

EXTENDING KNOWLEDGE >> CHANGING LIVES

NDSU

EXTENSION

# The Scouting Report

Sam Markell, Ph.D.

Professor and Extension Plant Pathologist

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PP1820

# Dry Edible Bean Disease Diagnostic Series

**Samuel Markell**, Extension Plant Pathologist, North Dakota State University

**Robert Harveson**, Extension Plant Pathologist, University of Nebraska

**Julie Pasche**, Dry Bean and Pulse Crop Pathologist, North Dakota State University

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NDSU NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION



UNIVERSITY OF Nebraska Lincoln

PP1820-9  
Dry Edible Bean Disease Diagnostic Series

## White mold

*Sclerotinia sclerotiorum*



Figure 1

Photo: S. Markell, NDSU



Figure 2

Photo: M. Wasech, NDSU



Figure 3

Photo: S. Markell, NDSU

Photo: R. Harveson, Univ. of Nebraska



Figure 4

PP1820-9  
Dry Edible Bean Disease Diagnostic Series

## White mold

*Sclerotinia sclerotiorum*

**AUTHORS:** Julie Pasche, Bob Harveson and Sam Markell

### SYMPTOMS

- Water-soaked lesion that becomes tan as it enlarges
- Stem lesions will dry out, lighten in color and tissue may shred
- White fungal growth and hard black sclerotia may form in or on stem

**FIGURE 1** - Small tan mushrooms (apothecia) about ¼ inch in diameter emerge from hard, black structures (sclerotia)

**FIGURE 2** - Enlarging tan lesions with white fungal growth

**FIGURE 3** - Mature stem lesion with dried-bone appearance, white fungal growth and black sclerotia

**FIGURE 4** - Severe white mold damage

### FACTORS FAVORING DEVELOPMENT

- Wet soils prior to bloom; allows sclerotia to germinate and release spores
- Cool daytime temperatures (60 to 70F) during and after bloom
- Long periods of canopy wetness and/or frequent rainfall during bloom
- Lush plant growth

### IMPORTANT FACTS

- All broadleaf crops and many weeds are susceptible to white mold
- Plants are only susceptible when in bloom
- Preventative fungicide applications may be economically viable
- Can be confused with wilt diseases or abiotic stress

