Agenda

• Monitoring Resistance Weed Trends
• Weed Identification
• Keys to Resistant Weed Control
• Chemical Distribution
• Conventional Herbicide Update
Pigweed Seedling Stage

- Cotyledons “Elongated”
- 1\textsuperscript{st} Leaves rounded like “C” shape
- Fine hairs throughout plant
- Rough stem & leaf surfaces

Waterhemp Seedling Stage

- Cotyledons “Egg-Shaped”
- Actual leaves are waxy long & narrow
- No hairs on plant “hairless”
- Smooth stem & leaf surfaces
Steps to Successful Waterhemp Control

• Pre-emeerge Herbicide Application
  – Dual Magnum, Nortron

• Tank Mix of Post-emerge Herbicides
  – Glyphosate, Nortron, Betamix, Upbeet
    • Proper ID of Waterhemp
    • Spray when weeds are 2” or less

• Split-layby Herbicide Application
  – Outlook, Dual Magnum, Warrant
Biennial Wormwood

Common Ragweed
Steps to Successful Common Ragweed Control

• Tank Mix of Post-emerge Herbicides
  – Glyphosate + Stinger
  – Spray weeds 2” or less for best results
  – Multiple Stinger applications is a must!
    • Stinger is labeled up to 8 leaf
Kochia/Common Lambsquarters

• Kochia
  – Keep an eye out for this weed

• Common Lambsquarters
  – No known resistance
  – If control seems marginal, hit it again in 10 days
### Resistant Weed Quick Guides

**Tips to Keep Roundup Ready® Technology Working in Your Sugarbeet Fields**

- **Pre-Treatment & Non-Treatment Options In-Row Corn, soybeans**
  - Use Pre-plant Herbicides or Pre-Emergent Herbicides for early control.
  - Consider non-treatment options for in-row corn and soybeans.

- **Resistant Weed Quick Guides**
  - Resistant weed management is critical to maintaining the effectiveness of Roundup Ready® technology.
  - Follow the Angelica and Angelica-resistant weed management guidelines for best results.

### General Pesticide Tank Mixing Order

1. Fill the tank 75% with water.
2. Buffer agent, pH adjuster.
3. Water Dispersible Granules (WDG) or Soluble Powder. Continue agitation and allow plenty of time to mix completely.
4. Surfactant, non-ionic (1% lipophilic surfactant).
5. Surfactant, ionic (1% surfactant).
6. Emulsifiable Concentrate (EC) or Suspension Concentrate (SC).
7. Soluble Liquid (SL) - Glyphosate.
8. Copper Oil.
9. 5. Surfactant, 1% lipophilic surfactant.
10. 4. Surfactant, ionic (1% surfactant).
11. 3. Water Dispersible Granules (WDG) or Soluble Powder.
13. Fill the remaining 25% of the tank with water.

**General Sprayer Cleaning Guidelines**

- Clean the sprayer after each use to prevent residue buildup.
- Use a combination of water and detergent to clean the sprayer.
- Rinse the sprayer thoroughly with water after cleaning.

**Read product label for specific sprayer cleaning instructions.**

**Read product label for specific sprayer cleaning instructions.**

---

**Footnotes:**
- American Crystal Company
- **C** Crystal Gold
- **D** DuraGold
- **G** Gold
- **O** Optima
- **P** PowerPro
- **R** Roundup Ready®
- **S** Sustain
- **V** Valor Gold
- **W** WestGold
- **X** Xtend Gold
- **Y** YieldGold

---

**Tips to Keep Roundup Ready® Technology Working in Your Sugarbeet Fields**

- **Pre-Treatment & Non-Treatment Options In-Row Corn, soybeans**
  - Use Pre-plant Herbicides or Pre-Emergent Herbicides for early control.
  - Consider non-treatment options for in-row corn and soybeans.

- **Resistant Weed Quick Guides**
  - Resistant weed management is critical to maintaining the effectiveness of Roundup Ready® technology.
  - Follow the Angelica and Angelica-resistant weed management guidelines for best results.

### General Pesticide Tank Mixing Order

1. Fill the tank 75% with water.
2. Buffer agent, pH adjuster.
3. Water Dispersible Granules (WDG) or Soluble Powder. Continue agitation and allow plenty of time to mix completely.
4. Surfactant, non-ionic (1% lipophilic surfactant).
5. Surfactant, ionic (1% surfactant).
6. Emulsifiable Concentrate (EC) or Suspension Concentrate (SC).
7. Soluble Liquid (SL) - Glyphosate.
8. Copper Oil.
9. 5. Surfactant, 1% lipophilic surfactant.
10. 4. Surfactant, ionic (1% surfactant).
11. 3. Water Dispersible Granules (WDG) or Soluble Powder.
13. Fill the remaining 25% of the tank with water.

