Disease and Insect Management in the RRV
Insects

Sugarbeet Root Maggot

Wireworm

Springtalis

Cutworms
Root Diseases

Fusarium

Rhizoctonia

Rhizomania

Aphanomyces
Sugarbeet Root Maggot Management
First Application Control Practices

- Counter is the recommended product to be used in heavy SBRM areas!

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Recommended rates (product/ac) for expected population levels</th>
<th>Timing Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Low</strong></td>
<td><strong>Moderate</strong></td>
</tr>
<tr>
<td>Counter 20G RUP</td>
<td>4.5 lb.</td>
<td>7.5 lb.</td>
</tr>
<tr>
<td>Counter 15G RUP</td>
<td>5.9 lb.</td>
<td>10.0 lb.</td>
</tr>
<tr>
<td>Poncho Beta</td>
<td>Seed Applied</td>
<td>*NR</td>
</tr>
<tr>
<td>Lorsban 15G RUP</td>
<td>6.7 lb.</td>
<td>10.0 lb.</td>
</tr>
<tr>
<td>Temik 15G RUP</td>
<td>6.7 lb.</td>
<td>10.0 lb.</td>
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</tbody>
</table>

RUP – Restricted Use Pesticide
*NR – Not Recommended without a 2\textsuperscript{nd} application of an insecticide
Counter 20G Replacing 15G:

- Same active ingredient as 15G formulation
- 20G is 75% of the 15G rate = less time re-filling planters

Conversion table for calibration:

<table>
<thead>
<tr>
<th>Target Rate lb (AI) / ac</th>
<th>OLD Counter 15G</th>
<th>NEW Counter 20G</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>lb. product/ac</td>
<td>oz. per 1000 row ft</td>
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<tr>
<td>0.9</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>1.05</td>
<td>7</td>
<td>4.7</td>
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<td>1.2</td>
<td>8</td>
<td>5.4</td>
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<tr>
<td>1.5</td>
<td>10</td>
<td>6.7</td>
</tr>
<tr>
<td>1.8</td>
<td>11.9</td>
<td>8</td>
</tr>
</tbody>
</table>
Postemergence Maggot Control
Auburn, ND 2009

Check

Counter 10 lb

Poncho Beta

Counter 10 lb + Lorsban 4E 1 pt/ac

Poncho Beta + Lorsban 4E 1 pt/ac
Seed Treatments vs. Counter
Maggot Control - St. Thomas, ND 2007

CHECK

Counter 10 lb

Cruiser

NipsIt

Poncho Beta
2011 SBRM Control
No Poncho

• Option 1 - Counter at planting followed by a post app. of Thimet 10 to 14 days before peak fly

• Option 2 - Counter at planting followed by two 1 pint applications of Lorsban 4E
  – one app. 4 days prior to peak fly and 1 app. at peak fly

• Option 3 - Mustang at plant followed by post application of Thimet
  – only if no insecticide boxes available on planter
2011 SBRM Control
With Poncho

• Option 1 – Poncho at planting followed by post app. of Thimet 10 to 14 days before peak fly

• Option 2 – Poncho at planting followed by two 1 pint applications of Lorsban 4E
  — one app. 4 days prior to peak fly and one app. at peak fly

• Fly counts are posted on ACSC website
Root Maggot Risk* for 2011

*Based on fly counts & root damage ratings
Stand Losses due to Wireworm can range from 1% to total replant.

Larvae Range from 1/2" to 1 1/2” long.
Wireworm Control

• No threshold for wireworms in sugarbeets has been established

<table>
<thead>
<tr>
<th>Insecticide</th>
<th>Rate</th>
<th>Application Method</th>
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</thead>
<tbody>
<tr>
<td>Counter 15G</td>
<td>5.9 to 11.9 lbs/acre</td>
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<tr>
<td>Counter 20G</td>
<td>4.5 to 8.9 lbs/acre</td>
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</tr>
<tr>
<td>Mustang Max</td>
<td>4.0 oz/acre</td>
<td>in furrow or T-Band</td>
</tr>
<tr>
<td>Lorsban 15G</td>
<td>10 to 13 lbs/acre</td>
<td>Suppression only</td>
</tr>
<tr>
<td>Poncho Beta, NipsIt, Cruiser Max</td>
<td>Seed Applied</td>
<td>Low infestation only</td>
</tr>
</tbody>
</table>
Springtail Control