Card 9 of 15

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Photo: R. Harveson





































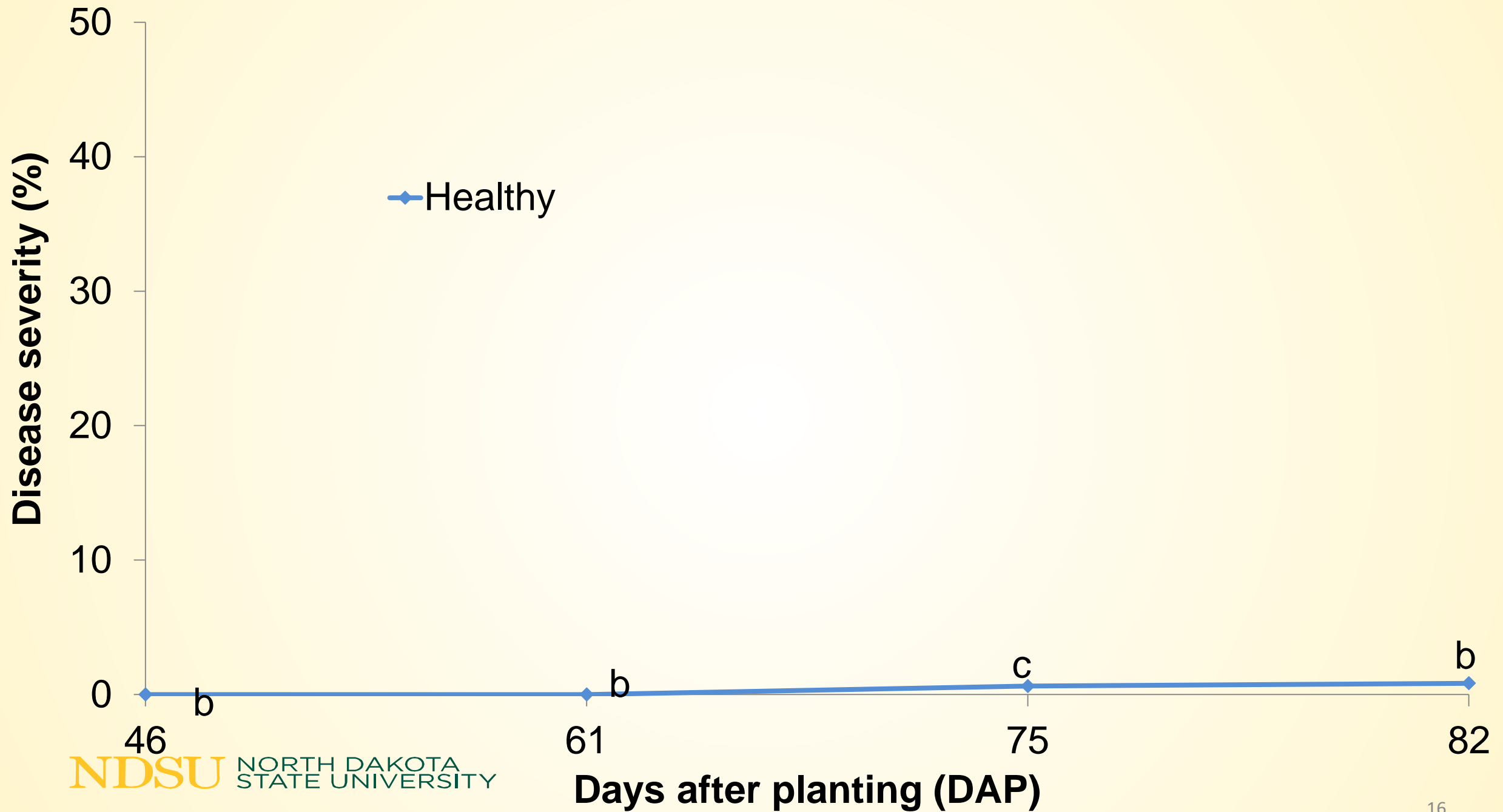




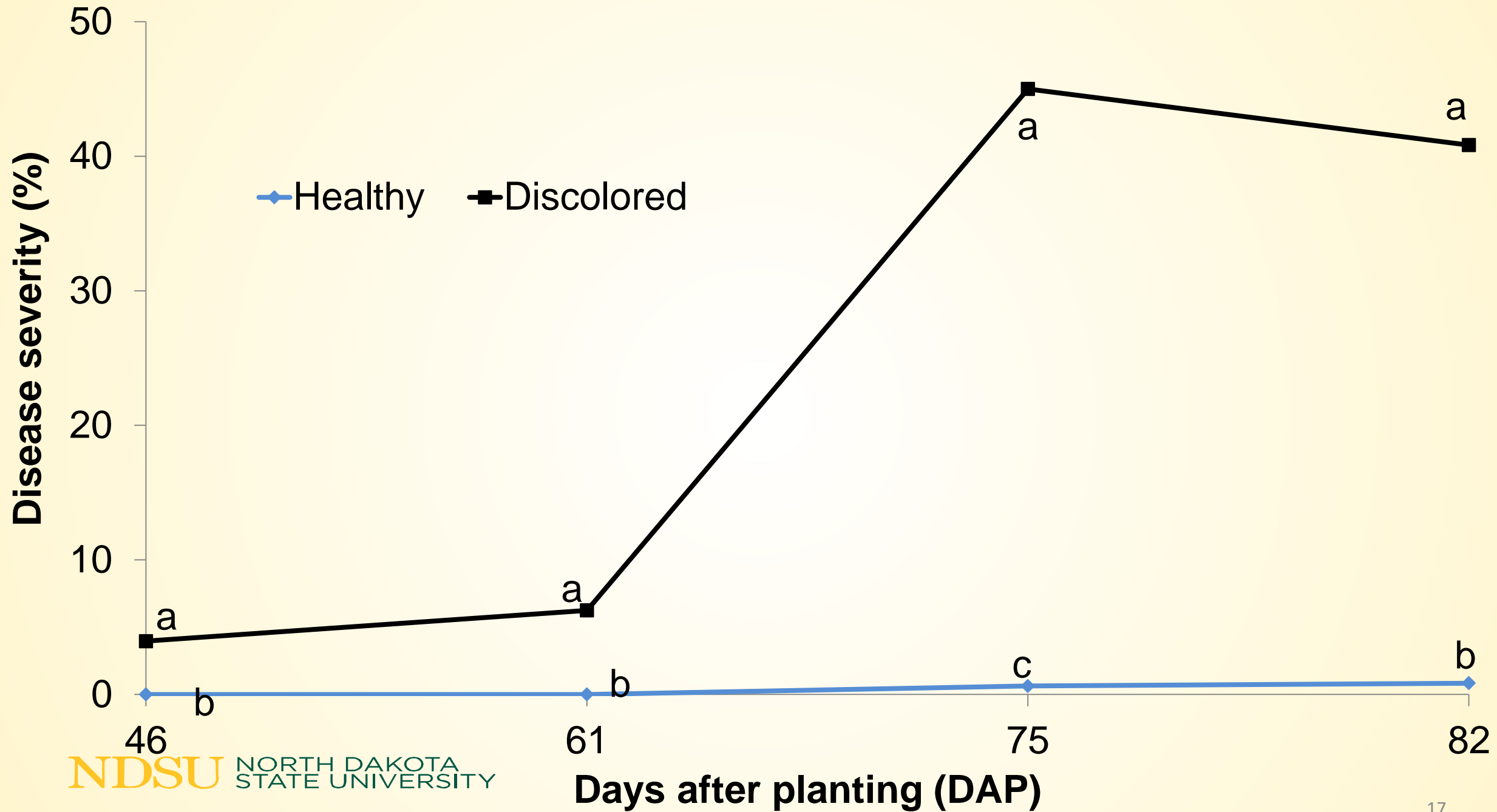
# Morden, MB: 2014



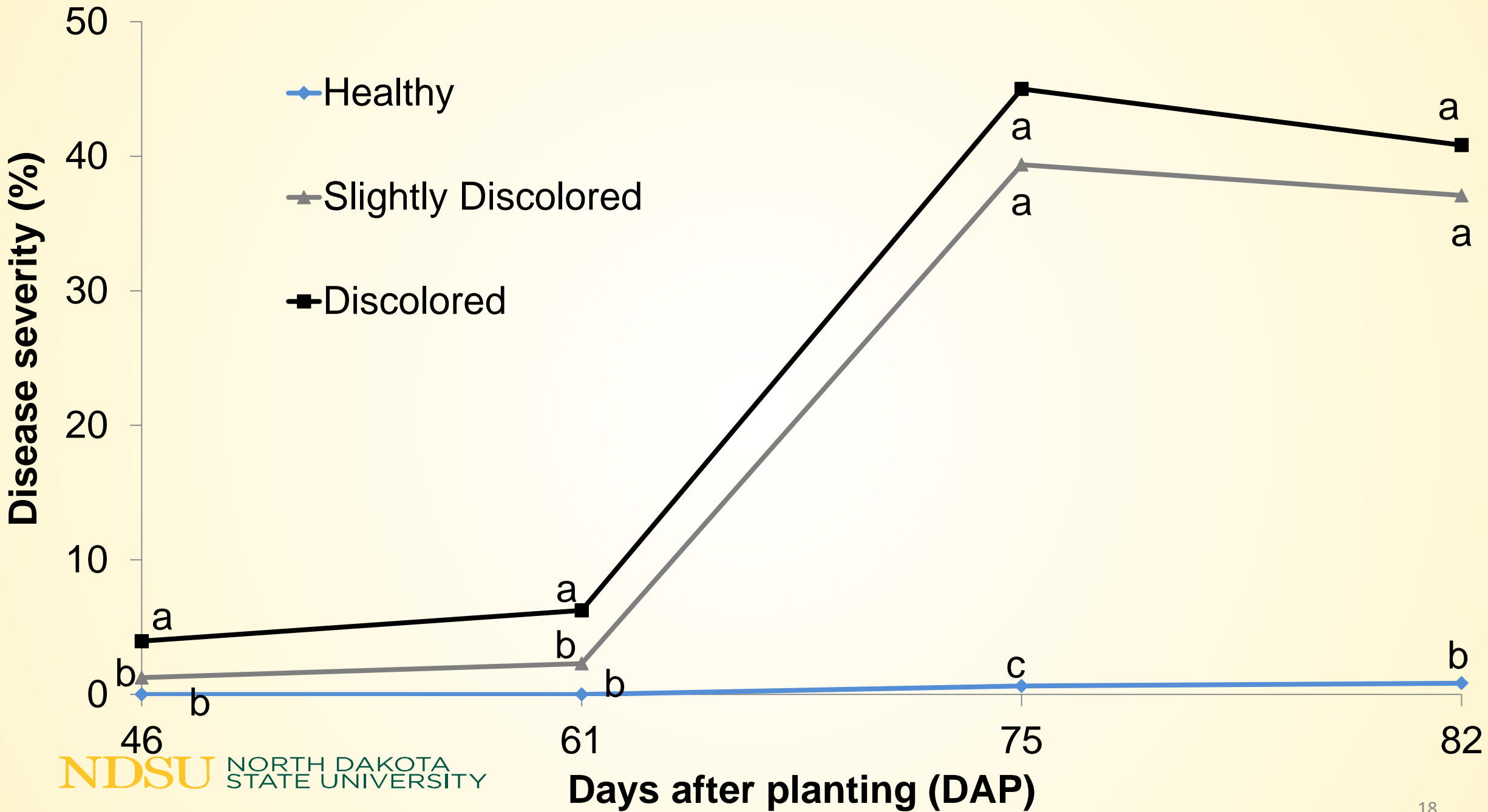




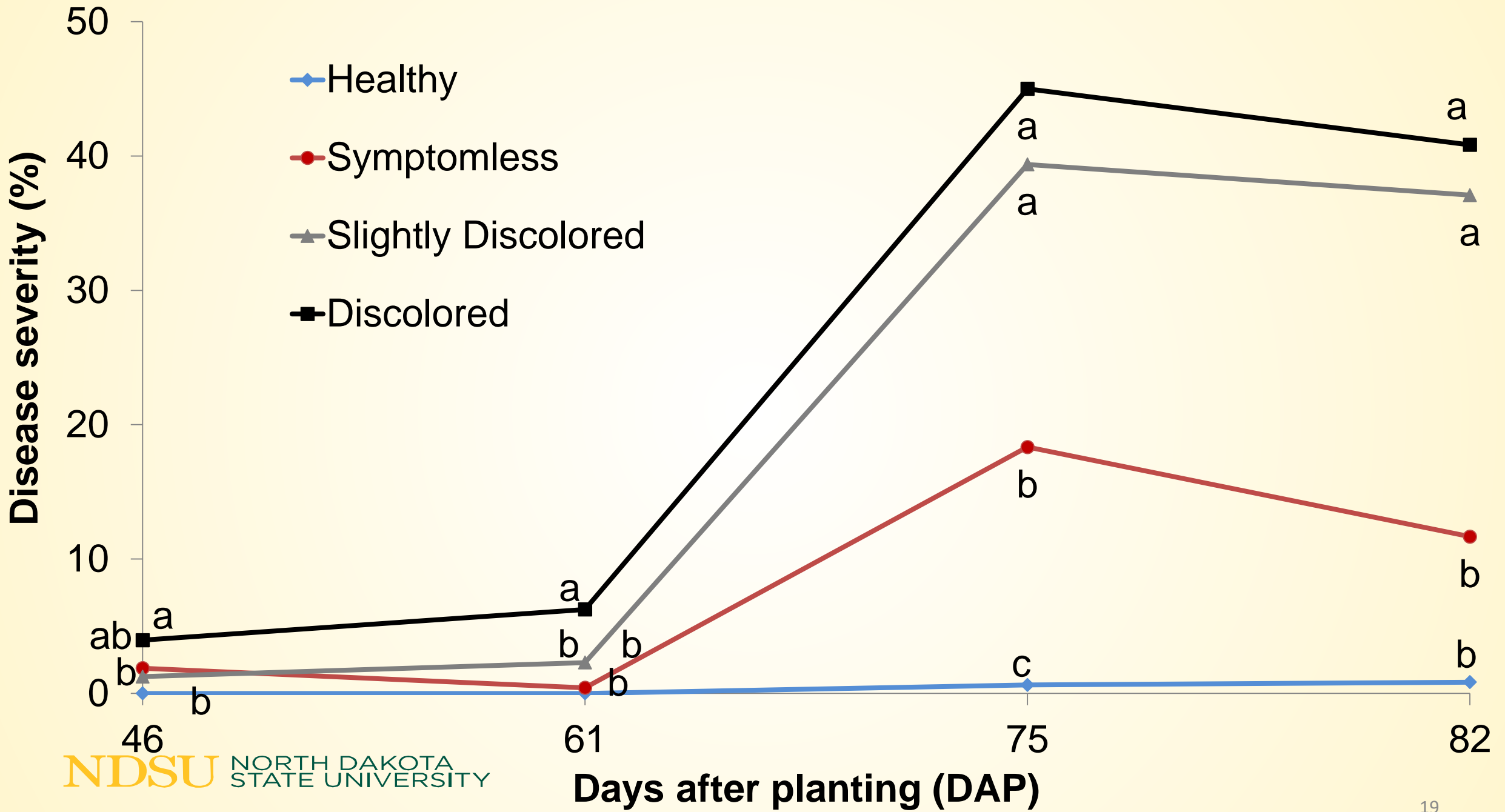














# Root Rots and Seed Treatment





Photo: R. Harveson



Photo: R. Harveson

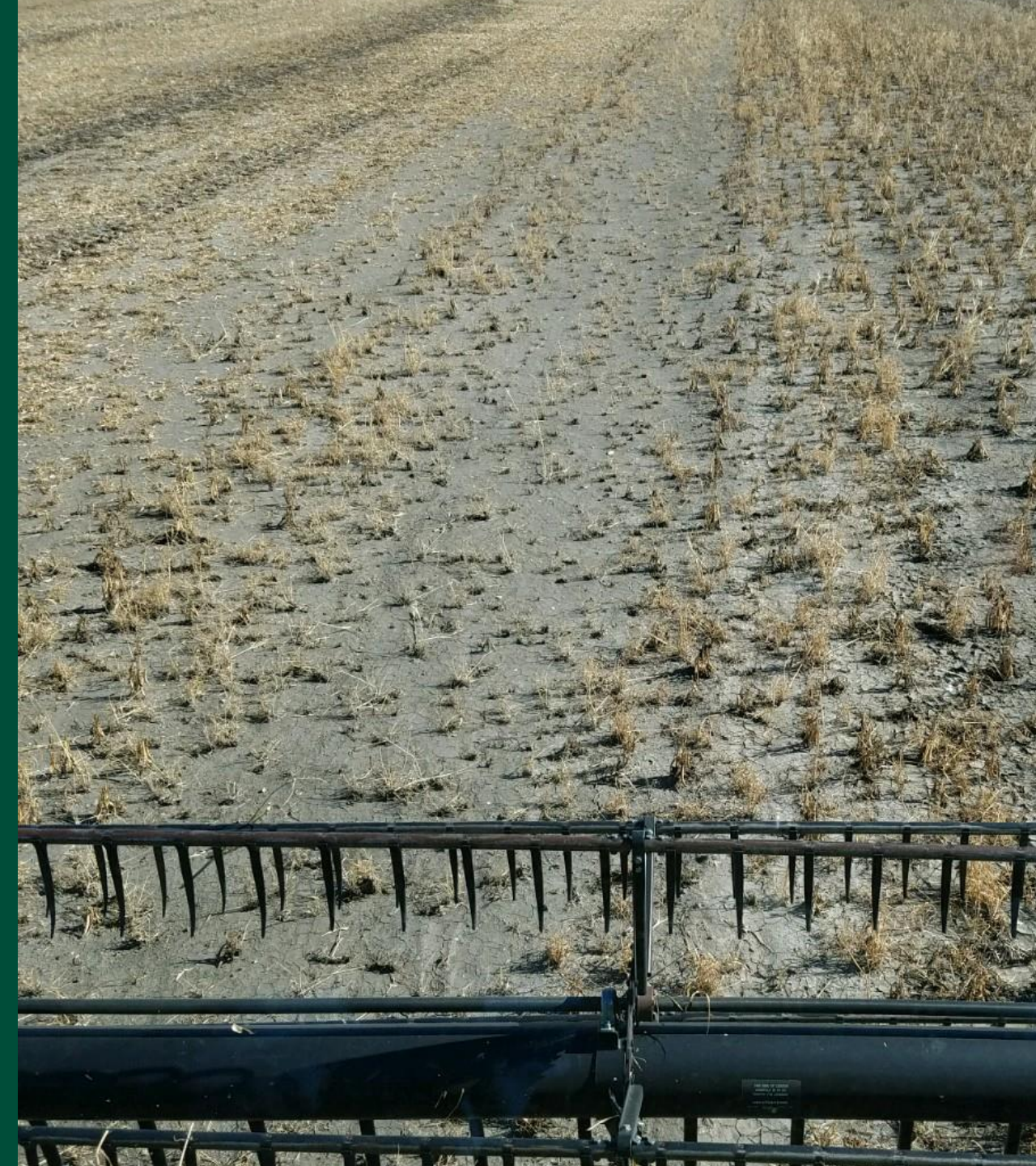


Photo: J. Pasche



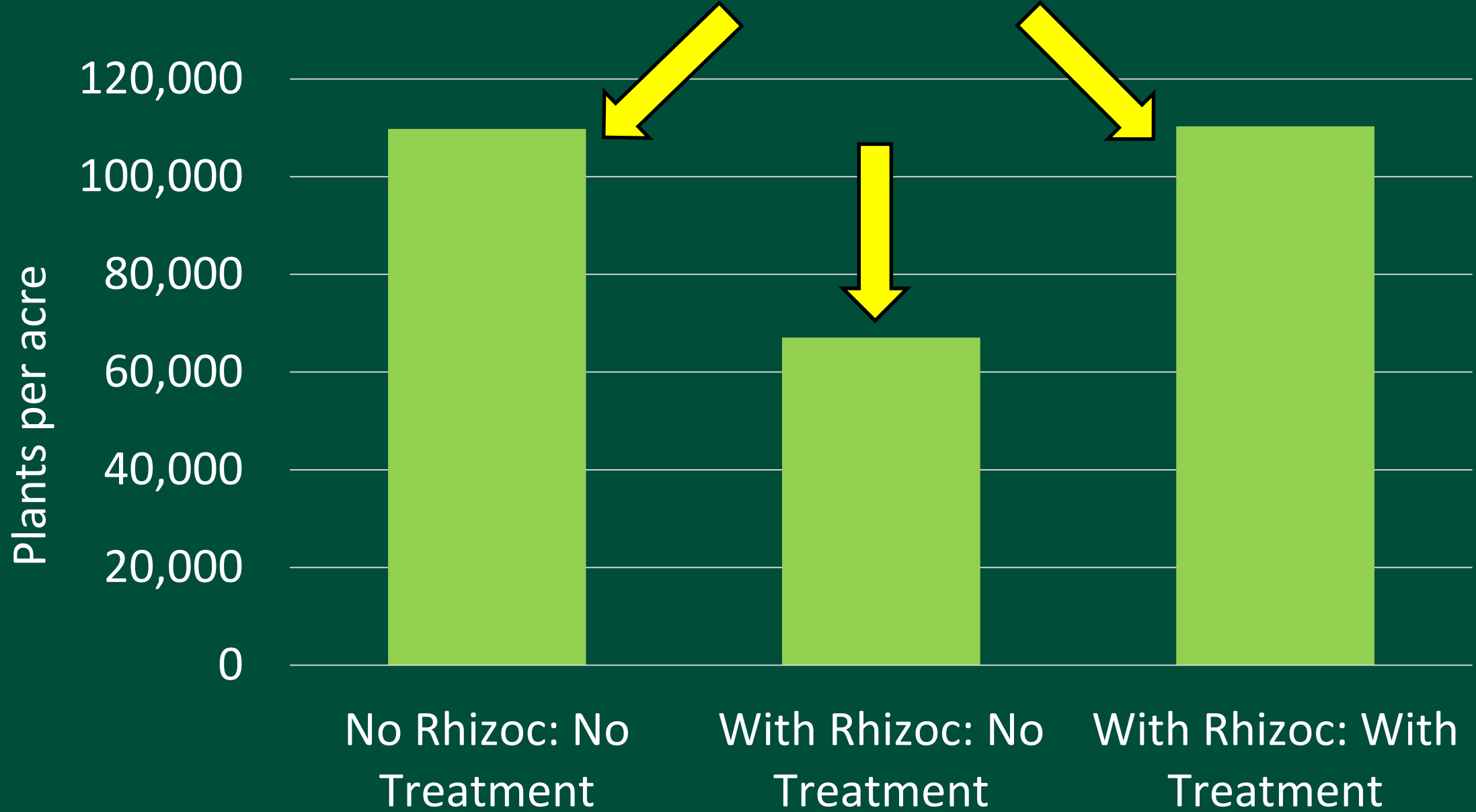


Photo: J. Pasche



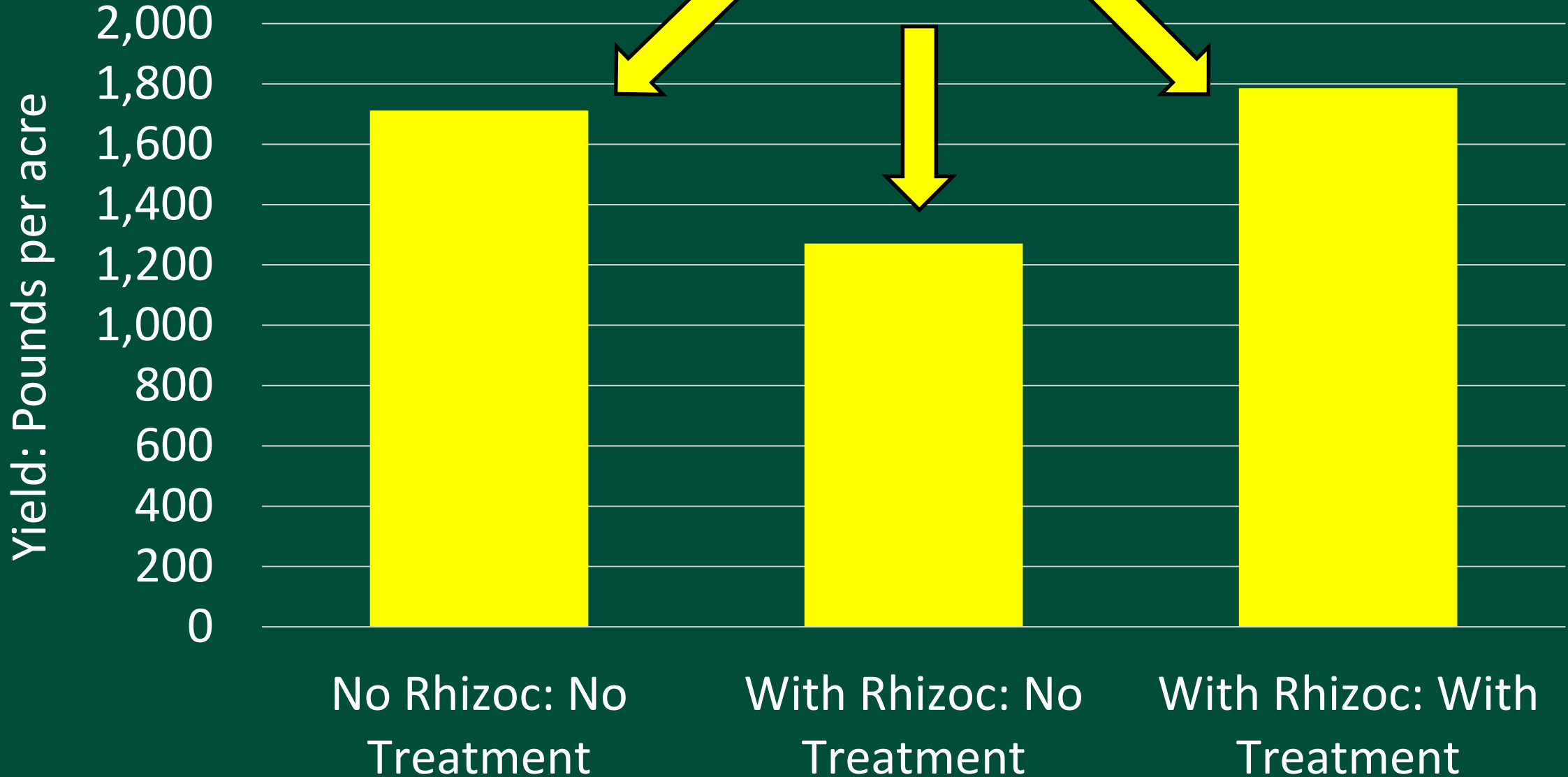


# *Rhizoctonia & Seed Treatment*





# *Rhizoctonia & Seed Treatment*







# Rust



























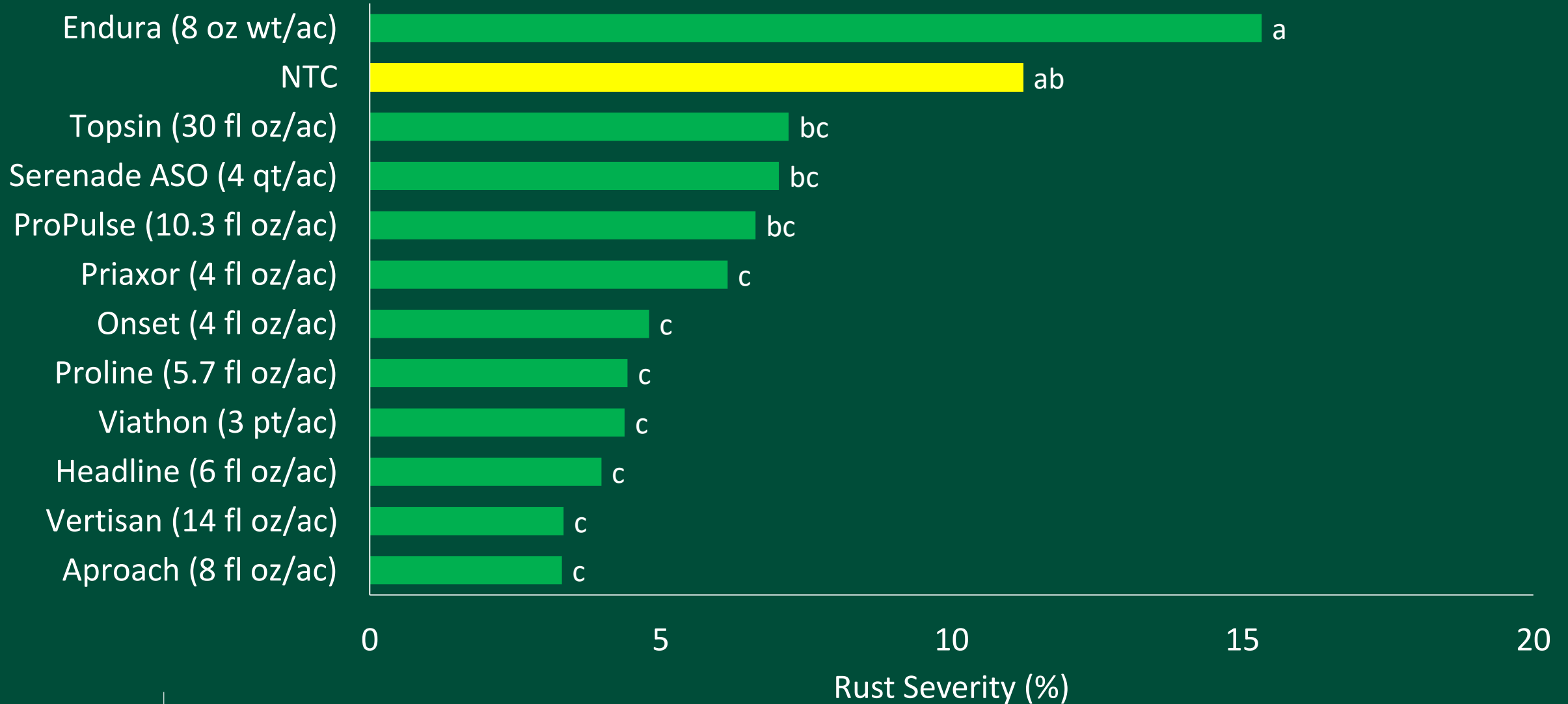


# Rust Management

- Rotation
- Genetic Resistance
  - Awesome, when it works
- Fungicides
  - Timing is after you identify it
