Cercospora Leaf Spot 2020

YWTG 2020
Goals, Objectives and Takeaways

- Review of 2019 AgNotes #607 CLS
- A Dollar Perspective on Treating CLS
- Recap the ACSC Grower Spraying Trends for 2019
- Effective Spraying Tips and Timing Actions
- 2020 ACSC Recommended Spray Program Review
- New Fungicide Label for Provysol in 2020
Are You More Familiar with #607-CLS Management Notes?

Cercospora Leafspot Management Notes

Last year’s Cercospora Leafspot (CLS) management throughout the Red River Valley was overall successful when considering three company record RSA crops in a row (2016-2018 crops) aided by proper varietal choices and supporting cultural practices throughout the RRV allied industry. We cannot relax CLS management efforts at all; keeping CLS inoculum low continues to be a critical objective.
Are You More Familiar with #607-CLS Management Notes?

- Was the CLS rating considered when selecting a variety?
- Did spraying start when DIV’s (daily infection values) were hit?
- Did 2 products always get tank mixed together?
- Were modes of actions always rotated between sprays?
- Was application rate minimum of 15-20 gallons per acre?
What’s Your Perspective on Controlling CLS?

• Is it costing money or making money? How are you looking at it?
  • CLS robs sugar %, tonnage and increases impurities
• One could look at the probability of a decision.
• If one is a betting person, what's the risk/reward of well timed spray program?

Dollars Gained Between Each Spray Event

1 spray: $1,206.00
2 Spray: $1,308.00
3 Spray: $1,412.00
4 Spray: $1,501.00

$ Difference Over Previous Spray:
1 spray: $102.00
2 Spray: $105.00
3 Spray: $89.00

Dollars Gained Between Each Spray Event

- 1 spray: $1,196.00
- 2 Spray: $1,330.00
- 3 Spray: $1,431.00
- 4 Spray: $1,520.00

Gross $ per Acre
$ Difference Over Previous Spray

Dollars Gained Between Each Spray Event

<table>
<thead>
<tr>
<th>Spray Event</th>
<th>Gross $ per Acre</th>
<th>Difference Over Previous Spray</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 spray</td>
<td>$1,291.00</td>
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<td>2 spray</td>
<td>$1,323.00</td>
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<td>3 spray</td>
<td>$1,385.00</td>
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<td>4 spray</td>
<td>$1,441.00</td>
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Dollars Gained Between Each Spray Event

<table>
<thead>
<tr>
<th>Spray</th>
<th>Gross $ per Acre</th>
<th>$ Difference Over Previous Spray</th>
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<tbody>
<tr>
<td>1 spray</td>
<td>$1,294.00</td>
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<td>2 Spray</td>
<td>$1,332.00</td>
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<td>3 Spray</td>
<td>$1,450.00</td>
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<td>4 Spray</td>
<td>$1,529.00</td>
<td>$79.00</td>
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Gross $ per Acre

$1,211.00
$1,382.00
$1,451.00
$1,548.00

$ Difference Over Previous Spray

$171.00 $70.00 $97.00

1 spray 2 Spray 3 Spray 4 Spray

Dollars Gained Between Each Spray Event

1 spray $1,211.00
2 Spray $1,382.00 $171.00
3 Spray $1,451.00 $70.00
4 Spray $1,548.00 $97.00

Gross $ per Acre

$200.00 $400.00 $600.00 $800.00 $1,000.00 $1,200.00 $1,400.00 $1,600.00 $1,800.00

$ Difference Over Previous Spray

$-$-

Dollars Gained Between Each Spray Event

<table>
<thead>
<tr>
<th></th>
<th>Gross $ per Acre</th>
<th>Difference Over Previous Spray</th>
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<td>$98.00</td>
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<td>3 spray</td>
<td>$1,382.00</td>
<td>$0.00</td>
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ACSC Average Number of Fungicide Applications
2019 = 2.7 Apps
Red = Top 5 Years
ACSC RED RIVER VALLEY
NUMBER OF SPRAYS PER FIELD - % for Each Spray

<table>
<thead>
<tr>
<th>Year</th>
<th>ONE</th>
<th>TWO</th>
<th>THREE</th>
<th>FOUR</th>
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<tbody>
<tr>
<td>2015</td>
<td>7.6</td>
<td>1.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>7.1</td>
<td>19.9</td>
<td>31.1</td>
<td></td>
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<tr>
<td>2017</td>
<td>5.1</td>
<td>20.7</td>
<td>34</td>
<td></td>
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<tr>
<td>2018</td>
<td>9</td>
<td>29.5</td>
<td>28.6</td>
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<tr>
<td>2019</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>26</td>
</tr>
</tbody>
</table>
MOORHEAD DISTRICT
NUMBER OF SPRAYS PER FIELD- % for Each Spray

