PROJECT TITLE: Broadleaf Weed Control in Malt Barley with Bronate Advanced (Experiment BA03C41).

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PROJECT PERSONNEL: Nicole D. Flowers, Research Associate, SARC, Huntley, MT
Tom A. Fischer, Research Specialist and Farm Foreman, SARC, Huntley, MT

OBJECTIVES: Evaluate broadleaf weed control and crop injury with postemergence herbicides in irrigated malt barley.

METHODS: Herbicides were broadcast applied with a CO2 backpack sprayer calibrated to deliver 10 gal/A at 30 PSI and 3 MPH using 8001XR nozzles spaced 16 inches apart. Entire study area was oversprayed with Puma at 2/3 pt/A for grass control. Crop response following herbicide applications was evaluated visually using a rating scale that ranged from 0 (no visible injury) to 100% (complete plant death). Weed control ratings were determined by visually estimating the amount of weed biomass present in each plot compared to the untreated control plots. The rating scale ranged from 0 to 100% control. Plots were harvested with an experimental-plot combine. Dockage was determined in each plot sample and reported grain yields were adjusted to reflect clean grain yields. Reported grain yields were adjusted to 13% grain moisture content, and based on a 48 pound per bushel test weight. Percent moisture and test weight were determined using a laboratory grain analyzer. Grain protein (%) was determined for each treatment bulked across replicates and expressed on a dry basis. Experimental site and herbicide application data are presented in Tables 1 and 2.

Table 1. Site information (Experiment BA03C41).

| Field no.: | C | Planting pop.: | 90 lbs/A |
| Soil type: | clay loam | Row spacing: | 6 in |
| % OM: | 1.9 | Plot size: | 8 ft X 22ft |
| pH: | 7.9 | Expt design: | RCB |
| Date planted: | 4/03/03 | Reps.: | 3 |
| Variety: | Moravian 37 | Previous crop: | barley |
| Date harvested: | 7/30/03 | Irrigation: | 6/10/03 |
| Precip. & Temp.: | See Table A. | |
| Fertility: | 216 lbs of 46-0-0 | |
Table 2. Herbicide application data (Experiment BA03C41).

<table>
<thead>
<tr>
<th>Treatment timing:</th>
<th>POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date treated:</td>
<td>5/19/03</td>
</tr>
<tr>
<td>Time:</td>
<td>8 am</td>
</tr>
<tr>
<td>Soil moisture (surface):</td>
<td>moist</td>
</tr>
<tr>
<td>Soil temperature (F) (2 in):</td>
<td>49</td>
</tr>
<tr>
<td>Air temperature (F):</td>
<td>43</td>
</tr>
<tr>
<td>Wind (MPH; direction):</td>
<td>3-5 W</td>
</tr>
<tr>
<td>Relative humidity (%):</td>
<td>54</td>
</tr>
<tr>
<td>Sky description:</td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>Barley</th>
<th>Height (in):</th>
<th>3-8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stage:</td>
<td>3-5lf, 1-3 tiller</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Kochia</th>
<th>Height (in):</th>
<th>0.5-1</th>
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</thead>
<tbody>
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<td>Stage:</td>
<td>2-3 lf</td>
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</table>

<table>
<thead>
<tr>
<th>W. Bckwht</th>
<th>Height (in):</th>
<th>1-3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stage:</td>
<td>2-3 lf</td>
</tr>
</tbody>
</table>

