Disease and Insect Management in the RRV

Insects

Sugarbeet Root Maggot

Springtalis

Wireworm

Cutworms

Root Diseases

Fusarium

Rhizomania

Rhizoctonia

Aphanomyces

Sugarbeet Root Maggot Management

First Application Control Practices

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

Insecticide	Recommended rates (product/ac) for expected population levels			Timing Options
	Low	Moderate	High	
Counter 20G RUP	4.5 lb.	7.5 lb.	8.9 lb.	Planting-time or Post
Counter 15G RUP	5.9 lb.	10.0 lb.	11.9 lb.	Planting-time or Post
Poncho Beta	Seed Applied	*NR	*NR	Planting time
Lorsban 15G RUP	6.7 lb.	10.0 lb.	13.4 lb.	Planting-time or Post
Temik 15G RUP	6.7 lb.	10.0 lb.	14.0 lb.	Planting-time & Post

RUP – Restricted Use Pesticide

*NR – Not Recommended without a 2nd 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:**

Target Rate lb (AI) / ac	OLD Counter 15G		***NEW* Counter 20G**	
	lb. product/ac	oz. per 1000 row ft	lb. product/ac	oz. per 1000 row ft
0.9	6	4	4.5	3
1.05	7	4.7	5.25	3.5
1.2	8	5.4	6	4
1.5	10	6.7	7.5	5
1.8	11.9	8	8.9	6

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

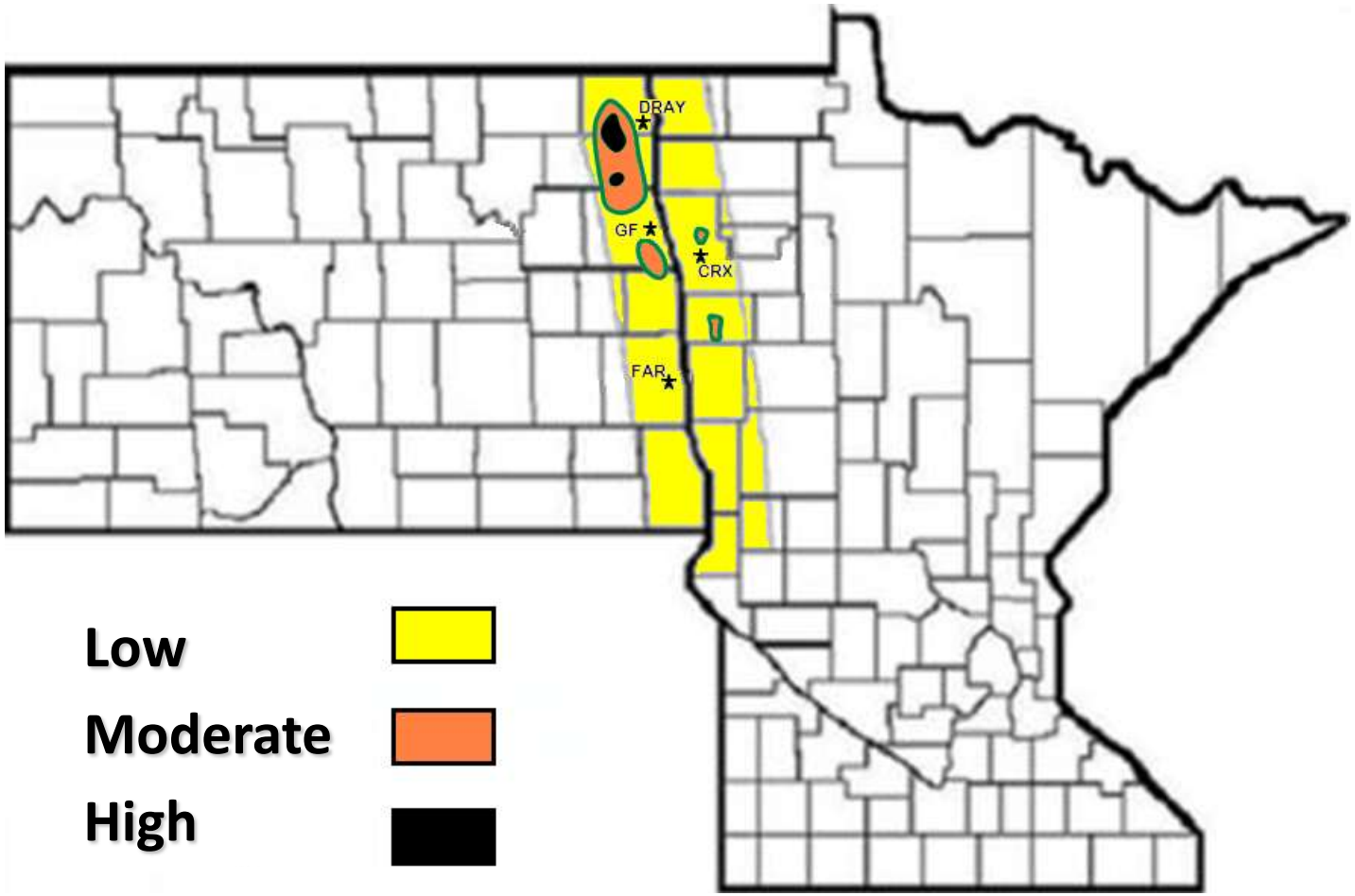
- Option 2 - Counter at planting followed by two 1 pint applications of Lorsban 4E
  - one app. 4 days prior to peak fly and 1 app. at peak fly

- Option 3 - Mustang at plant followed by post application of Thimet
  - only if no insecticide boxes available on planter

