# Cercospora

Your Way To Grow

Crookston Factory District

Feb 24, 2022

# Cercospora – Morning Line Odds

How are you going to place your bet?

# Topics covered

- Application tips
- ACSC application and RSA data
- ACSC 2022 recommendations –(NON CR+)
- CR+ data and 2022 ACSC recommendations

# Fungicide Application Tips

**CLS variety rating** – CLS control should improve with a better CLS variety rating. However, this may not equate to fewer fungicide applications.

**Water volume** – CLS fungicides need excellent coverage to protect the sugarbeet leaf surface. To achieve this requires **15 to 20 gallons** of water per acre. Using nozzles that will produce Medium droplet sizes of 250–350µm (microns) is optimum for fungicide applications. Utilize nozzle manufacturer's recommended application pressure for maximum leaf coverage.

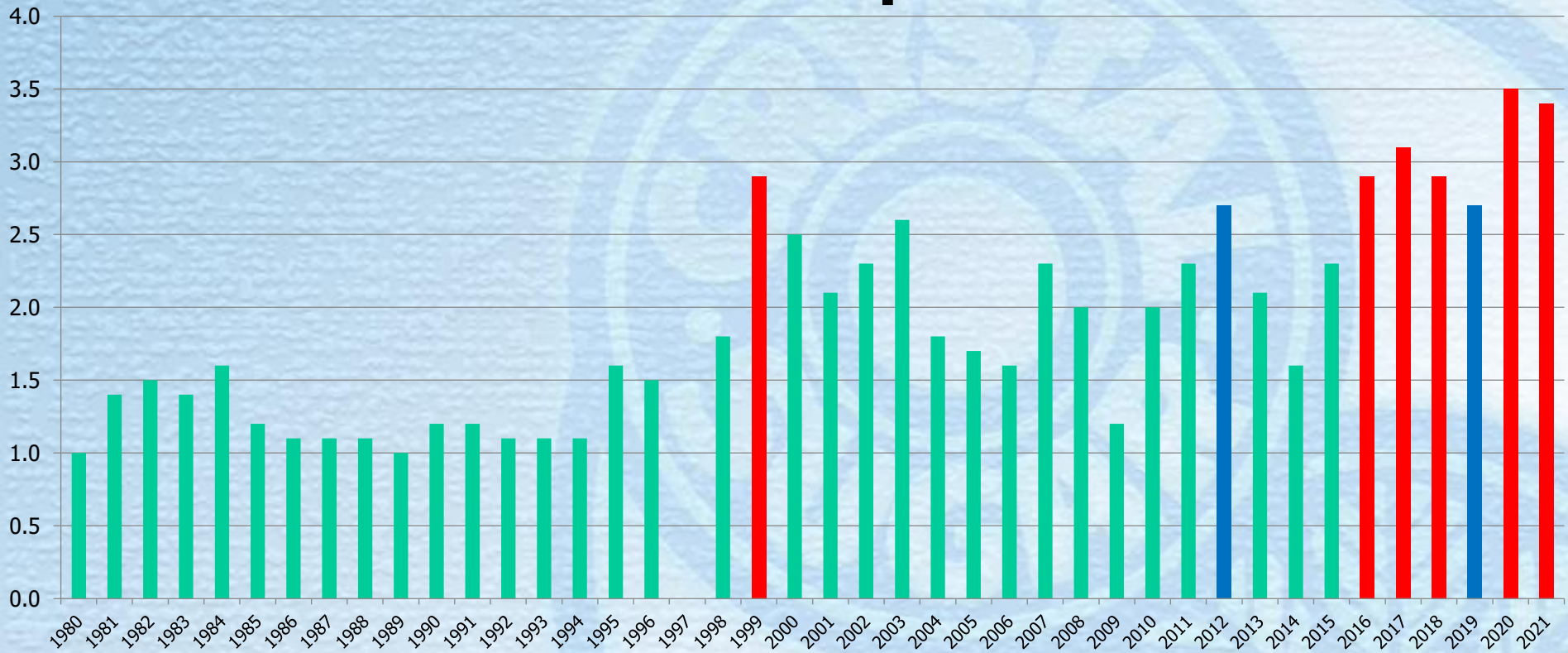
**Spray intervals** – Start early and stay on track once CLS is found in your area. The time interval between applications should not exceed 12 days, plan best as possible around adverse weather conditions (rain, wind, hail). For EBDC's alone follow a 7-8-day spray interval.

**Glyphosate tank mixes** – Are not recommended with CLS fungicide applications since optimum water volume requirements are different for glyphosate and CLS fungicide applications as the target pests are not the same.

# What effect does variety have?


Differences in varietal resistance response to CLS. Greener variety is a 4.1 and brown area is a 4.6. Photo taken on Sept.2, 2020.

# ACSC Average Number of Fungicide Applications
# 2021 = 3.4 Apps
# Red = Top Years



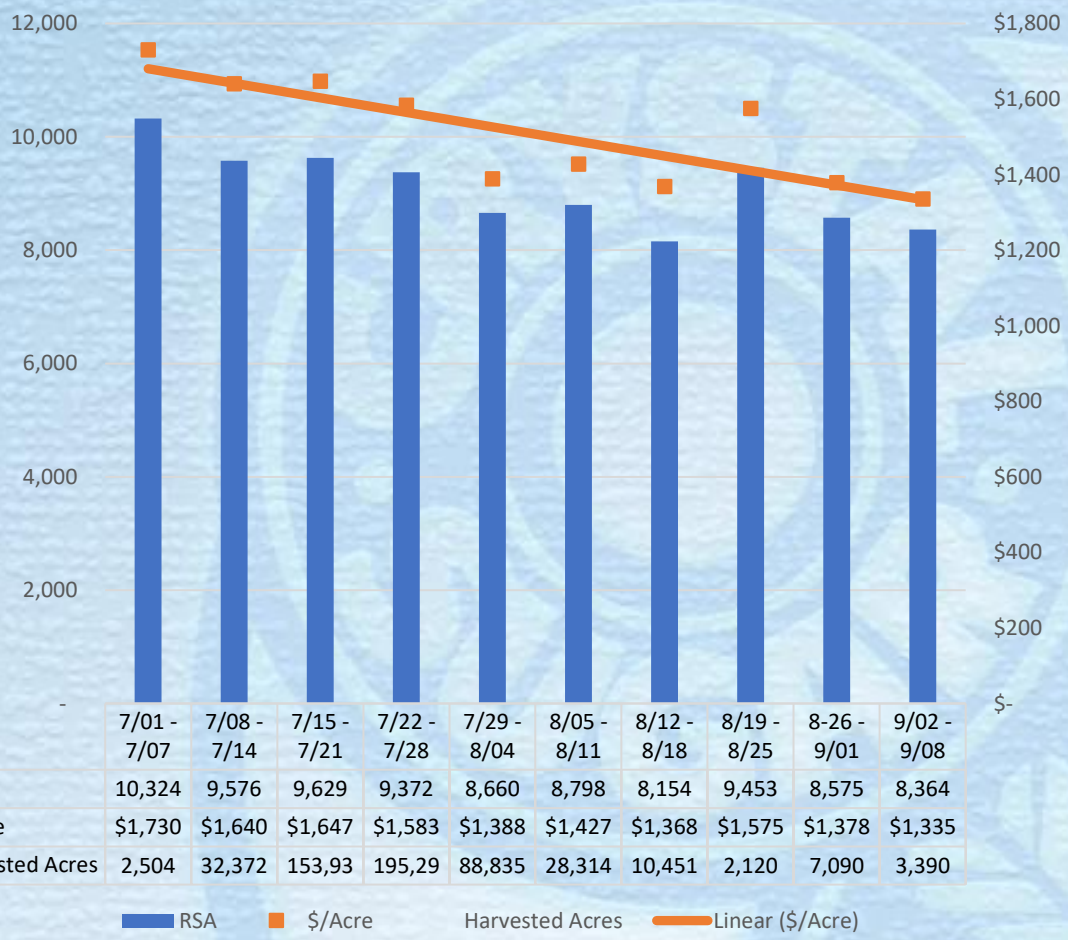
# RRV 5 Yr Avg Initial Fungicide App Timing (2017 - 2021)
## RSA & Rev/Acre


