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Short Communication

Evaluation of new fungicide against *R. solani*

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Introduction

Sheath blight caused by *Rhizoctonia solani* Kühn (teleomorph: *Thanatephorus cucumeris* (A.B. Frank) Donk) is a major constraint (second only to rice blast) to rice production, causing 5-10% yield losses in low land tropical Asia. The pathogen has a wide host range and can infect more than 32 plant families and 188 genera, often infecting legume crops grown in rotation with rice. Both seedlings and adult plants are equally affected but loss is much more when the disease appears in seedlings. The infection and spread of disease before the flag leaf stage revealed 20% grain loss. Further, a strong relationship between the severity of symptom and yield reduction was reported among cultivars. Sheath blight can be effectively controlled with the application of systemic fungicides. However, bio-fungicides and resistant varieties are the other options of control management but, are not *at par* with chemical control.

During the course of study, potato dextrose agar was used for maintaining the culture of *Rhizoctonia solani*. Prior to use the glass wares were cleaned with labolin, rinsed with tap water and / or distilled water. The dried glass wares were sterilized in hot air oven at 180°C for two hours. The forceps, inoculums needle and other metallic instrument were sterilized by dipping them in alcohol and heating over the flame of strip during isolation, multiplication and other studies. Media was sterilized by autoclaving at 121°C and 15 psi for 30 min. Wherever required, glasswares of Borosil make and chemicals of standard make (Himedia, SD fine, Qualigens, Merck etc.) were used during the course of investigation.

Nine fungicide (Taqat, Captaf, Contaf Plus, Pulsor, Propiconazole, III-Hexacarb, Hexaconazole, Bavistin, and Folicur) were used to evaluate the efficacy against sheath blight disease. The different fungicide at recommended concentration (detailed elsewhere in result and discussion) in water (Taqat, Captaf, Contaf Plus, pulsor, Propiconazole, Hexacarb, Hexaconazole, and bavistin, Hexaconazole, Folicur) was sprayed with the help of hand sprayer. Plant of variety swarna were inoculated first and a day after the inoculated plants were sprayed with fungicides. Rice bran is commercially cheap and nutritionally rich carrier molecule, and can be very easily colonized by *R. solani* and therefore can be used for mass multiplication. Mycelial growth of *R. solani* from the inoculated rice bran was visible within 24 hours of incubation.

Growth of runner hyphae originating from this lesion at the surface of rice tissues, establishes penetration structures to produce a new (daughter) lesion and typical symptoms of sheath blight which were observed 96 hrs after inoculation.

Soon after 48 hours of inoculation the plots (4 x 4 meter) containing inoculated plants were sprayed with different fungicides and the control plots were sprayed with water. Observation on infection development (Total lesion length number of tillers infected per hill, sheath length) was recorded seven days after inoculation.

Efficacy of fungicide on sheath blight incidence (no. of infected tillers)

Hills exhibiting sheath blight infection were further evaluated for the number of tillers infected per hill. (Table 1). Quantitative data was generated by counting the number of tillers showing sheath blight symptoms per hill. (Table 1). Fungicide sprayed plots in the order of their increasing frequency of number of tillers infected out of total number of tillers/plants observed are as follows: Propiconazole (42µl/l), Hexacarb (1200µl/l), Thifluzamide (Pulser S) (42µl/l), Taqat (6g/l). Frequency sheath blight infection was moderate (11.70% to 22.06%) in fungicide sprayed plot in the order of increasing frequency for % of sheath blight incidence is as follows:

Captan (2.10g/l), Carbendazim (bavistin) (1000µl/l), Sheath blight incidence was very high in Tebuconazole Hexaconazole (Contaf) (1ml/l), Hexaconazole (1300µl/l). (1000µl/l), sprayed plot with 40.94 infected tillers.

Table 1: Efficacy of different fungicide affecting the rice sheath blight incidence (no. of infected tillers /hill)

S #	Fungicide Treatment	No of plants infected /35	No of tillers	No of infected tillers infected	%
Low sheath blight incidence					
1	Propiconazole 42µl	4	79	4	5.06
2	Hexacarb 1200µl	8	163	11	6.75
3	Thiﬂuzamide (Pulsar S) 42µl	3	59	4	6.78
4	Taqat 6g	28	573	49	8.55
Moderate sheath blight incidence					
5	Captan 2.10g	33	730	86	11.78
6	Carbendazim (bavistin) 1000µl	14	246	36	14.63
7	Hexaconazole (Contaf) 1ml	31	722	122	16.90
8	Hexaconazole 1300µl	17	349	77	22.06
High sheath blight incidence					
9	Tebuconazole (Folicur) 1000µl	30	596	244	40.94
10	Control	35	781	446	57.11

Conclusion

Efficacy of fungicide application on sheath blight development in rice

1. Inoculated plants in the plots were sprayed with the fungicide Thiﬂuzamide (Pulsar S) (42µl/l), and Hexacarb 2400µl/l affected the sheath blight development by reducing the number of plants, tillers showing sheath blight incidence. These fungicides were also effective in reducing the lesion length and therefore identified as most effective fungicide in reducing the sheath blight infections.
2. Application of Captan, Carbendazim, Hexaconazole, Tebuconazole did not reduced sheath blight incidence and therefore not suitable for the management of sheath blight of rice.

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