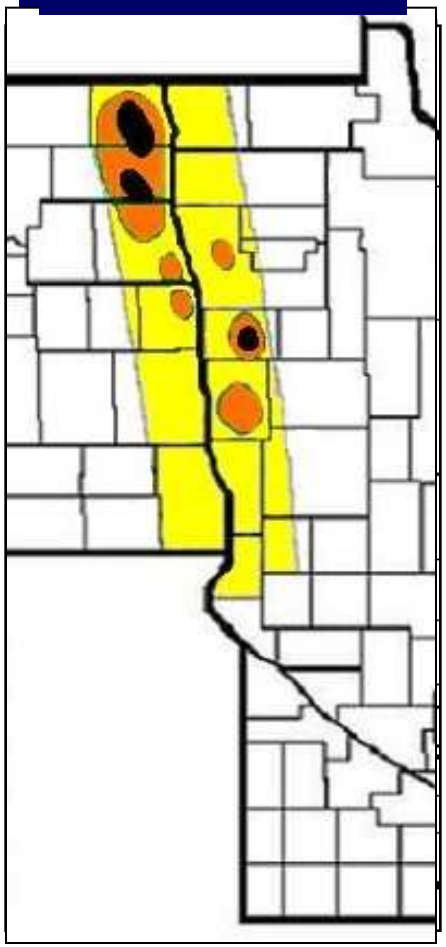
2011 SBRM Control With Poncho

- 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



2010



*Based on fly counts & root damage ratings

WIREWORMS

Larvae Range from 1/2" to 1 1/2” long

Stand Losses due to Wireworm can range from 1% to total replant

Wireworm Control

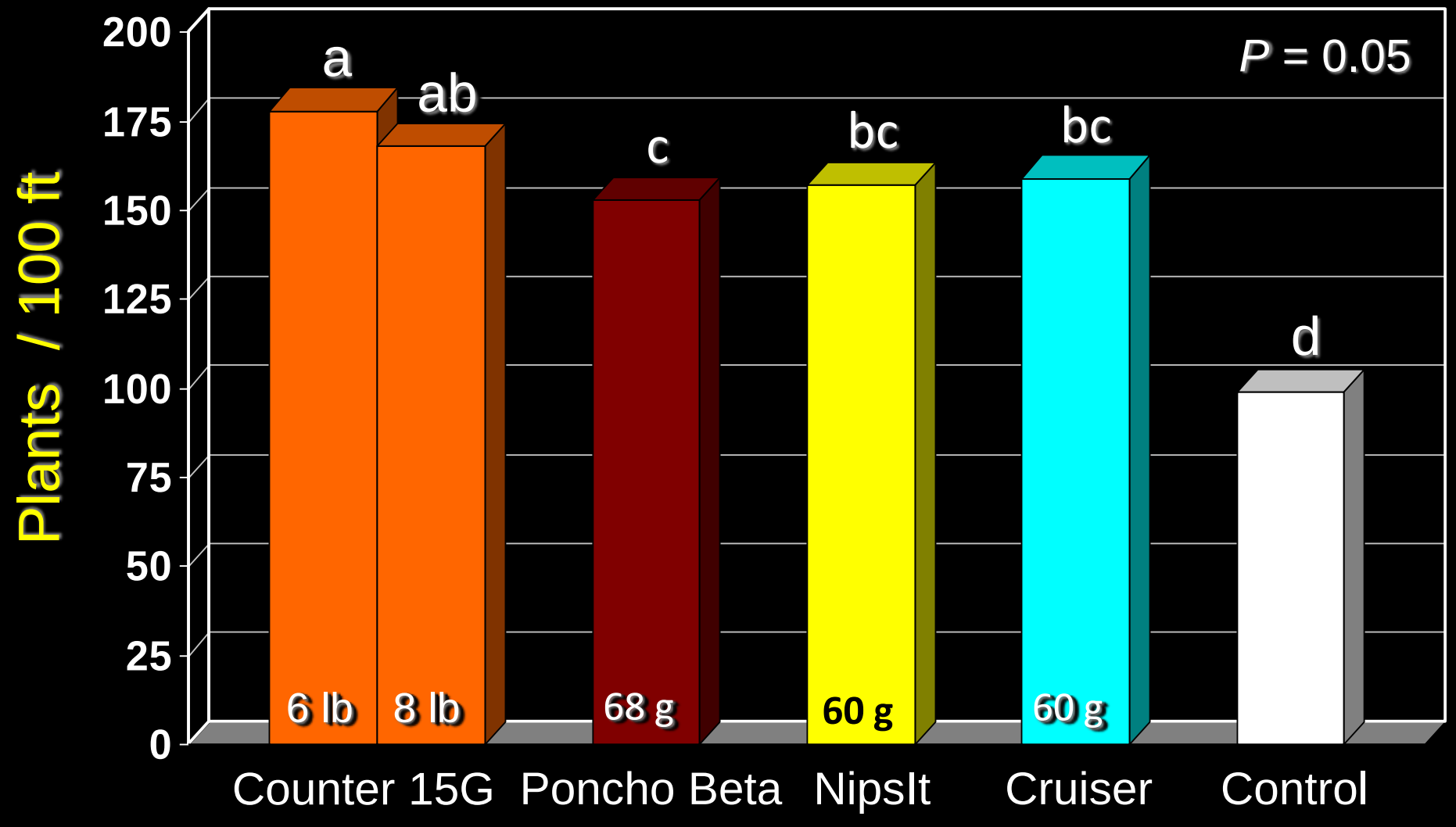
- No threshold for wireworms in sugarbeets has been established

Insecticide	Rate	
Counter 15G	5.9 to 11.9 lbs/acre	
Counter 20G	4.5 to 8.9 lbs/acre	
Mustang Max	4.0 oz/acre	in furrow or T-Band
Lorsban 15G	10 to 13 lbs/acre	Suppression only
Poncho Beta, NipsIt, Cruiser Max	Seed Applied	Low infestation only

Springtail Control

Surviving Plants (2006-2008)

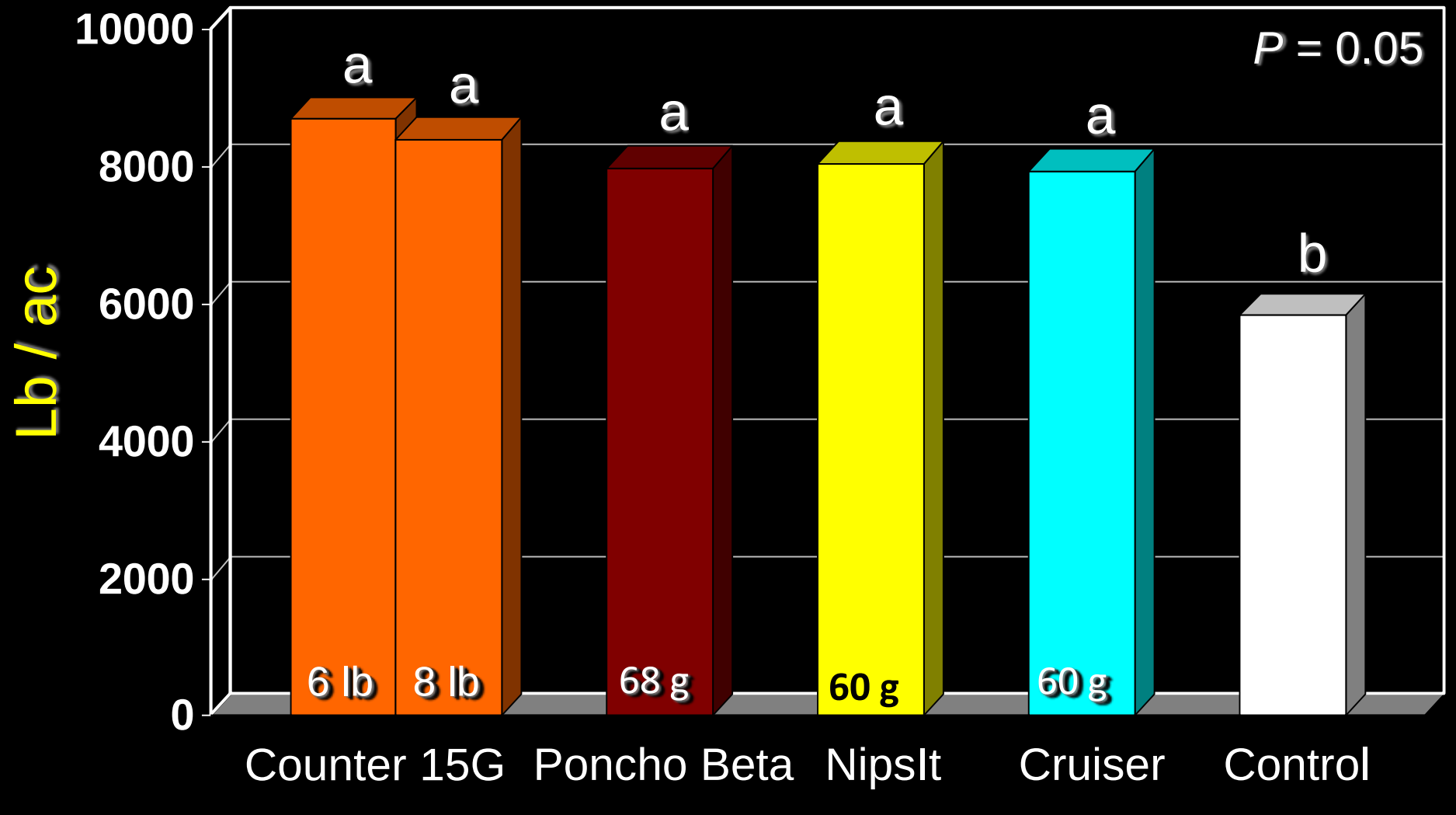
Boetel, Dragseth and Schroeder, 2010, NDSU



Springtail Control

Sucrose Yield (2006-2008)

Boetel, Dragseth and Schroeder, 2010, NDSU



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

Quadris Rate (fl oz product/A)	Revenue ($/A)	Product Cost ($/A)	Benefit Over No Fungicide [z] ($/A)
Control (no fungicide)	1,401	-	-
5.0	1,368	12.50	-46
7.5	1,403	18.75	-17
10.0	1,496	25.00	70
14.5	1,520	36.25	83

[z] Product cost subtracted, but does not account for other costs associated with application.