| | 6/24 - 6/30 | 7/01 - 7/07 | 7/08 - 7/14 | 7/15 - 7/21 | 7/22 - 7/28 | 7/29 - 8/04 | 8/05 - 8/11 | 8/12 - 8/18 | 8/19 - 8/25 | 8-26 - 9/01 | 9/02 - 9/08 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RSA | 10,104 | 10,318 | 9,811 | 9,616 | 9,300 | 8,696 | 9,013 | 8,237 | 9,475 | 8,475 | 8,183 |
| $/Acre | $1,730 | $1,750 | $1,605 | $1,567 | $1,547 | $1,399 | $1,455 | $1,381 | $1,542 | $1,338 | $1,303 |
| Harvested Acres | 30,562 | 83,040 | 486,53 | 488,84 | 313,34 | 147,13 | 45,580 | 12,319 | 3,996 | 9,569 | 5,478 |

# RRV 5 Yr Avg # of Fungicide Apps (2017 - 2021)
## RSA & Rev/Acre


| | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| RSA | 7,878 | 8,568 | 9,108 | 9,563 | 9,845 | 10,114 | 9,953 |
| Harvested Acres | 9,891 | 114,064 | 348,919 | 531,164 | 536,088 | 152,795 | 16,021 |
| $/Acre | $1,295 | $1,394 | $1,501 | $1,572 | $1,584 | $1,627 | $1,593 |

# DTN 5 Yr Avg Initial Fungicide App Timing (2017 - 2021)
## RSA & Rev/Acre

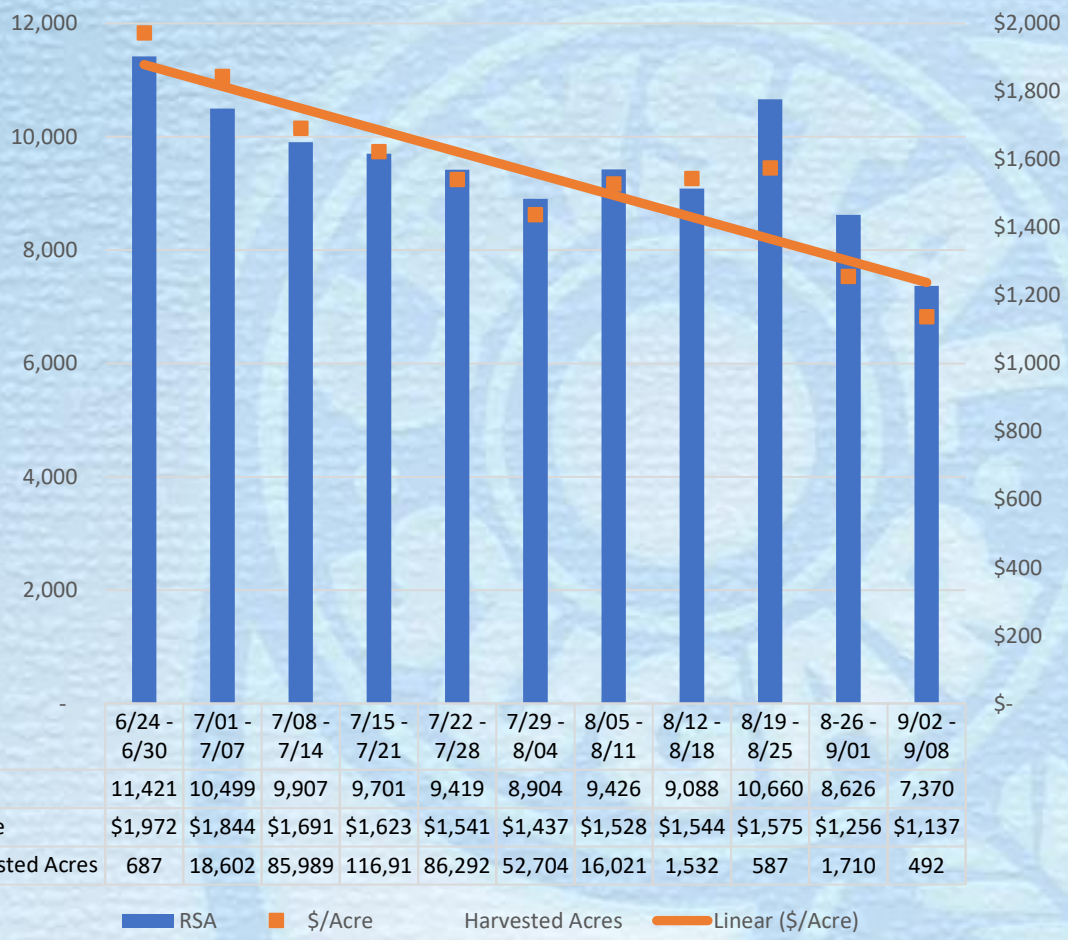



| | 7/01 - 7/07 | 7/08 - 7/14 | 7/15 - 7/21 | 7/22 - 7/28 | 7/29 - 8/04 | 8/05 - 8/11 | 8/12 - 8/18 | 8/19 - 8/25 | 8-26 - 9/01 | 9/02 - 9/08 |
|---|---|---|---|---|---|---|---|---|---|---|
| RSA | 10,324 | 9,576 | 9,629 | 9,372 | 8,660 | 8,798 | 8,154 | 9,453 | 8,575 | 8,364 |
| $/Acre | $1,730 | $1,640 | $1,647 | $1,583 | $1,388 | $1,427 | $1,368 | $1,575 | $1,378 | $1,335 |
| Harvested Acres | 2,504 | 32,372 | 153,93 | 195,29 | 88,835 | 28,314 | 10,451 | 2,120 | 7,090 | 3,390 |

## DTN 5 Yr Avg # of Fungicide Apps (2017 - 2021)
## RSA & Rev/Acre


| | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| RSA | 7,211 | 8,359 | 8,978 | 9,700 | 9,869 | 10,749 |
| $/Acre | $1,188 | $1,374 | $1,491 | $1,634 | $1,667 | $1,789 |
| Harvested Acres | 5,446 | 75,656 | 210,228 | 227,561 | 21,603 | 1,602 |

# EGF 5 Yr Avg Initial Fungicide App Timing (2017 - 2021)
## RSA & Rev/Acre




| | 6/24 - 6/30 | 7/01 - 7/07 | 7/08 - 7/14 | 7/15 - 7/21 | 7/22 - 7/28 | 7/29 - 8/04 | 8/05 - 8/11 | 8/12 - 8/18 | 8/19 - 8/25 | 8-26 - 9/01 | 9/02 - 9/08 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RSA | 11,421 | 10,499 | 9,907 | 9,701 | 9,419 | 8,904 | 9,426 | 9,088 | 10,660 | 8,626 | 7,370 |
| $/Acre | $1,972 | $1,844 | $1,691 | $1,623 | $1,541 | $1,437 | $1,528 | $1,544 | $1,575 | $1,256 | $1,137 |
| Harvested Acres | 687 | 18,602 | 85,989 | 116,91 | 86,292 | 52,704 | 16,021 | 1,532 | 587 | 1,710 | 492 |

