Evaluation of a Fungicide and an Insecticide Seed Treatment on Soybean Yield

Wm. Bruce Clevenger, OSU Extension Educator, Defiance County, Ag & NR

Objective
To evaluate the response of a fungicide and an insecticide seed treatment on soybean yield

Background

Crop Year: 2005
Cooperator: Defiance Ag Research Assoc.
County: Defiance
Nearest Town: Defiance
Drainage: Subsurface
Soil type: Paulding Clay, Roselms Silty Clay
Tillage: No-till
Previous Crop: Soybeans

Variety: NK S27-R1
Soil test: pH 7.1, P 22 ppm, K 153 ppm (12/12/03), Organic Mater 3.1%
Planting Date: May 10, 05
Row Width: 7.5-inch
Herbicide: June 23, 05, glyphosate 24oz/A
Insecticide: Aug 6, 05, Baythrhold 2.4oz/A
Harvest Date: September 13, 2005

Methods

Experimental design was a complete block with three treatments replicated six times giving 18 total plots. Individual plot area measured 30 feet by 250 feet and ran perpendicular to the subsurface drainage system. Planting was completed with a 15 foot John Deere no-till drill using bagged seed having been commercially treated by the manufacturer. Seeding rate was calibrated and adjusted to plant 220,000 seeds per acre. Stand counts were measured on May 31 using the 1/10,000th acre hoop method at five locations within each plot area. The five location counts were then averaged and used for statistical analysis. Plots were scouted four times (July 14, July 25, August 1, and August 3) counting aphids on the whole plant to determine when the field treatment was warranted. The center 25 ft was harvested from each of the 18 plot areas for the yield record. Yield was determined by a calibrated weigh wagon and confirmed by a calibrated GPS combine yield monitor. All 18 plots were individually harvested with the same combine continuously on the same day.

Seed Treatments
Apron Maxx® - treated with metalaxyl-M and Fludioxonil fungicide at the rates specified by the manufacturer.
Cruiser®MaxxPak® - treated with Thiamethoxam insecticide and metalaxyl-M and Fludioxonil fungicide at the rates specified by the manufacturer.
Control - no seed treatment

All plots were treated equally regarding herbicide and insecticide applications.
Results

Table 1. Stand Counts at Growth Stage VC (unifoilate stage)  
Std Cts (10,000 plants/A)

<table>
<thead>
<tr>
<th></th>
<th>Std Cts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apron Maxx</td>
<td>17.33a</td>
</tr>
<tr>
<td>Cruiser Maxx</td>
<td>17.93a</td>
</tr>
<tr>
<td>Control (no seed treatment)</td>
<td>11.13b</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td>3.90</td>
</tr>
</tbody>
</table>

ab: results having different letters indicate significant statistical differences

Table 2. Soybean Yields  
Variety NK S27-R1 Average Yield (bu/A)

<table>
<thead>
<tr>
<th></th>
<th>Average Yield (bu/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apron Maxx</td>
<td>38.0a</td>
</tr>
<tr>
<td>Cruiser Maxx</td>
<td>37.8a</td>
</tr>
<tr>
<td>Control (no seed treatment)</td>
<td>27.3b</td>
</tr>
<tr>
<td>LSD (0.05)</td>
<td>2.96</td>
</tr>
</tbody>
</table>

ab: results having different letters indicate significant statistical differences

Table 3. Economic Comparison of Treatments

<table>
<thead>
<tr>
<th></th>
<th>Seed Cost 50# unit</th>
<th>Seeds/lb</th>
<th>Seeds / A</th>
<th>Lbs planted/A</th>
<th>Seed Cost/A</th>
<th>Return above Control per Acre ($5.25/bu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apron Maxx</td>
<td>$29.54</td>
<td>3025</td>
<td>220,000</td>
<td>72.7</td>
<td>$42.97</td>
<td>$50.32</td>
</tr>
<tr>
<td>Cruiser Maxx</td>
<td>$35.49</td>
<td>3025</td>
<td>220,000</td>
<td>72.7</td>
<td>$51.62</td>
<td>$40.62</td>
</tr>
<tr>
<td>Control</td>
<td>$27.41</td>
<td>3250</td>
<td>220,000</td>
<td>67.7</td>
<td>$37.11</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Summary

The stand counts seem to have set the tone for the overall results early on in this plot. The May 31 stand count scouting did not reveal any significant bean leaf beetle leaf feeding among any of the 18 plots. The gain in stand count is attributed to the fungicide seed treatment not the addition of the insecticide seed treatment since the Apron Maxx and Cruiser Maxx stand counts were statistically equal. Soybean aphid scouting found a growing population from July 14 to Aug 3. Aphid counts in the Apron Maxx and Cruiser Maxx plots were very similar across all replications with the 250 aphid/plant average being reached on August 3. Control plot aphid counts approached 180-200 aphids/plant. The author believes the poor stand counts, reduced plant health and less soybean canopy contributed to lower Aphid counts in the control plots. All plots were treated with an insecticide application for aphids on August 6.

While stand count and yield were statistically higher for the Apron Maxx and Cruiser Maxx plots compared to the control, the highest economic return above the control was Apron Maxx. The added cost of the Cruiser did not show a yield increase above Apron Maxx and lowered its economic return per acre.

Acknowledgement

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For additional information contact:
Wm. Bruce Clevenger  
Ohio State University Extension, Defiance County  
06879 Evansport Road, Suite B  
Defiance, OH 43512  
419-782-4771 or clevenger10@ag.osu.edu