Weed Control Options for 2011

YWTG

AG GOLD STANDARDS

CRYSTAL SUGAR
American Crystal Sugar Company
Weed Control With Conventional Herbicides
# PPI/PRE Herbicides & Availability

<table>
<thead>
<tr>
<th>Herbicides</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nortron</td>
<td>Limited</td>
</tr>
<tr>
<td>Roneet</td>
<td>Limited</td>
</tr>
<tr>
<td>Eptam</td>
<td>Limited</td>
</tr>
<tr>
<td>Dual</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Fargo</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>
# Layby Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Outlook</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Treflan</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>
## Post Emergence Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betamix</td>
<td>Adequate if Broadcast</td>
</tr>
<tr>
<td></td>
<td>Unlimited if Banded</td>
</tr>
<tr>
<td>Stinger</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Upbeet</td>
<td>Very Adequate</td>
</tr>
<tr>
<td>Progress</td>
<td>Very Little Inventory</td>
</tr>
<tr>
<td></td>
<td>1 pint = .92 pints Betamix + 2.4 oz. Nortron SC</td>
</tr>
<tr>
<td>Betanex</td>
<td>Almost None</td>
</tr>
</tbody>
</table>
Before Planting Strategies

• Use high plant populations for best crop competition - use narrower seed spacing
• Maximize weed control with pre-plant tillage
• Ideal seedbed preparation critical
  – Fast germination
  – Fast emergence
  – Beets compete best if emerge ahead of weeds
• Starter fertilizer for rapid early growth
# Pre-plant Incorporated Strategies

<table>
<thead>
<tr>
<th>Product</th>
<th>Injury Risk</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Roneet</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Eptam</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Nortron</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Fargo</td>
<td>Low</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
PPI Benefits

• Reduce early competition
• Maximize weed control
• May reduce POST applications
• Improve POST applied product efficacy
• Weather insurance for POST applied timing
PPI Risks

- Crop injury
- Dry out seedbed
- Poorer beet stand sometimes
- Cover crop use
- Plant back restrictions – Nortron (12 mo.-beans)
Nortron Carryover on Wheat-Safest to Follow With Soybeans
# Efficacy of PPI/PRE Herbicides

| Herbicide | L | A | M | B | S | Q | U | K | O | C | T | H | I | A | S | D | W. |
|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dual      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Magnum    | P | F | G-E| P | P-F| P |
| Eptam     | F | F-G| F-G| P | F | P-F |
| Nortron   | F-G| P-F| G-E| G | P | F-G |
| Roneet    | P | F-G| F-G| P | F | P-F |

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PPI Fargo Use –
Primarily for Resistant Wild Oats
(ACCase- Puma, Select, etc.)
PRE/PPI Dual Magnum

- Must sign waiver to release Syngenta of all liability
- Contact agriculturist for assistance
Glyphosate/Paraquat Use

- Strongly consider an application **just before Beet emergence**
- Adds flexibility for 1\textsuperscript{st} POST application
- Beets get ahead of weed competition
Microrate Use Tips

Must **always** include:

- Betamix/Progress/Betanex
- Upbeet
- Stinger – nearly always
- MSO / basic blends
- Grass herbicide as needed
- Apply at 40 psi and 10 gpa or more
Microrate Use Tips - Adjuvants

MSO – 1.5 % - v/v

Basic Blend – 1.5 % - v/v (Ex. Quad 7, Newtone, Linkage, Transactive)

• Either MSO or Basic Blend
• Don’t use less than 1 pint/acre
• If droughty conditions MSO often better than basic blends
• 50/50 mix performs well - 1% v/v of each
Microrate Mixing Order

1. Begin with a clean tank
2. Fill tank ⅓ full of water
3. Adjust pH to 8.0 – 9.0 with use of Basic Blend adjuvants or 2% v/v household ammonia. Basic Blend not needed by air (use 2 pints MSO).
Microrate Mixing Order (Con’t)