Efficacy of Band-Applied Fungicides

Windels & Brantner, 2010, UM - NWROC

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

Efficacy of in-furrow Fungicides

Windels & Brantner, 2010, UM - NWROC

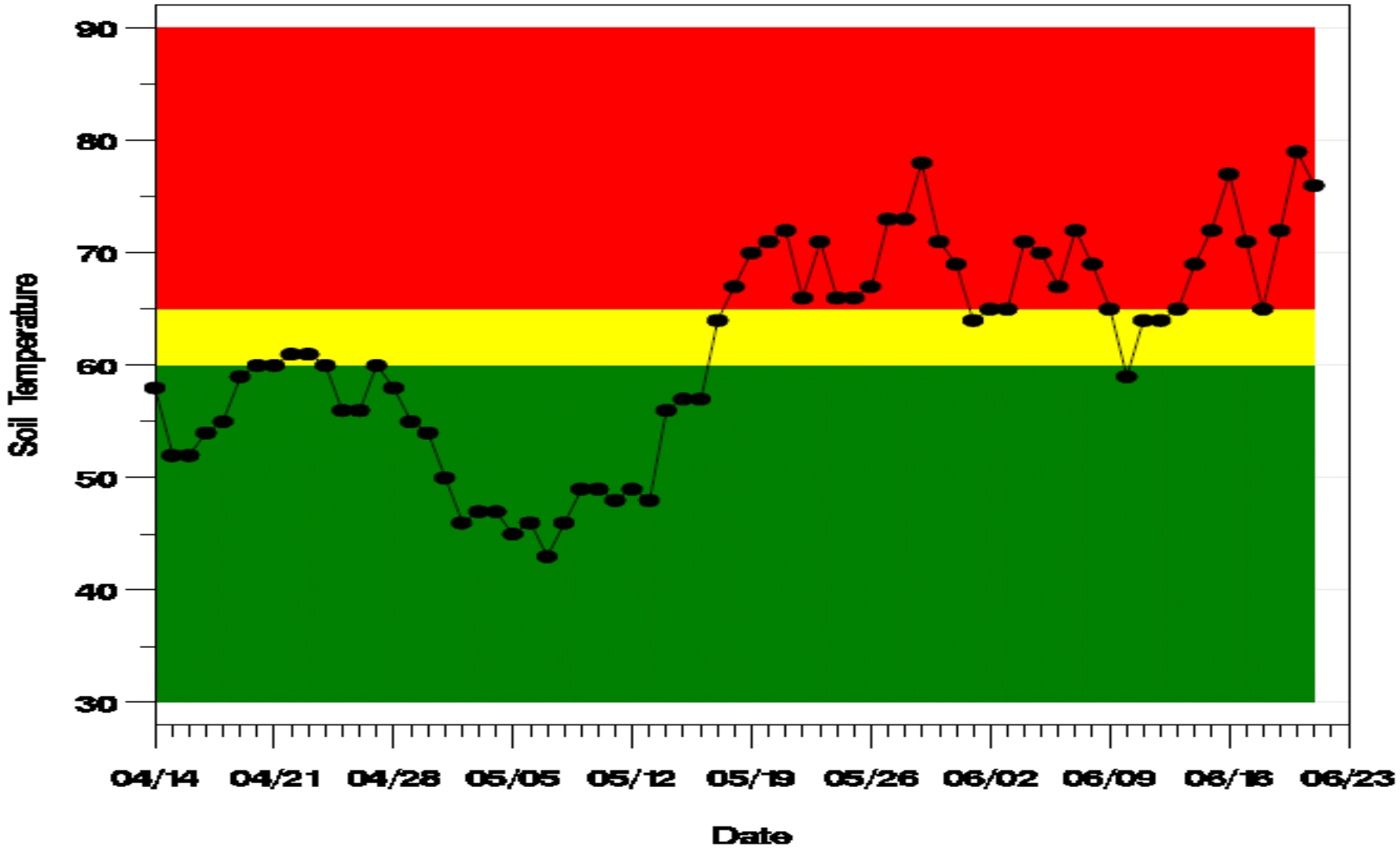
Treatment and Rate (in-furrow)	No. harv. Root/100 ft.	Yield T/A	Sucrose		Revenue ($/A)
			%	lb recov./A	
Non-inoculated control	157 a	27.2 a	16.9	8,635 a	1,353 a
Rhizoctonia inoculated					
No fungicide control	85 d	17.7 c	16.8	5,540 c	855 c
Headline @ 0.5 fl oz/1000 ft	142 ab	24.3 ab	16.7	7,599 ab	1,171 ab
Quadris @ 0.6 fl oz/1000 ft	143 ab	23.9 ab	17.0	7,614 ab	1,200 ab
LSD (P=0.05)	20.5	4.39	NS	1,395	228

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

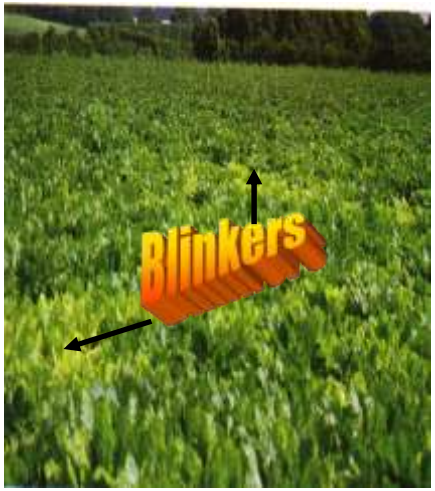

2010 Crop Daily Soil Temperature — Hillsboro
Soil Temperature
90
80
70
60
50
40
30
04/14
04/21
04/28
05/05
05/12
05/19
05/26
06/02
06/09
06/16
06/23
Date

