

# **DISEASE AND INSECTS**

**2016 YWTG**

# Sugarbeet Root Maggots (SBRM)



- Maggots overwinter as larvae, pupate and emerge in spring as flies in previous years beet fields
- Adult flies are monitored in current year beet fields with sticky stakes

# (SBRM)

- Peak fly activity can occur anytime after 600 DD's are accumulated, on average, this occurs at 650 DD's
  - This is monitored at each NDAWN site in the RRV
  - NDSU monitors sticky stakes
- It is important to know that warm weather (around 80° F), and calm to low wind conditions are most conducive for fly activity
- Flies will remain fairly inactive in cool, rainy, or windy conditions

# Root Maggot Populations are Rising!

Dr. Mark Boetel

## Flies Per Trap in RRV: 2007 – 2015



# 2016 Root Maggot Forecast\*

Dr. Mark Boetel

## High risk:

Ada  
Auburn  
Borup  
Grafton  
Grand Forks  
Nash  
St. Thomas

## Moderate risk:

Cavalier  
Crystal  
Euclid  
Fisher  
Oakwood  
Reynolds  
Thompson

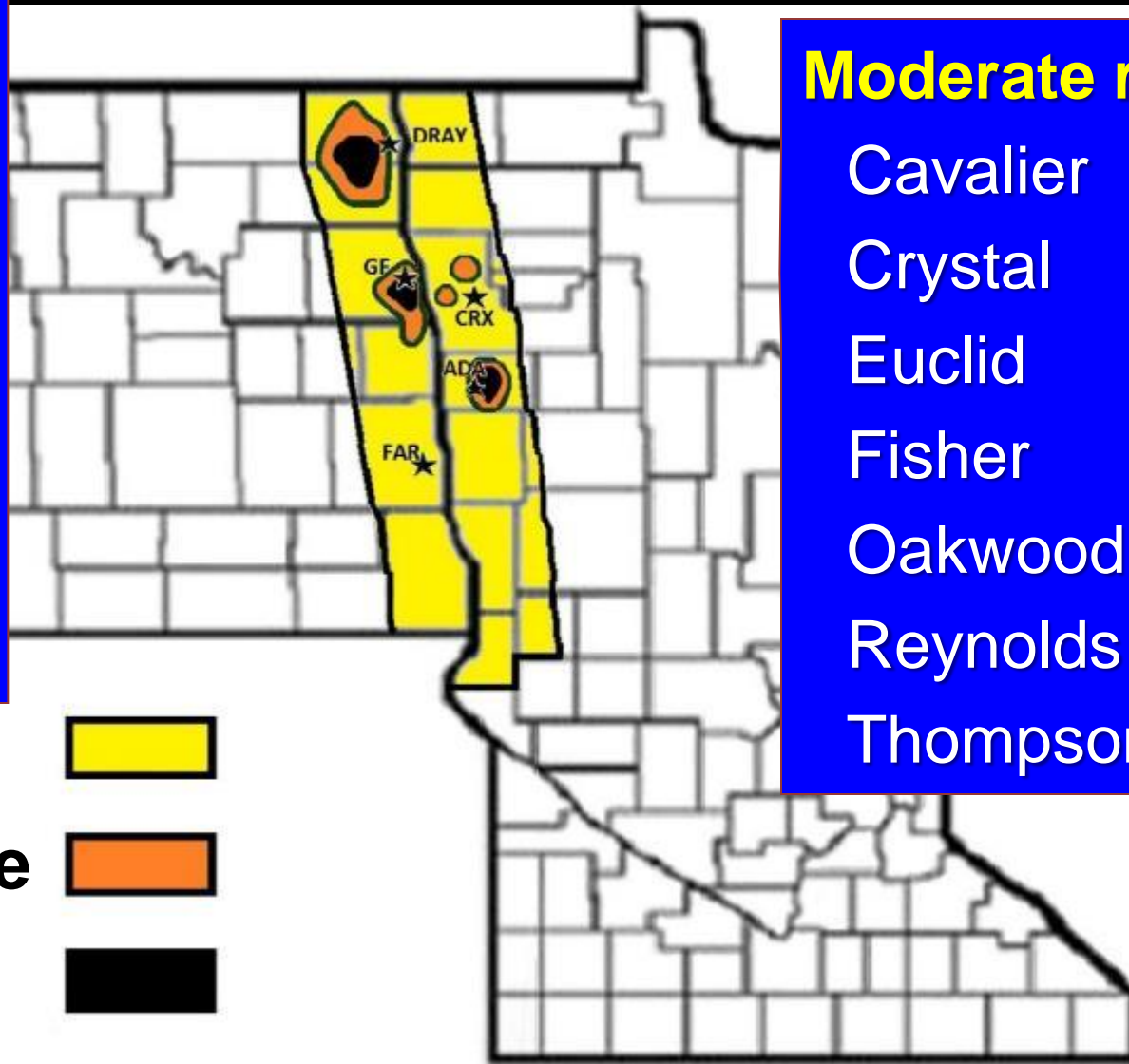
**Low**



**Moderate**



**High**



\*Based on fly counts & root maggot feeding injury ratings

## Economic Risk based on Sugarbeet Root Maggot Fly Counts on Sticky-stake Traps

<b><i>Daily</i> Capture (flies per stake)</b>	<b><i>Cumulative</i> Capture (flies per stake)</b>	<b>Risk Level*</b>	<b>Suggested Management Tactic**</b>
0-25	0-50	Low	Monitor fields closely.
26-50	51-100	Slight	A postemergence insecticide may be needed if an at-plant insecticide was used at a low rate or no at-plant material was applied.
51-75	101-150	Moderate	A postemergence insecticide is probably justified, even if an at-plant insecticide was applied to the field at a moderate or high rate (a granular insecticide can be used if 7 or more days before expected peak fly activity; use a liquid insecticide if within 4 days of peak fly).
76-100	151-200	Elevated	Apply a postemergence LIQUID insecticide as soon as possible (repeat if <u>daily</u> fly counts exceed 100 per trap.).
101-150	201-300	High	<b>Apply a postemergence LIQUID</b>
151+	301+	Extreme	<b>insecticide immediately</b> Apply a postemergence LIQUID insecticide at high labeled rate immediately (consider a 2 <sup>nd</sup> application if daily counts resurge).

\*Risk will vary based on actual peak fly activity date in a given field. Risk categories and corresponding management tactics in these tables are based on historical population levels and associated insecticide performance in research trials. Management suggestions are offered as general guidelines to assist growers with making informed management decisions; however, no guarantee can be made on whether economic return will be achieved from management tactics.

\*\*Consult the “Sugarbeet Production Guide” (viewable on the internet at <http://www.sbreb.org/Production/production.htm>) for this year’s sugarbeet root maggot forecast and management recommendations. Contact your local agriculturist or Mark Boetel, NDSU Entomologist (701-231-7901), for assistance with specific pest management decisions.

Updates on root maggot development and expected peak fly activity dates will be released on NDSU’s Crop & Pest Report and the “Sugarbeet Growing Tips” program on several area radio stations (visit <http://www.ag.ndsu.nodak.edu/aginfo/sugar/radio.html> for a list of stations and broadcast scheduling).

# Root Maggot Control Recommendations 2016

- **Moderate Risk area**

- **Counter 20G @ 7.5#** at-plant (preferred)
  - Or Poncho Beta/NipsIt/Cruiser Maxx at-plant (least preferred)
- **Planned post emerge Lorsban @ 2pts/a**
  - At or just prior to peak fly

- **High Risk area**

- **Counter 20g @ 8.9#** at plant
- **Planned post emerge Lorsban @ 2pts/a**
  - At or just prior to peak fly

# Root Maggot- Summary

- Populations are increasing
  - Proper management control measures are necessary
- Aggressive control is a must in areas of high risk and rising populations
- Counter 20G: better root protection & yield than any seed treatment (in high pressure)
- POST: Seed treatments or low rates of at-plant granules are not sufficient w/out a post insecticide
- POST: control tools may be key to success



**ROOT MAGGOT**

**QUESTIONS?**

# **Rhizoctonia**

## **Impact on your Beet**

### **Payment**

- In the Field
- Storage Pile
- Factory

# Rhizoctonia Impact In the Field

- Reduced Tonnage
- Reduced Sugar Content



Rhizoctonia big patches in a field



Rhizoctonia infects individual plants random throughout field



# ACS Growers Field Data

## 5 year summary

	Yield	Sugar %	SLM	Rec Sugar/Ton	Rec Sugar/Acre	\$/Acre
No Quadris Applied	24.8	17.87	1.18	334	8,283	1,286
Quadris Applied	25.6	18.13	1.19	339	8,678	1,366

