Dicamba update - traits

- XtendFlex
- Resistant to
  - Dicamba
  - Glyphosate
  - Glufosinate

Herbicide registrations

**Corn**
- Impact Core
  - Impact + acetochlor
  - 20-40 fl oz/A through 11^*^t
  - AMS plus MSO
- Sinate
  - Impact + Liberty
  - 21-28 fl oz/A through V7/24^*^t
  - AMS plus MSO or HSOC

**Soybean**
- Kyber
  - Same products as Fierce MTZ (pyroxasulfone + flumioxazin + metribuzin)
- Panther MTZ
  - Same products as Dimetric Charged (metribuzin + flumioxazin)
Other label updates

- Anthem Flex – sunflowers and soybean added to label
- Anthem Maxx – apply through V6 soybean (was V3)
- Authority Edge – soybean and sunflower added to label
- BroadAxe – rotation restriction for dry beans added (4 months)
- Outlook – increase to 31 fl oz/A/yr (was 21 fl oz/A/yr)
- Zidua – apply through V8 corn (anticipated)

Atrazine registration review

- Interim decision released Sept 2020
- Two more assessments
  - Endangered species assessment (deadline 9/28/21)
  - Endocrine disruptor screening
- Changes most likely to affect Kansas farmers
  - 15 MPH weed speed restriction
  - 5-foot buffer from edge of streams/rivers and endangered species habitat
  - Medium-sized droplets or larger

What are the two most challenging weeds in your crops?

Corn herbicide application calendar

- Oct-Dec: Fall Control emerged winter annuals
- March: EPP If no fall applications
- April: PRE Plan to apply 21-28 days after PRE
- May: EPOST Scout fields to determine need
- June: LPOST

Spend your money HERE
Residual herbicide activity

Herbicide persistence

- The length of time a herbicide is active in soil
- Needs to be in a ‘sweet spot’ for residual herbicides
  - Want extended control
  - Don’t want carryover
Herbicide persistence

- Described by the half-life ($t_{1/2}$)
- Time required for one-half of the herbicide to dissipate

Microbial degradation

- Influenced by:
  - Sorption
  - Previous applications

Microbial degradation

- Influenced by:
  - Moisture

Microbial degradation

- Influenced by:
  - Soil temperature
Half-life of some residual herbicides

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Example</th>
<th>SOA group</th>
<th>Half-life</th>
<th>Control duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pendimethalin</td>
<td>Prowl H2O</td>
<td>3</td>
<td>44 d</td>
<td></td>
</tr>
<tr>
<td>Atrazine</td>
<td>Aatrex 4L</td>
<td>5</td>
<td>60 d</td>
<td></td>
</tr>
<tr>
<td>Atracloprid</td>
<td>Harness</td>
<td>15</td>
<td>4-20 d</td>
<td>8-12 weeks</td>
</tr>
<tr>
<td>S-metolachlor</td>
<td>Dual II Magnum</td>
<td>15</td>
<td>30-50 d</td>
<td>10-14 weeks</td>
</tr>
<tr>
<td>Dimethenamid-P</td>
<td>Outlook</td>
<td>15</td>
<td>20 d</td>
<td></td>
</tr>
<tr>
<td>Pyroxasulfone</td>
<td>Zidua</td>
<td>15</td>
<td>16-26 d</td>
<td></td>
</tr>
<tr>
<td>Flumioxazin</td>
<td>Valor</td>
<td>14</td>
<td>12-18 d</td>
<td></td>
</tr>
<tr>
<td>Sulfapyrasulfone</td>
<td>Sharpen</td>
<td>14</td>
<td>1-36 d</td>
<td></td>
</tr>
<tr>
<td>Isoxaflutole</td>
<td>Balance Flexx</td>
<td>27</td>
<td>0.5-2.4 d</td>
<td></td>
</tr>
</tbody>
</table>

Residual herbicide activity

Weed escapes still produce seed

Up to 7 MILLION seeds per acre
Which herbicides have you used as a layered residual?

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>Example</th>
<th>SOA group</th>
<th>Activation</th>
<th>Crop</th>
<th>Restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrazine</td>
<td>Aatrex 4L</td>
<td>5</td>
<td>NA</td>
<td>Corn</td>
<td>12&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grain sorghum</td>
<td>2-5 if</td>
</tr>
<tr>
<td>Acetochlor</td>
<td>Harness</td>
<td>15</td>
<td>1/4-3/4&quot;</td>
<td>Grain sorghum</td>
<td>11&quot;&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Soybean</td>
<td>11&quot;&quot; R2</td>
</tr>
<tr>
<td>Dimethenamid-P</td>
<td>Outlook</td>
<td>15</td>
<td>NA</td>
<td>Corn</td>
<td>12&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grain sorghum</td>
<td>12&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Soybean</td>
<td>V5</td>
</tr>
<tr>
<td>Pyroxasulfone</td>
<td>Zitha</td>
<td>15</td>
<td>1/2&quot;</td>
<td>Corn</td>
<td>V4&quot;</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>Soybean</td>
<td>V6</td>
</tr>
<tr>
<td>S-metolachlor</td>
<td>Dual II Magnum</td>
<td>15</td>
<td>1/2-1&quot;</td>
<td>Corn</td>
<td>V8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grain sorghum</td>
<td>V5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Soybean</td>
<td>75 d PHI V3</td>
</tr>
<tr>
<td>Mesotrione</td>
<td>Callisto</td>
<td>27</td>
<td>1/4&quot;</td>
<td>Corn</td>
<td>V8</td>
</tr>
</tbody>
</table>

*Warrant = 30"*
**V8 anticipated**

Weed control 60 DAP
Warrant (2.5 qts/A)

Common waterhemp control
4, 8, & 16 WAP
### Is 95% control enough?

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed rain year 1</td>
<td>$350,000 \text{ seeds acre} \times 20% = 70,000 \text{ viable seeds acre}$</td>
<td>70,000 viable seeds acre</td>
</tr>
<tr>
<td>Plants emerged year 2</td>
<td>$70,000 \text{ seeds acre} \times 40% = 28,000 \text{ plants acre}$</td>
<td>28,000 plants acre</td>
</tr>
<tr>
<td>Plants escaped year 2</td>
<td>$28,000 \text{ plants acre} \times 95% = 1,400 \text{ plants acre}$</td>
<td>1,400 plants acre</td>
</tr>
<tr>
<td>Resistant plants year 2</td>
<td>$1,400 \text{ plants acre} \times 84% = 1,176 \text{ plants acre}$</td>
<td>1,176 plants acre</td>
</tr>
<tr>
<td>Seed rain from resistant plants year 2</td>
<td>$1,176 \text{ plants acre} \times 487 \text{ seeds plant} = 572,712 \text{ seeds acre}$</td>
<td>572,712 seeds acre</td>
</tr>
</tbody>
</table>

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**WAR AGAINST WEEDS**

**SILVER BULLETS ARE FOR WEREWOLVES**

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**2021 Chemical Weed Control for Field Crops: Patterns, Understanding, and Strategies**

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[Diagram of plants]