

Efficacy of Azoxystrobin 11% + Tebuconazole 18.3% SC on Rice Sheath Blight

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Abstract Azoxystrobin 11% + Tebuconazole 18.3% SC combination was evaluated for their efficacy on *Rhizoctonia solani*, the causal agent of rice sheath blight in *in-vivo*. The lowest disease index, highest disease control, highest yield was recorded in Azoxystrobin 11% + Tebuconazole 18.3% SC @ 1000 ml/ha followed by Azoxystrobin 11% + Tebuconazole 18.3% SC @ 750 ml/ha.

Keywords Rice sheath blight, Disease index, Fungicides, Yield.

Introduction

Rice (*Oryza sativa* L.) is an important food crop that serves as a major carbohydrate source for nearly half of the world's population. To sustain self-sufficiency and to meet food grain requirement of future, India has to produce 135-140 million tonnes of rice by 2030. This has to necessarily meet from less land, less water, less labor and fewer chemicals, constant battle against new emerging pathogens, pests and possible adverse effects from climate change [1]. Sheath blight of rice caused by *Rhizoctonia solani* Kuhn is a serious threat in rice growing areas. Sheath blight disease of rice occurs in all rice production areas worldwide [2]. Rice sheath blight disease causes losses ranging from 10-30% [3]. Chemical control of the sheath blight disease is successful at field level in majority of the cases [4]. Several new molecules are available in the market and farmers are going for 3-4 sprays for the control of sheath blight under field conditions. Keeping in view, the present investigation was undertaken to assess the efficacy of Azoxystrobin 11% + Tebuconazole 18.3% SC combination at different doses against *R. solani* under field conditions.

Materials and Methods

Field experiment was laid out in randomized block design (RBD) with seven treatments and three replications at BCKV, Nadia, West Bengal during *khari*f, 2014 to study the bio-efficacy and phytotoxicity of

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Table 1. Evaluation of Azoxystrobin 11% + Tebuconazole 18.3% SC against sheath blight in rice. *Figures in parentheses are angular transformed value.

| Sl. No. | Tr. No. | Treatments | Formulation ml/ha | Before spray | 10 Days after 1 st spray | 10 Days after 2 nd spray | 10 Days after 3 rd spray | Present disease control |
|---------|----------------|--|-------------------|-----------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------|
| 1 | T ₁ | Azoxystrobin 11% + Tebuconazole 18.3% SC | 500 | 6.77 (15.07) | 11.38 (19.70) | 14.23 (22.15) | 17.18 (24.47) | 51.15 |
| 2 | T ₂ | Azoxystrobin 11% + Tebuconazole 18.3% SC | 750 | 6.76 (15.07) | 9.94 (17.39) | 9.48 (17.92) | 10.45 (18.85) | 70.28 |
| 3 | T ₃ | Azoxystrobin 11% + Tebuconazole 18.3% SC | 1000 | 6.77 (15.07) | 8.63 (17.01) | 8.99 (17.45) | 9.85 (18.25) | 71.99 |
| 4 | T ₄ | Azoxystrobin 23% SC | 500 | 6.77 (15.07) | 13.45 (21.50) | 15.12 (22.87) | 16.40 (23.87) | 53.36 |
| 5 | T ₅ | Tebuconazole 25.9% EC | 750 | 6.58 (14.85) | 13.18 (21.27) | 15.95 (23.50) | 17.07 (24.39) | 51.46 |
| 6 | T ₆ | Validamycin 3% L | 2000 | 6.69 (14.98) | 12.40 (20.60) | 13.62 (21.69) | 16.44 (23.91) | 53.25 |
| 7 | T ₇ | Control | | 6.88 (15.20) | 17.46 (24.68) | 27.19 (31.43) | 35.17 (36.37) | - |
| | | CD 5% | | NS | 1.29 | 1.13 | 1.79 | - |

Azoxystrobin 11%+Tebuconazole 18.3% against sheath blight of rice.

Assessment of sheath blight

The sheath blight index was scored using 0-9 scale and percent disease index (PDI) was calculated by the following formula given by [5].

$$\text{PDI} = \frac{\text{Sum of all the numerical ratings}}{\text{Total number of leaves scored} \times \text{Maximum disease grade}} \times 100$$

Treatment wise yield (Q/ha) and cost benefit ratio of product was calculated. Disease index and yield were statistically analyzed by following the procedure of RBD.

| Score | 0-9 Scale for sheath blight disease. Description |
|-------|--|
| 0 | No infection |
| 1 | Vertical spread of the disease up to 20% of plant height |
| 3 | Vertical spread of the disease up to 21-30% of plant height |
| 5 | Vertical spread of the disease up to 31-45% of plant height |
| 7 | Vertical spread of the disease up to 46-65% of plant height |
| 9 | Vertical spread of the disease more than 66% of plant height |

Results and Discussion

The efficacy of different fungicidal formulation on the sheath blight severity showed that Azoxystrobin 11% + Tebuconazole 18.3% SC @ 1000 and 750 ml/ha lowest disease severity of 9.85 and 10.45 respectively (Table 1). However, the test fungicide gave the best control @ 1000 ml/ha against sheath blight with a percent disease control of 71.99 followed by @ 750

Table 2. Effect of different treatments of Azoxystrobin 11%+Tebuconazole 18.3% SC on grain yield of rice.

| Sl. No. | Treatments | a.i.(g) | Dose (g/ha) | Yield (q/ha) |
|---------|--|---------------|-------------|--------------|
| 1 | Azoxystrobin 11% + Tebuconazole 18.3% SC | 55 + 91.5 | 500 | 42.03 |
| 2 | Azoxystrobin 11% + Tebuconazole 18.3% SC | 82.5 + 137.25 | 750 | 50.76 |
| 3 | Azoxystrobin 11% + Tebuconazole 18.3% SC | 110 + 183 | 1000 | 51.65 |
| 4 | Azoxystrobin 23% SC | 125 | 500 | 41.67 |
| 5 | Tebuconazole 25.9% EC | 187.5 | 750 | 43.67 |
| 6 | Validamycin 3% L | 60 | 2000 | 39.01 |
| 7 | Untreated control | - | - | 36.48 |
| | CD (0.05%) | - | - | 2.23 |

The new combination fungicide i.e. Trifloxystrobin 25% + Tebuconazole 50% 75WG @ 0.4g/l was most effective in decreasing 37.61% lower sheath blight disease severity and increasing 50% higher grain yield over control [9].

Phytotoxic effects

No phytotoxic symptoms were observed at all the doses of Azoxystrobin 11% + Tebuconazole 18.3% SC (Table 4).

Conclusion

The lowest disease severity, highest percent disease control, highest yield was recorded in Azoxystrobin 11% + Tebuconazole 18.3% SC 1000 ml/ha followed by Azoxystrobin 11% + Tebuconazole 18.3% SC @ 750 ml/ha compared to control but highest benefit cost ratio was observed with Azoxystrobin 11% + Tebuconazole 18.3% SC @ 750 ml/ha. Azoxystrobin 11% Tebuconazole 18.3% SC @ 750 ml/ha may be considered as the optimum dose for controlling of sheath blight disease, keeping in view background the rational chemical use for the safety of the environment. None of the treatments were phytotoxic to rice plants. Thus, Azoxystrobin 11% + Tebuconazole

18.3% SC @ 750 ml/ha could be recommended for safe use in rice against sheath blight.

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