# ACS Growers Field Data

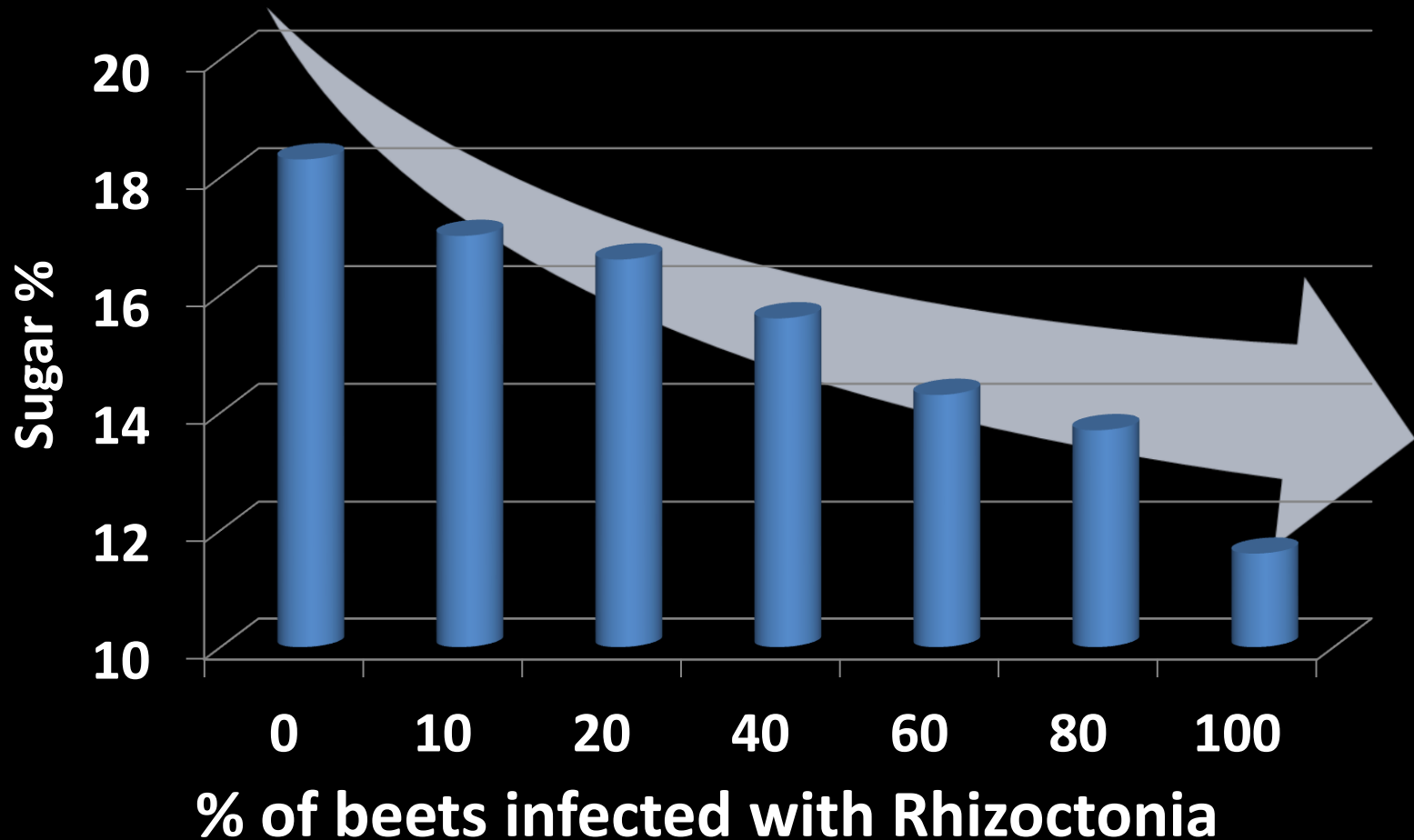
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Quadris return \$80 per Acre



# Rhizoctonia effect on Sugar % Before Storage





# Rhizoctonia Impact In the Storage Piles

- Increases Respiration
- Increases Pile Temperature
- Decreases Extractable Sugar



The image shows two carrots side-by-side on a white surface. The carrot on the left is healthy, with a smooth, light-colored skin and a clean, tapered shape. The carrot on the right is diseased, showing significant dark, necrotic lesions on its upper portion and a distorted, irregular shape. A dark blue rounded rectangle is positioned at the top center, containing the word 'Rhizoctonia'. Two overlapping circles are in the center: a light blue one on the left containing 'The Good' and a dark grey one on the right containing 'The Bad'. The text 'VS' is placed between the two circles.