Surviving Plants (2006-2008)

Boetel, Dragseth and Schroeder, 2010, NDSU

Counter 15G  Poncho Beta  NipsIt  Cruiser  Control

Plants / 100 ft

6 lb  8 lb  68 g  60 g  60 g  60 g

P = 0.05

Legend:

a  ab  c  bc  bc  d

Counter 15G: 6 lb
Poncho Beta: 8 lb
NipsIt: 68 g
Cruiser: 60 g
Control: 60 g
Springtail Control

Sucrose Yield (2006-2008)

Boetel, Dragseth and Schroeder, 2010, NDSU

Counter 15G  Poncho Beta  NipsIt  Cruiser  Control

6 lb  8 lb  68 g  60 g  60 g  60 g
Springtail Control

• No insecticide is labeled for springtail control in sugarbeet.

• Springtail insect pressure continues to increase.

• Counter has the most consistent control

• Poncho Beta provides fair control
Cutworm Management

• Feeding habits
  – Feed below soil surface when soil is dry
  – Feed above soil surface when soil is wet
• If the soil is crusted over, break up the crust during insecticide application
• **Evening spray most effective**
Cutworm Insecticides

- Asana XL* – 5.8 – 9.6 fl Oz  PHI=21 days
- Sevin 4F –  1.5 qts  PHI=28 days
- Lorsban 4E *-  2 pts  PHI=30 days
- Mustang Max *–  4 oz  PHI=50 days

- Lorsban provides the most consistent control

*Restricted use Pesticide
FUSARIUM
FUSARIUM

- Usually found in wet, poorly structured soils
- First appears as interveinal yellowing on older leaves.
- Optimum soil temp above 75 degrees F
- Can be confused with Verticillium Wilt
Fusarium Management With Disease Resistant Varieties

- Disease root rating of 3.0 or less.
- Crystal - 658RR, 539RR, R761, R434, R308
- Beta - 89RR50, 88RR13, 88RR21, 89RR30, 88RR31, 1125R
Factors affecting Rhizoctonia

• Density of fungus in soil
  – High populations disease begins early
  – Low populations onset of disease is later in season
  – Temperature 50 to 95° F
  – Soil moisture can be dry to wet (25 – 100% MHC)
Rhizoctonia Control Strategies

- Plant varieties with Rhizoc rating of 3.82 or less
- Use seed treatments
- In-furrow fungicides
Rhizoctonia Control Strategies

- Keep soil out of crowns if cultivating
- Apply fungicide on 4-6 leaf beets as soil temp reaches 65° F (timing very critical)
- Crop rotation planning
## Quadris Rate Evaluation

Windels & Brantner, 2010, UM-NWROC

<table>
<thead>
<tr>
<th>Quadris Rate (fl oz product/A)</th>
<th>Revenue ($/A)</th>
<th>Product Cost ($/A)</th>
<th>Benefit Over No Fungicide $^{Z}$ ($/A)</th>
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</thead>
<tbody>
<tr>
<td>Control (no fungicide)</td>
<td>1,401</td>
<td>-</td>
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<tr>
<td>5.0</td>
<td>1,368</td>
<td>12.50</td>
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<td>7.5</td>
<td>1,403</td>
<td>18.75</td>
<td>-17</td>
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<td>10.0</td>
<td>1,496</td>
<td>25.00</td>
<td>70</td>
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<td>14.5</td>
<td>1,520</td>
<td>36.25</td>
<td>83</td>
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$^{Z}$ Product cost subtracted, but does not account for other costs associated with application.
## Efficacy of Band-Applied Fungicides