# EGF 5 Yr Avg # of Fungicide Apps (2017 - 2021)
## RSA & Rev/Acre


| | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| RSA | 8,910 | 9,185 | 9,446 | 9,604 | 9,907 | 9,730 |
| $/Acre | $1,464 | $1,510 | $1,561 | $1,575 | $1,628 | $1,624 |
| Harvested Acres | 4,183 | 12,699 | 93,256 | 176,312 | 126,505 | 13,887 |

# MHD 5 Yr Avg # of Fungicide Apps (2017 - 2021)
## RSA & Rev/Acre


| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| RSA | 9,003 | 8,970 | 9,483 | 9,873 | 10,202 | 10,263 | 11,093 |
| $/Acre | $1,428 | $1,398 | $1,487 | $1,553 | $1,600 | $1,624 | $1,891 |
| Harvested Acres | 14,931 | 19,243 | 58,743 | 131,344 | 39,592 | 6,684 | 121 |

# Dr. Khan – CLS Fungicide – Tank-mix & Rotate

**Fungicide Mixtures in Alternation For Control of *Cercospora beticola* in 2021 (dry year)**

| *Treatments @ 14 d* | *CLS (1-10)* | *RSH* | *Net $/H* |
|---|---|---|---|
| Nontreated Check | 10 | 8,759 | 1,168 |
| Inspire XT + Manzate/ Manzate/ TPTH + Topsin/ Proline + Manzate/ Manzate / TPTH + Priaxor (6 Apps) | 3.8 | 13,863 | 2,459 |
| Inspire XT + Badge SC/ TPTH + Topsin/ Proline + Manzate/ TPTH + Priaxor/ TPTH + Manzate (5 Apps) | 4.3 | 13,460 | 2,337 |
| Manzate/ Man + TPTH/ Man + Proline/ Man + TPTH / Man + Inspire XT/ Man + TPTH / Man + Minerva (7 Apps) | 3.8 | 13,396 | 2,302 |
| LSD *P*=0.05 | 0.8 | 1,301 | |

Returns of $2,126 to $2,301 after deducting cost of fungicides and applications.

# 2022 ACSC Recommended

(Non CR+ Varieties)

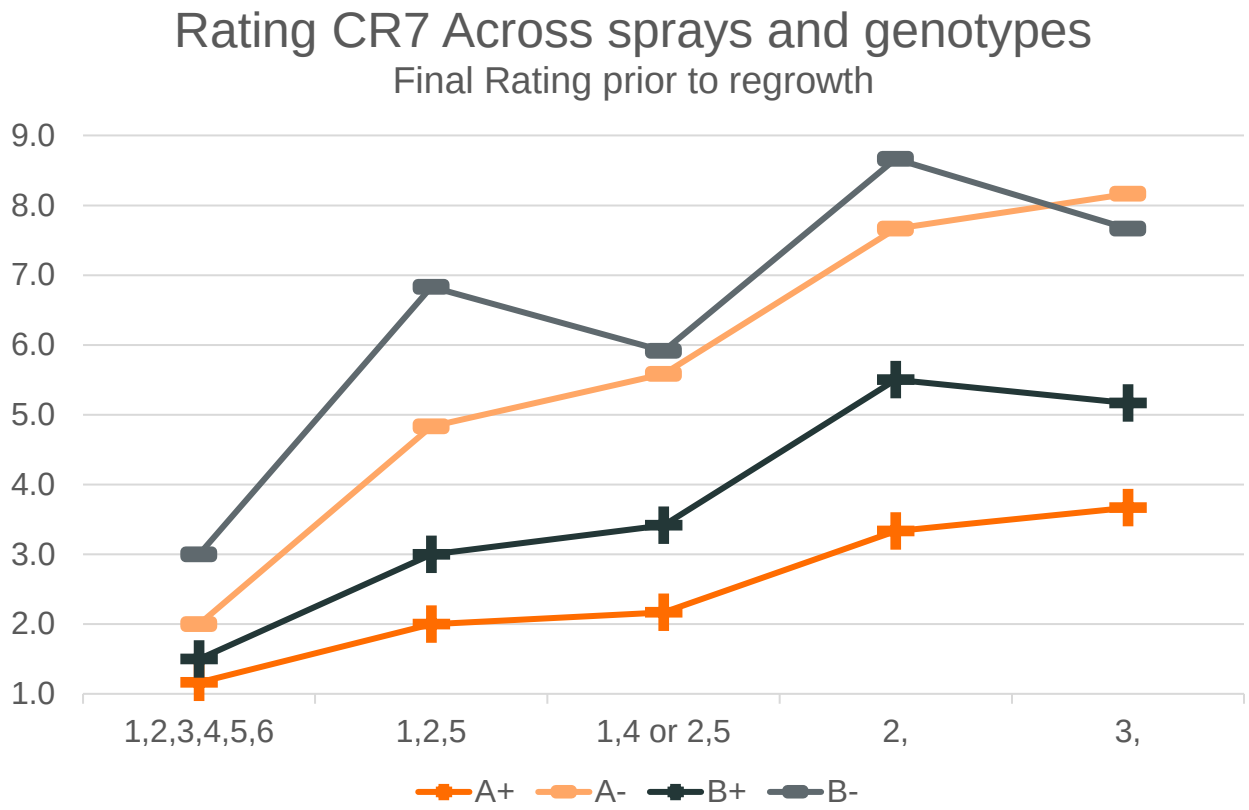
| Cercospora Fungicide Program | | | | | |
|---|---|---|---|---|---|
| **Application # Sequence based on Initial Fungicide Application Timing & 12-Day Intervals** | **Late June Initial Application** | **Early - Mid July Initial Application** | **Mid - Late July Initial Application** | **Late July Initial Application** | |
| | | | | **Option 1** | **Option 2** |
| **1** | Triazole + EBDC | Triazole + EBDC | Triazole + EBDC | Triazole + EBDC | TPTH + Benzimidazole |
| **2** | EBDC | TPTH + Benzimidazole | TPTH + Benzimidazole | TPTH + Benzimidazole | Triazole + EBDC |
| **3** | TPTH + Benzimidazole | Triazole + EBDC | Triazole + EBDC | Triazole + Headline/Priaxor | Headline/Priaxor + TPTH |
| **4** | Triazole + EBDC | EBDC | Headline/Priaxor + TPTH | | |
| **5** | EBDC | Headline/Priaxor + TPTH | | | |
| **6** | Headline/Priaxor + TPTH | | | | |

- Late July Rec – not best for optimizing RSA & Rev/acre
- Last application designed for last week of Aug. – 1st week of Sept.
  - Benefits of CLS control include better frost tolerance/recovery, and plant health for storage
  - Fungicide application may still be needed in September
    - Discuss with Agriculturist fungicide options for Prepile & Stockpile w/PHI's

# CR+ Varieties

- New Cercospora trait. (Tolerance not immunity)
- CR+ Cercospora ratings around 2.4-2.6 compared to the current best at 3.9 (NON CR+) and approximately 4.6 average for all currently approved varieties for 2022.
- Tank-mixing and rotating fungicide MOA's will still be important to maintain the use of this trait.
- CR+ Varieties are available for the ACSC growing area in 2022.