# Rhizoctonia

**The  
Go  
od**

**VS**

**The  
Bad**

# Rhizoctonia

30 DAH Storage Pile

Sugar %

17.3

14.3

Respiration mg CO<sub>2</sub>/kg/hr

3.54

6.27

Extractable Sucrose lb/T

307

241

Larry Campbell USDA-ARS, Carol Windels U of M

# Rhizoctonia Financial Impact

307 lb sugar per ton no disease

-241 lb sugar per ton rhizoctonia present

66 lb sugar loss

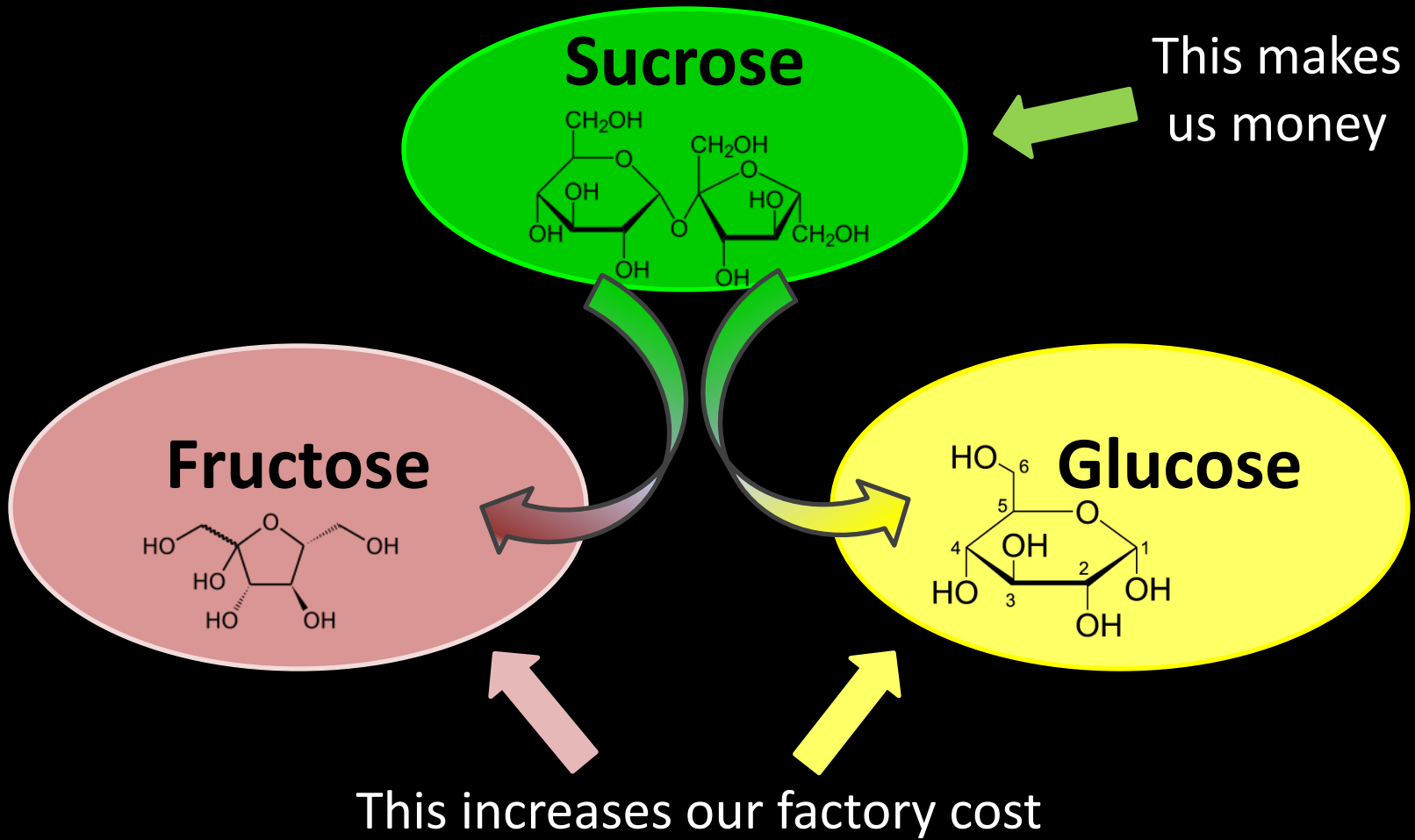
21.5 % loss

Can you take a 21.5% deduction  
in your beet payment?

