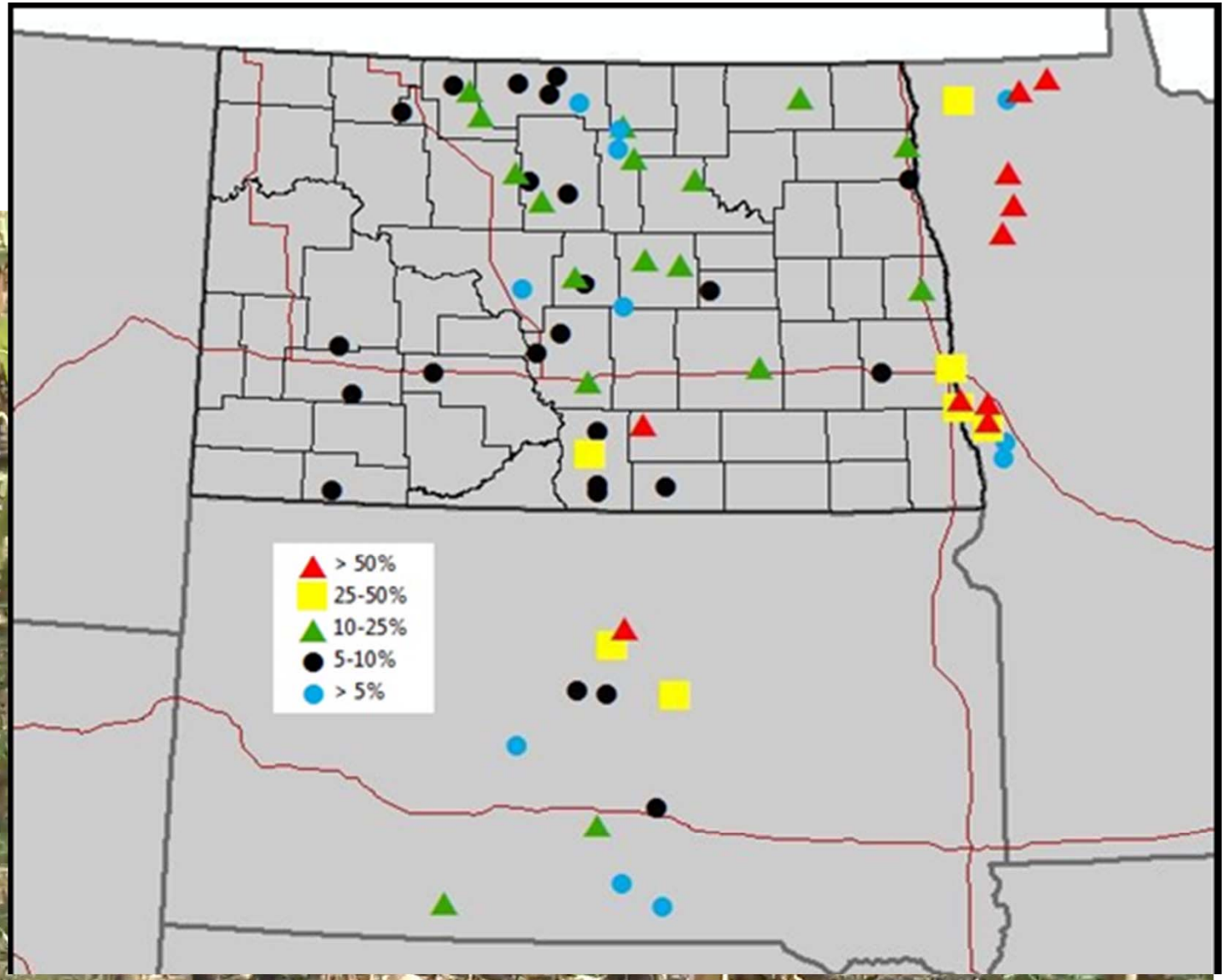
Phomopsis and fungicides

Febina Mathew, Nathan Braun (SDSU);
Robert Harveson, Clay Carlson, Tyler Patrick & Allison Rickey (UNL);
David Carruth, Derek Cottrill & Scott Fitterer (BASF);
Jeff Nehring, Anoop Sindhu & Joel Schaefer (CHS);
Bryan Hansen, Michelle Gilley & Samuel Markell (NDSU)