![Bar Chart showing number of sprays per field from 2015 to 2019. The chart indicates the percentage of fields with one to four sprays per year.](chart.png)
HILLSBORO DISTRICT

NUMBER OF SPRAYS PER FIELD - % for Each Spray

Chart Title

%  
80%  
70%  
60%  
50%  
40%  
30%  
20%  
10%  
0%  

2015 2016 2017 2018 2019

0.7 1.7 1 2

1.8 8.3 1 8

55.9 25 12 19

66 66 67 13 16

%  

0.7 1.8 1.7 1 2

1.8 8.3 1 8

55.9 25 12 19

66 66 67 13 16

ONE  TWO  THREE  FOUR
<table>
<thead>
<tr>
<th>Year</th>
<th>ONE</th>
<th>TWO</th>
<th>THREE</th>
<th>FOUR</th>
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<tr>
<td>2015</td>
<td>6.1</td>
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<td>2016</td>
<td>30.7</td>
<td>37.1</td>
<td>26.3</td>
<td>12.8</td>
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<tr>
<td>2017</td>
<td>2.6</td>
<td>15.8</td>
<td>25.4</td>
<td>56.6</td>
</tr>
<tr>
<td>2018</td>
<td>2.6</td>
<td>15.8</td>
<td>25.4</td>
<td>56.6</td>
</tr>
<tr>
<td>2019</td>
<td>10</td>
<td>27</td>
<td>15</td>
<td>48</td>
</tr>
</tbody>
</table>

EAST GRAND FORKS DISTRICT
NUMBER OF SPRAYS PER FIELD - % for Each Spray
CROOKSTON DISTRICT
NUMBER OF SPRAYS PER FIELD- % for Each Spray

- 2015: 4.5% (ONE), 24.7% (TWO), 70.2% (THREE)
- 2016: 0.5% (ONE), 1.6% (TWO), 33.6% (THREE)
- 2017: 2.1% (ONE), 3.7% (TWO), 15.4% (THREE)
- 2018: 1.2% (ONE), 19.9% (TWO), 22.8% (THREE)
- 2019: 6% (ONE), 10% (TWO), 12% (THREE)

% distribution for each spray level from 2015 to 2019.
DRAYTON DISTRICT
NUMBER OF SPRAYS PER FIELD- % for Each Spray

2015 2016 2017 2018 2019

15 14.9 9.5 21.7 28

74.9 33.7 41.5 48 54

8.2 44.9 47 0.2 18

3.9 18 28.1 28.1 0

0 0 1.2 0.2 0

ONE TWO THREE FOUR
CLS Conditions-Know the Pest

• Warm, humid, rainy weather conducive for development of Cercospora Leafspot

• Leaf spots develop 5 to 21 days after infection, depending on: amount of inoculum, temp, & duration of wet period.

• Leaf spots typically occur first on lower, older leaves & progresses to younger leaves

Comparison of Cercospora and Bacterial Leaf Spot, PP1244, March 2018; NDSU publication
**Cercospora Daily Infection Values (DIV)**

**Found on:**
- Crystal Agronomy App
- NDAWN
- Crystalsugar.com

### Grand Forks

<table>
<thead>
<tr>
<th>Date</th>
<th>Daily Infection Value</th>
<th>Two-Day Total Infection Value</th>
<th>Daily Infection Risk</th>
<th>14-Day Accum Infection Values</th>
<th>21-Day Accum Infection Values</th>
<th>Season Total Infection Values</th>
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<tbody>
<tr>
<td>2018-06-29</td>
<td>2</td>
<td>2</td>
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<td>10</td>
<td>10</td>
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<tr>
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<td>5</td>
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<td>13</td>
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<tr>
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<td>Slight</td>
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<td>13</td>
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<tr>
<td>2018-07-02</td>
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<td>0E</td>
<td>Slight (E)</td>
<td>12E</td>
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<td>13E</td>
</tr>
<tr>
<td>2018-07-03</td>
<td>4</td>
<td>4E</td>
<td>Moderate (E)</td>
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<td>17E</td>
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<tr>
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<td>7</td>
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<td>20E</td>
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<td>22E</td>
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<td>5</td>
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<td>25E</td>
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<td>Moderate</td>
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<td>26E</td>
<td>27E</td>
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<td>2018-07-10</td>
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<td>5</td>
<td>Moderate</td>
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<td>29E</td>
<td>30E</td>
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<tr>
<td>2018-07-11</td>
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<td>6</td>
<td>Moderate</td>
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<td>33E</td>
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<td>Slight</td>
<td>25E</td>
<td>32E</td>
<td>33E</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Daily Infection Value</th>
<th>Two-Day Total Infection Value</th>
<th>Daily Infection Risk</th>
<th>14-Day Accum Infection Values</th>
<th>21-Day Accum Infection Values</th>
<th>Season Total Infection Values</th>
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</thead>
<tbody>
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<td>1</td>
<td>Slight</td>
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<td>33E</td>
<td>34E</td>
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<td>2</td>
<td>Slight</td>
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<td>34E</td>
<td>35E</td>
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<tr>
<td>2018-07-15</td>
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<td>1</td>
<td>Slight</td>
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<td>31E</td>
<td>35E</td>
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<td>28E</td>
<td>35E</td>
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<td>2018-07-18</td>
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<td>Slight</td>
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<td>27E</td>
<td>35E</td>
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<tr>
<td>2018-07-19</td>
<td>3</td>
<td>3</td>
<td>Slight</td>
<td>18</td>
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<td>38E</td>
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<td>22</td>
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<td>42E</td>
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<td>6</td>
<td>Moderate</td>
<td>22</td>
<td>31E</td>
<td>44E</td>
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<td>47E</td>
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<td>2018-07-23</td>
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<td>50E</td>
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<td>17</td>
<td>30</td>
<td>50E</td>
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</table>
Effective Spraying and Timing Considerations