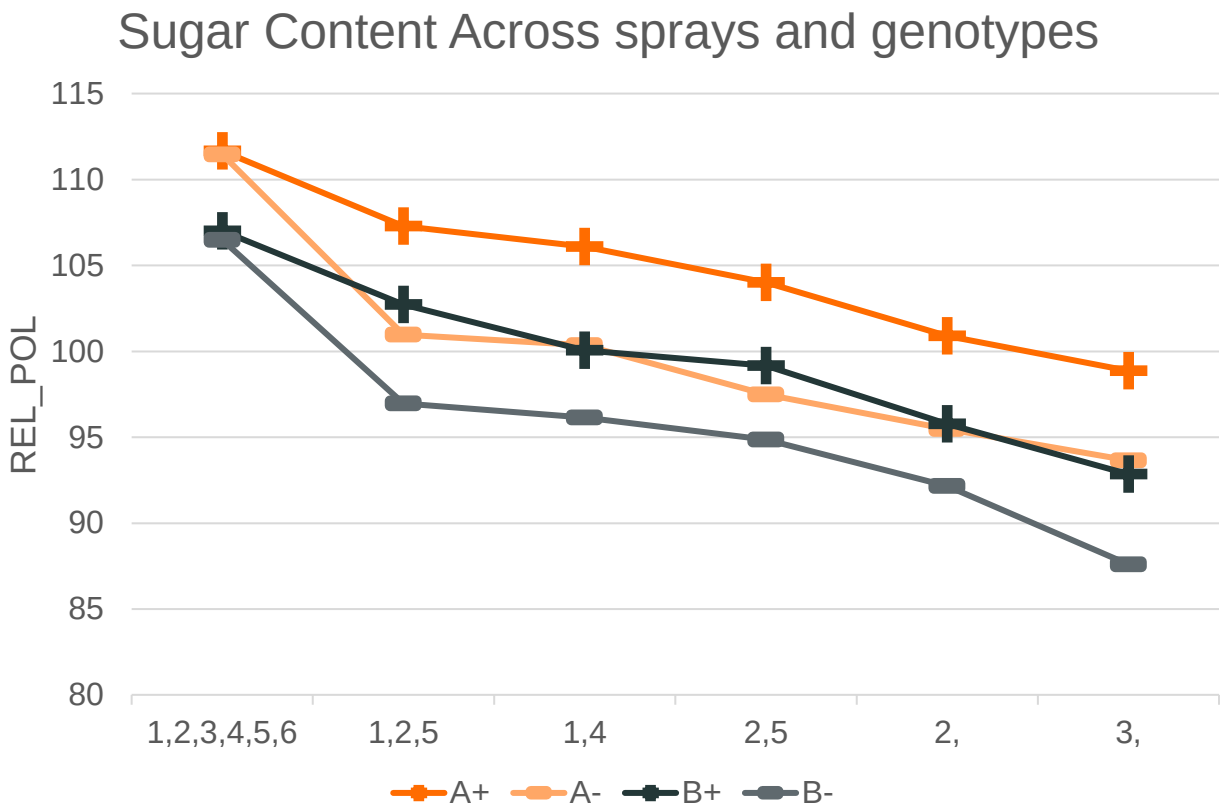
# CR+/- Genotypes X Spray management ROS site – CLS Data (Extreme CLS pressure)




| Spray # | Spray Treatment |
|---|---|
| Spray 1 | Super Tin, Manzate |
| Spray 2 | Eminent, Dithane, |
| Spray 3 | Super Tin, Badge SC |
| Spray 4 | Manzate, Inspire |
| Spray 5 | Super Tin, Dithane |
| Spray 6 | Badge SC, Proline |

Used with permission from KWS

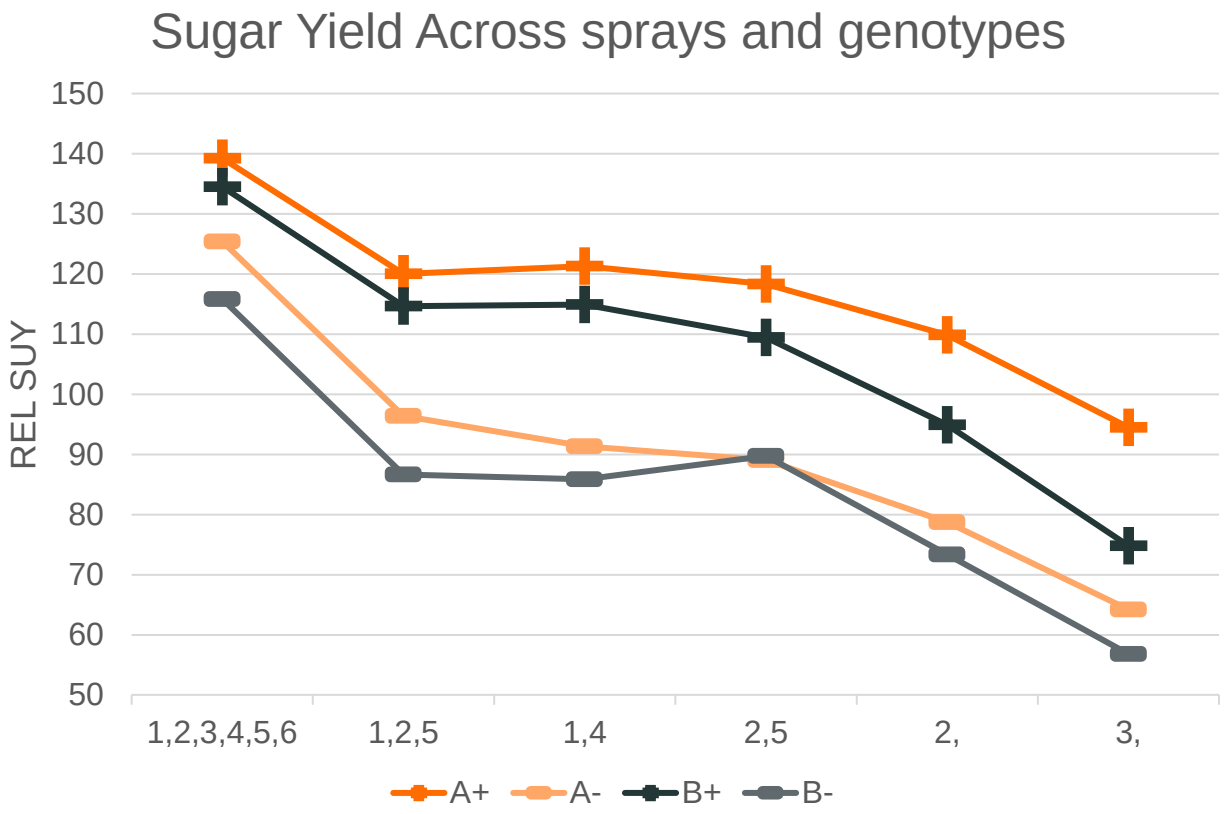
# CR+/- Genotypes X Spray management ROS site – Sugar Content (Extreme CLS pressure)




| Spray # | Spray Treatment |
|---|---|
| Spray 1 | Super Tin, Manzate |
| Spray 2 | Eminent, Dithane, |
| Spray 3 | Super Tin, Badge SC |
| Spray 4 | Manzate, Inspire |
| Spray 5 | Super Tin, Dithane |
| Spray 6 | Badge SC, Proline |

Used with permission from KWS

# CR+/- Genotypes X Spray management ROS site – Sugar Yield (Extreme CLS pressure)




| Spray # | Spray Treatment |
|---|---|
| Spray 1 | Super Tin, Manzate |
| Spray 2 | Eminent, Dithane, |
| Spray 3 | Super Tin, Badge SC |
| Spray 4 | Manzate, Inspire |
| Spray 5 | Super Tin, Dithane |
| Spray 6 | Badge SC, Proline |