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

Resistant Resistant Susceptible Susceptible

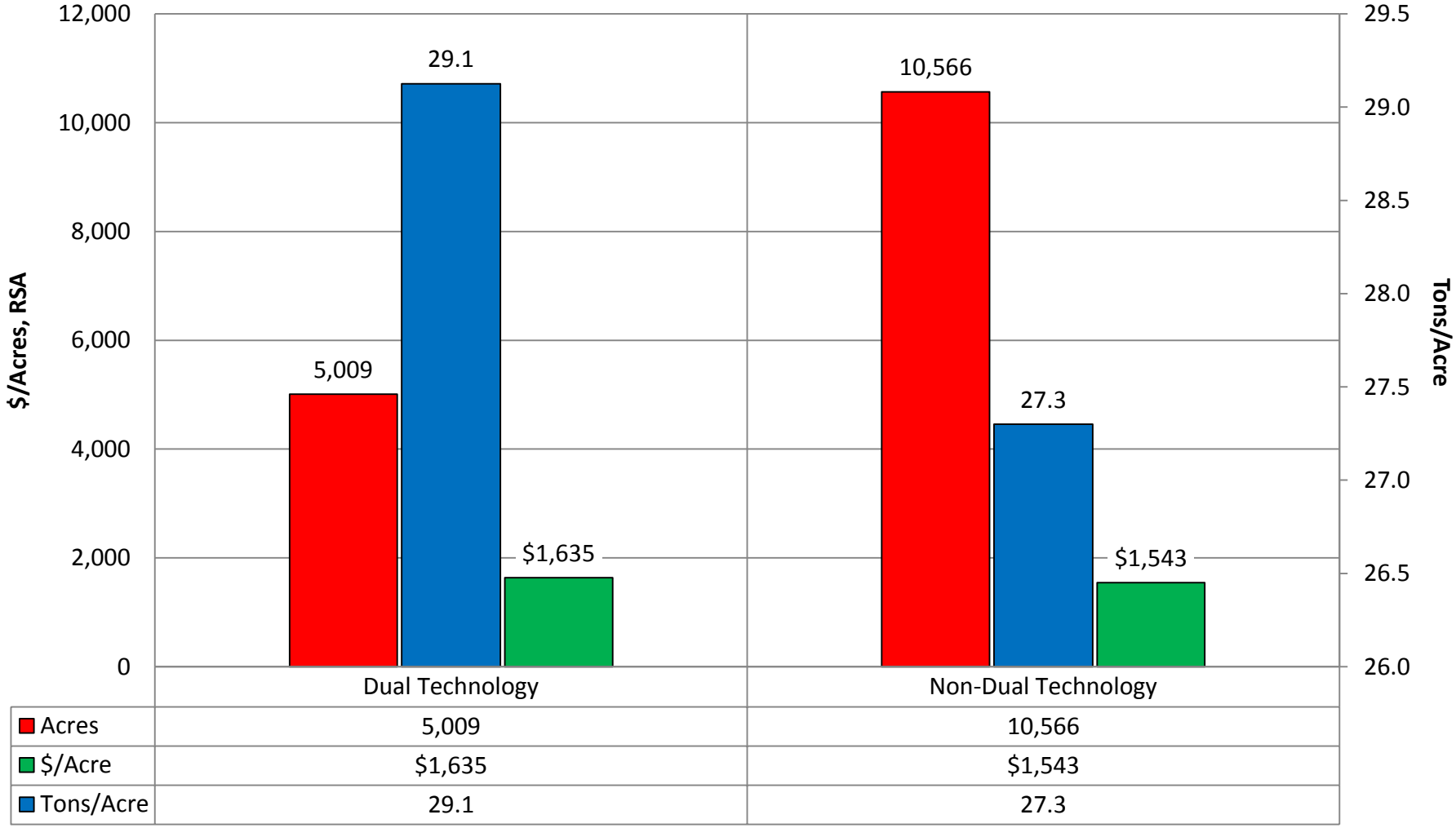


2010 Rhizomania
“Blinkers”

Rhizomania Root Symptoms

Dual Technology

Crookston Severe Rhizomania area:
Dual technology has a $92 advantage over other varieties.



	Dual Technology	Non-Dual Technology
Acres	5,009	10,566
$/Acre	$1,635	$1,543
Tons/Acre	29.1	27.3

Dual Technology Varieties

- SESVanderhave – 48607TT, 48717TT
- BetaSeed – BTS 89RR50, BTS 88RR41, BTS 88RR83, 1125R
- Crystal – 879RR, R761
- Seedex – Deuce (limited availability)

