Grape Herbicide Screening
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Grape production in the state of Oklahoma is a growing industry with production being utilized for wine, juice, and fresh table grapes. Weed control for a perennial crop such as grape is particularly important during the establishment period when newly planted vines are small and competing with weedy species for light, water and nutrients. Currently there are several preemergence herbicides that have shown potential for season long control for several weed species. The objective of this study was to screen three preemergence herbicides for their potential for weed control in Oklahoma grapes.

Methods and Materials: Plots were arranged in a randomized block design with five replications, each plot consisted of 5 vines on 12 foot row centers with 6 feet between vines in the row. Plant population was approximately 605 plants per acre of ‘Chambourcin’ grape on 101-14 Mgt. rootstock. Plots were transplanted on 4/16/09 by hand. Treatments included three different compounds (Callisto mesotrione-pre, Sandea halosulfuron-pre, Spartan sulfentrazone-pre) at two rates for a total of six pre treatment and a glyphosate-post check (Table 1). Pre treatments were applied on 5/18/09 and all plots including the glyphosate check were sprayed with glyphosate (2% solution) on 5/19/09. Treatment ratings were recorded for phytotoxicity on 6/02/09 and phytotoxicity and efficacy on 8/04/09. The rating scale that was used was a 0 to 100 scale where 0 represents no visible crop damage or weed control and 100 represents 100% of the crop or weed species being dead or non-existent.

Results and Discussion: There were no differences in crop injury observed on either day that ratings were recorded (Table 1). All ratings on 6/02/09 were less than 10% injury with the highest rating being 7%. Weed control varied for each of the four weed species that were observed in the study (Table 1). Control of Palmer amaranth (Amaranthus palmeri S. Wats.) ranged from 0 for the glyphosate check to 100% for the highest rate of Spartan. The three treatments with the highest level of control were Spartan at 0.375, 0.1875, and Callisto at 0.24 lbs ai/acre these had recorded ratings of 100, 99, and 77% control respectively. Carpetweed (Mollugo verticillata L.) control was highest for Callisto at 0.24 lb ai/acre and Spartan at 0.1875 and 0.375 lbs ai/acre. Carpetweed control for these treatments was 93, 87, and 99% control, respectively. Control of goosegrass (Eleusine indica L.) ranged from 0 to 75% control, with Spartan 0.1875 and Callisto 0.24 lbs ai/acre having recorded ratings of 75 and 69% control respectively. There were no differences observed in the study for control of crabgrass (Digitaria sp.) which ranged from 0 to 51%.

In conclusion, very low levels of crop damage to grape were observed for any of the treatments included in the study, but there were significant differences between treatments for weed control. Both Spartan and Callisto provided significantly higher levels of weed control for Palmer amaranth, carpetweed, and goosegrass compared to the glyphosate check and Sandea. Although levels of crabgrass control ranged widely between treatments there were no differences observed, this was likely due to variability in this weed species naturally occurring population within the test area.
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Table 1. 2009 Grapes Herbicide trial, Bixby, OK.

<table>
<thead>
<tr>
<th>Treatment/ acre</th>
<th>% Injury</th>
<th>% Control on 8/4/09</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6/2/09</td>
<td>8/4/09 Palmer amaranth</td>
</tr>
<tr>
<td>Glyphosate check</td>
<td>1 a&lt;sub&gt;2&lt;/sub&gt;</td>
<td>0 a</td>
</tr>
<tr>
<td>Callisto 0.12 pre</td>
<td>1 a</td>
<td>0 a</td>
</tr>
<tr>
<td>Callisto 0.24 pre</td>
<td>6 a</td>
<td>0 a</td>
</tr>
<tr>
<td>Sandea 0.024 pre</td>
<td>2 a</td>
<td>4 a</td>
</tr>
<tr>
<td>Sandea 0.048 pre</td>
<td>6 a</td>
<td>0 a</td>
</tr>
<tr>
<td>Spartan 0.1875 pre</td>
<td>6 a</td>
<td>0 a</td>
</tr>
<tr>
<td>Spartan 0.375 pre</td>
<td>7 a</td>
<td>0 a</td>
</tr>
</tbody>
</table>

<sup>2</sup>Numbers in a column followed by the same letter exhibited no significant differences based on Duncan’s Multiple Range Test where P=0.05.