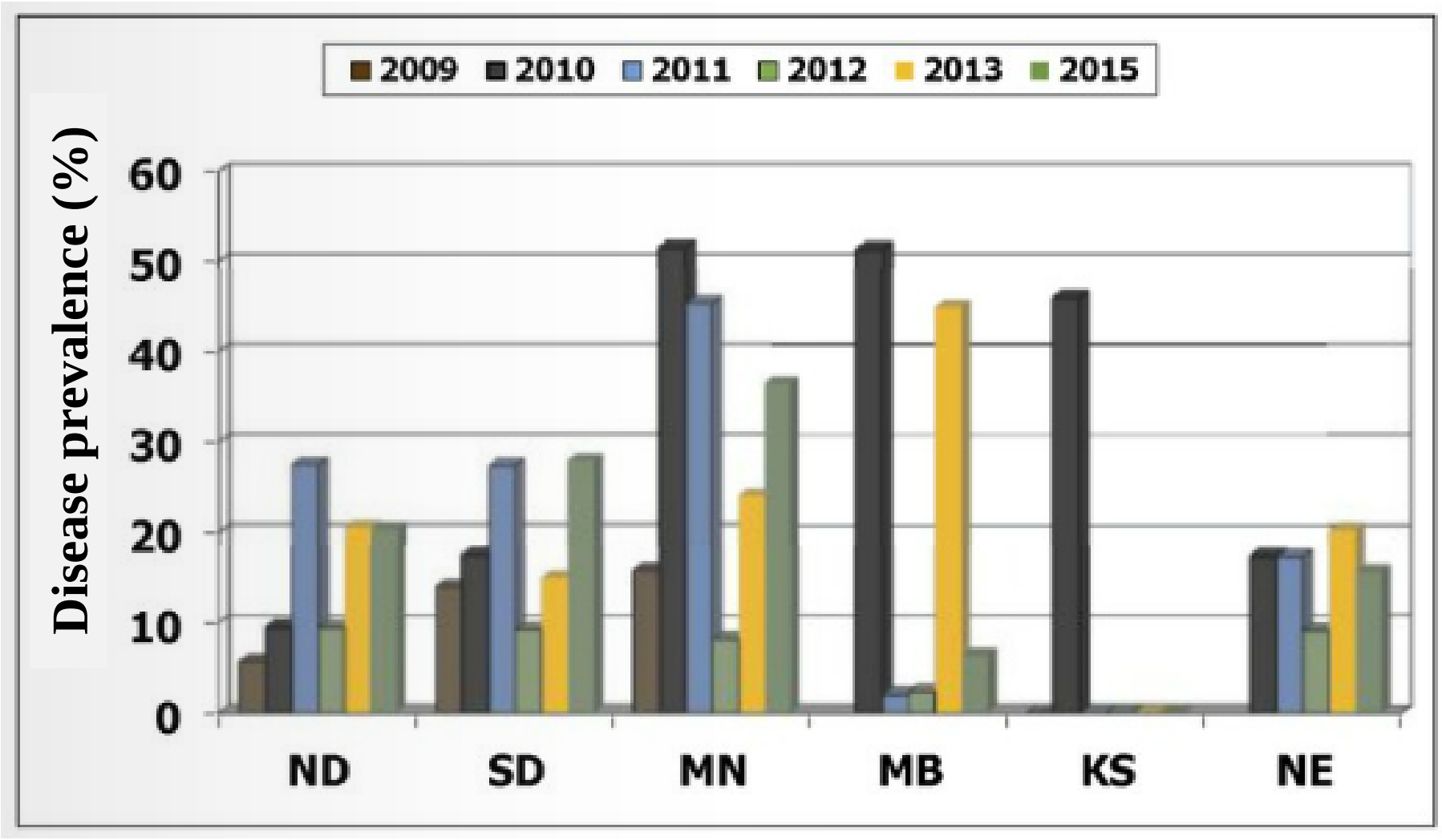
South Dakota State University
College of Agriculture, Food and Environmental Sciences

2010



National Sunflower Association survey, 2010

2015



(Hans Kandel and Tom Gulya, 2016 National Sunflower Association survey)