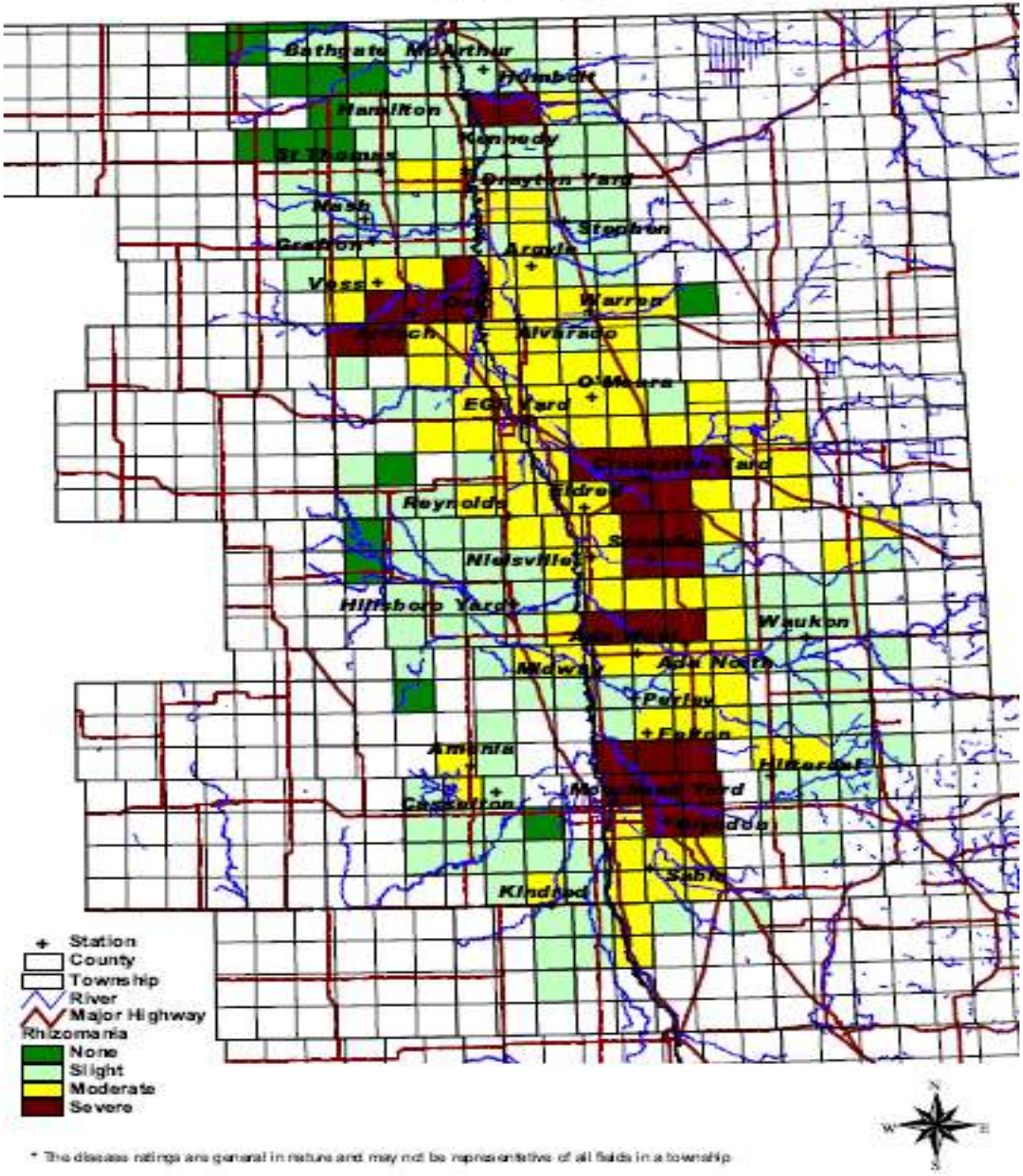
Aphanomyces

- 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

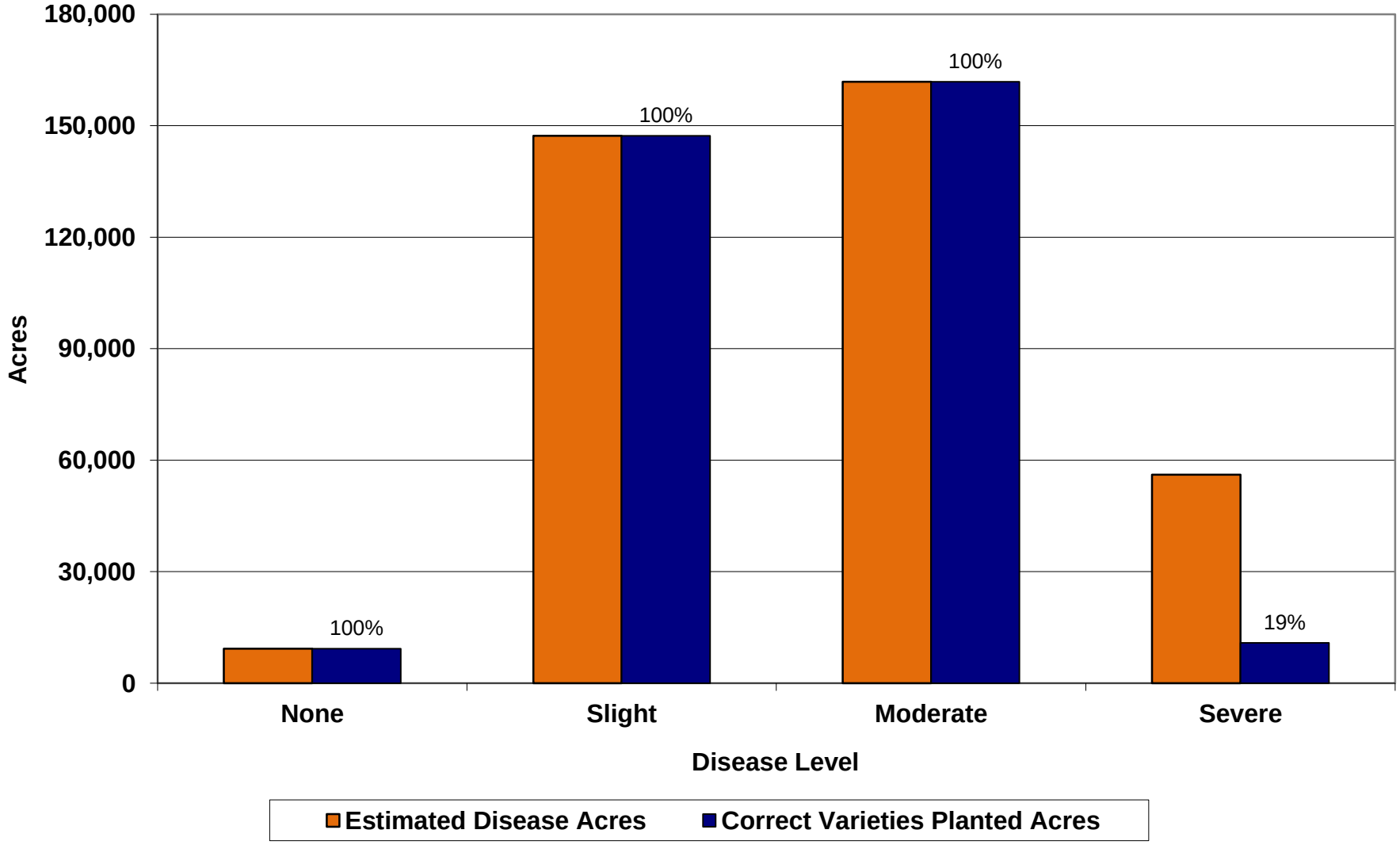
- VersaLime improves soil structure allowing for better water movement in heavy clay soils
- VersaLime has no detrimental effects on other rotational crops. Improved yields seen on all crops
- The use of resistant varieties and a good liming program on infected fields can help reduce disease and improve yield on sugar beets

2010 Disease Rating*
Rhizomania

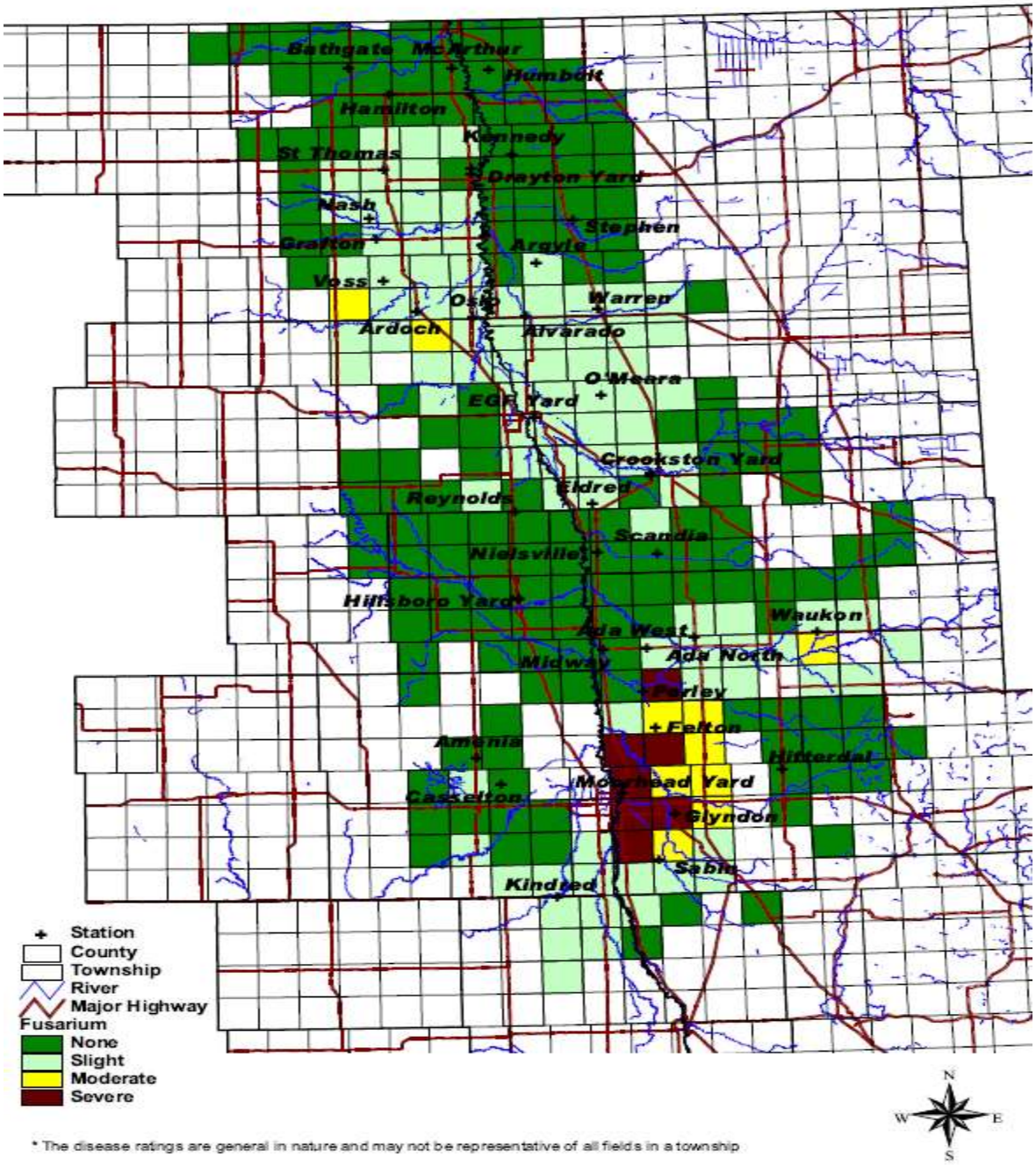


* The disease ratings are general in nature and may not be representative of all fields in a township

