Evaluation of Foliar Fungicides and Insecticides on Soybean in 2013

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Abstract
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Plant Pathology and Microbiology

Disciplines
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Evaluation of Foliar Fungicides and Insecticides on Soybean in 2013

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Iowa State University personnel assessed foliar fungicide and insecticide use on soybeans at seven locations across Iowa (Fig. 1) including the Northwest Farm (Sutherland), Northern Farm (Kanawha), Northeast Farm (Nashua), Curtiss Farm (Ames), Armstrong Farm (Lewis), McNay Farm (Chariton) and Southeast Farm (Crawfordsville). This research was partially funded by soybean checkoff through the Iowa Soybean Association.

Figure 1. Field locations for 2013 fungicide and insecticide research.

Materials and methods

The experimental design at each location was a randomized complete block with four replications. Details on variety and date of planting, pesticide application and harvest are listed in Table 1. Fungicides and insecticides were applied with a self-propelled research sprayer (Fig. 2) at growth stage R3 (beginning pod) at all seven locations unless otherwise noted. Disease was assessed when soybeans were at the R6 (full seed) growth stage. Diseases found included Septoria leaf blight (brown spot) in the lower canopy and small amounts of downy mildew and soybean vein necrosis virus in the upper canopy. Only diseases that had more than 1 percent severity were analyzed and included in this report. Although soybean aphid populations were observed between R3 and R6, none of the seven locations reached threshold. Thus, an IPM insecticide treatment for soybean aphid was never applied. Total seed weight per plot and seed moisture were measured with a 2009 Almaco SPC20 research plot combine. Seed weight was adjusted to 13 percent moisture and yield was calculated.
Figure 2. Self-propelled research sprayer built by Iowa State University personnel.

Table 1. Research location, cultivar, planting population, planting date, chemical application date, disease assessment date, and harvest date for seven fungicide and insecticide trials in 2013.

<table>
<thead>
<tr>
<th>Research Location</th>
<th>Cultivar</th>
<th>Planting Population</th>
<th>Planting Date</th>
<th>Chemical Application Date</th>
<th>Disease Assessment Date</th>
<th>Harvest Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armstrong Farm</td>
<td>AG2933</td>
<td>160,000</td>
<td>25-May</td>
<td>1-Aug</td>
<td>10-Sep</td>
<td>18-Oct</td>
</tr>
<tr>
<td>Curtiss Farm</td>
<td>AG2831</td>
<td>180,000</td>
<td>24-May</td>
<td>29-Jul</td>
<td>10-Sep</td>
<td>2-Oct</td>
</tr>
<tr>
<td>McNay Farm</td>
<td>Pioneer 93M11</td>
<td>160,000</td>
<td>12-Jun</td>
<td>9-Aug*</td>
<td>10-Sep</td>
<td>15-Oct</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14-Aug*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast Farm</td>
<td>AG2534</td>
<td>180,000</td>
<td>11-Jun</td>
<td>13-Aug</td>
<td>9-Sep</td>
<td>10-Oct</td>
</tr>
<tr>
<td>Northern Farm</td>
<td>Stine 19RA02</td>
<td>157,000</td>
<td>3-Jun</td>
<td>30-Jul</td>
<td>9-Sep</td>
<td>8-Oct</td>
</tr>
<tr>
<td>Northwest Farm</td>
<td>Kruger 1901</td>
<td>161,000</td>
<td>19-May</td>
<td>31-Jul</td>
<td>11-Sep</td>
<td>21-Oct</td>
</tr>
<tr>
<td>Southeast Farm</td>
<td>Pioneer 93Y80</td>
<td>166,000</td>
<td>13-Jun</td>
<td>5-Aug</td>
<td>10-Sep</td>
<td>9-Oct</td>
</tr>
</tbody>
</table>

*Spray split into two days due to sprayer breakdown.

Results

This growing season had less than average rainfall, similar to 2012. Figure 3 shows drought conditions in the United States in early August. While it was abnormally dry across much of Iowa, there were parts that did catch timely rains, especially in the northeast portion of the state.
The dry weather conditions contributed to lack of foliar disease development at any location. The only fungal disease with more than 1 percent severity in the plots was Septoria brown. This low level of disease was not severe enough to affect yield at any location. Soybean vein necrosis virus and soybean green stem syndrome were also identified at several locations.

The majority of fungicide and insecticide treatments had minimal or no effect on seed moisture.

Yield averaged between 45.4 – 71.7 bu/A across locations. Yield response to fungicide, insecticide and fungicide plus insecticide application was minimal at all locations. There were both negative and positive responses to various treatments at some locations, but nothing consistent over the seven locations (Fig. 4). The average yield response for all fungicides across all locations was 0.6 bu/A. The average yield response by chemical family is reported in Figure 5. SkyRaider™ insecticide alone averaged 2.6 bu/A greater than the untreated control and was the only stand-alone insecticide in the trial. We did not see an additive effect for fungicide + insecticide as yield response for these treatments averaged 2.2 bu/A greater than the untreated control across all seven locations.

Figure 4. Yield response (bu/A) to treatments compared to untreated control on soybean at seven locations in Iowa during the 2013 growing season. Treatments consisted of 12 fungicides, one insecticide and four fungicide and insecticide combinations. The average response to each treatment was plotted as management response (bu/A).
Figure 5. Yield response (bu/A) to different fungicide classes, insecticide and combinations of fungicide and insecticide on soybean in Iowa during the 2013 growing season. Fc = Fungicide, UTC = Untreated control and Ic = Insecticide. See larger image

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