Used with permission from KWS

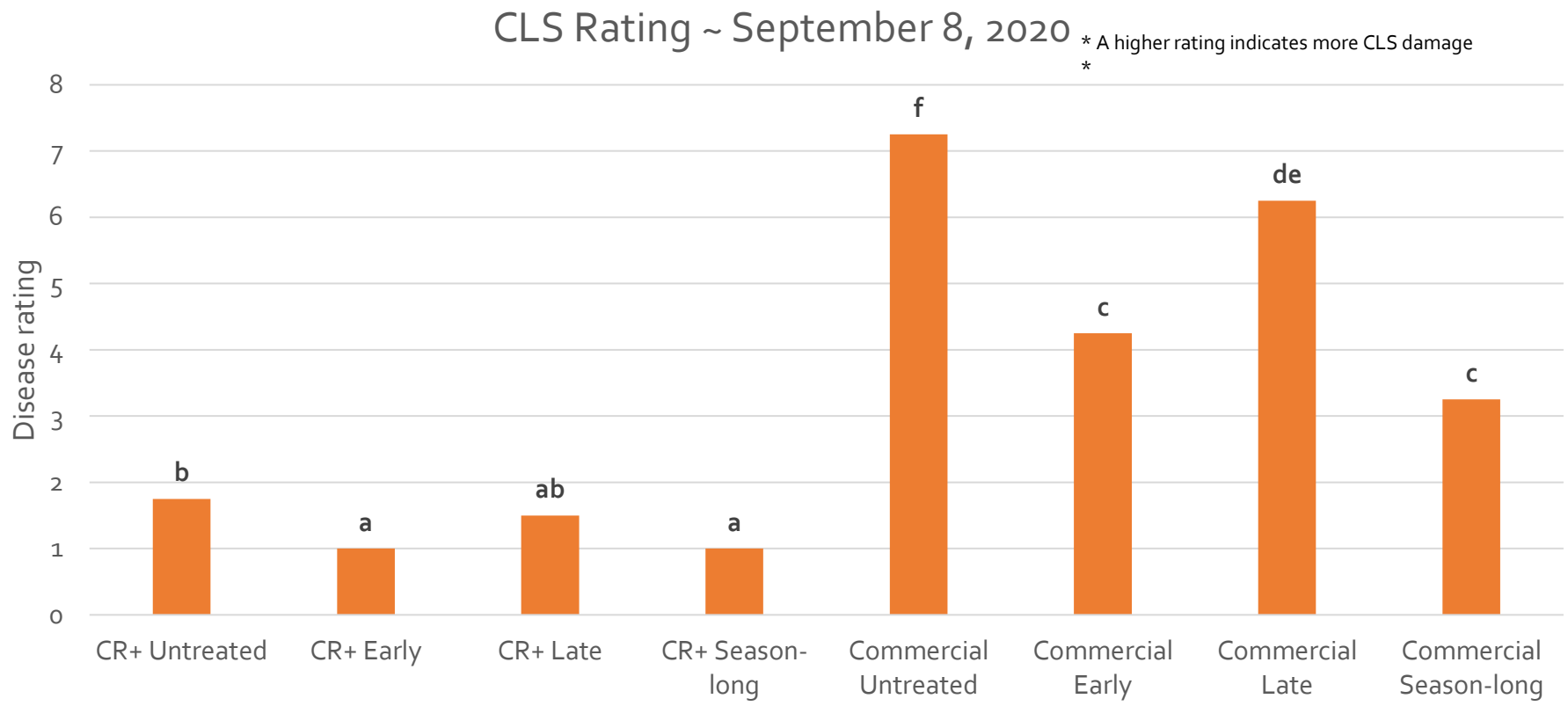
# MDFC Trials -2020

# Trial Info. – BTS CR+

- Three fungicide programs were tested:
  - Early
    - Start on time but only 3 applications were made (last spray July 31)
  - Late
    - Start at the end of July and only spray 3 applications
  - Season-long
    - Follow the MDFC program – start on time and spray all season
- Two varieties were tested:
  - CR+ ~ CLS rating 1.90
  - Commercial ~ CLS rating 3.91

# BTS CR+

LSD (p=0.10): 0.75
CV: 18.09

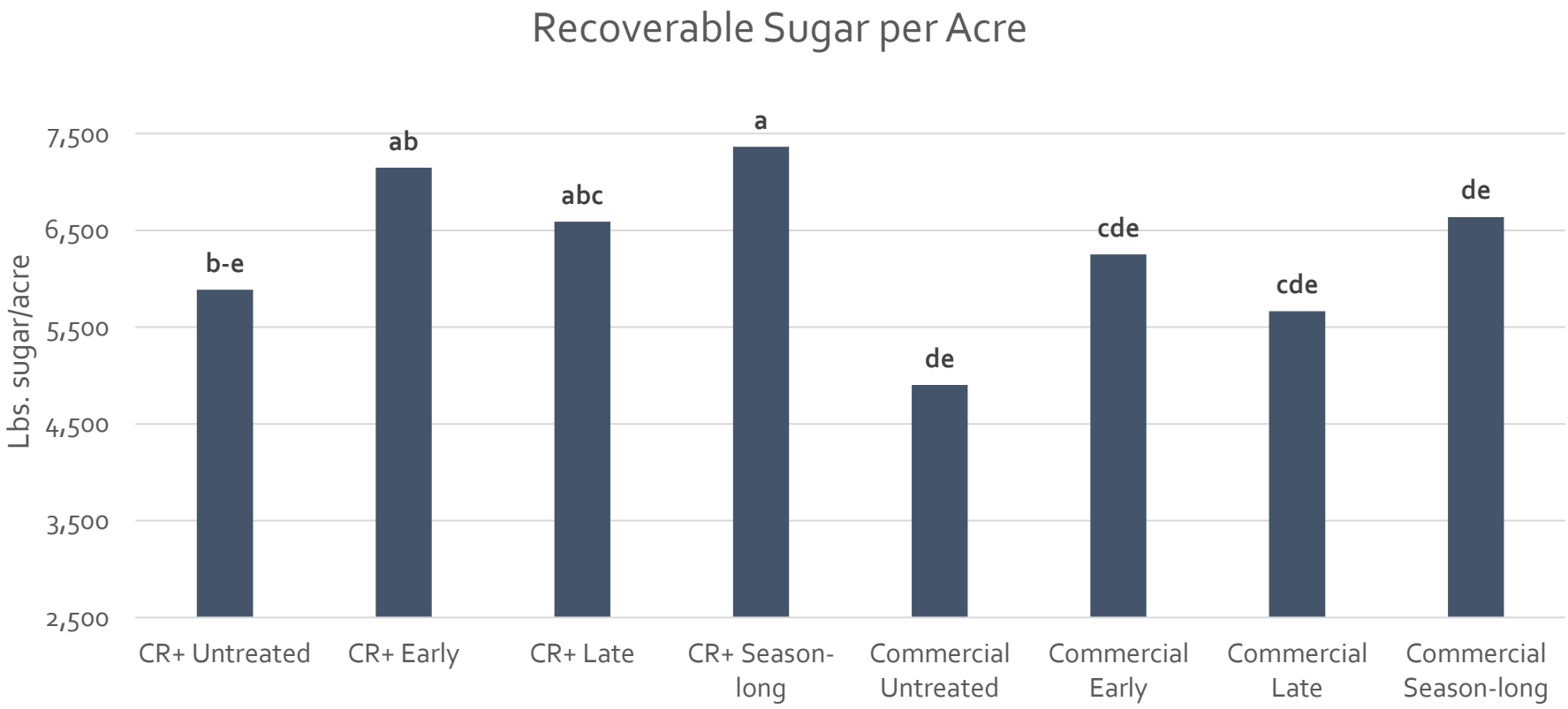



*Treatments with the same letter are not statistically different*

**Used with permission**

# BTS CR+

LSD (p=0.10): 1,338.06
CV: 18.77




*Treatments with the same letter are not statistically different*

**Used with permission**

# ASCS CR+ Variety Tips

- Early fungicide applications optimize control & RSA
- 1st two applications are important to achieve maximum potential
- Resistance management still necessary
  - Preserve trait's effectiveness
  - Bring back fungicide efficacy?
  - Decrease CLS inoculum?
- Placement of CR+ varieties
  - Fields bordering last year's beet fields with high pressure
  - Fields protected from wind (higher humidity) – river fields/shelter belts
  - Farther away fields – difficult to reach for timely applications
  - Field not planned for prepile deliveries
- Advantages: Keep CR+ fields in good shape to withstand late-season CLS outbreaks (example - 2021)