**General Sprayer Cleaning Guidelines**

- Clean the sprayer after each use to prevent residue buildup.
- Use a combination of water and detergent to clean the sprayer.
- Rinse the sprayer thoroughly with water after cleaning.

**Read product label for specific sprayer cleaning instructions.**

---

**Footnotes:**
- American Crystal Company
- **C** Crystal Gold
- **D** DuraGold
- **G** Gold
- **O** Optima
- **P** PowerPro
- **R** Roundup Ready®
- **S** Sustain
- **V** Valor Gold
- **W** WestGold
- **X** Xtend Gold
- **Y** YieldGold

---

**Tips to Keep Roundup Ready® Technology Working in Your Sugarbeet Fields**

- **Pre-Treatment & Non-Treatment Options In-Row Corn, soybeans**
  - Use Pre-plant Herbicides or Pre-Emergent Herbicides for early control.
  - Consider non-treatment options for in-row corn and soybeans.

- **Resistant Weed Quick Guides**
  - Resistant weed management is critical to maintaining the effectiveness of Roundup Ready® technology.
  - Follow the Angelica and Angelica-resistant weed management guidelines for best results.

### General Pesticide Tank Mixing Order

1. Fill the tank 75% with water.
2. Buffer agent, pH adjuster.
3. Water Dispersible Granules (WDG) or Soluble Powder. Continue agitation and allow plenty of time to mix completely.
4. Surfactant, non-ionic (1% lipophilic surfactant).
5. Surfactant, ionic (1% surfactant).
6. Emulsifiable Concentrate (EC) or Suspension Concentrate (SC).
7. Soluble Liquid (SL) - Glyphosate.
8. Copper Oil.
9. 5. Surfactant, 1% lipophilic surfactant.
10. 4. Surfactant, ionic (1% surfactant).
11. 3. Water Dispersible Granules (WDG) or Soluble Powder.
13. Fill the remaining 25% of the tank with water.

**General Sprayer Cleaning Guidelines**

- Clean the sprayer after each use to prevent residue buildup.
- Use a combination of water and detergent to clean the sprayer.
- Rinse the sprayer thoroughly with water after cleaning.

**Read product label for specific sprayer cleaning instructions.**

---

**Footnotes:**
- American Crystal Company
- **C** Crystal Gold
- **D** DuraGold
- **G** Gold
- **O** Optima
- **P** PowerPro
- **R** Roundup Ready®
- **S** Sustain
- **V** Valor Gold
- **W** WestGold
- **X** Xtend Gold
- **Y** YieldGold

---
## Resistant Weed Rec's

### Glyphosate and Conventional Herbicide Tank-mixes

For Weed Resistance Management:

**This is not a substitute for reading the product labels.**

1. **Maxim®** (glufosinate), 2.7 lb ae as a substitute for 3.6 lb ae Roundup PowerMAX®
2. **Paraquat** (paraquat-diquat), 0.5 lb ai
3. **Basta®** (mebendazole), 0.7 lb ai

### Early Planted Waterhemp Management

<table>
<thead>
<tr>
<th>Application</th>
<th>Glyphosate</th>
<th>Nitrine</th>
<th>Dual</th>
<th>Outlook</th>
<th>OR</th>
<th>Progress</th>
<th>PPIs:</th>
<th>1st Application 5-Leaf Stage</th>
<th>2nd Application 10-14 DAT</th>
<th>3rd Application 15-18 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 - 30 lb/acre</td>
<td>3.8 lb ai</td>
<td>4.5 lb ai</td>
<td>12 fl oz A</td>
<td>6 fl oz A</td>
<td>3 fl oz A</td>
<td>OR</td>
<td>Glyphosate = 20 - 28 lb/acre</td>
<td>Glyphosate = 24 - 28 lb/acre</td>
<td>Glyphosate = 22 lb/acre</td>
</tr>
</tbody>
</table>

**Resistant Kochia Management**

<table>
<thead>
<tr>
<th>Application</th>
<th>Glyphosate</th>
<th>Nitrine</th>
<th>Dual</th>
<th>Outlook</th>
<th>OR</th>
<th>Progress</th>
<th>PPIs:</th>
<th>1st Application 5-Leaf Stage</th>
<th>2nd Application 10-14 DAT</th>
<th>3rd Application 15-18 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 - 30 lb/acre</td>
<td>3.8 lb ai</td>
<td>4.5 lb ai</td>
<td>12 fl oz A</td>
<td>6 fl oz A</td>
<td>3 fl oz A</td>
<td>OR</td>
<td>Glyphosate = 20 - 28 lb/acre</td>
<td>Glyphosate = 24 - 28 lb/acre</td>
<td>Glyphosate = 22 lb/acre</td>
</tr>
</tbody>
</table>