4. Slurry Upbeet in warm/hot water
5. Add Upbeet to tank
6. Fill tank ⅔ full with water
7. Add Nortron if using it
8. Add B/B/P
Microrate Mixing Order (Con’t)

9. Add Stinger
10. Add Outlook if desired
11. Add grass herbicide
12. Fill tank with water
13. Add remaining required MSO or Basic Blend
Microrate Use – Measures to Reduce Nozzle Plugging

1. Clean the sprayer frequently

2. Mix the herbicides in warm water or at least let the water warm to air temperature before adding herbicides rather than mixing in cold well water
Microrateuse – Measures to Reduce Nozzle Plugging (Con’t)

3. Increase the pH of the spray solution by using ammonia or a Basic Blend Adjuvant
   Option 1 – use household non-sudsing ammonia with a 2% concentration (1 gallon/100 gallons of water)
   Option 2 – Use a Basic blend Adjuvant i.e. Quad 7, Linkage, Newtone or Transactive (1% v/v)

4. Spray out the tank load immediately after mixing. Spray until the tank is empty and flush the sprayer with water before any spray residue can dry in the sprayer
Microrate use – Measures to Reduce Nozzle Plugging (Con’t)

5. All of the grass herbicides reduced nozzle plugging **Assure II** had more effect than **Poast, Select**

6. Use the minimum amount of agitation needed to keep the solution mixed.
Microrate Use – Measures to Reduce Nozzle Plugging (Con’t)

7. Tests show that nozzle plugging is less with Betamix than Betanex

8. Flush sprayer with clean water after every application
Microrate Use Strategies

- Apply first POST application to cotyledon weeds
- Repeat applications every 5-7 days
- Increase B/B/P rates as needed after first application
- GDD timing option on Crystal website

crystalsugar.com choose ag tools, choose pest alert, choose NDAWN links, and choose predictive leaf stages and GDD
# Standard Microrate Mix

<table>
<thead>
<tr>
<th>Product</th>
<th>Rate/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betamix</td>
<td>8 oz. – 12 oz.</td>
</tr>
<tr>
<td>Upbeet</td>
<td>⅛ oz.</td>
</tr>
<tr>
<td>Stinger</td>
<td>1.3 oz.</td>
</tr>
<tr>
<td>MSO</td>
<td>1.5 % v/v (max 2 pt.)</td>
</tr>
<tr>
<td>Select Max if Needed</td>
<td>4-8 oz.</td>
</tr>
</tbody>
</table>
## Standard Mid-Rate Program

<table>
<thead>
<tr>
<th>Product</th>
<th>Rate/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betamix</td>
<td>12 – 16 oz.</td>
</tr>
<tr>
<td>Upbeet</td>
<td>⅛ oz.</td>
</tr>
<tr>
<td>Stinger</td>
<td>2.6 oz.</td>
</tr>
<tr>
<td>MSO</td>
<td>1.5% v/v (max 2 pt.)</td>
</tr>
<tr>
<td>Select Max</td>
<td>4- 8 oz.</td>
</tr>
</tbody>
</table>
Weeds Stinger Improves Control On

Canada Thistle
Wild Sunflower
Lanceleaf Sage
Nightshades
Smartweeds
Biennial Wormwood
V. Soybean

Wild Buckwheat
Cocklebur
Buffalo Bur
Common Ragweed
Marshelder
Russian Thistle
Common Lambsquarters
Weeds Upbeet Improves Control On

Pigweed        Velvetleaf
Nightshades    C. Mallow
Venice Mallow  Non-Resistant Kochia
V. Canola      Nightflowering Catchfly
Other Considerations

• Reduce POST rates if soil applied herbicide is used
• Early morning spraying increases activity reduces crop safety
• Late afternoon spraying reduces herbicide activity - increases crop safety
• Don’t spray 1-2 days before frost = less weed control and more crop injury
Other Considerations (Con’t)