# 2022 ACSC Recommended

| CR+ Variety CLS Fungicide Program | | | | |
|---|---|---|---|---|
| **Application # Sequence based on Initial Fungicide Application Timing & 12-Day Intervals** | **Late June Initial Application** | **Early - Mid July Initial Application** | **Mid - Late July Initial Application** | **Late July Initial Application** |
| **1** | Triazole + EBDC | Triazole + EBDC | Triazole + EBDC | Triazole + EBDC |
| **2** | TPTH + Benzimidazole | TPTH + Benzimidazole | TPTH + Benzimidazole | **Extended Interval** |
| **3** | **Extended Interval** | **Extended Interval** | **Extended Interval** | Headline/Priaxor + TPTH |
| **4** | Triazole + EBDC | Triazole + EBDC or EBDC | Triazole + Headline/Priaxor | |
| **5** | **Extended Interval** | Headline/Priaxor + TPTH | | |
| **6** | Headline/Priaxor + TPTH | | | |

- **Extended Intervals ARE NOT Skips** – Continue to monitor conditions for high DIV's and CLS
  - May require treatment based on pressure
- Last application designed for: Last week of Aug. – 1st week of Sept.
  - Benefits for CLS control, frost recovery, and plant health for storage
  - Fungicide application may still be needed in September
    - Discuss with Agriculturist fungicide options for Prepile & Stockpile w/PHI's

# Questions?

# Sugarbeet Root Disease Management

American Crystal Sugar Company

# Fusarium

NDSU Extension

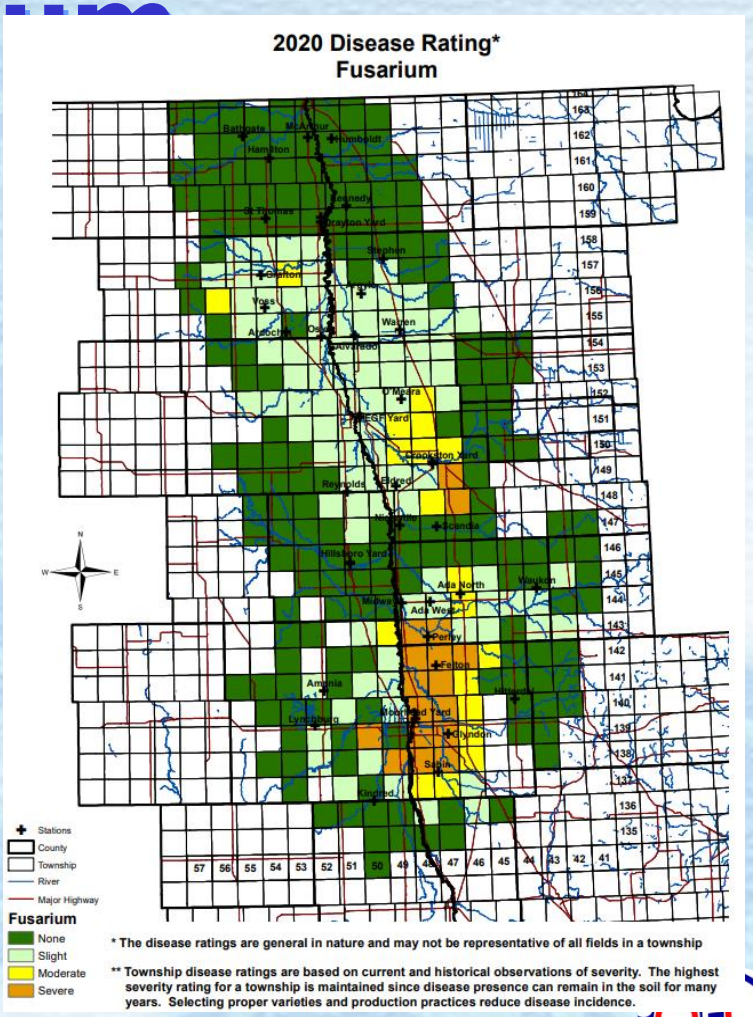
# Fusarium

- Caused by soil borne fungus Fusarium oxysporum
- Overwinters in soil for long periods of time
- Warm soil temps and waterlogged fields provide

Joe Hastin

# Fusarium

- Was most severe in Clay and Norman County
- Has spread south in Wilkin County MN
- Moderate areas in the Crookston district with



# Fusarium Symptoms

- First appears on older leaves as chlorosis
- Half the leaf will display chlorosis
- As disease progresses older leaves become necrotic


NWRO

Joe Hasti

# Fusarium Management

- Choose resistant varieties
- Use good drainage practices
- Control alternate weed hosts
- Plant early
- Proper crop rotation

# Aphanomyces

# Aphanomyces

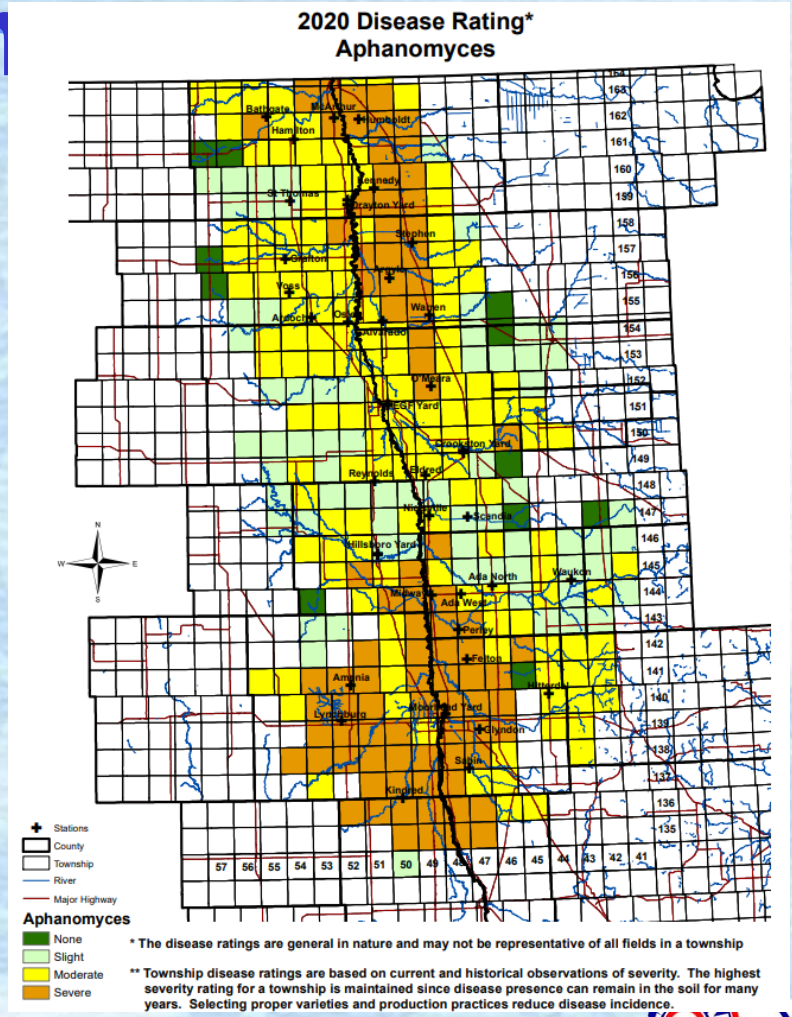
- Caused by soil borne fungus Aphanomyces cochliodes
- Warm and hot temperatures with wet soil conditions promote development