• Disease control products work best in the *preventative* and *protection* mode

• Timing of 1st fungicide spray is very important!!

• Be *ahead of infection* during a period of wet conditions-
  • Watch visual symptoms and monitor DIV levels
Spray Now or Wait?

• Do we spray before a rain system coming, as long as we get rain fastness time, or is it better to wait?
  • A: It’s better to have it on before the rain because rain moves spores and spores like wetness to infect tissue, protect with barrier of fungicide

• Remember: that new growth from last spray doesn’t have fungicide on it
• Estimate a new ring of leaves/week during mid to late summer
• Consider morning dew levels on leaf tissue
• Poor coverage is like a broken window—doesn’t keep rain out very well
ACSC Fungicide Recommendations

• Continue to Tank-mix MOA’s and rotate chemistry families
• Keeps fungicides viable and preserves them
  • If a spore is resistant to one fungicide MOA the other may prevent infection
• Priaxor/Headline and Topsin still have a place in recs w/tank-mixes
  • Priaxor/Headline provides:
    • Storage benefits
    • Frost damage recovery
    • Still works in tank-mix
• Topsin provides
  • Good tank-mix partner with Tin to decrease resistance development
  • Still works in tank-mix
Gone Forever: Single Fungicide Applications

<table>
<thead>
<tr>
<th>TRIAZOLE</th>
<th>EBDC</th>
<th>TINS (TPTH)</th>
<th>BENZIMIDAZOLE</th>
<th>STROBILURIN</th>
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<tbody>
<tr>
<td>Minerva</td>
<td>Several:</td>
<td>Supertin</td>
<td>Topsin M</td>
<td>Headline</td>
</tr>
<tr>
<td>Proline</td>
<td>Dithane</td>
<td>Agritin</td>
<td>Thiophanate</td>
<td>Priaxor</td>
</tr>
<tr>
<td>Inspire XT</td>
<td>Koverall</td>
<td></td>
<td>Methyl 85</td>
<td>Gem</td>
</tr>
<tr>
<td>Provysol</td>
<td>Penncozeb</td>
<td></td>
<td></td>
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</tbody>
</table>

- Good resistance management starts with rotating different modes of action
- **Never** use fungicides from same mode of action back-to-back
Resistance Management Tips

• Use multiple modes of action in each spray tank
• Use full rates of all tank mix partners, ALL THE TIME
• Know the PHI (pre-harvest interval) for prepile
New Fungicide 2020 Full Label- Provysol

- Group 3- DMI, a Triazole
  - Other triazoles examples: Proline, Inspire, Eminent
  - SC formulation, 21 day PHI, 4 fl. Oz/A application rate
  - Locally systemic like other DMI’s, doesn’t go to new growth
  - Translaminar, goes from top leaf surface into lower leaf surface
  - Binds well to leaf surface; 1 hour rainfast
  - Wanting 20 gpa water for better coverage
  - Always tankmix with other Mode of Action fungicides
### ACSC Fungicide Recs