  - Multiple chemistries are effective

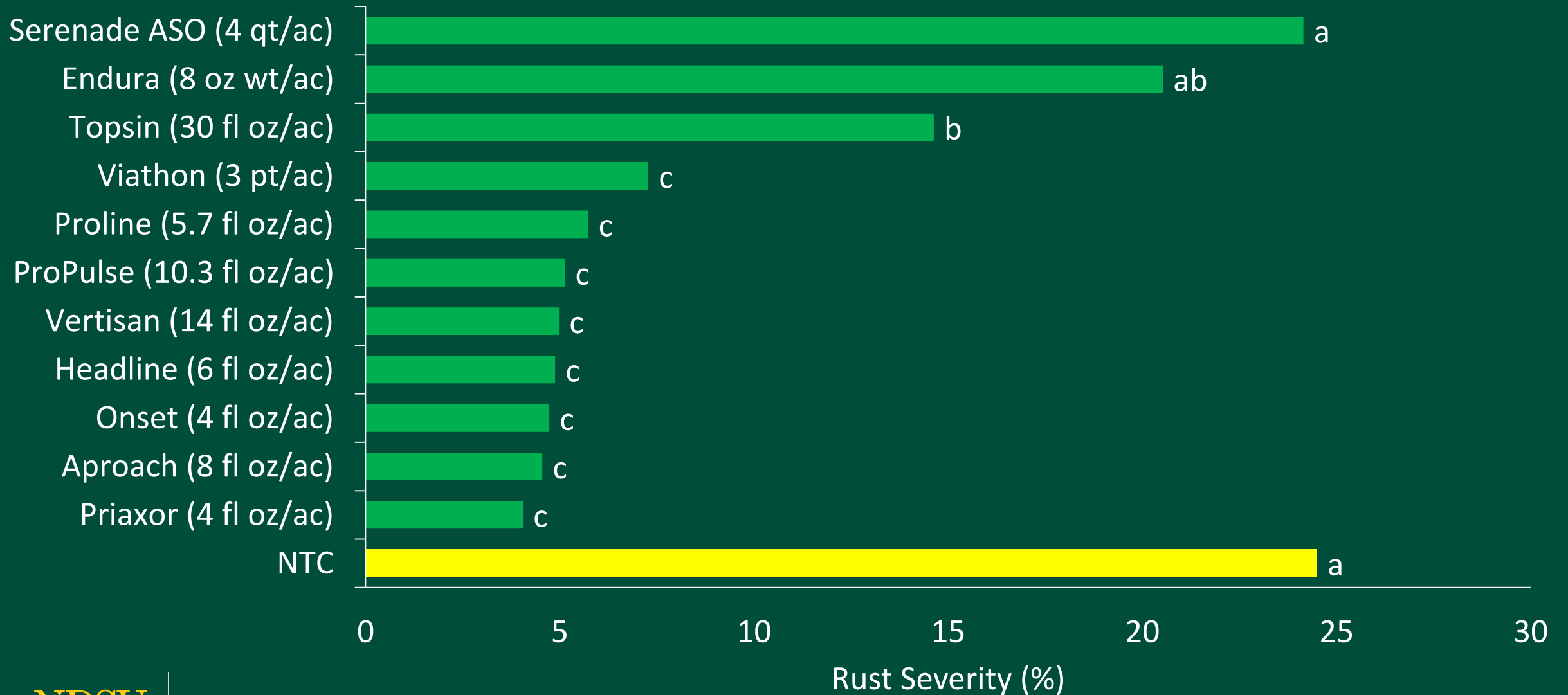


# Rust Fungicides – 2015 Severity





# Rust Fungicides – 2016 Severity





# White mold

















Wunsch



Markell







# Managing white mold with fungicides

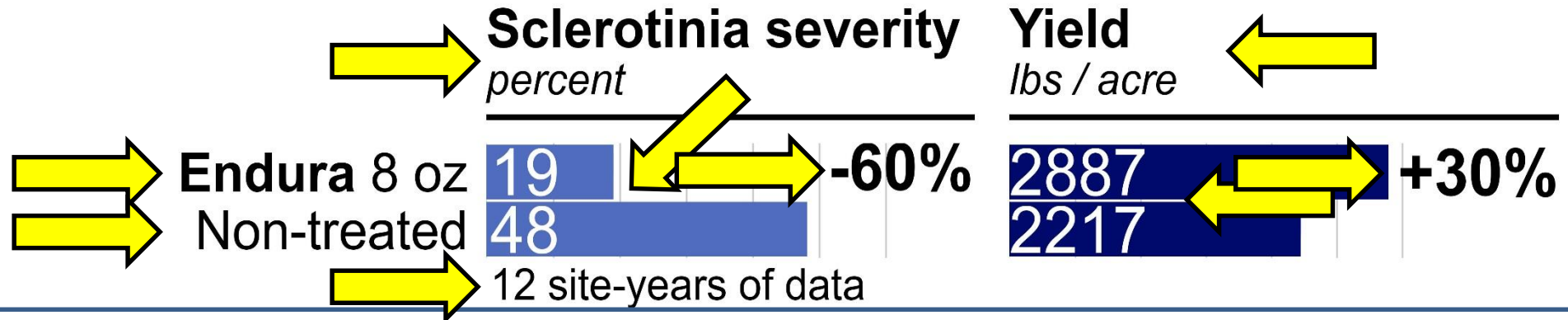
- Timing
  - Favorable conditions – bloom stages
- Fungicide efficacy
  - Don't cut rates
  - Multiple chemistries are effective
  - Strobilurins and triazoles (*exceptions*) are generally less effective
- Resources
  - Carrington REC (Dr. Michael Wunsch)
  - Canola risk map



# SCLEROTINIA MANAGEMENT IN DRY BEANS

## Fungicide efficacy – Multi-year summary

### Multiple chemistries are effective



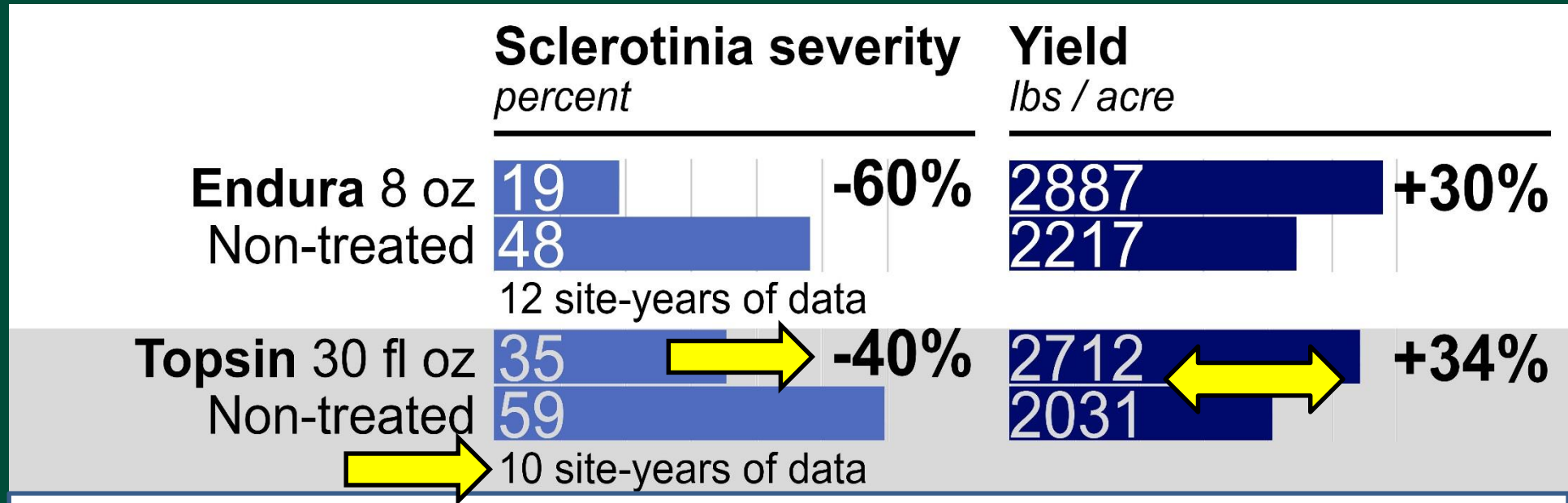
15 gal/ac, 35 psi 8001, flat fan nozzles. Two applications first at 80-100% bloom (Wunsch).