Rhizomania Disease Acres



2010 Disease Rating*
Fusarium



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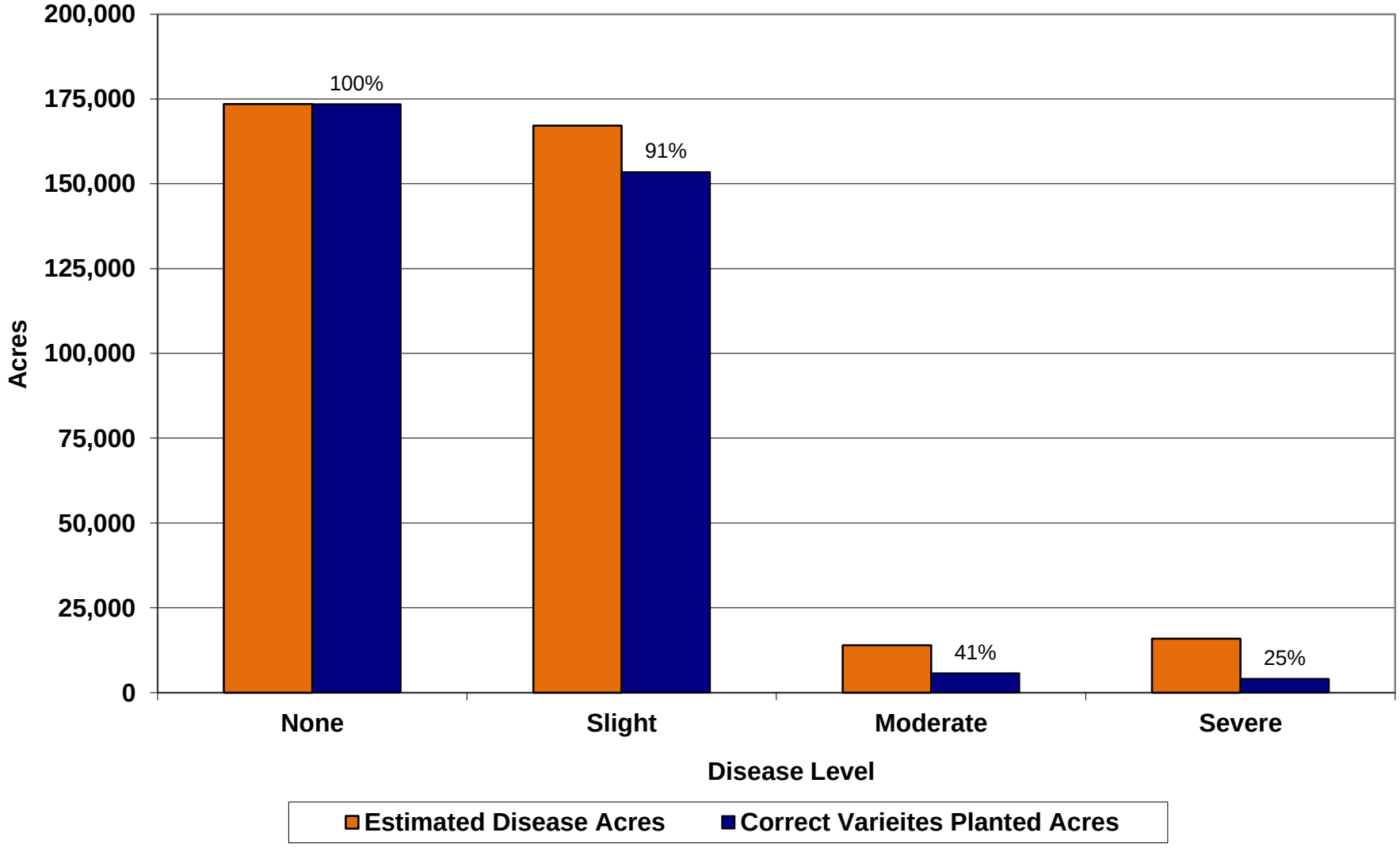
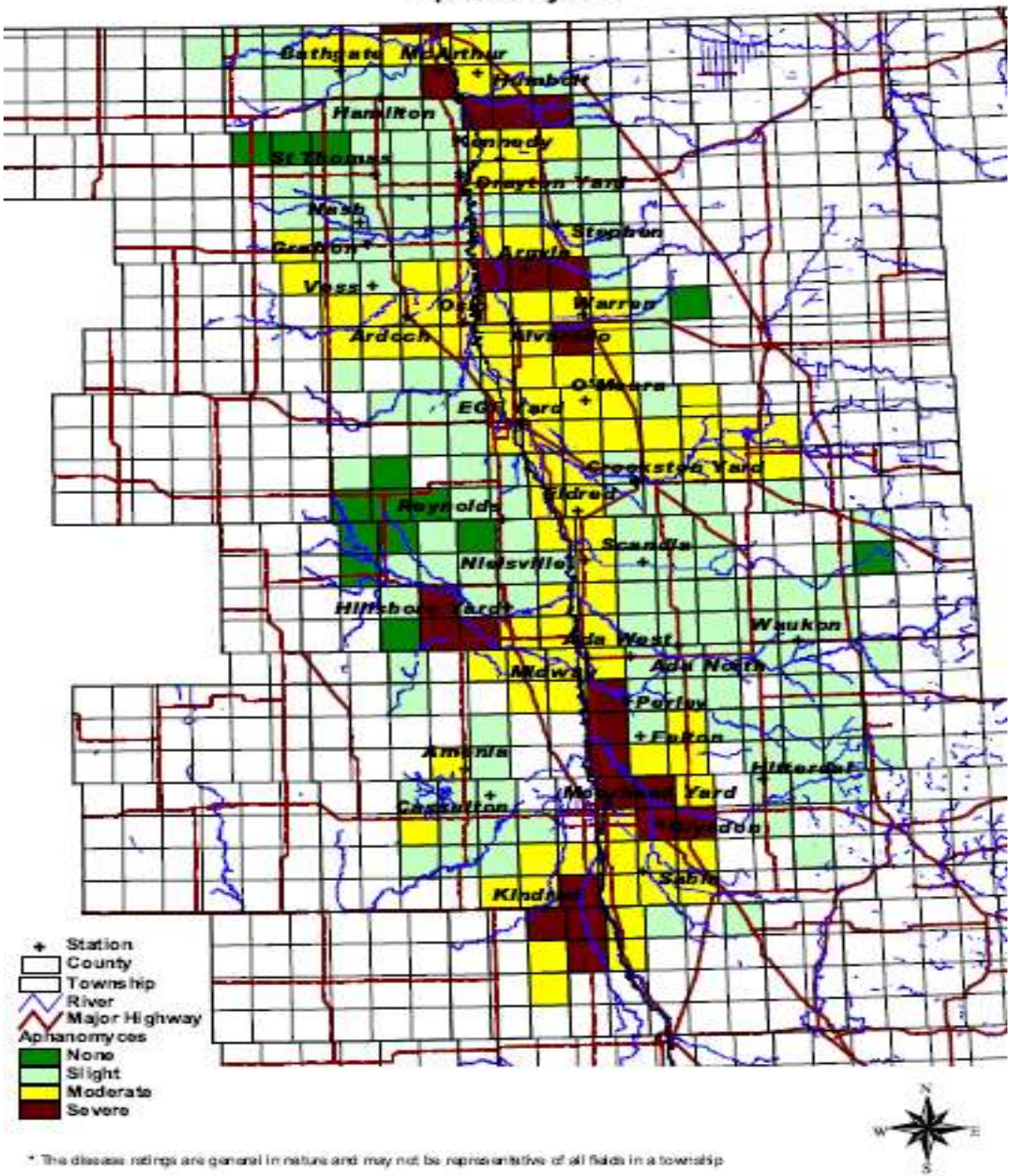
Fusarium Disease Acres



