Efficacy and Stability of Integrating Fungicide and Cultivar Resistance to Manage FHB and DON

K. T. Willyerd et al. Plant Dis
A Management Plan for FHB

Head Scab/Deoxynivalenol

- Fungicide + Resistant variety
  - Triazole (NOT STROBILURIN!!)
  - Resistance (NO IMMUNITY)
A Management Plan for FHB

At least 75% control is needed

- Untreated
- 2 ppm DON (dockage)
- 50% Reduction
- 75% Reduction
- 4 ppm DON

FHB MGNT CP 2007-2010
National Coordinated Project

Map from Wheat Health Management by Cook and Veseth
National Coordinated Project

Integrated Management

- Core Treatments
  - Resistance (S, MS, MR)
  - Fungicide application
    - Prosaro (Tebuconazole+Prothioconazole)
  - Inoculation

- Cropping sequence/Rotation

- Responses
  - FHB Incidence and Severity
  - FDK, DON, NIV

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Fungicide/Resistance treatment Combinations

<table>
<thead>
<tr>
<th>Combination</th>
<th>Prosaro</th>
<th>Resistance</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Check)</td>
<td>NO</td>
<td>Susceptible</td>
<td>S_UT</td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td>Susceptible</td>
<td>S_TR</td>
</tr>
<tr>
<td>3</td>
<td>NO</td>
<td>Moderately Susceptible</td>
<td>MS_UT</td>
</tr>
<tr>
<td>4</td>
<td>Yes</td>
<td>Moderately Susceptible</td>
<td>MS_TR</td>
</tr>
<tr>
<td>5</td>
<td>NO</td>
<td>Moderately Resistant</td>
<td>MR_UT</td>
</tr>
<tr>
<td>6</td>
<td>Yes</td>
<td>Moderately Resistant</td>
<td>MR_TR</td>
</tr>
</tbody>
</table>
**National Coordinated Project**

- Lots of data and variably results

- Lots of questions
  - How effective?
  - How stable?
The overall mean percent control

Percent Control Relative to the Untreated Susceptible Check
MS = Moderately Susceptible, MR = Moderately Resistant

FHB MGNT CP 2007-2010
Management Plan: Head scab

Is the treatment better than the Check?

5: Always
4: Almost always
3: More often than not
2: Sometimes
1: Never

Figure 2. Score Relative to the Untreated Susceptible Check
MS = Moderately Susceptible, MR = Moderately Resistant
So, what have we learned?

1. Combining resistance with fungicide was more effective than either approach alone;
2. Relative to fungicide alone, the integrated approach led to comparable levels of index and DON reduction;
3. The integrated approach is more stable across environment;
4. There was evidence for interaction of environment and management combination for index;
5. There was an additive effect of fungicide and resistance on both index and DON; and
6. Percent control of index with fungicide tended to be lower on moderately resistant cultivars than on susceptible cultivars.
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