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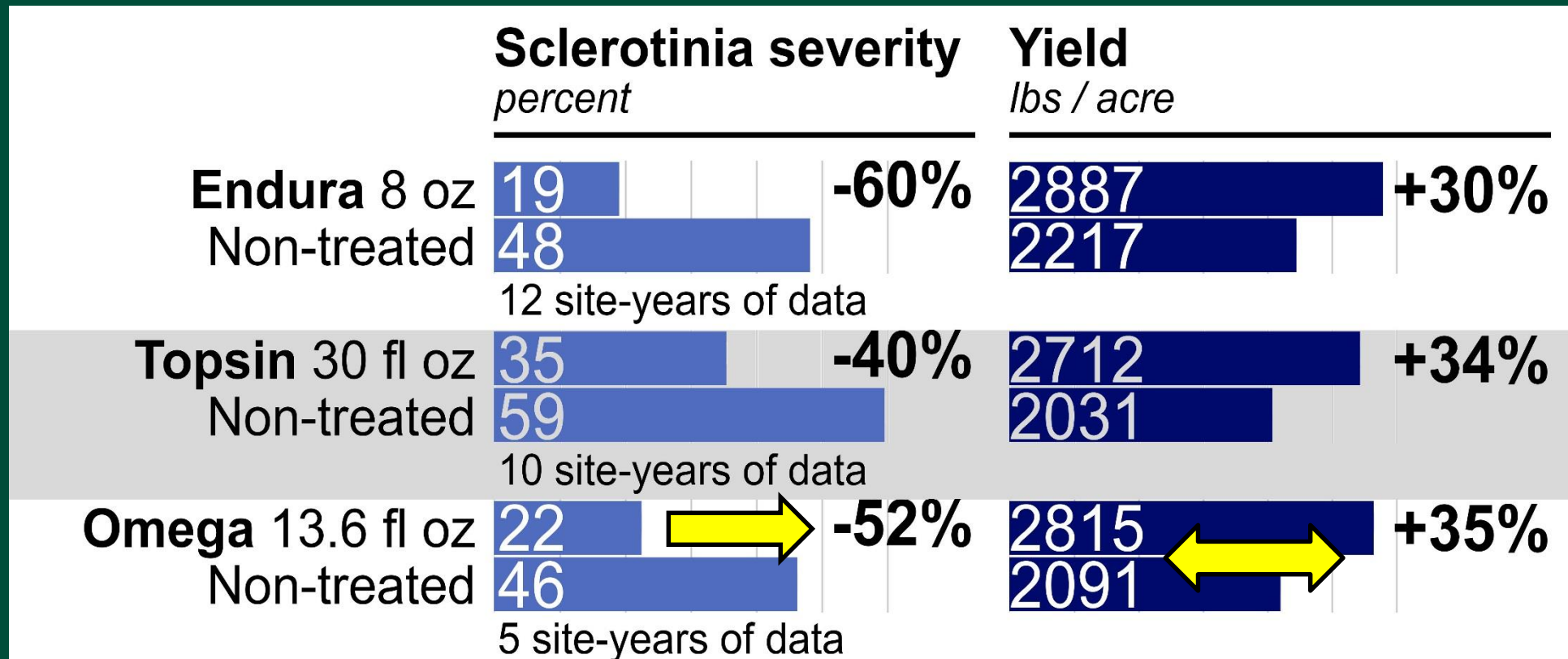
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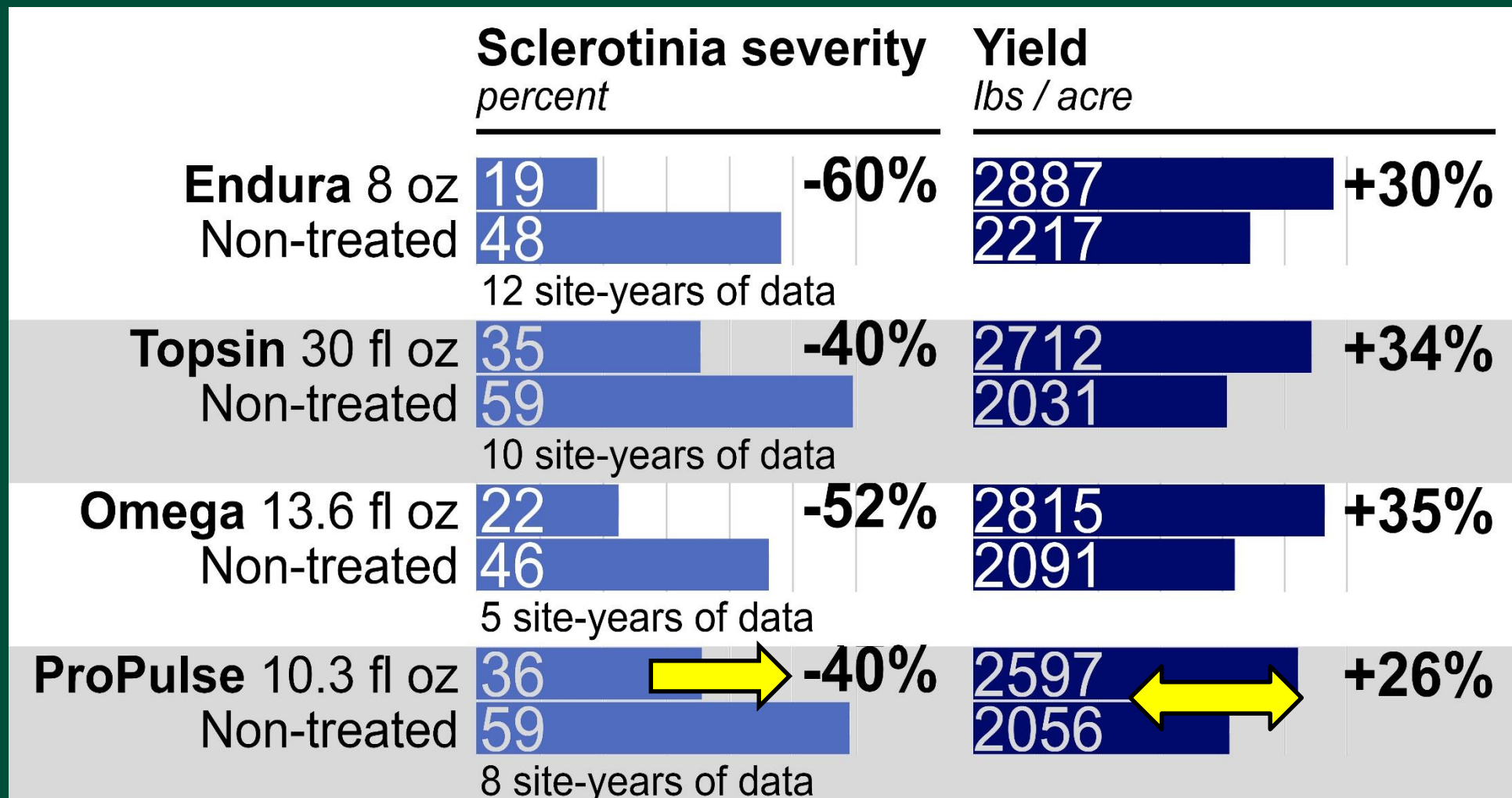
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15 gal/ac, 35 psi 8001, flat fan nozzles. Two applications first at 80-100% bloom (Wunsch).



# SCLEROTINIA MANAGEMENT IN DRY BEANS

## Fungicide efficacy – Multi-year summary

**Application rates are important**

	<b>Sclerotinia severity</b> <i>percent</i>	<b>Yield</b> <i>lbs / acre</i>
<b>Topsin 30 fl oz</b> Non-treated		
<b>Topsin 20 fl oz</b> Non-treated		

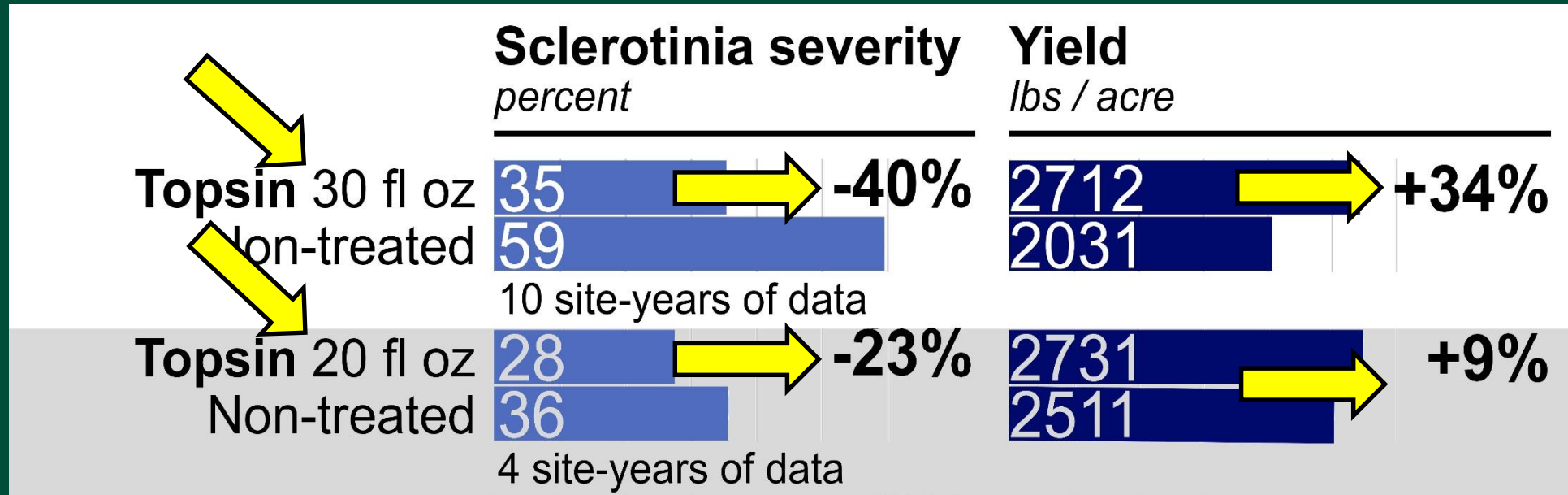
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# SCLEROTINIA MANAGEMENT IN DRY BEANS

## Fungicide efficacy – Multi-year summary

### Application rates are important



15 gal/ac, 35 psi 8001, flat fan nozzles. Two applications first at 80-100% bloom (Wunsch).



# SCLEROTINIA MANAGEMENT IN DRY BEANS

## Fungicide efficacy – Multi-year summary

### Application rates are important

	<b>Sclerotinia severity</b> <i>percent</i>	<b>Yield</b> <i>lbs / acre</i>
<b>Topsin 30 fl oz</b>	<b>35</b>	<b>2712</b>
Non-treated	59	2031
	-40%	+34%
10 site-years of data		
<b>Topsin 20 fl oz</b>	<b>28</b>	<b>2731</b>
Non-treated	36	2511
	-23%	+9%
4 site-years of data		
<b>ProPulse 10.3 fl oz</b>		
Non-treated		
<b>ProPulse 8.6 fl oz</b>		
Non-treated		