Phomopsis on sunflower

R1 = bud initiation stage

R5 = flowering stage

Pictures by Dr. Sam Markell, and Dr. Febina Mathew

Brookings, South Dakota

Current Problems

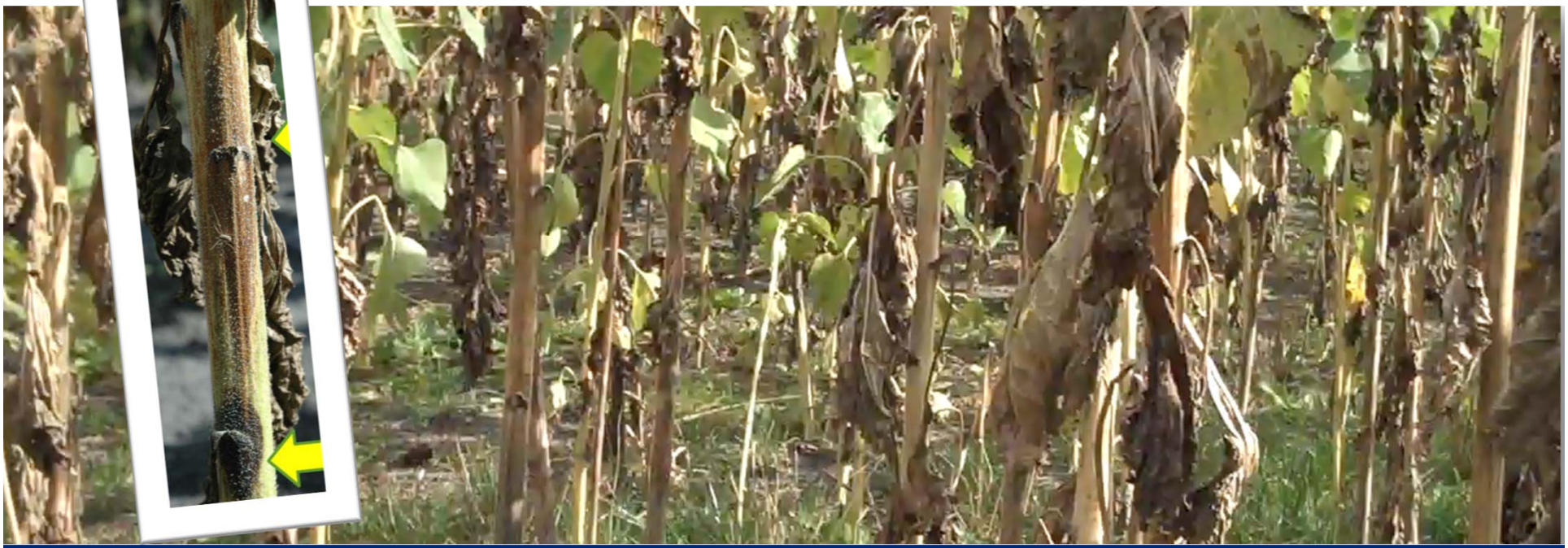
- Phomopsis stem canker continues to be of concern.
  - Disease incidence between 40 to 100% in commercial fields

    (H. Kandel and T. Gulya, NSA survey).

Pictures by Dr. Sam Markell

Current Problems

- Three fungi cause disease in the U.S.
  - *Phomopsis helianthi*
  - *P. gulyae*
  - *P. stewartii*



(Mathew et al. 2015; Olson et al. 2017)

Pictures by Dr. Sam Markell

Current Problems

- Alternative hosts have been identified.
  - Soybean is a host of *P. gulyae* in South Dakota

(F. Mathew, S. Markell, and I. Lal, *unpublished*).