# Rhizoctonia in the Factory

- Increase in Inverted Sugar
- Decrease in Raw Juice Quality
- Reduction in Slice
- Increase Factory Operation Cost

# Inverted Sugar

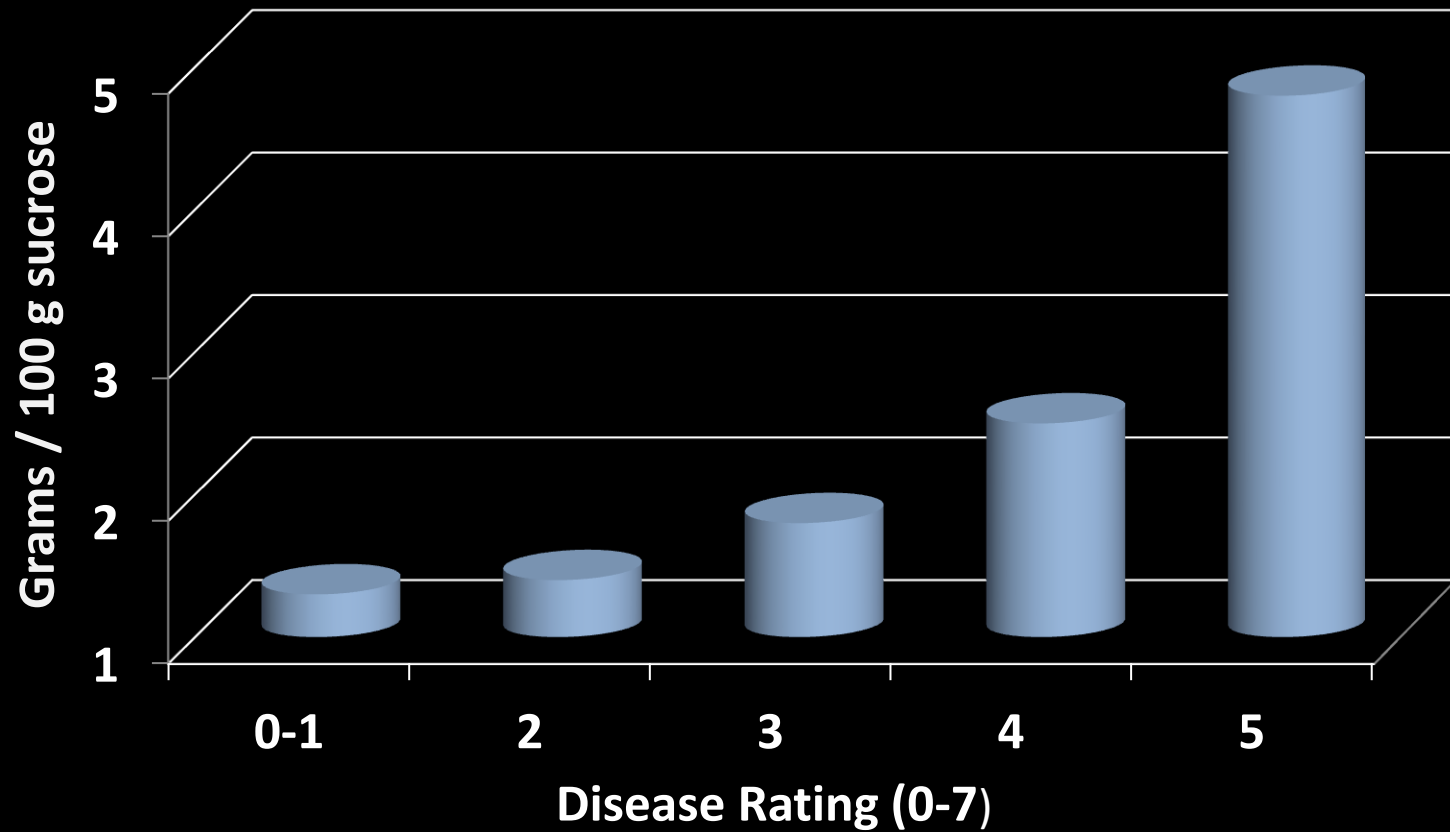


# Invert Sugar in the Factory

- For every 1 lb of invert, the factory loses at least 1.5 lbs of good sugar to molasses
- Inverted sugar creates more color in the juice purification process
- Elevated color forces the centrifuges to work harder – more factory cost