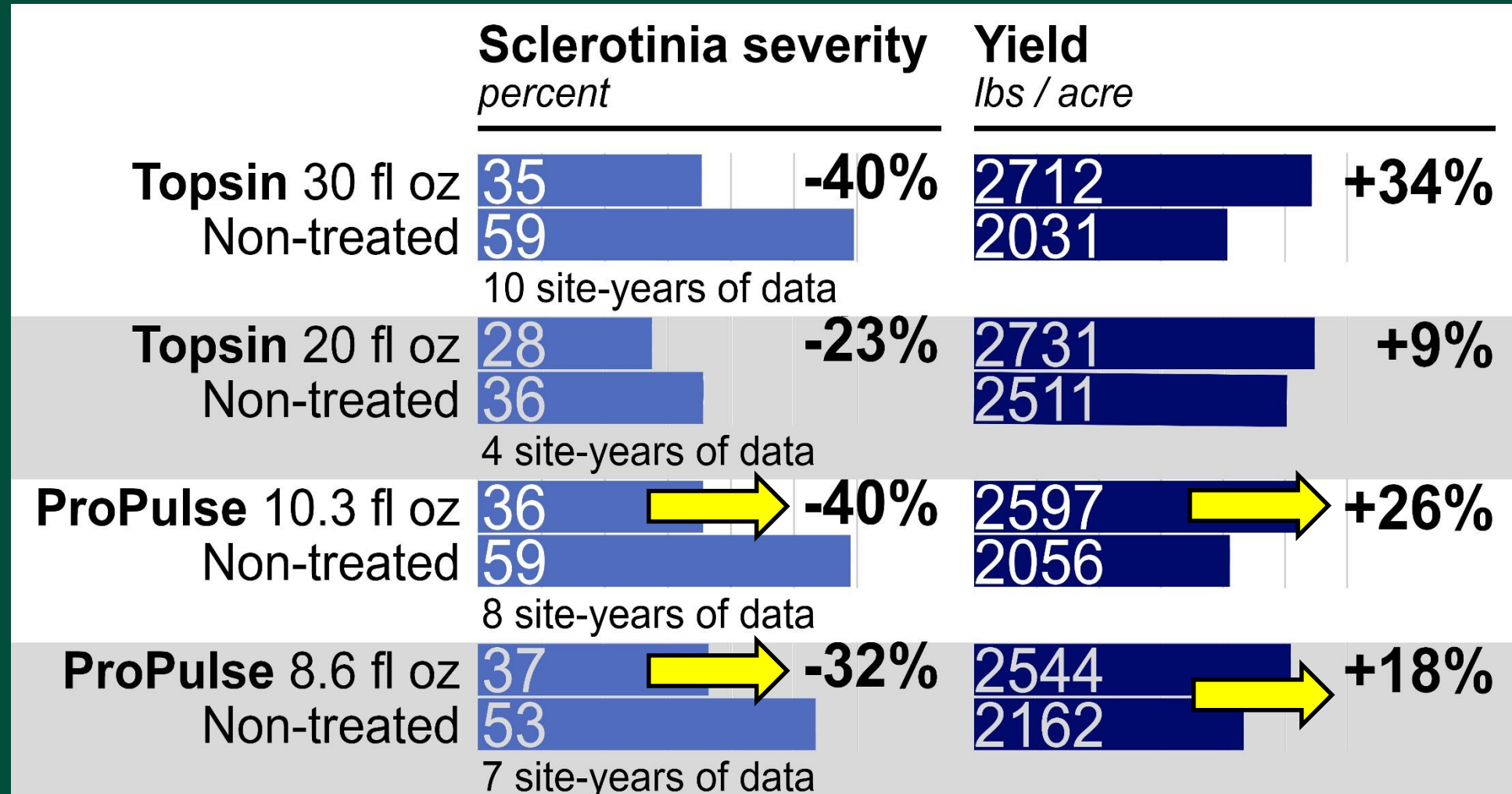
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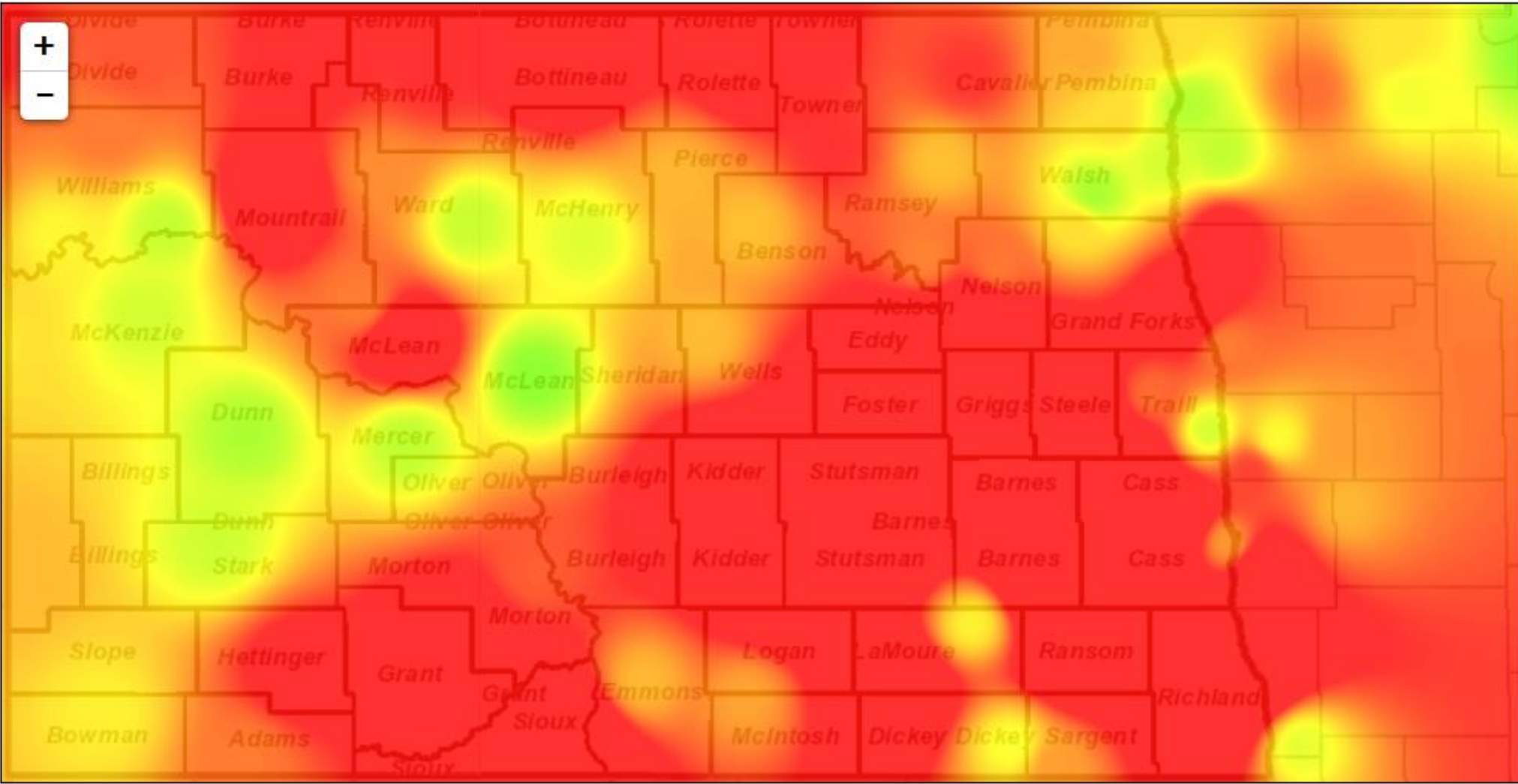
## Fungicide efficacy – Multi-year summary

### Application rates are important



15 gal/ac, 35 psi 8001, flat fan nozzles. Two applications first at 80-100% bloom (Wunsch).

# Estimated risk of Sclerotinia stem rot development for canola 07/04/2020



## Previous risk maps

Select date:

## Risk calculator

Closest NDAWN Station:  
  
Last time planted to canola:  
  
Sclerotinia on last canola:  
  
Last year's crop in this field:  
  
Tillage last year:  
  
Canola Row Spacing:



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# Managing white mold with fungicides

- Sclerotinia Risk Map
  - [www.ag.ndsu.edu/sclerotinia](http://www.ag.ndsu.edu/sclerotinia)
  - [www.northerncanola.com/](http://www.northerncanola.com/)
- Developed by the NDSU
- Funded by Northern Canola Growers Association and Minnesota Canola Council



# Soybean Cyst Nematode





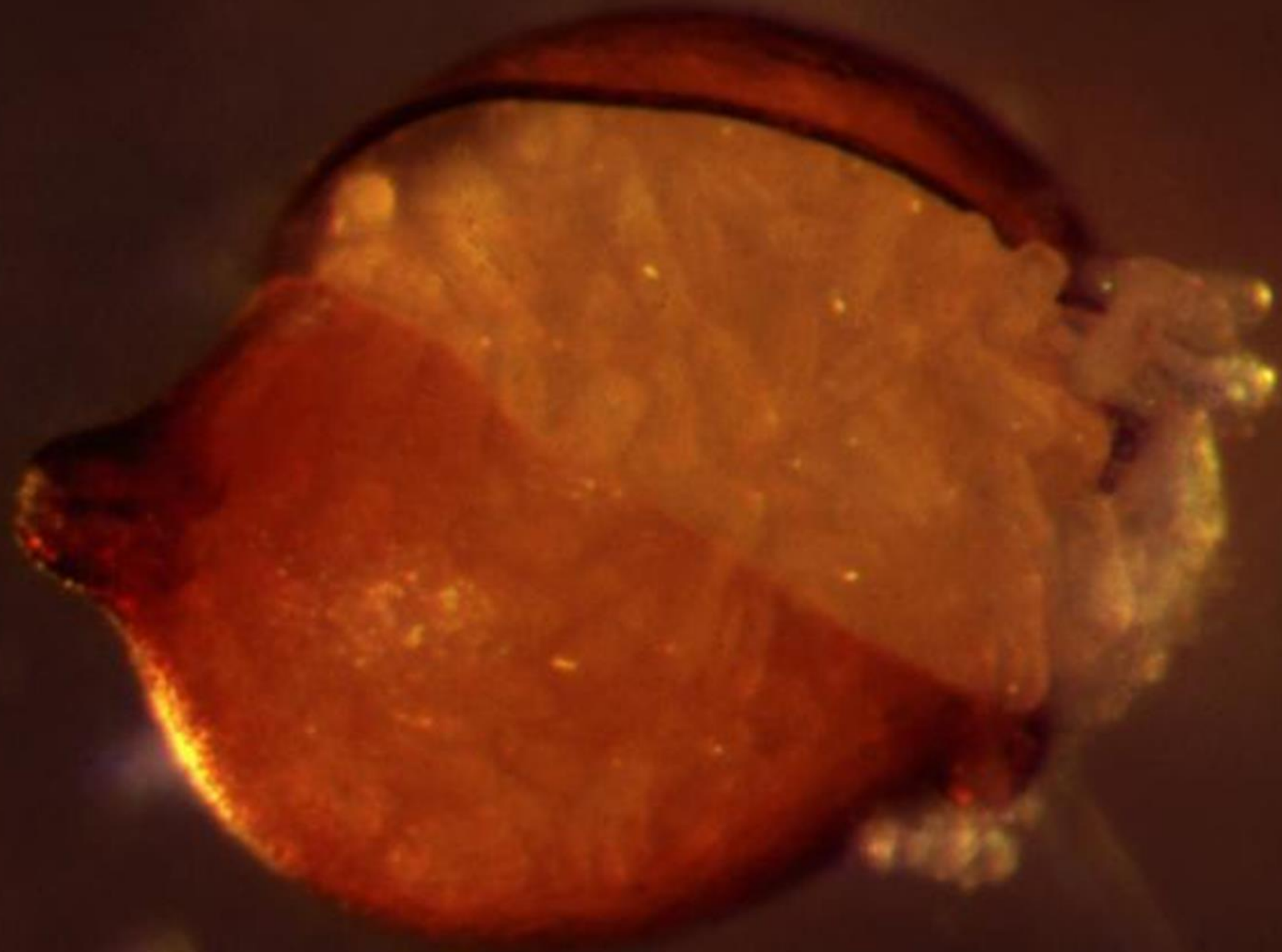
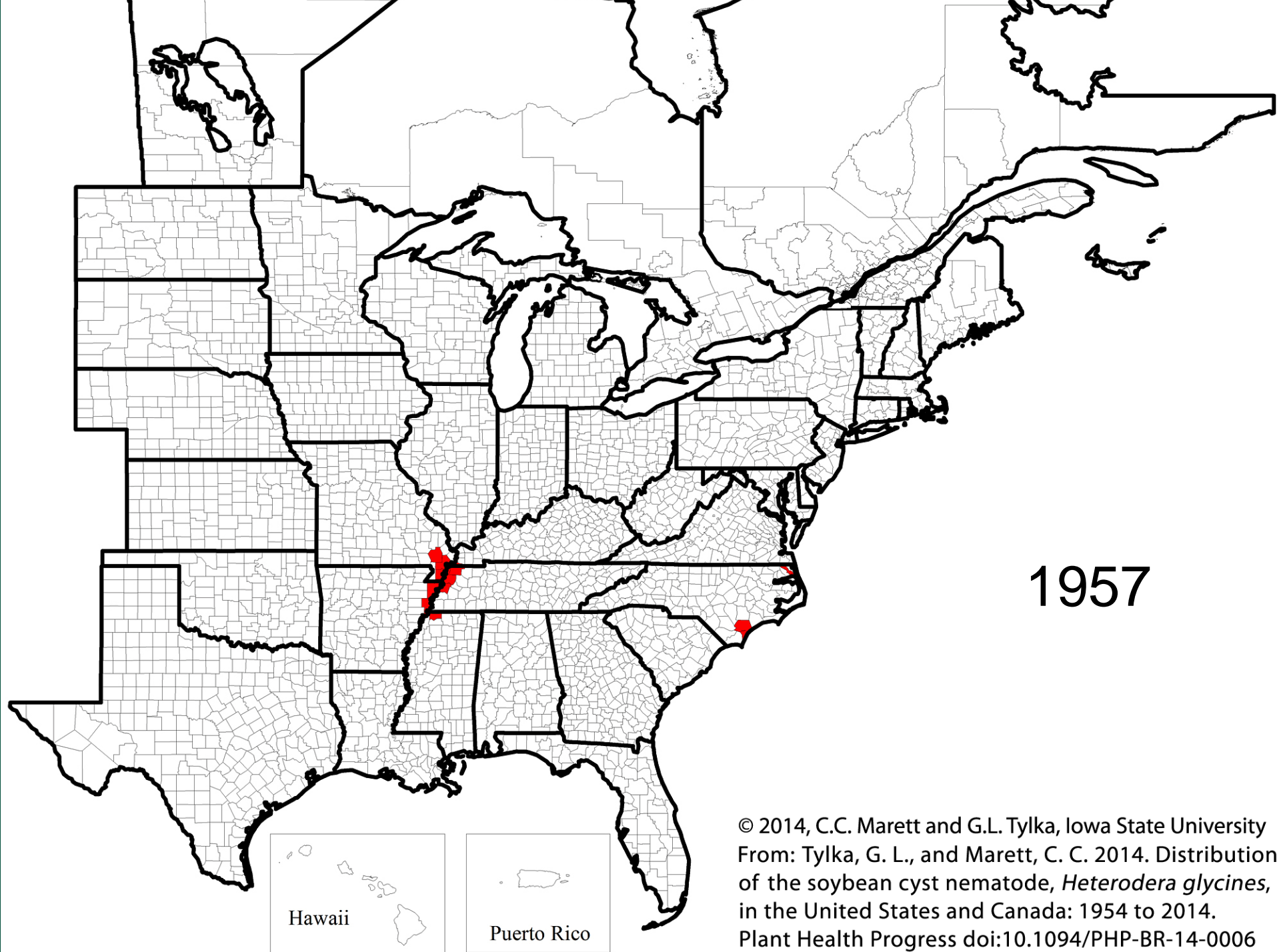
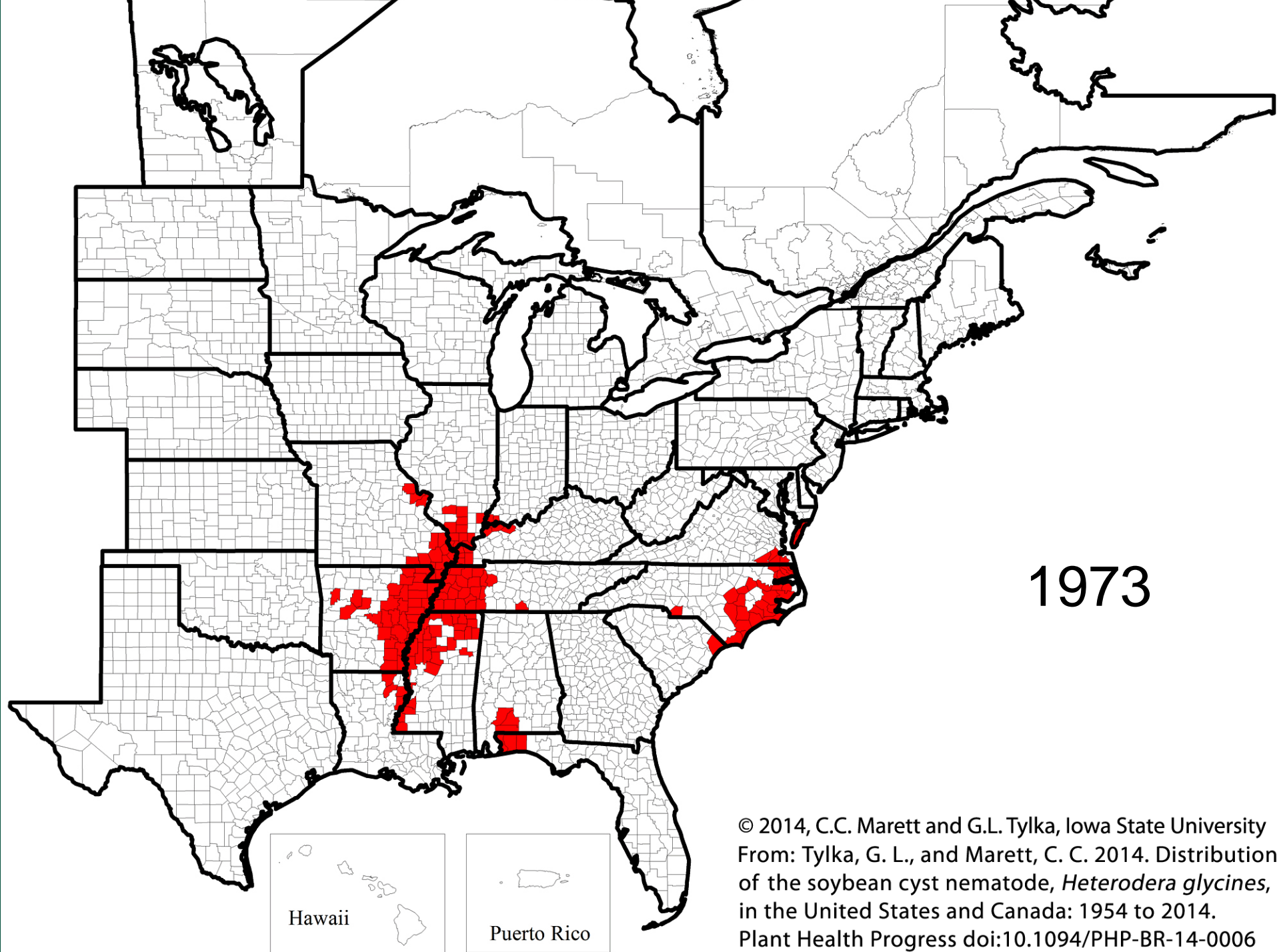