2010 Disease Rating*
Aphanomyces



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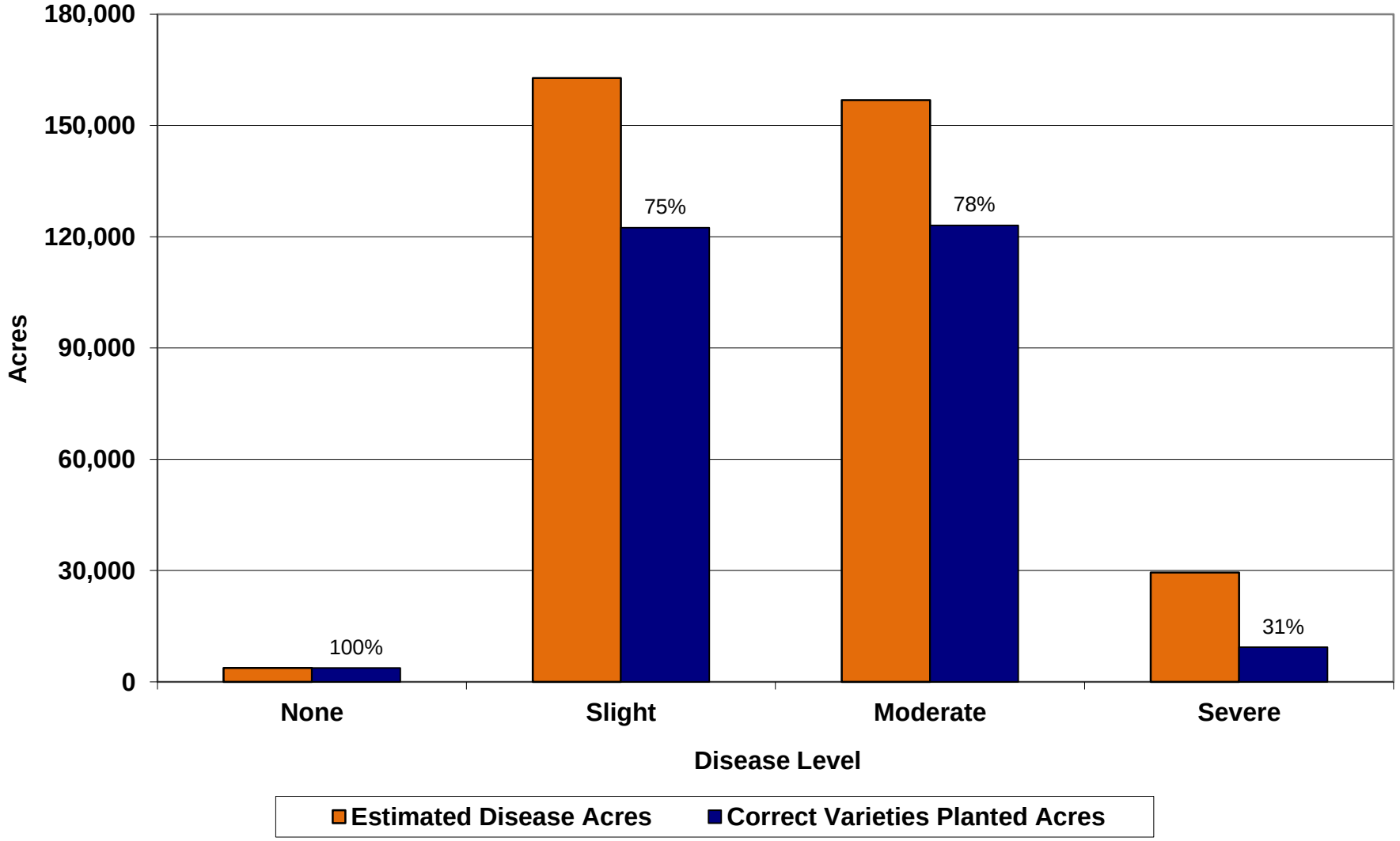
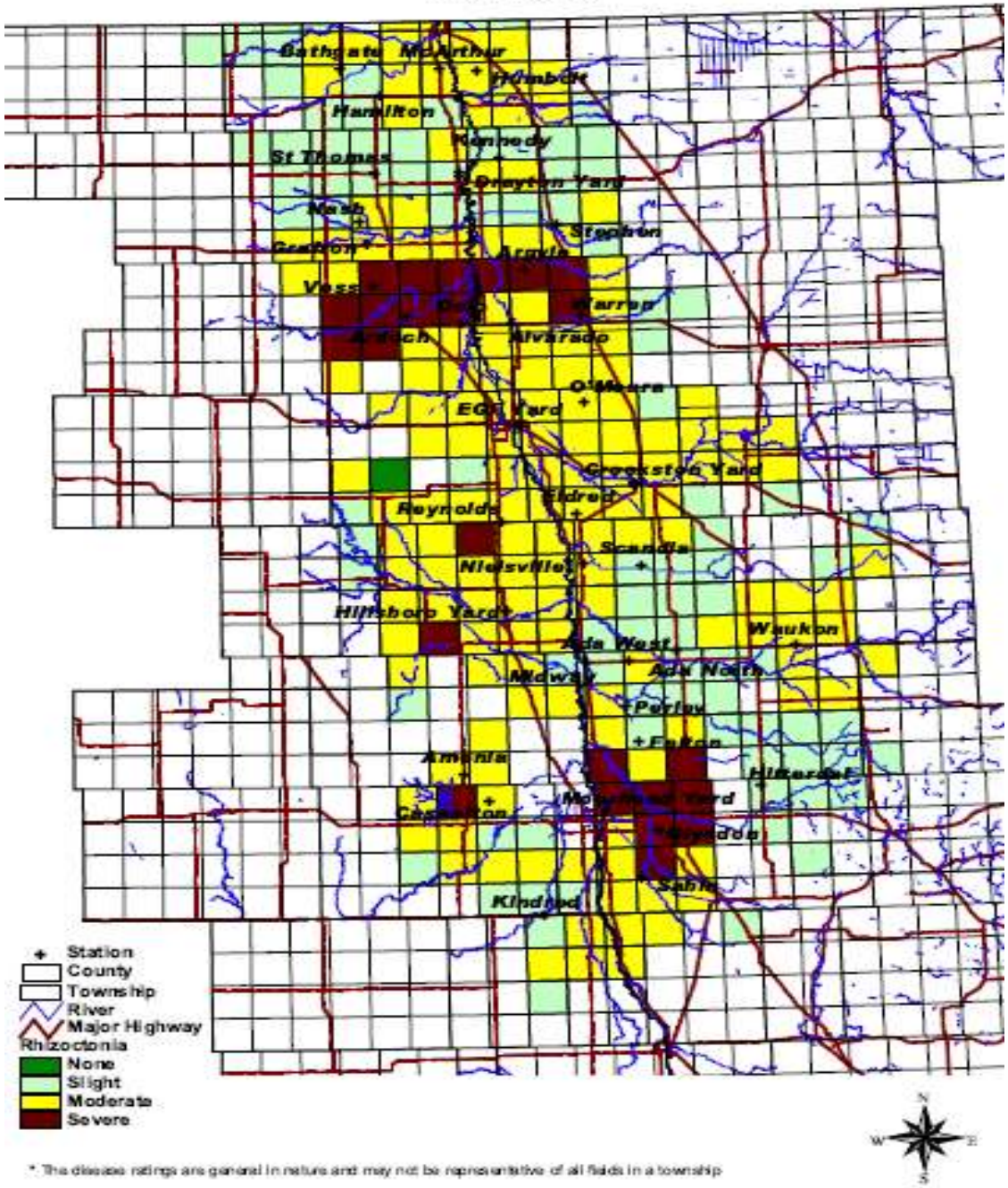
Aphanomyces Disease Acres