Windels & Brantner, 2010, UM - NWROC

<table>
<thead>
<tr>
<th>Treatment and Rate (7-inch band)</th>
<th>No. harv. Root/100 ft.</th>
<th>Yield T/A</th>
<th>Sucrose</th>
<th>Revenue ($)</th>
<th>Revenue (%/A)</th>
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</thead>
<tbody>
<tr>
<td>Non-inoculated control</td>
<td>142 a</td>
<td>23.8 a</td>
<td>16.8 bc</td>
<td>7,537 a</td>
<td>1,180 ab</td>
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<tr>
<td>Rhizoctonia inoculated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No fungicide control</td>
<td>73 b</td>
<td>9.5 b</td>
<td>15.6 d</td>
<td>2,780 b</td>
<td>399 c</td>
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<tr>
<td>Headline @ 0.5 fl oz/1000 ft</td>
<td>147 a</td>
<td>23.7 a</td>
<td>16.6 cd</td>
<td>7,228 a</td>
<td>1,086 b</td>
</tr>
<tr>
<td>Proline @ 5.7 fl oz/A</td>
<td>160 a</td>
<td>24.7 a</td>
<td>17.5 abc</td>
<td>8,064 a</td>
<td>1,300 ab</td>
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<tr>
<td>Quadris @ 0.6 fl oz/1000 ft</td>
<td>162 a</td>
<td>24.5 a</td>
<td>18.0 a</td>
<td>8,295 a</td>
<td>1,381 a</td>
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<tr>
<td>LSD (P=0.05)</td>
<td>30.5</td>
<td>5.3</td>
<td>1.1</td>
<td>1,693</td>
<td>247</td>
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</tbody>
</table>
## Efficacy of in-furrow Fungicides

Windels & Brantner, 2010, UM - NWROC

<table>
<thead>
<tr>
<th>Treatment and Rate (in-furrow)</th>
<th>No. harv. Root/100 ft.</th>
<th>Yield T/A</th>
<th>Sucrose</th>
<th>Revenue ($/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>%</td>
<td>lb recov./A</td>
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<tr>
<td>Non-inoculated control</td>
<td>157 a</td>
<td>27.2 a</td>
<td>16.9</td>
<td>8,635 a</td>
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<tr>
<td>Rhizoctonia inoculated</td>
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<td></td>
</tr>
<tr>
<td>No fungicide control</td>
<td>85 d</td>
<td>17.7 c</td>
<td>16.8</td>
<td>5,540 c</td>
</tr>
<tr>
<td>Headline @ 0.5 fl oz/1000 ft</td>
<td>142 ab</td>
<td>24.3 ab</td>
<td>16.7</td>
<td>7,599 ab</td>
</tr>
<tr>
<td>Quadris @ 0.6 fl oz/1000 ft</td>
<td>143 ab</td>
<td>23.9 ab</td>
<td>17.0</td>
<td>7,614 ab</td>
</tr>
<tr>
<td>LSD (P=0.05)</td>
<td>20.5</td>
<td>4.39</td>
<td>NS</td>
<td>1,395</td>
</tr>
</tbody>
</table>
In-Furrow Headline Use Tips

• Can tank mix with other products ONLY IF you have very good agitation
• Spray out within 4 hours if possible
• Tank mixes left overnight need extremely good agitation
• Stand loss may occur
• Adding water to 10-34-0 improves compatibility
Quadris Use Tips

• Do not mix Quadris with 10-34-0 or similar starter fertilizers
• Spray out Quadris tank mixes within 4 hours
• Maintain constant tank agitation with mixes
• T-band applications are better than in-furrow
• Never apply post Quadris with microrates
• Better to apply too early vs. too late
2010 Crop Daily Soil Temperature — Hillsboro
Rhizomania

RHIZOMANIA
Identification – Detection

• Virus carried by a fungus
• Large number of small lateral roots
• Root may be small with dark veins or rot
• Leaves bright in color and extend upright
• The infection blocks water and nutrients uptake
2010 Rhizomania
“Blinkers”
Rhizomania Root Symptoms
Crookston Severe Rhizomania area:
Dual technology has a $92 advantage over other varieties.
Dual Technology Varieties

- SESVanderhave – 48607TT, 48717TT

- BetaSeed – BTS 89RR50, BTS 88RR41, BTS 88RR83, 1125R

- Crystal – 879RR, R761

- Seedex – Deuce (limited availability)
Aphanomyces

• Aphanomyces is a water fungus in the soil
  – Likes warm and wet conditions (late spring planting)
• Use Tachigaren for early season symptoms
  – Provides 3 to 4 weeks of seedling protection
• RRV occurrences tend to be late season infections
• Improve Soil Structure
  – Surface drainage, Tiling or Lime application
• Most important to select variety with Aphanomyces rating of 4.9 or less
Aphanomyces and VersaLime