Photo: McGawley

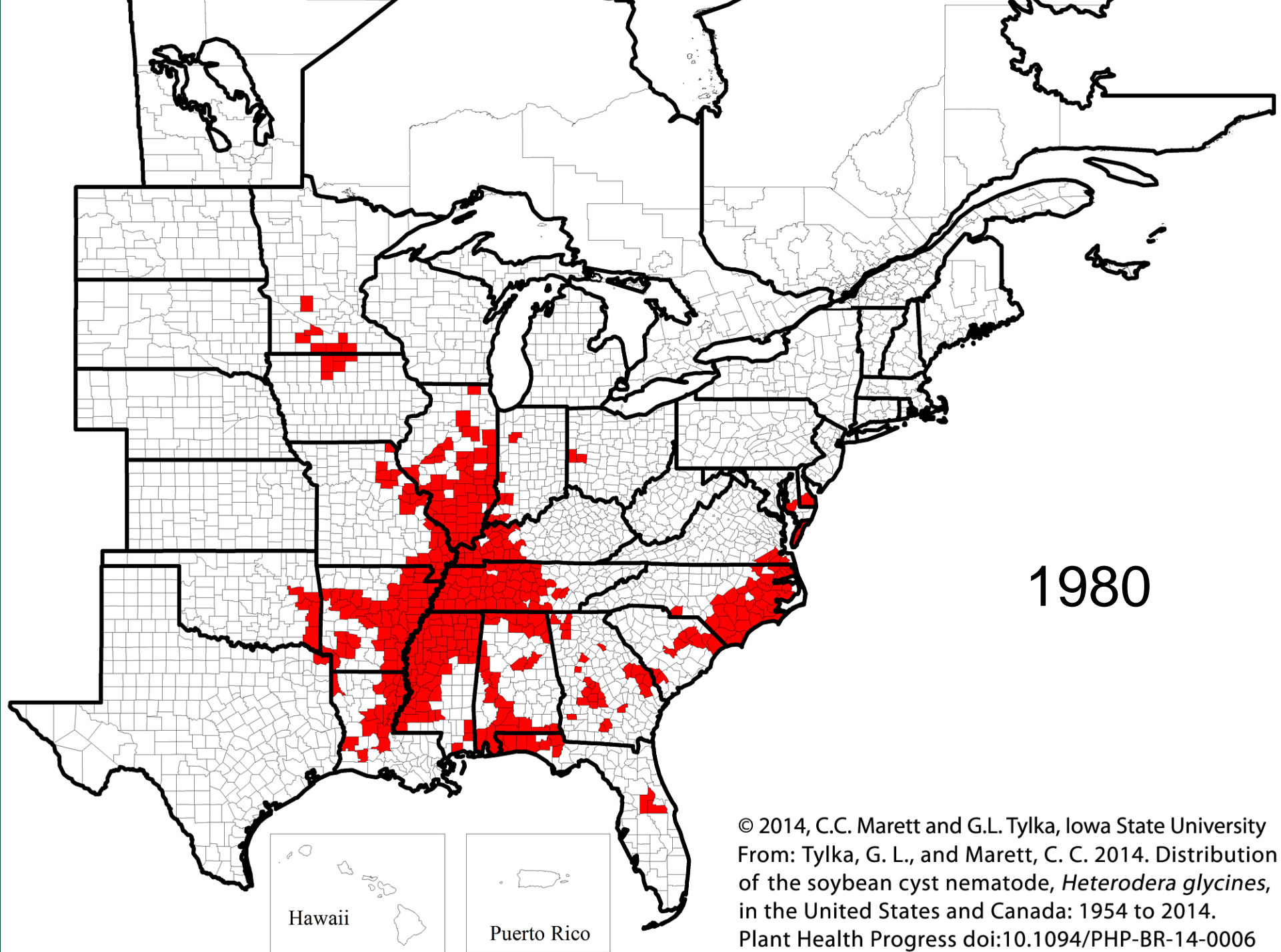


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of the soybean cyst nematode, *Heterodera glycines*,  
in the United States and Canada: 1954 to 2014.  
Plant Health Progress doi:10.1094/PHP-BR-14-0006





