Management of rice sheath blight through new fungicidal formulations in field

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Sheath blight of rice caused by Rhizoctonia solani Kuhn (Thanatephorus cucumeris (Frank) Donk) is a serious disease in many rice growing regions and has become more prevalent in many high yielding varieties currently grown in India. The disease generally appears at maximum tillering stage and affects all plant parts above water line. A cultivar ‘Karuna’ at CRRI, Cuttack could not be harvested due to severe infection of this disease during 1980 (3). A modest estimation of loss of 16.8-48.4% due to sheath blight disease alone in India has been reported (7). Fungicidal control of the disease has been reported by several workers from different parts of India (1,2,5,6,8,9). In the present study an attempt was made to evaluate new fungicidal formulations namely Amistar 25 SC (Azoxystrobin) at 0.75 ml/l and 1.0 ml/l, Flusilazole 40 EC (Flusilazole) at 0.4 ml/l and 0.6 ml/l, Opus 7.5 EC (Epoxyconazole) at 3.0 ml/l as compared with standard fungicides Sheathmar 3L (Validamycin) at 2.5 ml/l and Rhizocin 3L (Validamycin) at 2.5 ml/l.

A field experiment was conducted in randomized block design (RBD) with three replications and eight treatments including control in a susceptible variety ‘Annapurna’ at the research farm of CRRI, Cuttack with a plot size of 6m x 3m with plant spacing of 20 x 15 cm during the kharif season of 2005 and 2006. Adequate dosage of N (120 kg/ha) in splits, one half as basal and the remaining in two splits were applied at tillering and panicle initiation stages with P and K as basal at their recommended dosages. The fungicides like Amistar 25 SC at 0.75ml/l and 1.0ml/l of water, Flusilazole 40EC at 0.4 ml/it and 0.6ml/l, Opus 7.5 EC at 3.0ml/lit, Rhizocin 3L at 2.5 ml/l and Sheathmar 3L at 2.5ml/l were evaluated against sheath blight.

Twenty five days’ old seedlings were transplanted. At the time of maximum tillering stage the plants were inoculated with the virulent S 8 isolate of the sheath blight pathogen, R. solani. Inoculation was done by inserting the bits of mycelia with 5 sclerotial bodies inside the leaf sheath of rice plants followed by wrapping with a swab of moist cotton and cello tape just above the water line. Five tillers per hill (a total of fifteen hills per plot) were inoculated with the sheath blight pathogen. After 10 days of inoculation the test fungicides at their scheduled doses were sprayed to the plants twice at an interval of 15 days. In control, the plants were sprayed with water only. Observations on

Table 1. Efficacy of new fungicide formulations against sheath blight of rice during Kharif 2005 and 2006

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Dosage (ml/l)</th>
<th>Disease intensity (%) Mean</th>
<th>Disease control (%) Mean</th>
<th>Effective panicle / hill Mean</th>
<th>Grains /panicle Mean</th>
<th>1000 - grain wt. (g) Mean</th>
<th>Grain yield ( Qtls/ ha) Mean</th>
<th>Increase in yield (%) Mean over control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amistar 25SC</td>
<td>0.75</td>
<td>18.0</td>
<td>17.6</td>
<td>17.8</td>
<td>74.44</td>
<td>11</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Amistar 25SC</td>
<td>1.0</td>
<td>9.1</td>
<td>9.7</td>
<td>9.4</td>
<td>86.50</td>
<td>17</td>
<td>16</td>
<td>16.5</td>
</tr>
<tr>
<td>Flusilazole 40EC</td>
<td>0.4</td>
<td>30.5</td>
<td>26.2</td>
<td>28.3</td>
<td>59.30</td>
<td>10</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Flusilazole 40EC</td>
<td>0.6</td>
<td>25.6</td>
<td>29.3</td>
<td>27.45</td>
<td>60.59</td>
<td>11</td>
<td>10</td>
<td>10.5</td>
</tr>
<tr>
<td>Opus 7.5EC</td>
<td>3.0</td>
<td>31.4</td>
<td>28.3</td>
<td>29.85</td>
<td>57.14</td>
<td>12</td>
<td>9</td>
<td>10.5</td>
</tr>
<tr>
<td>Rhizocin 3L</td>
<td>2.5</td>
<td>10.4</td>
<td>11.7</td>
<td>11.05</td>
<td>84.13</td>
<td>14</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Sheathmar 3L</td>
<td>2.5</td>
<td>10.3</td>
<td>11.6</td>
<td>10.95</td>
<td>84.28</td>
<td>17</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Control</td>
<td>-</td>
<td>70.9</td>
<td>68.4</td>
<td>69.65</td>
<td>-</td>
<td>6</td>
<td>5</td>
<td>5.5</td>
</tr>
</tbody>
</table>

CD 2.2
αSE 0.7
CV% 7.4
±SE 0.7
CV% 0.06
CD 1.5
αSE 0.5
CV% 1.7
±SE 0.06
CV% 4.6

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disease development were recorded in all the treatments ten days after first and second spray with test fungicides by adopting 0-9 SES scale (4) and compared with control.

Observations were also recorded with regard to different yield attributing characters like effective panicles per hill, grains per panicle, 1000 grain weight, grain yield for assessing the effect of new fungicidal formulations against the fungal pathogen.

Spraying with the fungicide, Amistar 25SC at 1.0ml/l significantly reduced the disease intensity (86.50%) followed by spraying with Sheathmar 3L at 2.5ml/l (84.28%) and Rhizocin 3L at 2.5ml/l (84.13%) over control (Table 1). There was a significant increase in effective panicles per hill (16.5) by spraying the crop with Amistar 25SC at 1.0 ml/l followed by spraying with Sheathmar 3L at 2.5 ml/l (16) and Rhizocin 3L at 2.5ml/l (15) as compared to control. Maximum number of grains per panicle were observed in Sheathmar 3L (113) treated plots at 2.5 ml/l followed by Amistar 25SC at 1.0ml/l and Rhizocin 3L at 2.5ml/l, while 1000-grain weight was found maximum in the plants sprayed with Amistar 25 SC at 1.0 ml/l (21.45 g) followed by Sheathmar 3L and Rhizocin 3L.

Further, maximum increase in yield over control could be achieved by spraying with fungicide, Amistar 25 SC at 1.0 ml/l to the extent of 92.47% followed by spraying with Sheathmar 3L and Rhizocin 3L indicating that the most effective of the fungicidal formulations in controlling the sheath blight disease under field condition was Amistar 25 SC.

REFERENCES


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