• VersaLime improves soil structure allowing for better water movement in heavy clay soils

• VersaLime has no detrimental effects on other rotational crops. Improved yields seen on all crops

• The use of resistant varieties and a good liming program on infected fields can help reduce disease and improve yield on sugar beets
2010 Disease Rating
Rhizomania

* The disease ratings are general in nature and may not be representative of all fields in a township.
2010 Disease Rating
Fusarium

* The disease ratings are general in nature and may not be representative of all fields in a township.
Fusarium Disease Acres

- None: 100%
- Slight: 91%
- Moderate: 41%
- Severe: 25%

Disease Levels:
- Estimated Disease Acres
- Correct Varieties Planted Acres
2010 Disease Rating*
Rhizoctonia

* The disease ratings are general in nature and may not be representative of all fields in a township.
**Variety Selection Worksheet**

### Performance of Roundup Ready® Varieties

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</thead>
<tbody>
<tr>
<td><strong>BTS 89RR50</strong></td>
<td>110 114 112</td>
<td>101 100 100</td>
<td>100 101</td>
<td>100 101</td>
<td>114 112</td>
<td>114 112</td>
<td>77 78</td>
<td>5.2 5.0</td>
<td><strong>3.9</strong> 3.7</td>
<td>4.0 4.4</td>
<td><strong>2.1</strong> 2.1</td>
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<tr>
<td><strong>BTS 89RR83</strong></td>
<td>103 115 110</td>
<td>97 96 96</td>
<td>97 98</td>
<td>120 113</td>
<td>77 77</td>
<td>4.8 4.7</td>
<td>5.7 4.9</td>
<td><strong>3.6</strong> 3.6</td>
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<tr>
<td><strong>Crystal 986RR</strong></td>
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<td>108 104 106</td>
<td>102 103</td>
<td>108 103</td>
<td>67 65</td>
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<td>4.7 4.6</td>
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<td><strong>Crystal 765RR</strong></td>
<td>119 102 109</td>
<td>112 106 109</td>
<td>103 104</td>
<td>95 101</td>
<td>77 75</td>
<td>4.5 4.7</td>
<td>5.7 5.6</td>
<td>4.4 4.5</td>
<td>4.0 3.9</td>
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<td><strong>Crystal 768RR</strong></td>
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<td>108 101 104</td>
<td>101 102</td>
<td>103 104</td>
<td>78 77</td>
<td>5.2 5.1</td>
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<td>107 99 103</td>
<td>100 102</td>
<td>106 105</td>
<td>70 69</td>
<td>5.1 4.9</td>
<td><strong>4.1</strong> 4.3</td>
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<td><strong>Crystal 875RR</strong></td>
<td>106 108 107</td>
<td>103 101 102</td>
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<td>80 78</td>
<td>4.3 4.4</td>
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<td>3.8 3.8</td>
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<td>96 95</td>
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<td><strong>SES/VDH H36812RR</strong></td>
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<td><strong>Hilleshög 4012RR</strong></td>
<td>104 104 104</td>
<td>101 102 102</td>
<td>101 101</td>
<td>103 102</td>
<td>78 75</td>
<td>5.0 5.1</td>
<td><strong>4.3</strong> 4.4</td>
<td>4.5 4.7</td>
<td>6.1 5.7</td>
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<td><strong>SES/VDH H36917RR</strong></td>
<td>108 100 103</td>
<td>111 101 105</td>
<td>100 102</td>
<td>100 99</td>
<td>NA NA</td>
<td>4.9 5.0</td>
<td><strong>4.7</strong> 4.5</td>
<td>4.3 --</td>
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* Illustration includes 1/3rds of RR varieties available for sale in ACSC region
Take Home Message

Insects

• Root Maggots – Counter at plant

• Wireworms – Counter or Mustang Max at plant

• Springtails – Counter at plant

• Cutworms – Lorsban 4E or Mustang Max post
Take Home Message

Root Diseases

• Fusarium – Select variety with score of < 3.0

• Rhizoctonia – Variety with score of < 3.82 and apply Quadris at 4-6 leaf stage or 65° F soil temp.

• Rhizomania – Use TT or Dual Technology

• Aphanomyces – Variety with score of < 4.9 and consider Versa Lime application
Questions