**RESULTS:**

No injury was observed following any of the herbicide treatments (Table 3). An overspray of Puma to the entire trial for grass control resulted in 5% injury to all plots on June 2. Kochia control increased from 88% to 95% as the rate of Bronate Advanced increased from 0.8 pt/A to 1.2 pt/A. Tank mixing 0.3 pt/A of Starane with 0.8 pt/A of Bronate Advanced increased kochia control from 88% to 98%. Tank mixing an ALS inhibiting herbicide (Express, Harmony Extra, Harmony GT) with 0.8 pt/A of Bronate Advanced increased kochia control from 88% to 93%. The ALS herbicides were not as good of a tank mix partner as Starane because some ALS resistant kochia was present at the site. Wild buckwheat control increased from 90% to 98% on June 25 as the rate of Bronate Advanced increased from 0.8 pt/A to 1.2 pt/A. Tank mixing 0.3 pt/A of Starane with 0.8 pt/A of Bronate Advanced increased wild buckwheat control from 88% to 97%. Tank mixing an ALS inhibiting herbicide (Express, Harmony Extra, Harmony GT) with 0.8 pt/A of Bronate Advanced increased kochia control from 88% to 91-93%. Untreated barley yielded 80 bu/A (Table 4). Barley treated with 0.8 to 1.2 pt/A of Bronate Advanced produced 86 to 87 bu/A. Tank mix treatments produced barley yields ranging from 80 to 86 bu/A. Overall, barley yields were lower than expected, likely because the barley was irrigated once and some moisture stress may have occurred during grain fill. There were no differences in barley test weight, moisture, plumps, or thins among treatments.
Table 3. Barley injury and weed control ratings at Huntley, MT in 2003 (Experiment BA03C41).

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<thead>
<tr>
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<tbody>
<tr>
<td>Untreated</td>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
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<tr>
<td>Bronate Advanced</td>
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<td>Post</td>
<td>0</td>
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<td>Post</td>
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<td>98</td>
<td>91</td>
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<td>Post</td>
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<tr>
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<td>Post</td>
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<td>99</td>
<td>97</td>
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<td>Bronate Advanced</td>
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<td>Post</td>
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<td>99</td>
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<td>91</td>
<td>98</td>
<td>91</td>
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<tr>
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<td>Post</td>
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<td>93</td>
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<td>Post</td>
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<td>5</td>
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<td>91</td>
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<td>Harmony Extra</td>
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<td>97</td>
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<tr>
<td>NIS</td>
<td>0.25% v/v</td>
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<td>Starane+Sword</td>
<td>1.4 pt</td>
<td>Post</td>
<td>0</td>
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<td>98</td>
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<tr>
<td>NIS</td>
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<td>Post</td>
<td>0</td>
<td>5</td>
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<td>98</td>
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\(^{1}\)NS indicates no significant difference among treatments within a column based on Fisher’s protected LSD (p=0.05).
Table 4. Barley yield data at Huntley, MT in 2003 (Experiment BA03C41).

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<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>Appl. timing</th>
<th>Barley Yield Jul 30</th>
<th>Barley Test wt Jul 30</th>
<th>Barley Moisture Jul 30</th>
<th>Barley Plumps Jul 30</th>
<th>Barley Thins Jul 30</th>
<th>Barley Protein Jul 30</th>
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<tbody>
<tr>
<td></td>
<td>Per Acre</td>
<td></td>
<td>bu/a</td>
<td>lb/bu</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
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<tr>
<td>Untreated</td>
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<tr>
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<td>Post</td>
<td>86</td>
<td>48.7</td>
<td>9.17</td>
<td>63.3</td>
<td>18.0</td>
<td>9.30</td>
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<td>Post</td>
<td>87</td>
<td>49.6</td>
<td>9.07</td>
<td>73.5</td>
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<td>Bronate Advanced</td>
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<td>Post</td>
<td>86</td>
<td>49.2</td>
<td>9.10</td>
<td>66.9</td>
<td>14.5</td>
<td>9.23</td>
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<td>Bronate Advanced Starane</td>
<td>0.8 pt</td>
<td>Post</td>
<td>84</td>
<td>47.8</td>
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<td>57.4</td>
<td>20.1</td>
<td>9.19</td>
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<td>Bronate Advanced Express</td>
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<td>Post</td>
<td>82</td>
<td>49.2</td>
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<td>69.3</td>
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<td>80</td>
<td>48.9</td>
<td>9.03</td>
<td>64.9</td>
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<td>49.5</td>
<td>9.07</td>
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<td>8.93</td>
<td>58.0</td>
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<td>9.20</td>
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<td>Starane+Sword NIS</td>
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<tr>
<td>CV %</td>
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<td>1.84</td>
<td>9.97</td>
<td>22.9</td>
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*NS indicates no significant difference among treatments within a column based on Fisher’s protected LSD (p=0.05).