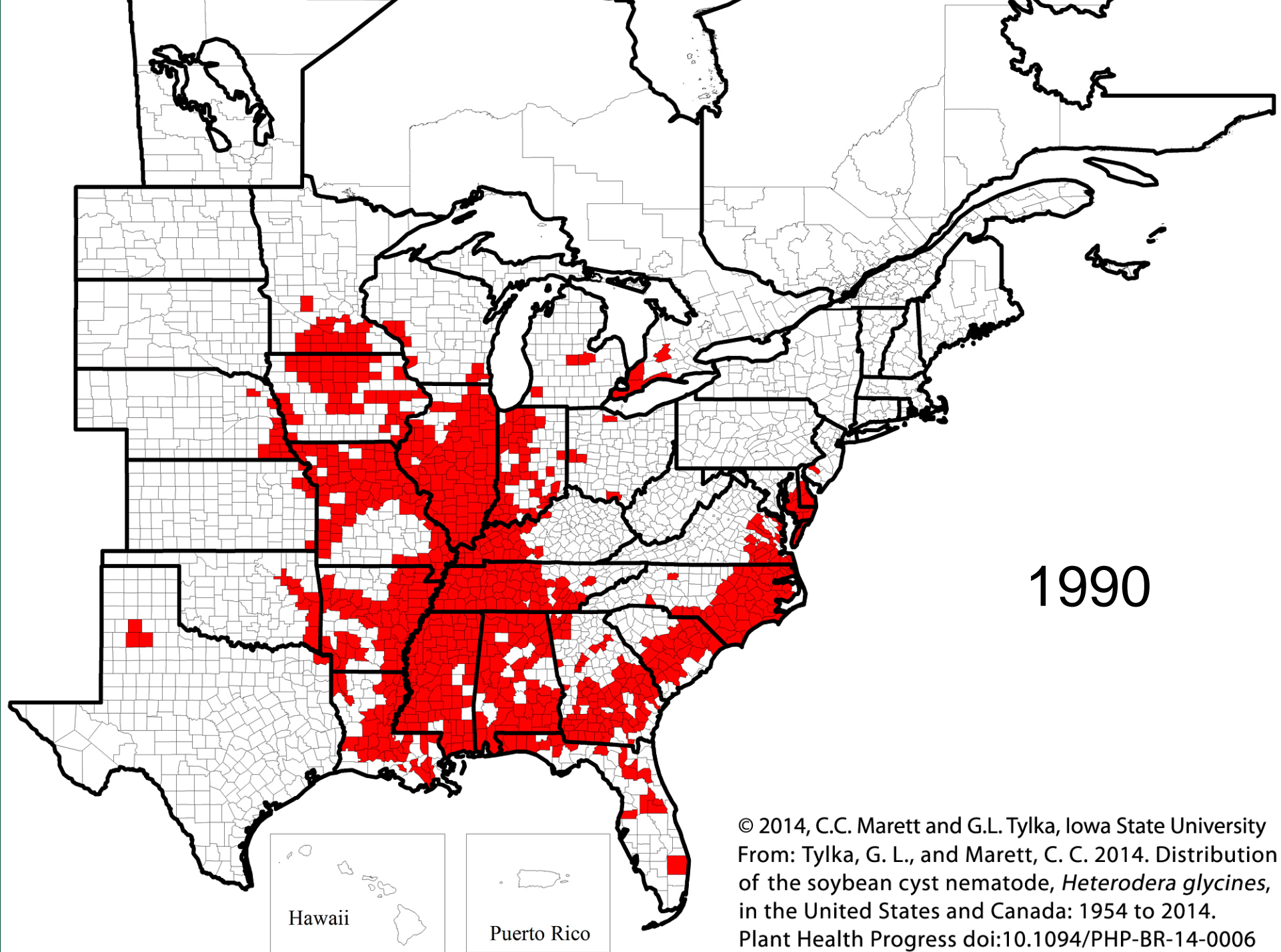
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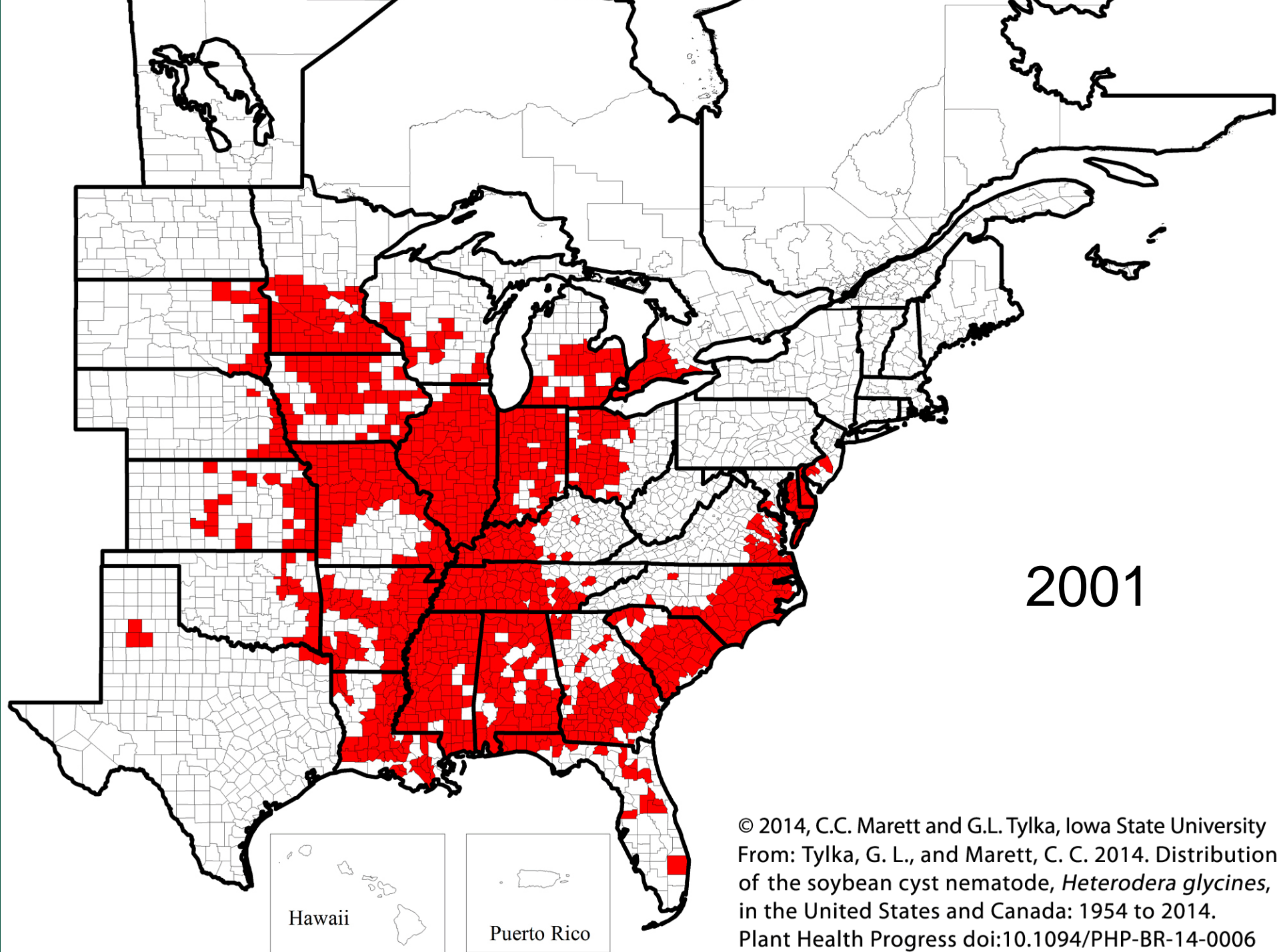
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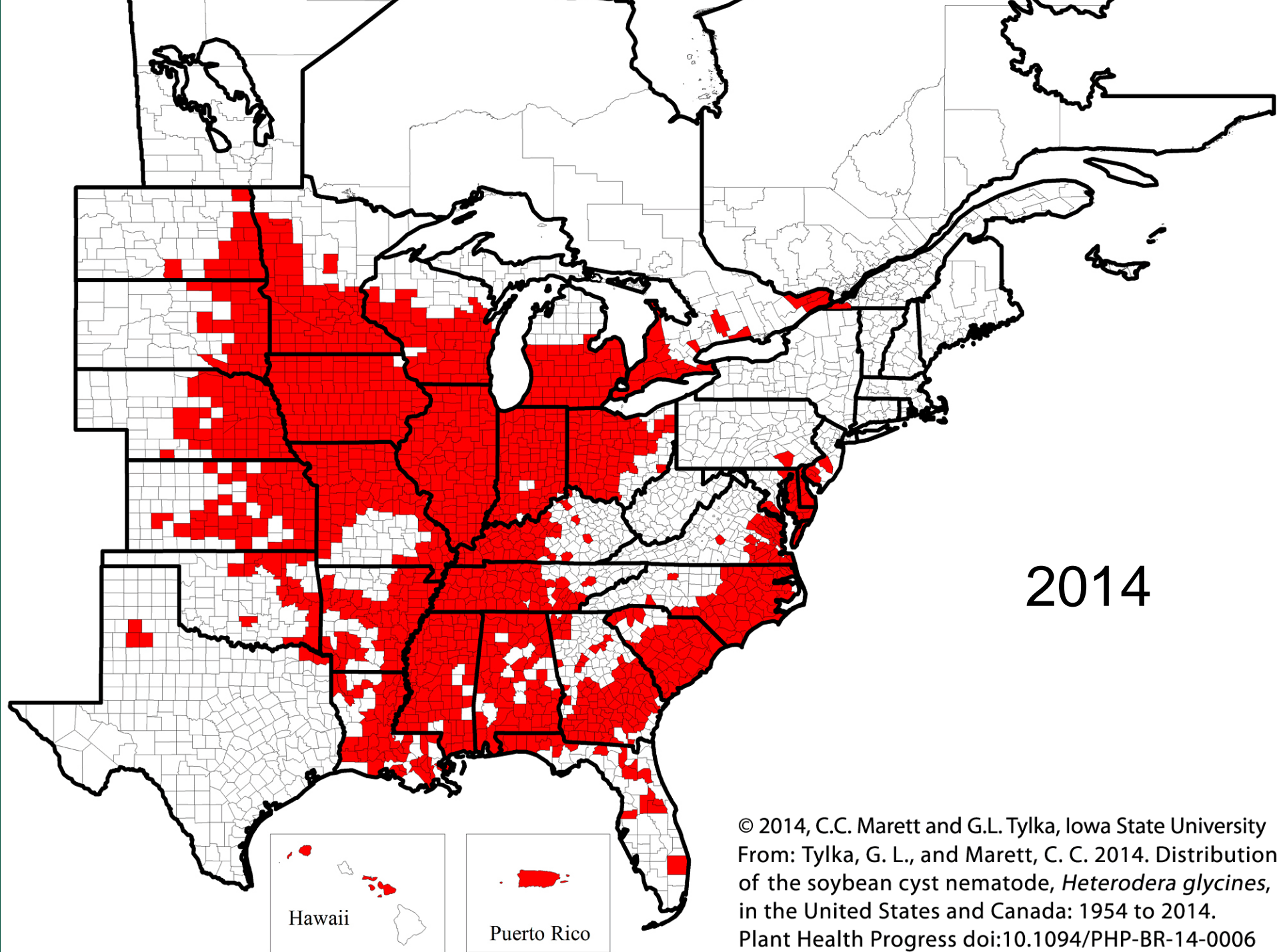


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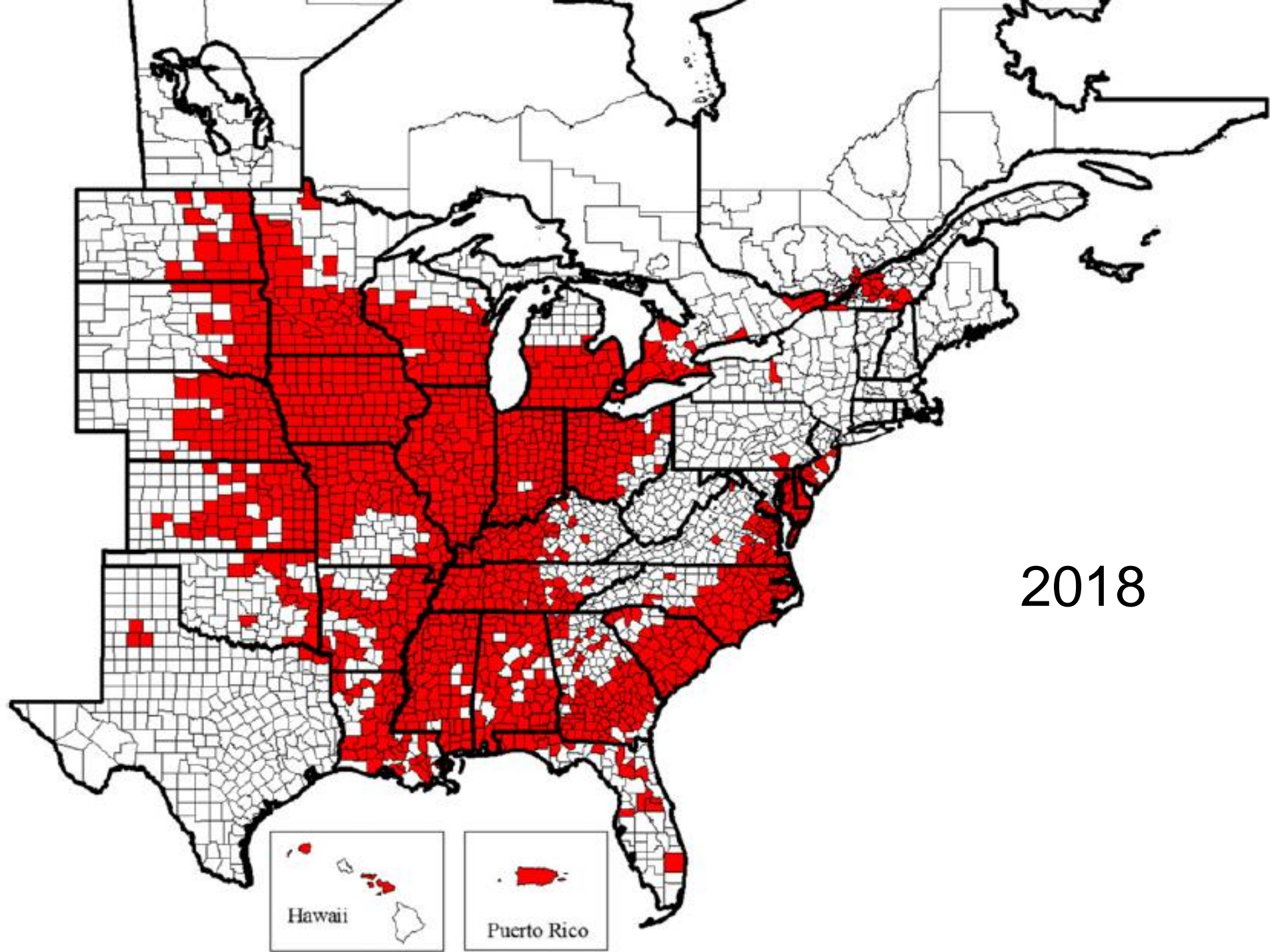