<table>
<thead>
<tr>
<th>Timing of 1st Fungicide Application</th>
<th>Late June</th>
<th>Early - Mid July</th>
<th>Mid-Late July</th>
<th>Late July to Early Aug</th>
<th>Early-Mid August</th>
<th>Late August</th>
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<tbody>
<tr>
<td>Application #</td>
<td>Triazole + EBDC</td>
<td>Triazole + EBDC</td>
<td>Triazole + EBDC</td>
<td>TPTH + Benzimidazole</td>
<td>Triazole + EBDC</td>
<td>Headline/Priaxor + TPTH</td>
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<tr>
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<td>EBDC</td>
<td>TPTH + Benzimidazole</td>
<td>TPTH + Benzimidazole</td>
<td>Triazole + EBDC</td>
<td>Headline/Priaxor + TPTH</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TPTH + Benzimidazole</td>
<td>Triazole + EBDC</td>
<td>Triazole + EBDC</td>
<td>Headline/Priaxor + TPTH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Triazole + EBDC</td>
<td>EBDC</td>
<td>Headline/Priaxor + TPTH</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>EBDC</td>
<td>Headline/Priaxor + TPTH</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>Headline/Priaxor + TPTH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Headline/Priaxor + TPTH</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

- Triazoles: Do not use both Provysol & Inspire in the same growing season.
- 83% probability a cercospora spore resistant to Provysol is also resistant to Inspire.
**2019 Top 4 Fungicide Applications
* Top 4 Exactly Follow ACSC Recs ***

<table>
<thead>
<tr>
<th>Fungicide Product &amp; Combination</th>
<th>Treated Acres</th>
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</thead>
<tbody>
<tr>
<td>Tin + Topsin</td>
<td>168,481</td>
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<tr>
<td>Priaxor/Headline + Tin</td>
<td>132,512</td>
</tr>
<tr>
<td>Inspire + EBDC</td>
<td>124,472</td>
</tr>
<tr>
<td>Proline + EBDC</td>
<td>98,321</td>
</tr>
</tbody>
</table>
In Summary

• CLS program starts with seed selection and ends a few weeks before harvest
• Implement a well-timed, Preventative and Protection attack plan
• Spray recommendations are ready to implement and execute
• Thank you for your attention today!
Disease Management Strategies
Fusarium Control Strategies in 2020 Crop
• Continues to be RRV Production Issue
• Likes wet, poorly structured soils
• Optimum soil temp above 75 degrees F
• First appears as interveinal yellowing on older leaves.
• 2 yr. Fusarium rating of 3.0 or less.

• Managed best with Fusarium tolerant varieties
  • BTS 8500
  • Crystal 574RR
  • Crystal 684RR
  • Crystal 804RR
  • Crystal 808RR
  • Crystal 796RR
  • Crystal 247RR
  • Crystal 578RR
  • BTS 8767
• Can be confused with Verticillium Wilt
  • Samples can be taken to NWROC Lab in Crookston for Identification

• Use good drainage practices
• Plant early
• Control alternate weed hosts
Aphanomyces
• Plant early
• Use 45 gram Tachigaren rate
• Plant Aphanomyces varieties with rating of 4.4 or less
• Provide excellent field drainage
• Apply VersaLime
• Apply 10 tons/acre
• Apply 1 year prior to sugarbeets for best results
• Spread as evenly as possible
• Incorporate thoroughly with tillage
• Consider an additional 5 tons per acre application on previously Versalime applied acreage
• Contact Ag Staff for assistance with procedure
Average Versalime Nutrients (lb/ton) Valley

- Nitrogen
  - 4.9 Lbs/ton Average
- Phosphorus
  - 13.2 Lbs/ton Average
- Potash
  - 1.7 Lbs/ton Average
- Sulfur
  - 6.2 Lbs/ton Average

- Applying Versalime at a 10 Ton/Acre Rate would provide 49#N, 132#P, 17#K, 62#S
- Benefits include decreased Aphanomyces and improved soil tilth
- Apply 1 year before beets for best results
Split field comparison
10 tons Lime vs. No Lime
Rhizoctonia
Degree of control options used depends on: Field History, Rhizoctonia Varietal Tolerance; preceding crop.
• Plant early
• Plant Rhizoctonia varieties with rating of 3.82 or less
• Seed Treatments: Kabina; Systiva; Vibrance; Metlock Suite – provides control 4-5 wks after planting
• Band apply full rate of Quadris fungicide 4-5 weeks after planting
• Azteriod At Plant In-Furrow provides 8 weeks control
  • Allows for a bigger window for a post Quadris app.
• Previous crop should be small grains
• Use good field drainage practices
Field Abandonment

Root Aphid/ Active Root Rot
Field Abandonment Procedures

• Field abandonment assessments will only be done by ACSC Ag staff when requested by shareholder.
• A minimum of four sample areas and one additional area for each additional 40 acres.
• Mark off 50 feet of row (5 rows by 10ft) to be sampled.
• Determine % root aphid/active rot damage for each sample area and then average all sample areas to determine if % is above or below 50 %.