Pictures by Dr. Sam Markell

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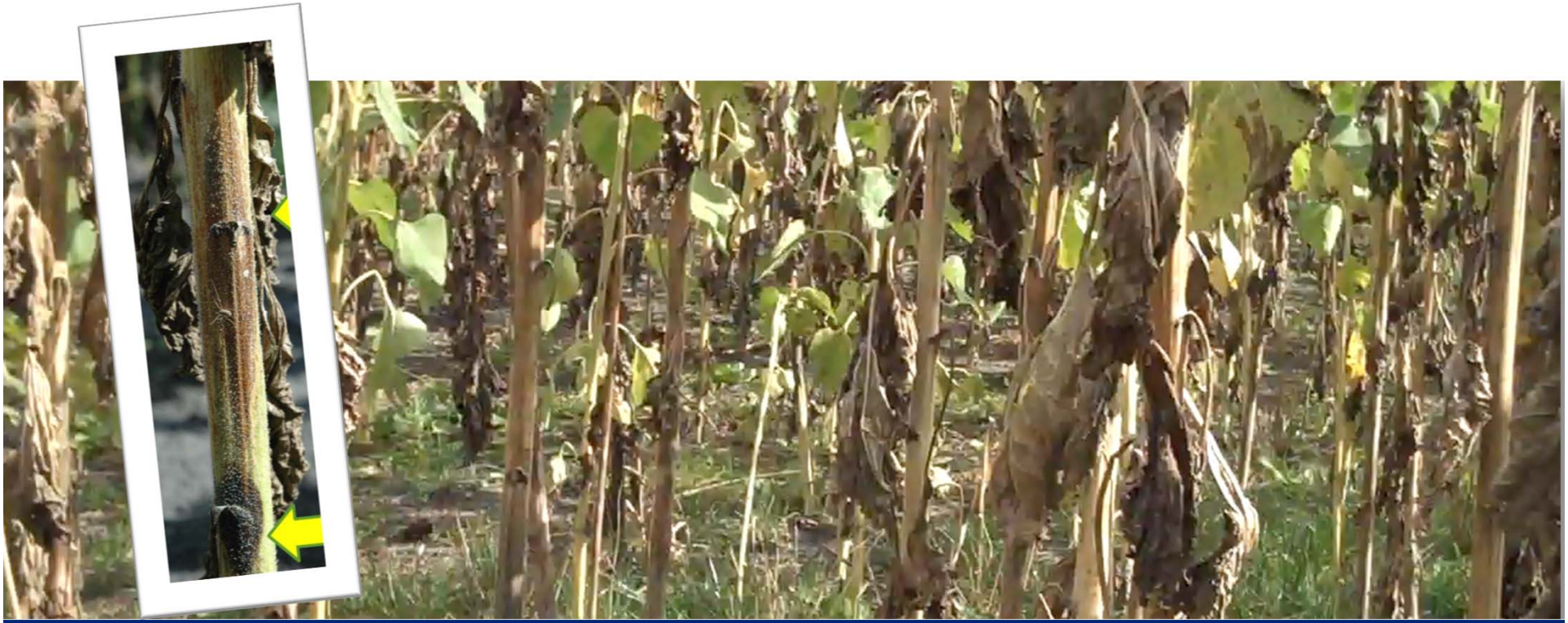
Results from ND & SD