# Invert Sugar from Rhizoctonia

## 30 DAH



Larry Campbell USDA-ARS, Carol Windels U of M



# ACS Recommendation

## Rhizoctonia Control

### 1. CROP ROTATION

- ✓ Break up infection cycle and reduce inoculum buildup
- ✓ Rhizoctonia will survive on corn and bean residue

### 2. VARIETY SELECTION

- ✓ Rhizoctonia traits kick in later in the season



# ACS Recommendation Rhizoctonia Control

## 3. SEED TREATMENT

- ✓ Improves stand establishment, crop vigor, and Yield
- ✓ (Kabina, Metlock Suite, Rizolex, Vibrance)

## 4. POST APPLICATION OF QUADRIS

- ✓ (4-5 weeks after planting)
- ✓ Band preferred method, broadcast is still beneficial



# Cercospora



# Conditions for disease

- Favored by warm, humid, rainy weather
- Cercospora spores form most readily at 68-79°F at relative humidities of 90-100% (spores do not form at temperatures less than 50°F)
- Spores germinate and infect leaves through stomata (natural openings) at daytime temperatures of 77-95°F, night temperatures above 60°F, and high relative humidities (90-95%) or free moisture. Infection is reduced or inhibited at temperatures less than 59°F or when leaves are wet for less than 11 hours
- Leaf spots develop from 5 to 21 days after infection, depending on amount of inoculum, temperature, and duration of wet period. Leaf spots typically occur first on lower, older leaves and progress to younger leaves

# When do losses start to occur?

- If leaf spots cover at least 3% of the foliage by harvest, economic losses occur through reduced root tonnage and sucrose content and increased impurities. Also, roots of infected plants do not store as well as roots of healthy plants



