Testing for Suitable Soybean Maturity Group for the Bighorn Basin

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Introduction
Hairy nightshade (Solanum sarrachoides) weed control is becoming increasingly difficult in fields with a long history of dry bean production in the Bighorn Basin. Glyphosate-resistant soybeans are an alternative that would allow better hairy nightshade control while keeping 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 2015 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) and was broadcast fertilized with 50 lbs. nitrogen and 20 lbs. phosphorous per acre previous to planting. On June 8, Asgrow® soybean varieties AG0333, AG0430, AG0735, AG0835, AG0934, and AG1135 were planted with a John Deere MaxEmerge™ planter at 22” row spacing. Previous to planting, seeds from varieties AG0333, AG0934, and AG1135 were treated with Stamina® fungicide seed treatment at 0.4 fl oz/100 lb of seed. All varieties were inoculated with N-Dure™ at 2.5 oz/50 lb of seed (this treatment promotes rhizobia root nodulation, which helps fix nitrogen). The trial was furrow irrigated, and water was supplied according to crop needs. Roundup WeatherMAX®, at 32 oz/ac, was applied twice for weed control (Outlook® herbicide, at 14 oz/ac, was tank mixed with the second application). Two weeks after crop emergence, Endura® fungicide was broadcast applied at 3.5 oz/ac. Herbicide and fungicide treatments were applied with a CO₂-pressurized knapsack sprayer delivering 16 gal of total volume per acre at 40 psi with TeeJet® 8002-DG nozzles. Plots were 22 feet wide by 50 feet 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 22.

Results and Discussion
Soybean varieties based on growth and development are grouped in maturity groups. The higher 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 for the Powell area. The number of plants per acre and weight of 100 seeds are important yield components, and for that reason they were recorded in the study. Plant populations after emergence ranged between 139,300 and 158,200 plants per acre (Table 1). Differences in weight of 100 seeds were recorded between varieties. AG0333 had the heaviest weight of 100 seeds at 0.57 oz, while AG0835 had the lightest at 0.44 oz (Table 1). Grain moisture was close to 14% at time of harvest on October 22. The highest yields were recorded for varieties AG1135, AG0934, and AG033 with 38.8, 37.9, and 37.2 bu/ac, respectively (Table 1). Results suggest that the maturity group to which the variety belonged was not the main factor determining soybean yields in the Powell area. Varieties AG0430 and AG0835 were shorter in height, and plants exhibited yellowing during the growing season. Since all varieties had vigorous and active root nodules, nitrogen was probably not a limiting factor. Variety tolerance to high soil pH is a factor that needs further evaluation.

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**Table 1.** Soybean plant population, yield, and weight of 100 seeds for six maturity groups planted at PREC in 2015.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Maturity group</th>
<th>Population/ac*</th>
<th>Yield (bu/ac)</th>
<th>Weight 100 seeds(oz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG0333</td>
<td>0.3</td>
<td>142,400 b</td>
<td>37.2 a</td>
<td>0.57 a</td>
</tr>
<tr>
<td>AG0430</td>
<td>0.4</td>
<td>145,200 b</td>
<td>15.1 b</td>
<td>0.49 bc</td>
</tr>
<tr>
<td>AG0735</td>
<td>0.7</td>
<td>151,100 ab</td>
<td>22.8 b</td>
<td>0.51 b</td>
</tr>
<tr>
<td>AG0835</td>
<td>0.8</td>
<td>151,300 ab</td>
<td>23.4 b</td>
<td>0.44 c</td>
</tr>
<tr>
<td>AG0934</td>
<td>0.9</td>
<td>139,300 b</td>
<td>37.9 a</td>
<td>0.53 ab</td>
</tr>
<tr>
<td>AG1135</td>
<td>1.1</td>
<td>158,200 a</td>
<td>38.8 a</td>
<td>0.49 bc</td>
</tr>
</tbody>
</table>

*means followed by same letter do not differ at p<0.05