- Rapid change from cool to hot weather increases injury risk
- Never mix POST conventional herbicides with Quadris
- May reduce rates if high pressure or aerial application
- Maintain higher rates if droughty conditions persist
Layby Herbicides

- Outlook – Dual Magnum – Treflan
- Can be included with microrate but injury risk increases
- Improve Pigweed control in particular
- Do **NOT** apply over top of Nortron
- Less rainfall to activate Outlook than Dual
Lay-by Rates

**Dual Magnum**
Apply to 4 leaf beets 1.0 pt. (coarse) 1.33 pt. (med) 1.67 pt. (fine) maximum of 2.67 pt. split applied

**Outlook**
2-8 leaf beets (more injury on small beets) 12-18 oz. (coarse), 18-21 oz. (med-fine) maximum of 24 fl. oz. if split applied

**Treflan**
1.5 pt./A, 2-6 leaf beet stage, root injury risk if on root or crown
Much More Information Available

- See 2010 Sugarbeet Research and Extension Reports – pages 25-44
- See 2011 Pocket Production Guide
- See 2011 North Dakota Weed Control Guide
- Contact your Agriculturist
- Go to crystalsugar.com
Weed Control In Roundup Ready Beets
Avoid Competition With Proper Timing

<table>
<thead>
<tr>
<th>Weed Pressure</th>
<th>Recommended Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>2-4 Leaf Beets</td>
</tr>
<tr>
<td>Moderate</td>
<td>2 Leaf Beets</td>
</tr>
<tr>
<td>Heavy</td>
<td>Cotyledon – 2 Leaf Beets</td>
</tr>
</tbody>
</table>

Yes, this was a beet field
Roundup Rate Selection

One rate of glyphosate does not fit all situations. Select rates based on a number of factors including the following considerations:

• Weed species present
• Environmental conditions
• Weed growth stage
• Possible weed tolerance or resistance to glyphosate
Maximize Glyphosate Effectiveness

<table>
<thead>
<tr>
<th>Situation</th>
<th>Rate (4.5 lb/Gal. Acid Equiv)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small weeds, very favorable environment</td>
<td>22 oz/acre</td>
</tr>
<tr>
<td>Less favorable environment or larger weeds</td>
<td>28 oz/acre</td>
</tr>
<tr>
<td>Unfavorable environment, very large weeds, hard to control weed species, suspected tolerance to glyphosate</td>
<td>32 oz/acre</td>
</tr>
</tbody>
</table>
Timing the Second Application

• The label states it must be 10 days or more after the first application
• Determine if sufficient weeds have emerged
• Determine when weed size, species and density justify spraying
• Most second applications will be from 14 to 28 days after the initial application
Tips on Maximizing Weed Control With Roundup

• Best control is from 10 a.m. to 4 p.m.
• Add 8.5 to 17 lbs. of AMS per 100 gallons of spray solution (or reputable AMS replacement)
• Control is often better with lower spray volumes
• Rain within 6 hours after application may reduce weed control
Tips on Maximizing Weed Control With Roundup (Con’t)

- Avoid spraying with dust on plants
- Avoid spraying with dew on plants
- Cool weather slows activity and time needed to kill weeds
- Frost before application will reduce control
Tips on Maximizing Weed Control With Roundup (Con’t)

• Drought slows weed growth, reduces Roundup activity

• Delay cultivation **at least 3 days** after Roundup use to maximize control

• Air temperature over 85°F during application can reduce weed control

• Don’t spray after sunset-weed control can be reduced
Know Your Acid Equivalents

Over 50 Glyphosate formulations were available in 2010

Be sure you use correct rates
When to Tank Mix Stinger and Glyphosate

- For volunteer soybeans
- For Glyphosate resistant Common Ragweed
- For Wild Buckwheat
- For Biennial Wormwood
Tips For Controlling Volunteer Roundup Ready Canola

- Use ¼ to ½ oz. of Upbeet (costly)
- Use microrate as 1st application on RR beets
- Pull resistant plants if population is low
- Control in other crops whenever possible