Category 1  
1-5 spots/leaf  
0.1% severity



Category 2  
6-12 spots/leaf  
0.35% severity



Category 3  
13-25 spots/leaf  
0.75% severity



Category 4  
26-50 spots/leaf  
1.5% severity



Category 5  
51-75 spots/leaf  
2.5% severity



Category 6  
3% severity  
**PROVEN ECONOMIC DAMAGE**



Category 7  
6% severity



Category 8  
12% severity



Category 9  
25% severity

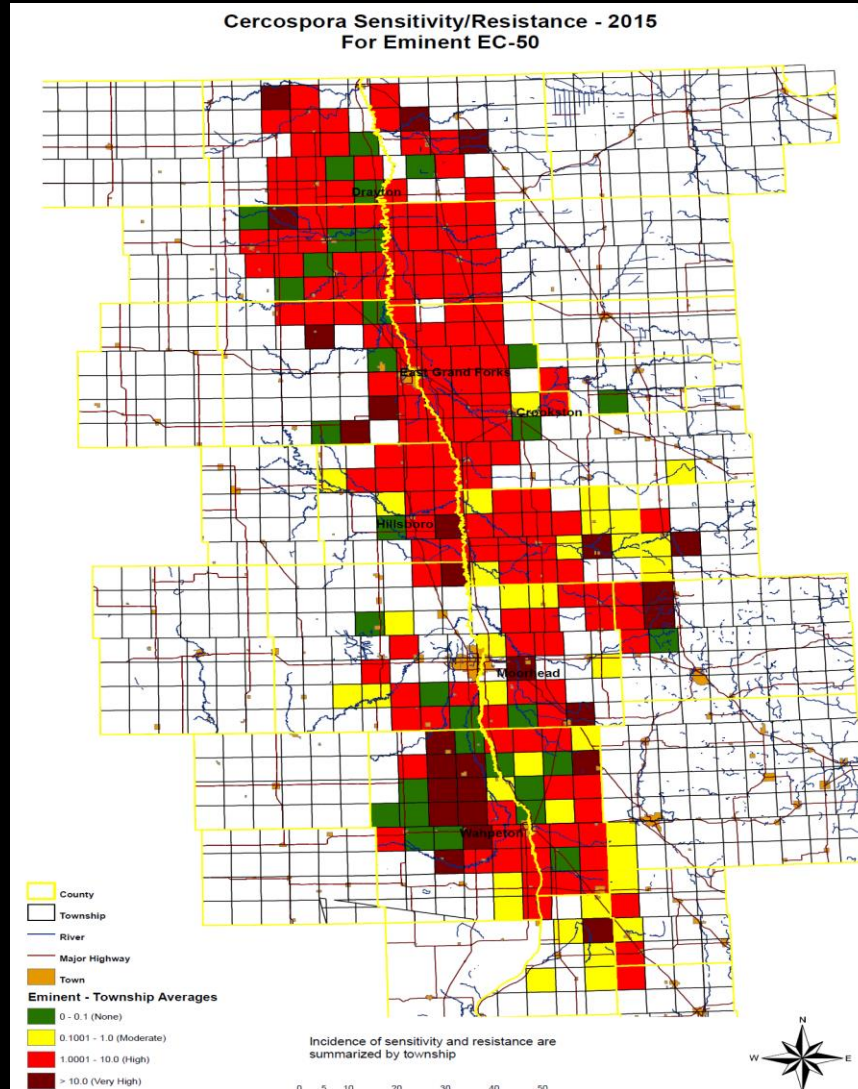


Category 10  
50% severity

**Figure B: Cercospora Leaf Spot Damage Categories**

# 2015 Cercospora leaf sampling resistance maps

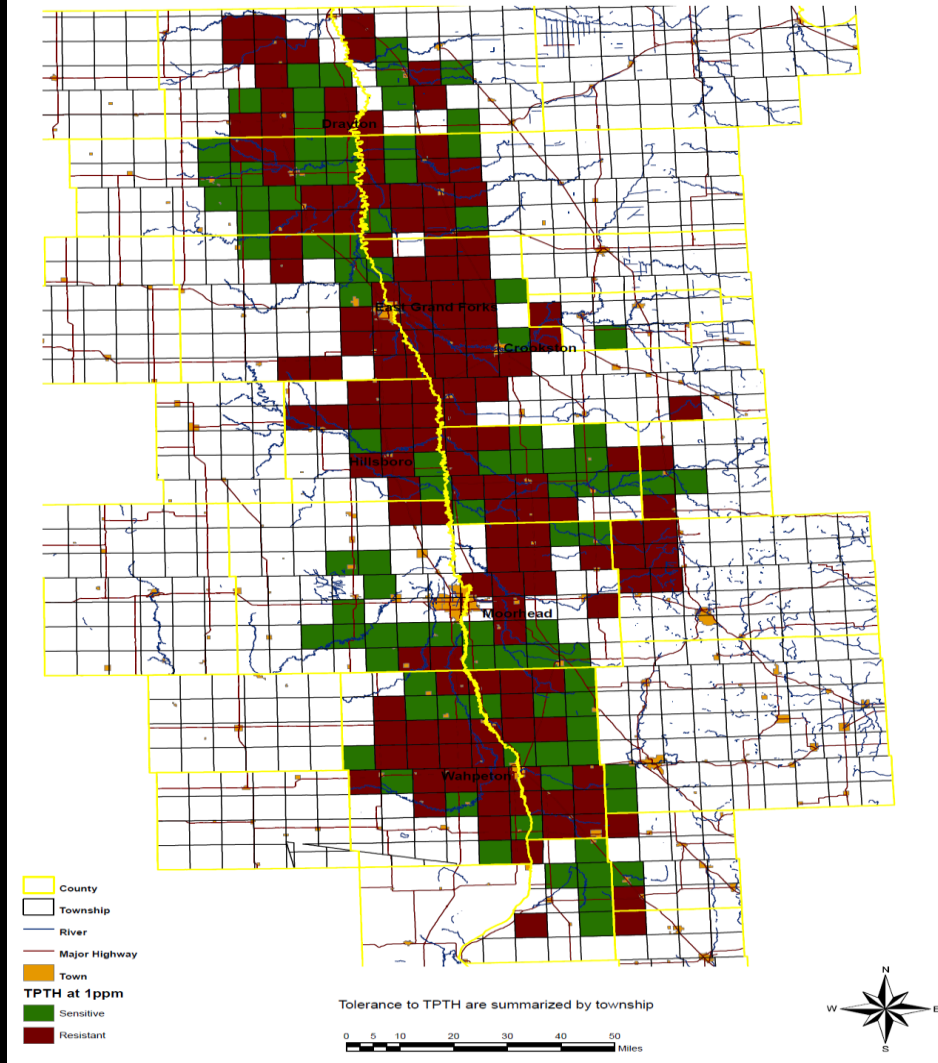
# Eminent





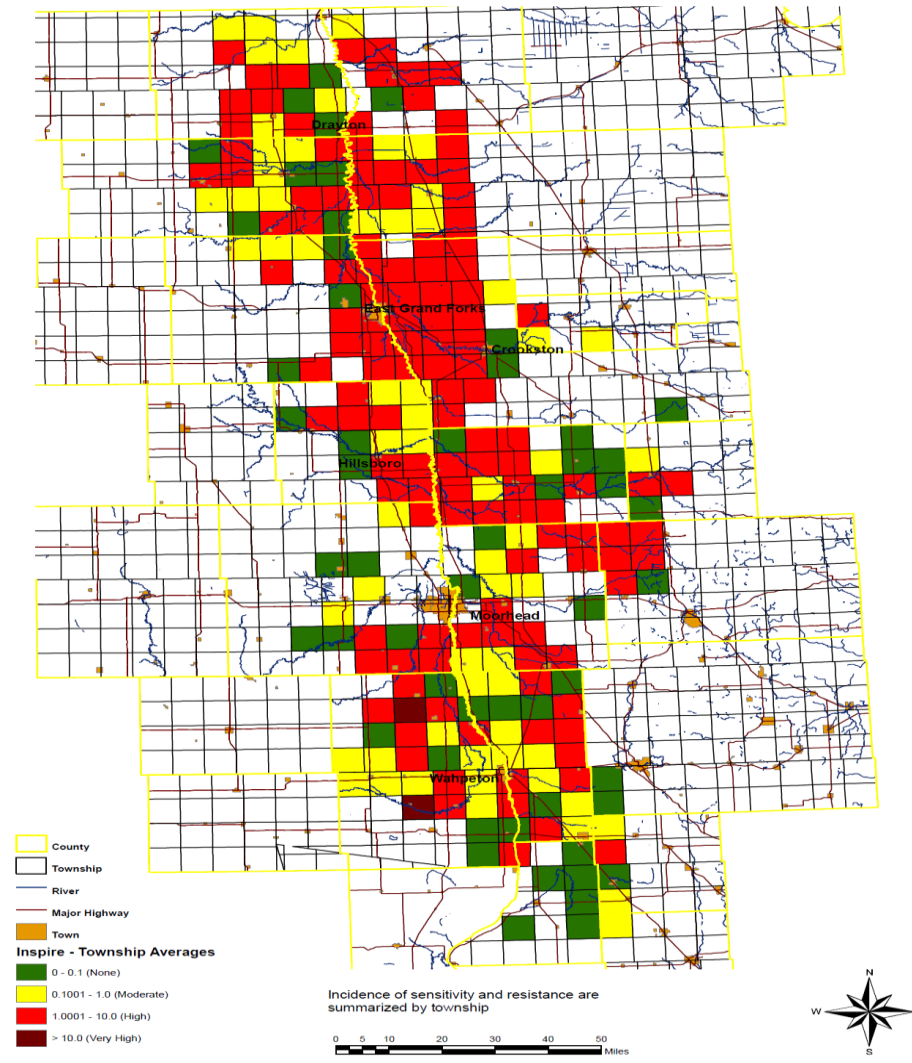
# TPTH

Cercospora Tolerance - 2015  
For TPTH at 1 PPM



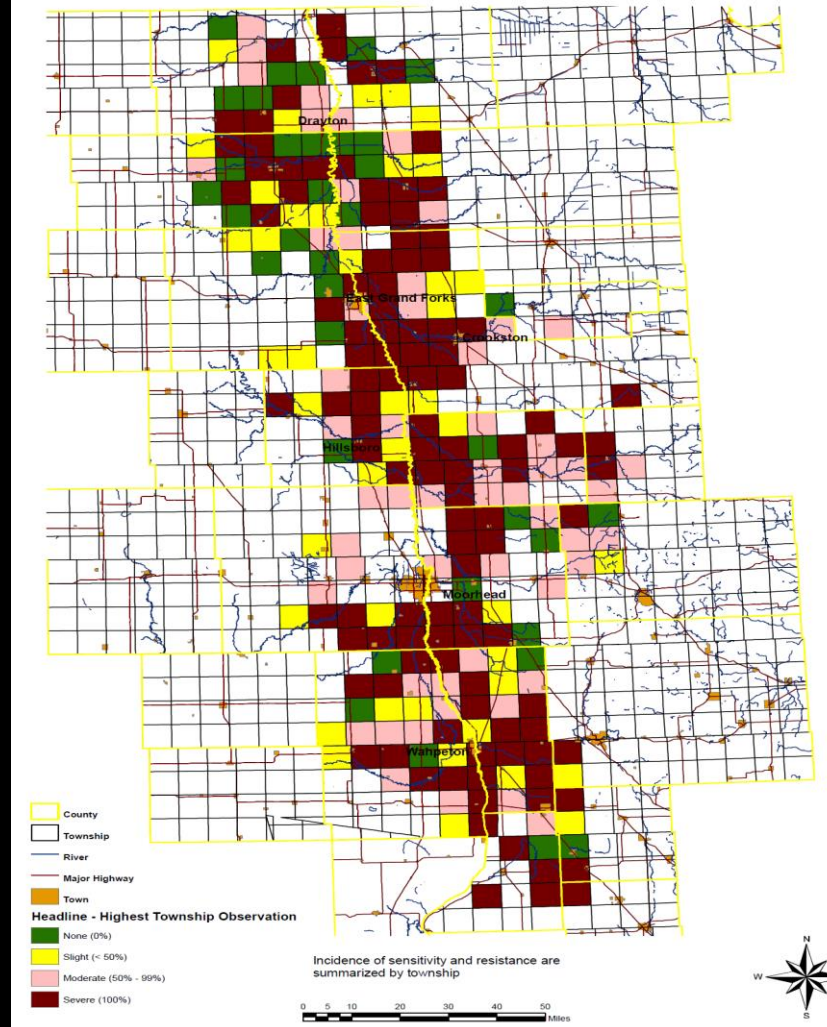
# Inspire

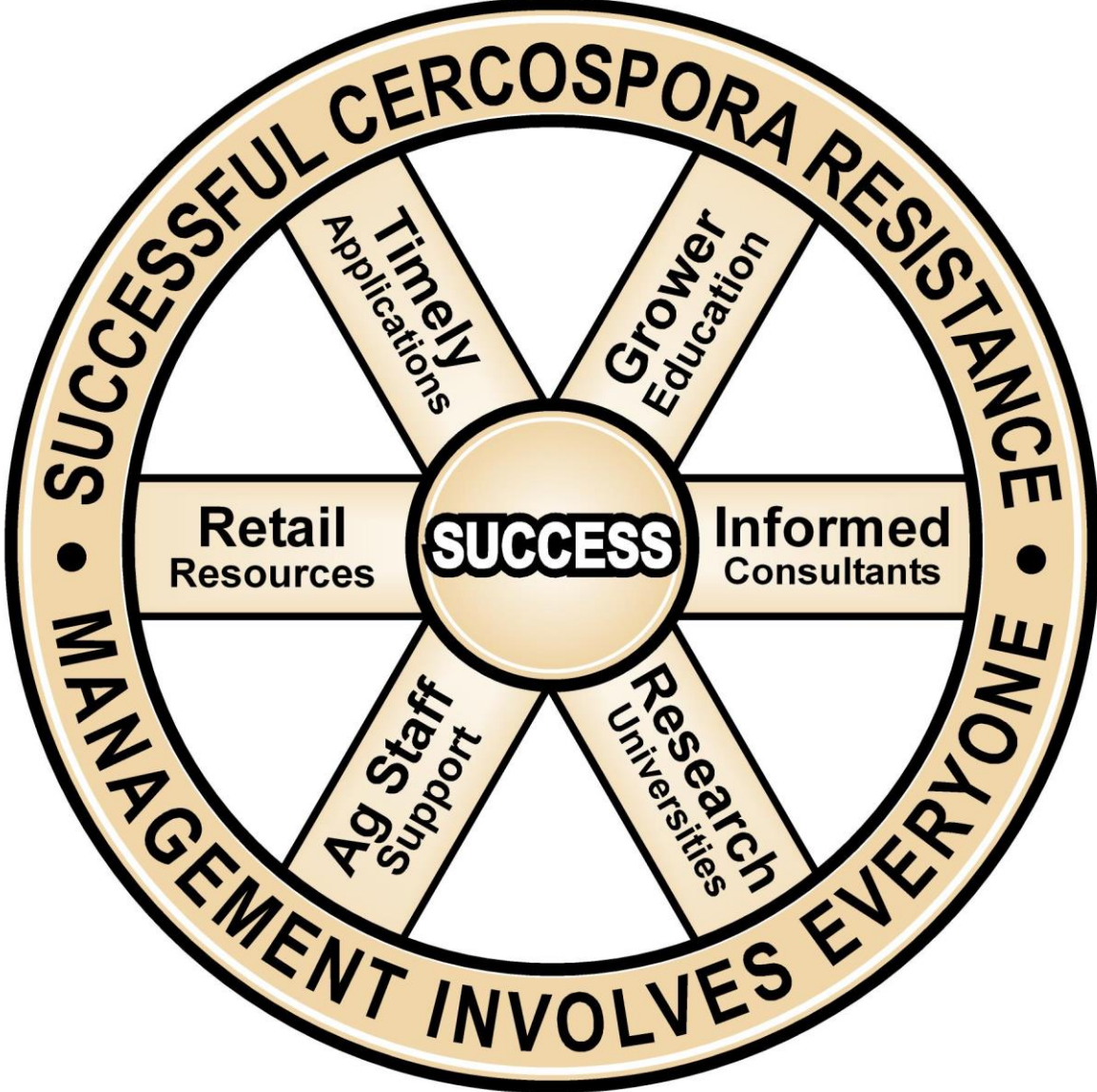
Cercospora Sensitivity/Resistance - 2015  
For Inspire EC-50



# Headline

Cercospora Sensitivity/Resistance - 2015  