**Resistant Ragweed Management**

<table>
<thead>
<tr>
<th>Application</th>
<th>Glyphosate</th>
<th>Nitrine</th>
<th>Dual</th>
<th>Outlook</th>
<th>OR</th>
<th>Progress</th>
<th>PPIs:</th>
<th>1st Application 5-Leaf Stage</th>
<th>2nd Application 10-14 DAT</th>
<th>3rd Application 15-18 DAT</th>
<th>4th Application 15-18 DAT (if needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30 - 30 lb/acre</td>
<td>3.8 lb ai</td>
<td>4.5 lb ai</td>
<td>12 fl oz A</td>
<td>6 fl oz A</td>
<td>3 fl oz A</td>
<td>OR</td>
<td>Glyphosate = 20 - 28 lb/acre</td>
<td>Glyphosate = 24 - 28 lb/acre</td>
<td>Glyphosate = 22 lb/acre</td>
<td>Glyphosate = 22 lb/acre</td>
</tr>
</tbody>
</table>

**Product Notes:**
- **Stinger,** labeled on oxadiazon 2.7 lb/acre. Total maximum usage per season: 10.7 lb/acre; 45 day PHI.
- **Basta,** tested total maximum allowed usage: 4 lb/acre; 30 day PHI.
- **Mebuctol®** (mebendazole), 0.7 lb ai; 75 day PHI.
- **Dual,** label maximum usage: 12 lb ai; 15 day PHI.
- **Outlook,** total maximum allowed usage: 12 fl oz A; 60 day PHI.
- **Glyphosate,** 20 lb/acre; 24 fl oz A; 10 day PHI.

**Note on Prem-Grazing Application:** Grasses (BERMUDA, BENTHAM) may be tank-mixed with the Conventional Herbicides (paraquat, Roundup) or applied right before to protect against injury. Optimal timing is 3 days before or 3 days after application.

**Tank-mixing Order for Glyphosate and Conventional Herbicides**

1. Fill tank with 1.5 gal of water and water in water (WDG) at 0.2%.
2. Add AMS liquid or dry (heater conditioners).
3. If needed, add Atena® at 6 oz.
4. Add Basta® at 6 oz.
5. Fill with water.
6. Add Outlook® at 30 gal.
7. Add Roundup® PowerMAX® at 6 gal.
8. Add Stinger® at 6 gal.
9. Add Targa® at 6 gal.
10. Add Norlut® at 6 gal. Norlut® should be applied as a pre-emergent.
12. Spray tank until properly designed for application.
Chemical Distribution

- It will happen in 2017
- You will be updated on details soon
- 156 pallets of chemical in inventory
Conventional Herbicide Update

• Ethofumesate (Nortron, Ethotron, Etho SC)
  – Need label edited for >12 oz/acre Broadcast POST
  – Need label edited for < 90 day PHI
  – Summer 2018 or Section 18 prior

• Desmedipham = Betanex “Black Can”
• Phenmedipham (Spin-Aid) + Desmedipham = Betamix “Red Can”
  – Phenmedipham – possible label
  – Desmedipham – challenging, buried deeper
<table>
<thead>
<tr>
<th>Weed Type</th>
<th>Betanex *</th>
<th>Betamix</th>
<th>Stinger</th>
<th>UpBeet</th>
<th>Ethofumesate 12</th>
<th>Ethofumesate 32-64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambsquarters</td>
<td>G</td>
<td>G</td>
<td>N</td>
<td>P</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Common Ragweed</td>
<td>P-F</td>
<td>F</td>
<td>G-E</td>
<td>F</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Kochia</td>
<td>G-E</td>
<td>F-G</td>
<td>N</td>
<td>F-E</td>
<td>N</td>
<td>G</td>
</tr>
<tr>
<td>Redroot Pigweed</td>
<td>F</td>
<td>G</td>
<td>N</td>
<td>F</td>
<td>N-P</td>
<td>G-E</td>
</tr>
<tr>
<td>Waterhemp</td>
<td>N</td>
<td>F</td>
<td>N</td>
<td>F</td>
<td>N</td>
<td>F</td>
</tr>
</tbody>
</table>

*Scale: E = 90 to 99%; G = 80 to 90%; F = 65 to 80%; P = 40 to 65%; N = None, Courtesy Dr. Tom Peters
Any Questions?