Palmer Amaranth and Dicamba Concerns

Jenny Rees, Nebraska Extension Educator
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Pesticide Resistant Weeds in Nebraska

- **Common ragweed** – Glyphosate
- **Giant ragweed** – Glyphosate
- **Kochia** – Glyphosate; Glean; 2,4-D; Dicamba; Atrazine
- **Horseweed** – Glyphosate, FirstRate
- **Palmer Amaranth** – Glyphosate, Pursuit, Classic, Callisto, Laudis, Impact, Armezon, Buctril, Atrazine
- **Common Waterhemp** - Glyphosate, Pursuit, Classic, Callisto, Laudis, Impact, Armezon, Atrazine
- **Redroot pigweed** – Atrazine
- **Shattercane** – Accent, Beacon
YIELD LOSS POTENTIAL FROM PALMER

Corn ranged from 7-91% YL
.66 to 10.5 plants per m²

Soybean ranged from 17 to 79% YL
.33 to 10.5 plants per m²
Identification
EMERGENCE

Initial: Early May (can be as early as late April)…soil temp sensitive but light interception more important
Peak: 4th week of June
Duration: 5-6 months
Factors that affect emergence:
  - Burndown apps
  - Shallow tillage
  - Crop canopy formation
  - Crop density

Growth rate 0.75-1”/day with peak at 2.5” per day
6 days after emergence

Waterhemp

Palmer amaranth
8 days after emergence

Waterhemp

Palmer amaranth
12 days after emergence

Waterhemp

Palmer amaranth
16 days after emergence

Waterhemp

Palmer amaranth
Seed Production of One Plant at Edge of Field

Seed Production?

1,775,000 Seed
MANAGEMENT

• Combine-99% of seed survived
• Hoeing-needed to hoe 2” below ground to kill.
• Pulling-pulling out female plants, remove from field and burning southern U.S.
• Follow with wheat or rye cover crop to reduce light for germination.
• Narrow row beans may help with canopy closure.
• Burial-Research showed burying seed 4” and greater reduced seed bank 50-80% first year. 80-100% by year 3.
Figure 4. Palmer amaranth seeds become less viable with time.
PRINCIPLES OF PALMER CONTROL

1. Size is Important
   - 2.5 – 3 inches
2. Start Clean – Stay Clean
PRINCIPLES OF PALMER CONTROL

1. Size is Important
   - 2.5 – 3 inches max
2. Start Clean – Stay Clean
3. PRE is KEY
4. Manage Your Seedbank
   1. 6 inch stem 129,000 seeds
   2. 1 inch stem 36,000 seeds
   3. Soil surface 22,000 seeds
   4. Viable palmer seed produced 2 weeks after pollination.
University of Kentucky

Treatments:
• Wheat/DC Soybeans
• Fallow
• Full-season Soybeans

FIGURE 1. PALMER AMARANTH DENSITY (Warren County – 2013)
UNIVERSITY OF KENTUCKY STUDY

Photo 1.
(No Palmer in wheat)

Photo 2.
(Palmer in tramline)
LET’S DO OUR BEST TO AVOID THIS!
RUP Dicamba-based Herbicides

Only three products allowed for use on Xtend beans; all other dicamba herbicides are illegal to use on Xtend soybeans

XtendiMax® (Monsanto)  
FeXapan™ (DuPont)  

Identical “Vaporgrip®” technology to reduce volatility

Engenia™ (BASF): uses a new dicamba salt to reduce volatility.
How much do the new formulations of Dicamba reduce volatility as compared to Clarity?

- Research Presented at the 2017 North Central Weed Science Society Annual Meeting December 4-7
- From about 50 to 70% Reduction
Dicamba-tolerant soybeans (left)
Non-dicamba-tolerant soybeans (below)
# Corn Dicamba Products Also Widely Used

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
<th>Spike Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIFLEXX DUO</td>
<td>24.0 - 40.0 oz</td>
<td>CORN SPIKE – 36”</td>
</tr>
<tr>
<td>DIFLEXX</td>
<td>8.0 - 16.0 oz</td>
<td>CORN SPIKE – 36”</td>
</tr>
<tr>
<td>STATUS</td>
<td>5.0 oz</td>
<td>CORN 4 - 24”</td>
</tr>
<tr>
<td>STATUS + GLYPHOSATE</td>
<td>2.5 oz</td>
<td>CORN 4 - 24”</td>
</tr>
<tr>
<td></td>
<td>32.0 oz</td>
<td></td>
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</tbody>
</table>

Corn Dicamba Products Also Widely Used
Lowest observed dose causing significant visual crop response

Source: Not all risk is created equal
Bob Hartzler – July 14, 2017
### Dicamba and Sensitive crops:
Soybean Injury (%) and yields (Bu/A), influenced by Dicamba rates

Spraying at 2nd trifoliolate (V2):

<table>
<thead>
<tr>
<th>Rates (oz/a)</th>
<th>DT-soy %</th>
<th>Bu/A</th>
<th>RR-soy %</th>
<th>Bu/A</th>
<th>Conven.-soy %</th>
<th>Bu/A</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/10</td>
<td>0</td>
<td>75</td>
<td>72</td>
<td>45</td>
<td>75</td>
<td>41</td>
</tr>
<tr>
<td>1/100</td>
<td>0</td>
<td>73</td>
<td>32</td>
<td>70</td>
<td>44</td>
<td>65</td>
</tr>
<tr>
<td>1/500</td>
<td>0</td>
<td>74</td>
<td>34</td>
<td>71</td>
<td>41</td>
<td>68</td>
</tr>
</tbody>
</table>

Stevan Knezevic Preliminary Study
## Dicamba and Sensitive Crops:

Soybean Injury % and yields (Bu/A) as influenced by Dicamba rates

### Spraying at full flower (R2):

<table>
<thead>
<tr>
<th>Rates (oz/a)</th>
<th>DT-soy %</th>
<th>RR-soy %</th>
<th>Conven.-soy %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DT-soy Bu/A</td>
<td>RR-soy Bu/A</td>
<td>Conven.-soy Bu/A</td>
</tr>
<tr>
<td>0</td>
<td>71</td>
<td>78</td>
<td>70</td>
</tr>
<tr>
<td>1/10</td>
<td>1.6</td>
<td>0</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>19</td>
<td>42</td>
</tr>
<tr>
<td>1/100</td>
<td>0.16</td>
<td>0</td>
<td>72</td>
</tr>
<tr>
<td>(1 teaspoon)</td>
<td></td>
<td>32</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21</td>
<td>73</td>
</tr>
<tr>
<td>1/500</td>
<td>0.032</td>
<td>0</td>
<td>72</td>
</tr>
<tr>
<td>(1/5 teaspoon)</td>
<td></td>
<td>34</td>
<td>75</td>
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<td></td>
<td></td>
<td>13</td>
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Questions?

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