For Headline





# 2016 Cercospora Control Recommendations

## Mid to Late July (4 Spray Program)

Application 1 - TPTH\* + Benzimidazole\*\*

Application 2 - Triazole

Application 3 - TPTH\*

Application 4 - Headline or Priaxor (apply Aug 25 through 1st week of September)

## Late July to Early August (3 Spray Program)

Application 1 - Triazole or TPTH\* + Triazole

Application 2 - TPTH\* or TPTH\* + Benzimidazole\*\*

Application 3 - Headline or Priaxor + TPTH\* (apply Aug 25 through 1<sup>st</sup> week of September)

\* TPTH should NOT be used more than twice per season

\*\* Benzimidazole should be used only once per season and never alone

\*\*\* In tank mixing order, dry formulations go in first followed by liquids

# 2016 Cercospora Control Recommendations

## Early to Mid-August (2 Spray Program)

Application 1 - TPTH\* + Triazole or TPTH\* + Benzimidazole\*\*

Application 2 - Headline or Priaxor + TPTH\* (apply Aug 25 through 1<sup>st</sup> week of September )

## Late August (1 Spray Program)

Headline or Priaxor + TPTH\* (apply Aug 25 through 1<sup>st</sup> week of September ) or  
Headline or Priaxor + Triazole (apply Aug 25 through 1<sup>st</sup> week of September )

\* TPTH should NOT be used more than twice per season

\*\* Benzimidazole should be used only once per season and never alone

\*\*\* In tank mixing order, dry formulations go in first followed by liquids

# Summary

- Scout fields diligently / Contact ACSC staff
- Use DIV alerts
- Monitor weather – models not perfect
- Get it right
  - Product – rotating chemistry and tank mixes
  - Rate – proper rates alone or in tank mixes
  - Timing – start on time and stay on schedule
  - Method - Ground versus aerial – both can work well
- Use correct nozzles, boom height and speed

# Questions?