NWRO

# Aphanomyces Active Rot vs Inactive

# Aphanon

- Aphanomyces is found throughout the valley with ranges in severity
- High Severity in the Moorhead District and in the southern part of the Hillsboro District



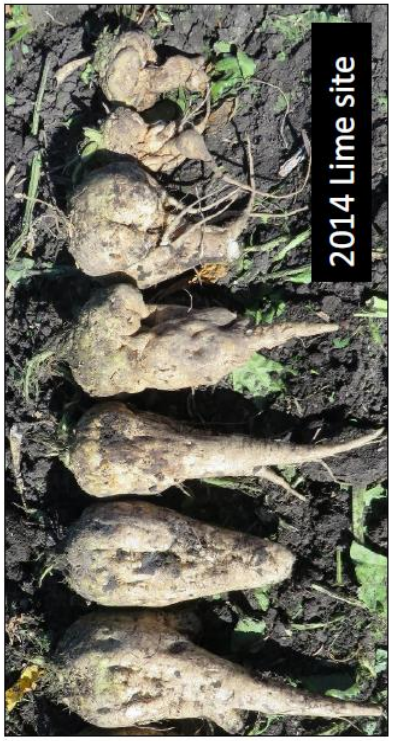
# Aphanomyces Symptoms

- Damping off in sugarbeet seedlings
- Poor canopy development and chlorotic leaves
- Water-soaked lesions on roots
- Russeting occurs

Jason Brant

# Sugar Beet - Aphanomyces Root Rot





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Ashok Chanda & Jason Brantner

# Aphanomyces Management

- Plant resistant varieties
- Use a Tachigaren seed treatment
- Apply Versalime
- U
  d actices
- Plant early
- Use proper crop

# Rhizoctonia

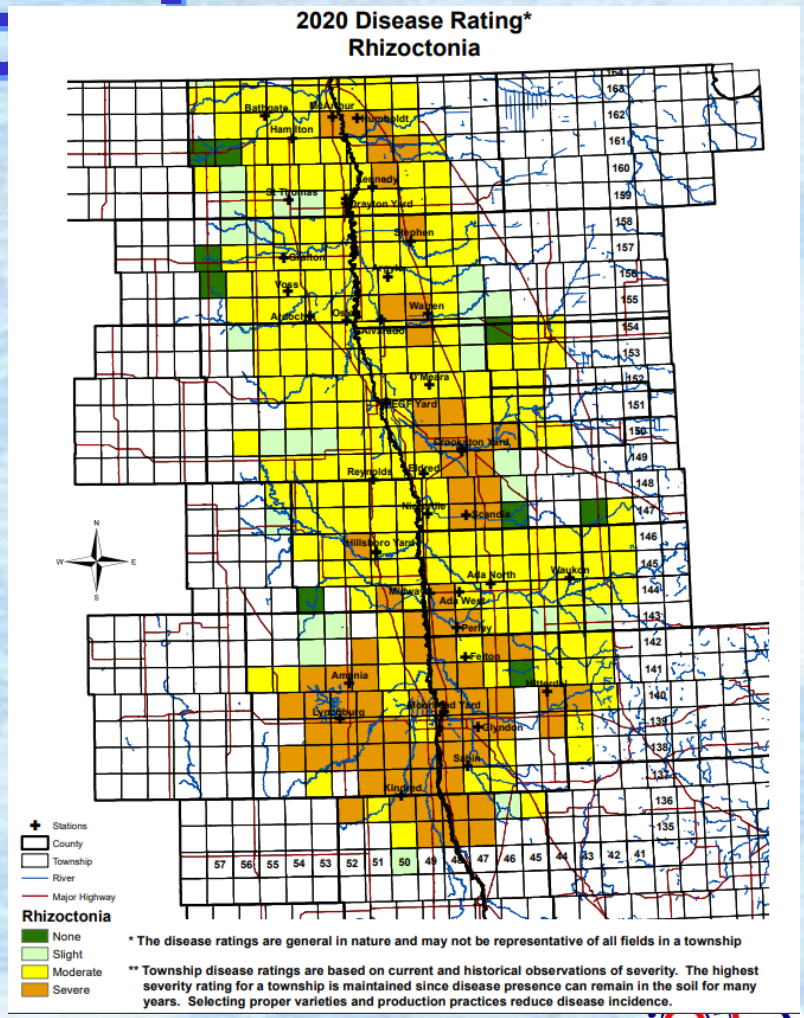
Justin Krieg

# Rhizoctonia

- Caused by soil borne fungus Rhizoctonia solani.
- Warm and wet soil temps favor disease development
- Susceptible crops include corn &

# Rhizoct

- Rhizoctonia is found throughout the RRV
- Can be found virtually in every sugarbeet field today
- Most of the Valley has a moderate rating



# Rhizoctonia Symptoms

- Damping off in sugarbeet seedlings
- Rarely can cause foliar blight
- Wilted petioles that turn black
- Leaves become prostrate on soil

Jason Brantner
TSC

# Sugar Beet - Rhizoctonia Root Rot





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# Rhizoctonia Management

- Plant resistance varieties
- Use a fungicide seed treatment
- Use at plant, in-furrow and post fungicide treatments
- Follow beets on small grain crops
- Limit mechanical weed control

| Recommended Products | AZteroid® FC 3.3 | Priaxor® Xemium® Brand Fungicide | Quadris® | Elatus® | EXCALIA™ |
|---|---|---|---|---|---|
| METHOD | IN-FURROW/T-band<br>BAND (3-7")/Broadcast | BAND/BROADCAST | BAND (7-11")<br>BROADCAST | IN-FURROW<br>BAND (3-7") | BAND (6-7")<br>BROADCAST |
| LABELED TIMING | AT-PLANT<br>Post 4 to 8 leaf | 4 to 5 weeks after planting | 4 to 8 leaf stage | In-Furrow at Plant<br>Post 2-8 Leaf Stage | 2 to 8 leaf stage |
| RATE | 6 oz/Acre in-furrow/t-band<br>9.4 oz/Acre Band & Bdcst | 6.7 oz/Acre | 10 oz/Acre Band<br>15 oz/Acre Bdcst | At Plant:<br>7.1 oz./Acre on 22" rows (0.3-0.6 oz/1,000 row feet)<br>Post: 7.1 oz/Acre | Band:<br>.64 oz/Acre on 22" rows (0.023 to 0.027 oz/1,000 row feet)<br>Bdcst: 2 oz/Acre |
| TANK-MIXES | w/starter fertilizer | Glyphosate w/surfactant | Glyphosate w/surfactant | Do not mix with Starter Fertilizer | No concerns. Consult your agriculturist. |
| WATER VOLUME | 5-10 gal/acre | 10-15 gal/Acre | 10-20 gal/Acre | Minimum 10 gal/Acre | Minimum 10 gal/Acre |

