Testing for Suitable Soybean Maturity Group for the Bighorn Basin—2016 Trial

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Introduction

Hairy nightshade (\textit{Solanum sarrachoides}) control is becoming increasingly difficult in fields with a long history of dry bean production in the Bighorn Basin. Weed control programs in dry beans rely on pre-plant incorporated herbicides, which do not control late-emerging weeds such as nightshades. Glyphosate-resistant soybeans are an alternative that could allow better hairy nightshade control while maintaining the benefits of having an annual legume in the crop rotation.

Objectives

A trial was conducted at the Powell Research and Extension Center (PREC) in 2016 to evaluate the yield potential of glyphosate-resistant soybean varieties from different maturity groups.

Materials and Methods

The soil at the site is a Garland loam (soil organic matter: 1.6%; pH: 8.1). It was broadcast fertilized with 50 lb nitrogen (N) and 20 lb phosphorous per acre prior to planting. On May 31, Asgrow\textsuperscript{®} soybean varieties AG0333, AG0430, AG0735, AG0835, AG0934, and AG1135 were planted with a John Deere MaxEmerge\textsuperscript{™} planter at 22-inch row spacing. All varieties were inoculated with N-Dure\textsuperscript{™} at 2.5 oz/50 lb of seed (this treatment promotes rhizobia root nodulation, which helps N fixation). The trial was furrow irrigated, and water was supplied according to crop needs. Roundup WeatherMAX\textsuperscript{®}, at 32 oz/ac, was applied twice for weed control. Outlook\textsuperscript{®} herbicide, at 14 oz/ac, was tank-mixed with the second application. Herbicide and fungicide treatments were applied with a CO\textsubscript{2}-pressurized knapsack sprayer delivering 16 gallons of total volume per acre at 40 psi with TeeJet\textsuperscript{®} 8002-DG nozzles. Plots were 22 feet wide by 50 ft long and arranged in a randomized complete block design with five replications. Yields were estimated by harvesting the six middle rows of each plot on October 27.

Results and Discussion

Soybean varieties based on growth and development are classified in maturity groups. The larger the number of the maturity group, the longer the growing season of the variety. To obtain maximum yields, the correct maturity group has to be determined for a location. In this study maturity groups 0.3, 0.4, 0.7, 0.8, 0.9, and 1.1 were tested at PREC. The number of plants per acre and weight of 100 seeds are important yield components, and for that reason these were recorded. Plant populations after emergence ranged from \(\sim 143,000\) to \(163,000\) plants/ac (Table 1). Differences in the weights of 100 seeds were recorded between varieties. Soybean variety AG0735 had the heaviest weight of 100 seeds (11.8 g), followed by AG0934 (11 g). No major differences were recorded in the weight of 100 seeds among the rest of the tested varieties. The highest yields were recorded for varieties AG0735 at 19.9 bu/ac and AG1135 at 17.3 (Table 1). Results suggest that the maturity group to which the variety belonged was not the main factor determining soybean yields at PREC. Soybean yields were considerably lower in 2016 when compared to the 2015 trial, which offered promising results. To help determine why there was such a big difference in yields, we are repeating the study in 2017.

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Table 1. Soybean plant population, weight of 100 seeds, and yields at PREC in 2016.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Population/ac*</th>
<th>Weight 100 seeds(g**)</th>
<th>Yield (lb/ac)</th>
<th>Yield (bu/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG0333</td>
<td>143,100</td>
<td>10.2</td>
<td>917</td>
<td>15.3</td>
</tr>
<tr>
<td>AG0430</td>
<td>155,400</td>
<td>9.6</td>
<td>561</td>
<td>9.3</td>
</tr>
<tr>
<td>AG0735</td>
<td>159,600</td>
<td>11.8</td>
<td>1,187</td>
<td>19.8</td>
</tr>
<tr>
<td>AG0835</td>
<td>163,100</td>
<td>9.8</td>
<td>872</td>
<td>14.6</td>
</tr>
<tr>
<td>AG0934</td>
<td>158,500</td>
<td>11.0</td>
<td>887</td>
<td>14.8</td>
</tr>
<tr>
<td>AG1135</td>
<td>161,400</td>
<td>9.6</td>
<td>1,039</td>
<td>17.3</td>
</tr>
</tbody>
</table>

Least significant difference p=0.05 14,800 0.7 1.2 2.6

*Means followed by different letters are significantly different at p=0.05
**1 gram=0.035 oz.

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