2010 Disease Rating*
Rhizoctonia



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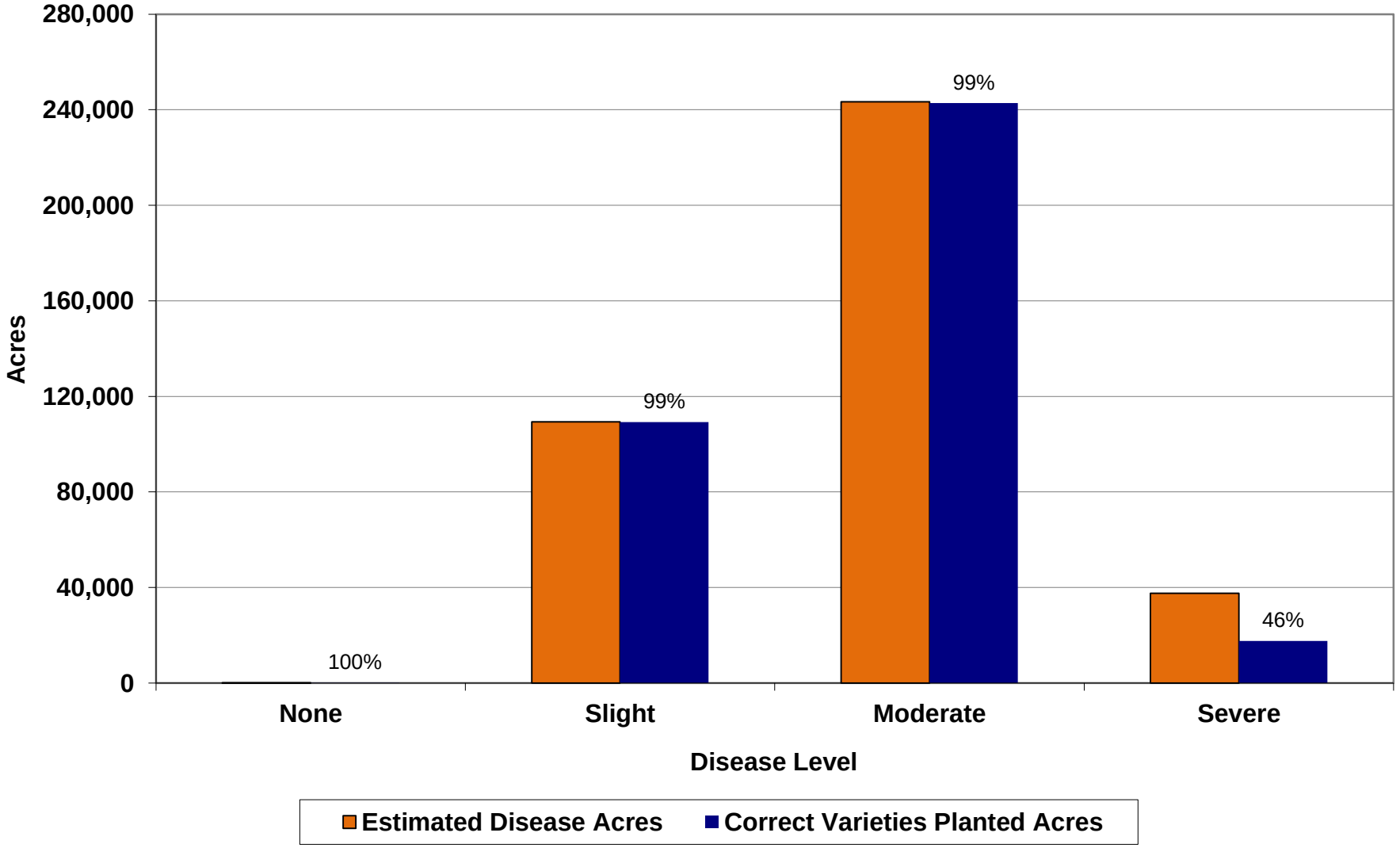
Rhizoctonia Disease Acres



Variety Selection Worksheet

Performance of Roundup Ready® Varieties

	Revenue/Acre % of Benchmark			Revenue/Ton % of Benchmark			Sugar Content % Benchmark		Yield per Acre % Benchmark		Emergence		Cercospora		Aphanomyces <4.9		Rhizoctonia <3.82	>5.0	Fusarium <3.0	>5.0
	2009	2010	2 Year	2009	2010	2 Year	2010	2 Year	2010	2 Year	2010	2 Year	2010	2 Year	2010	2 Year	2010	2 Year	2010	2 Year
BTS 89RR50	110	114	112	101	100	100	100	101	114	112	77	78	5.2	5.0	**3.9**	3.7	4.0	4.4	**2.1**	2.1
BTS 89RR83	103	115	110	97	96	96	97	98	120	113	77	77	4.8	4.7	5.7	4.9	**3.6**	3.6	3.2	3.0
Crystal 986RR	105	113	110	108	104	106	102	103	108	103	67	65	5.4	5.0	**4.2**	4.6	4.7	4.6	5.0	--
Crystal 765RR	119	102	109	112	106	109	103	104	95	101	77	75	4.5	4.7	5.7	5.6	4.4	4.5	4.0	3.9
Crystal 768RR	114	105	108	108	101	104	101	102	103	104	78	77	5.2	5.1	**4.8**	4.9	4.3	4.2	4.2	4.3
BTS 89RR40	111	106	108	107	99	103	100	102	106	105	70	69	5.1	4.9	**4.1**	4.3	4.2	4.3	3.6	3.7
Crystal 875RR	106	108	107	103	101	102	101	101	106	105	80	78	4.3	4.4	**3.3**	3.2	**3.5**	3.8	5.1	4.6
BTS 89RR30	108	107	107	97	97	97	98	98	110	110	80	79	5.1	5.1	**4.3**	4.2	**3.7**	3.8	**1.6**	1.8
BTS 88RR61	111	105	107	107	105	106	103	103	100	102	66	70	4.5	4.8	**4.3**	4.4	**3.6**	4.1	3.8	3.8
Crystal 878RR	110	105	107	103	103	103	102	102	101	104	77	78	5.2	5.0	5.7	5.4	4.4	4.4	4.4	4.3
Crystal 984RR	109	105	107	107	103	105	102	102	102	102	69	73	5.1	5.0	**4.2**	4.3	4.1	--	6.1	--
BTS 89RR10	106	106	106	113	110	111	105	106	96	95	79	76	4.9	4.7	**3.7**	3.8	3.9	4.2	5.5	4.9
BTS 87RR58	108	104	106	104	102	103	101	102	102	103	73	72	5.4	5.2	5.1	4.9	4.5	4.5	5.2	4.8
Crystal 985RR	109	102	105	106	104	105	102	102	99	101	72	74	4.3	4.2	**4.2**	4.2	4.0	--	4.2	--
BTS 87RR38	108	103	105	104	101	102	101	101	102	103	76	71	4.8	4.8	**4.3**	4.5	4.4	4.1	3.6	3.7
SES/VDH H36812RR	108	102	104	103	98	100	99	100	104	105	78	82	5.2	4.9	**4.6**	4.6	4.5	4.5	4.9	4.5
Hilleshög 4012RR	104	104	104	101	102	102	101	101	103	102	78	75	5.0	5.1	**4.3**	4.4	4.5	4.7	6.1	5.7
SES/VDH H36917RR	108	100	103	111	101	105	100	102	100	99	NA	NA	4.9	5.0	**4.7**	4.5	4.3	--	5.0	--

* 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