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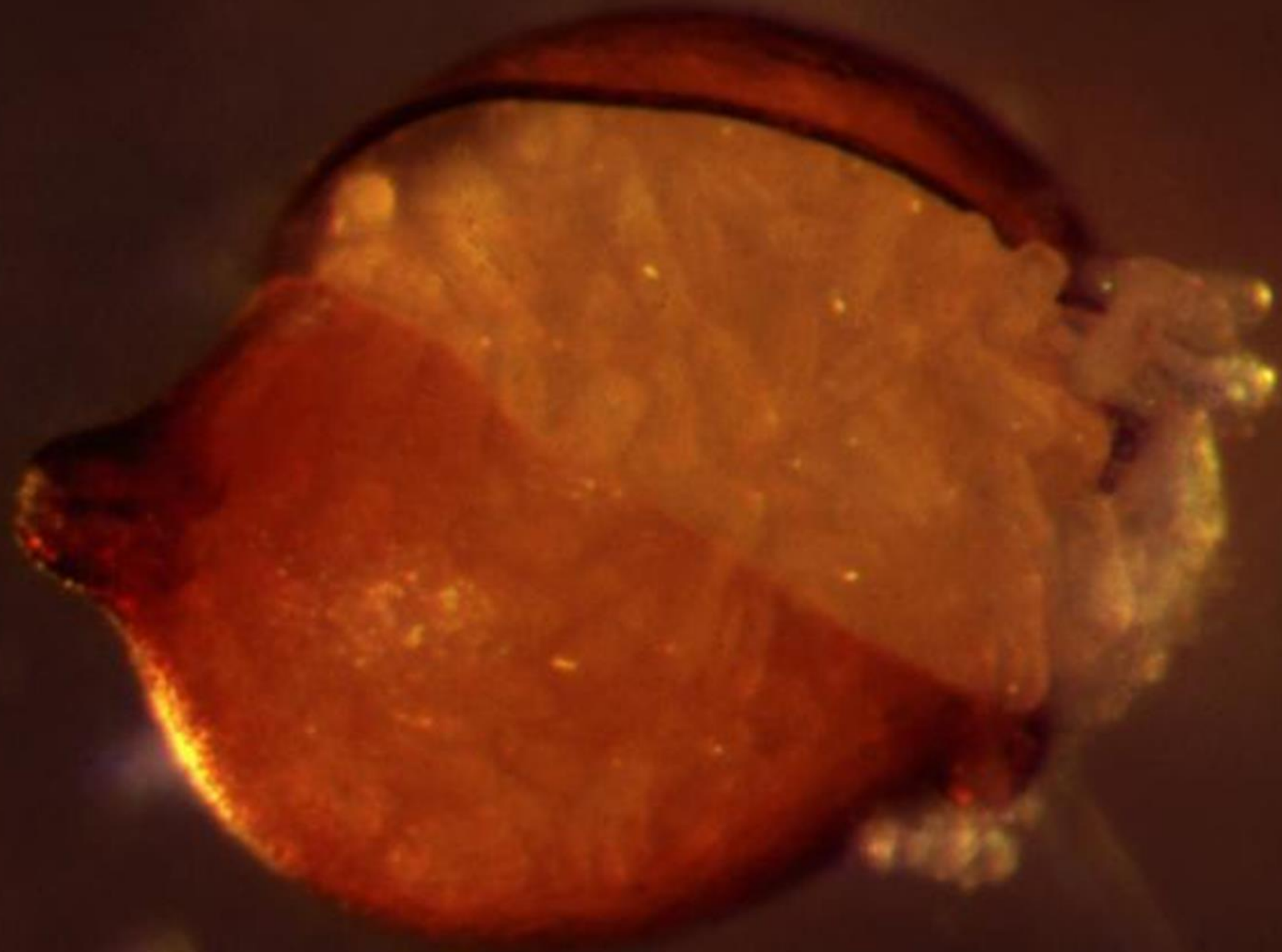
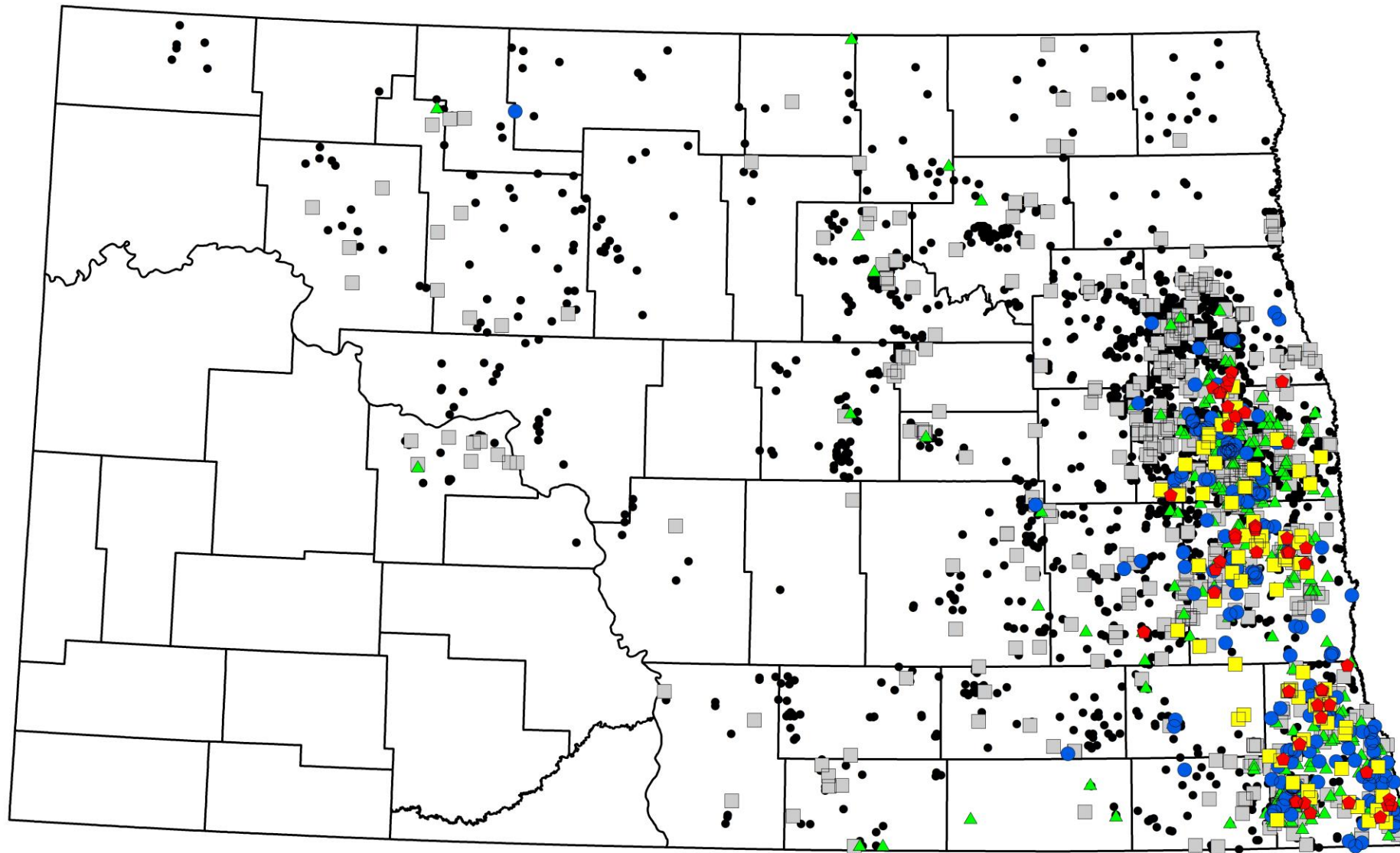


Photo: McGawley



### Eggs/100cc

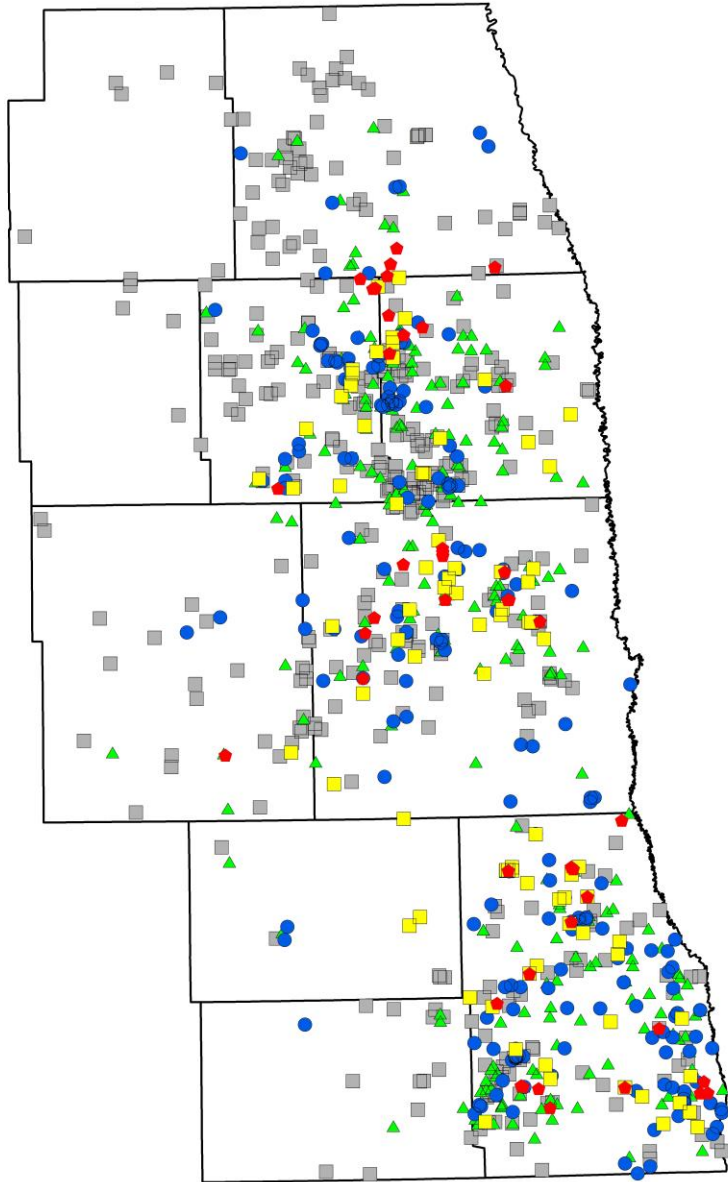
0 12.5 25 50 Miles

- 0 - 49
- 50 - 200
- ▲ 201 - 2000
- 2001 - 10000
- 10000 - 20000
- ◆ 20000+

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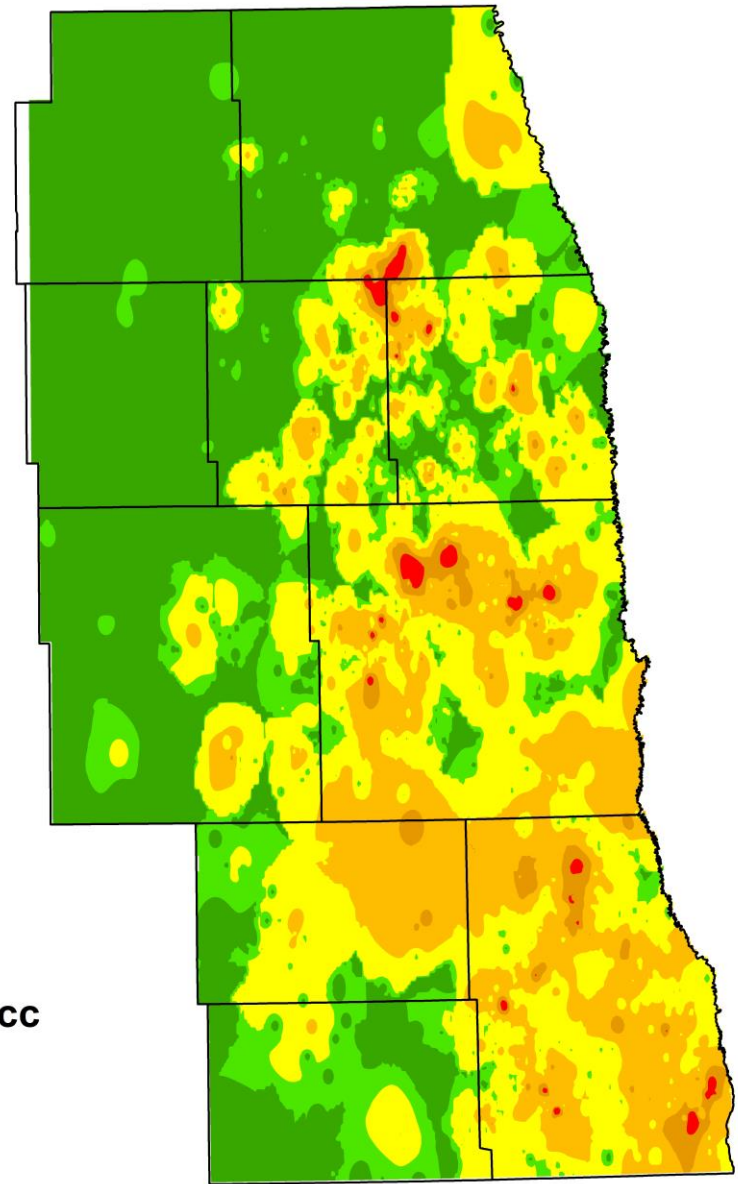






**Eggs/100cc**

- 50 - 200
- ▲ 201 - 2000
- 2001 - 10000
- 10001 - 20000
- ◆ 20000+



**Eggs/100cc**

- 0 - 49
- 50-200
- 201-2000
- 2001 - 10000
- 10001 - 20000
- 20000+

**Pinto bean field experiment in 2007**



**5,000 EGGS/100 CC SOIL**

**CONTROL**

**10,000 EGGS/100 CC SOIL**



# SCOUTING AND SOIL TESTING FOR SOYBEAN CYST NEMATODE.

What's your number?

Take the test.  Beat the pest.

The **SCN Coalition**<sup>®</sup>  
Funded by the soybean checkoff

**TWO WAYS** to scout for SCN.

**1** Dig roots and look for females. (Dig, don't pull.)

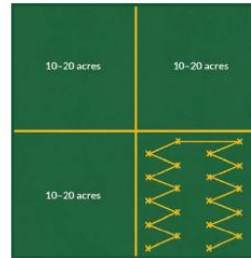


**2** Collect soil samples for testing.

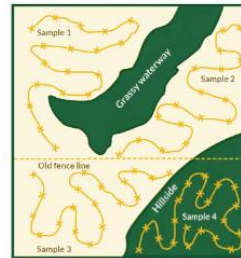


**THREE APPROACHES** to collecting soil samples.

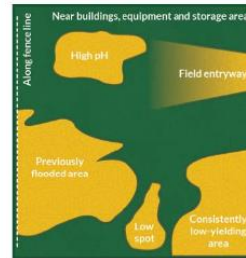
Collect 15–20 (or more) 1-inch-diameter core samples, 8 inches deep, for every 20 acres. Mix the cores well, put the mixed soil into a soil sample bag and send it to an SCN testing lab.



**1** Collect soil cores using a zigzag pattern.



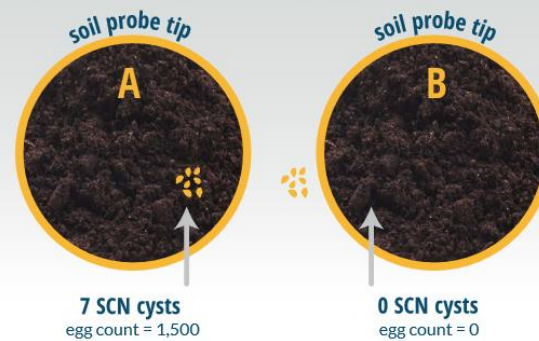
**2** Collect soil cores from logical areas or management zones in the field.



**3** Collect soil cores from high-risk areas in the field where SCN might first be discovered.

**WHY SCN SOIL TEST** results are variable.

It all depends on where you put the probe. A ½-inch difference can mean the difference between zero and 1,500 eggs. (Each cyst can hold 200 to 250 eggs.)



**WHEN** to sample.

- Fall in a non-host crop.
- Fall in soybean stubble.
- Spring before a soybean crop.
- During the season in the soybean crop root zone.