T3- The soil drenching of Trichoderma @5.0Kg/ha with 100Kg of FYM (Before transplanting), Seed treatment with Vitavax @2.5 gm/kg seed (During nursery sowing) and two spray of Tebuconazole 25 EC @ 1.0ml/lt water (During vegetative stage & before panicle initiation) found most effective in reducing the disease severity 8% and recorded 55.56% decrease of sheath blight of rice &yield increase 33.14% over control. The module treatment T2- The soil drenching of Trichoderma @5.0Kg/ha with 100Kg of FYM (Before transplanting), Seed treatment with Vitavax @2.5 gm/kg seed (During nursery sowing) and two spray of Propeconazole 25 EC @ 1.0ml/lt water (During vegetative stage & before panicle initiation) was found better than T1 and reducing disease severity 11% and recorded 38.88% decrease of sheath blight of rice & yield increased 25.14% over control. In module T1- The soil drenching of Trichoderma @5.0Kg/ha with 100Kg of FYM(Before transplanting), Seed treatment with Vitavax @2.5 gm/kg seed (During nursery sowing) disease severity was found 14% and recorded 22.22% decrease of sheath blight of rice & yield increased 18.57% over the control. The findings under the field condition in the study clearly revealed that all fungicides significantly reduced the disease severity over control and increased yield of rice. These findings one in line with the observation of on the basis of Borthakur and Addy(1989), Das & Mishra (1990), Dutta & Kalha(2011), Deepmala Kindo & P.K.Tiwari (2015), Akansha Singh, Ram Chandra & Nitish Rattan Bhardwaj(2015) and V. Bhuvaneswari & Krishnan Raju(2012).

Table 1: Evaluation of modules under field condition:

S. No	Treatments(Modules)	Disease Severity Scale	Percent Disease Index(PDI)	Yield (Q/ha)	% Increase in Yield	BC Ratio
1.	T1- Trichoderma@5.0Kg/ha with 100 Kg of FYM (Before transplanting)+Seed treatment with Vitavax@2.5gm/kg seeds(During Nursery Sowing).	3	14	41.5	18.57	3.54:1
2.	T2- T1+Propeconazole 25EC @1.0ml/lt water (02 spray) at vegetative stage & before panicle initiation.	3	11	43.8	25.14	3.66:1
3.	T3- T1+Tebuconazole 25EC @1.0ml/lt water (02 spray) at vegetative stage & before panicle initiation.	2	8	46.6	33.14	3.88:1
4.	T4- No treatment (Control).	3	18	35.0	--	3.06:1

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