NWRO

# Rhizomania

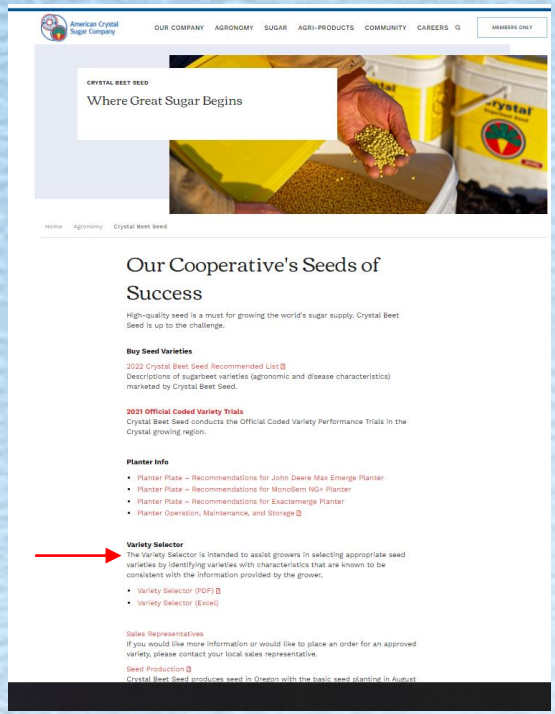
# Rhizomania

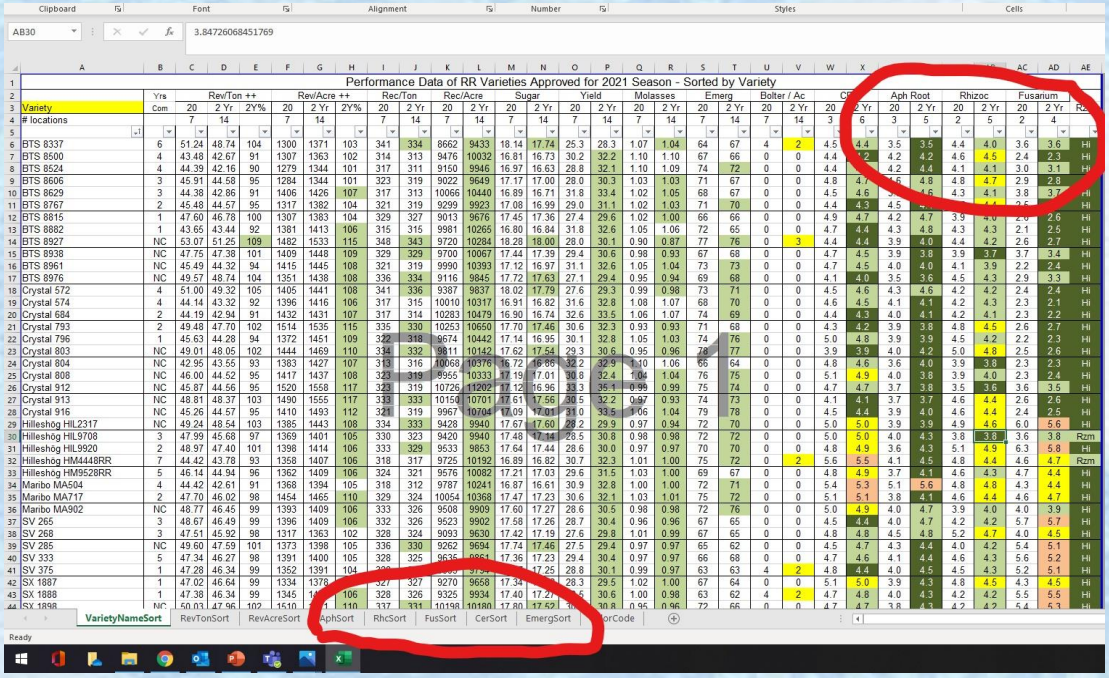
- The bearded root
- Root takes a wine glass shape with crazy root hairs
- Will show as blinkers in the field
- Controlled by resistant varieties

# Keys to Sugarbeet Root Disease Management

- Use resistant seed varieties
- Use proper seed treatments when needed
- Apply timely chemical control when available
- Use good drainage practices
- Plant early
- Use crop rotations to your advantage
- Know your field history

# Crystal Beet Seed Variety Selector

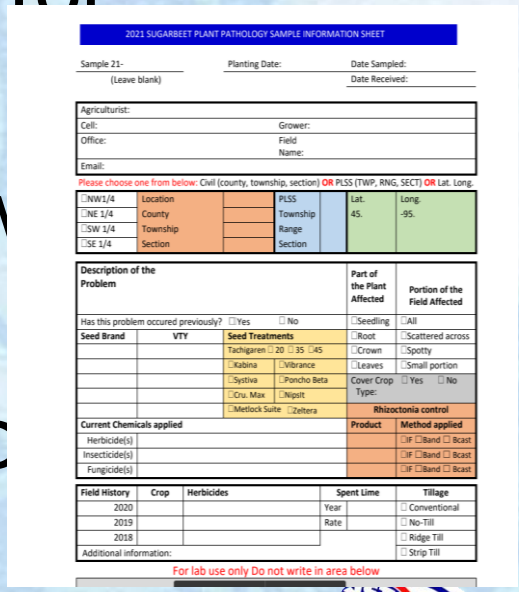


# Northwest Research and Outreach Center

- NWROC has a disease diagnosis lab
- Accepts samples to be tested for disease identification
- Sample Info sheet can be dow off website

Crookston, MN
**Northwest Research and Outreach Center**



2021 SUGARBEET PLANT PATHOLOGY SAMPLE INFORMATION SHEET

Sample 21- (Leave blank) | Planting Date: | Date Sampled: | Date Received:

Agriculturist:
Cell: | Grower:
Office: | Field Name:
Email:

Please choose one from below. Civil (county, township, section) OR PLSS (TWP, RNG, SECT) OR Lat. Long.

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐NW1/4 | Location | | PLSS | | Lat. | Long. |
| ☐NE 1/4 | County | | Township | | 45. | -95. |
| ☐SW 1/4 | Township | | Range | | | |
| ☐SE 1/4 | Section | | Section | | | |

| Description of the Problem | | | Part of the Plant Affected | Portion of the Field Affected |
|---|---|---|---|---|
| Has this problem occured previously? ☐Yes ☐No | | | ☐Seedling | ☐All |
| Seed Brand | VTY | Seed Treatments | ☐Root | ☐Scattered across |
| | | Tachigaren ☐20 ☐35 ☐45 | ☐Crown | ☐Spotty |
| | | ☐Kabina ☐Vibrance | ☐Leaves | ☐Small portion |
| | | ☐Systiva ☐Poncho Beta | Cover Crop Type: | ☐Yes ☐No |
| | | ☐Cru. Max ☐Nipsit | | |
| | | ☐Metlock Suite ☐Zeltera | Rhizoctonia control | |
| Current Chemicals applied | | | Product | Method applied |
| Herbicide(s) | | | | ☐IF ☐Band ☐Bcast |
| Insecticide(s) | | | | ☐IF ☐Band ☐Bcast |
| Fungicide(s) | | | | ☐IF ☐Band ☐Bcast |

| Field History | Crop | Herbicides | Spent Lime | | Tillage |
|---|---|---|---|---|---|
| 2020 | | | Year | | ☐ Conventional |
| 2019 | | | Rate | | ☐ No-Till |
| 2018 | | | | | ☐ Ridge Till |
| Additional information: | | | | | ☐ Strip Till |

For lab use only Do not write in area below

# Sugar Beet - Rhizoctonia & Aphanomyces Root Rot

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# American Crystal Sugar Disease Maps

- Shows disease severity for each township
- Found under the individual disease section in the Gold Standards Tab