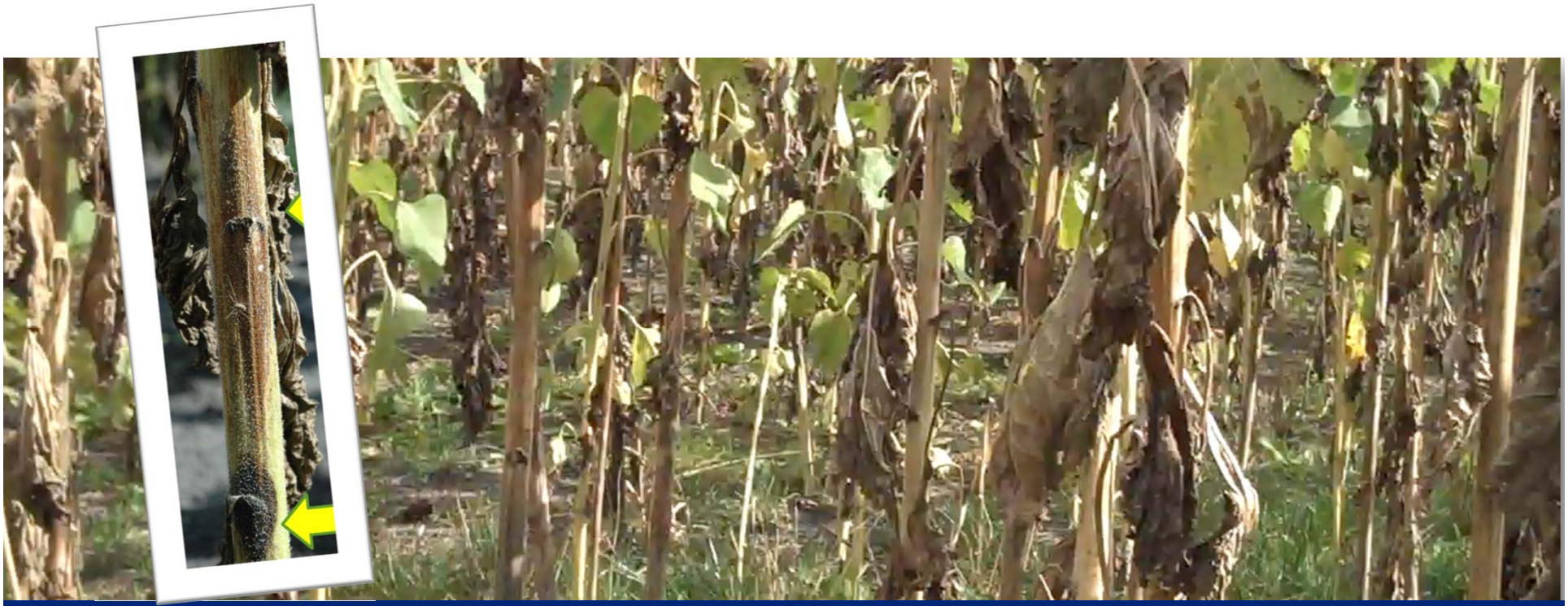
Current Problems

- Limited genetics available.
  - Several questions – if resistance holds up to multiple strains or pathogens?



Pictures by Dr. Sam Markell

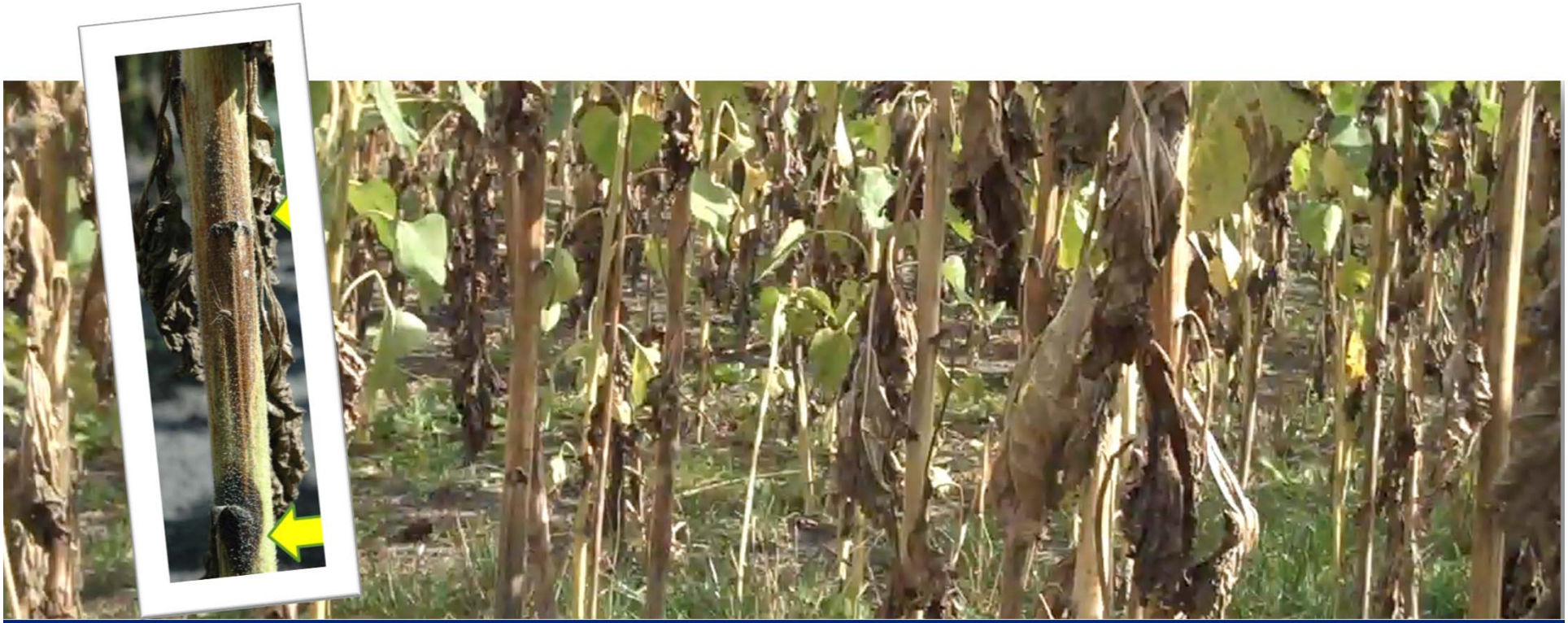
Solution?



Pictures by Dr. Sam Markell

Solution?

- Fungicides?



Pictures by Dr. Sam Markell

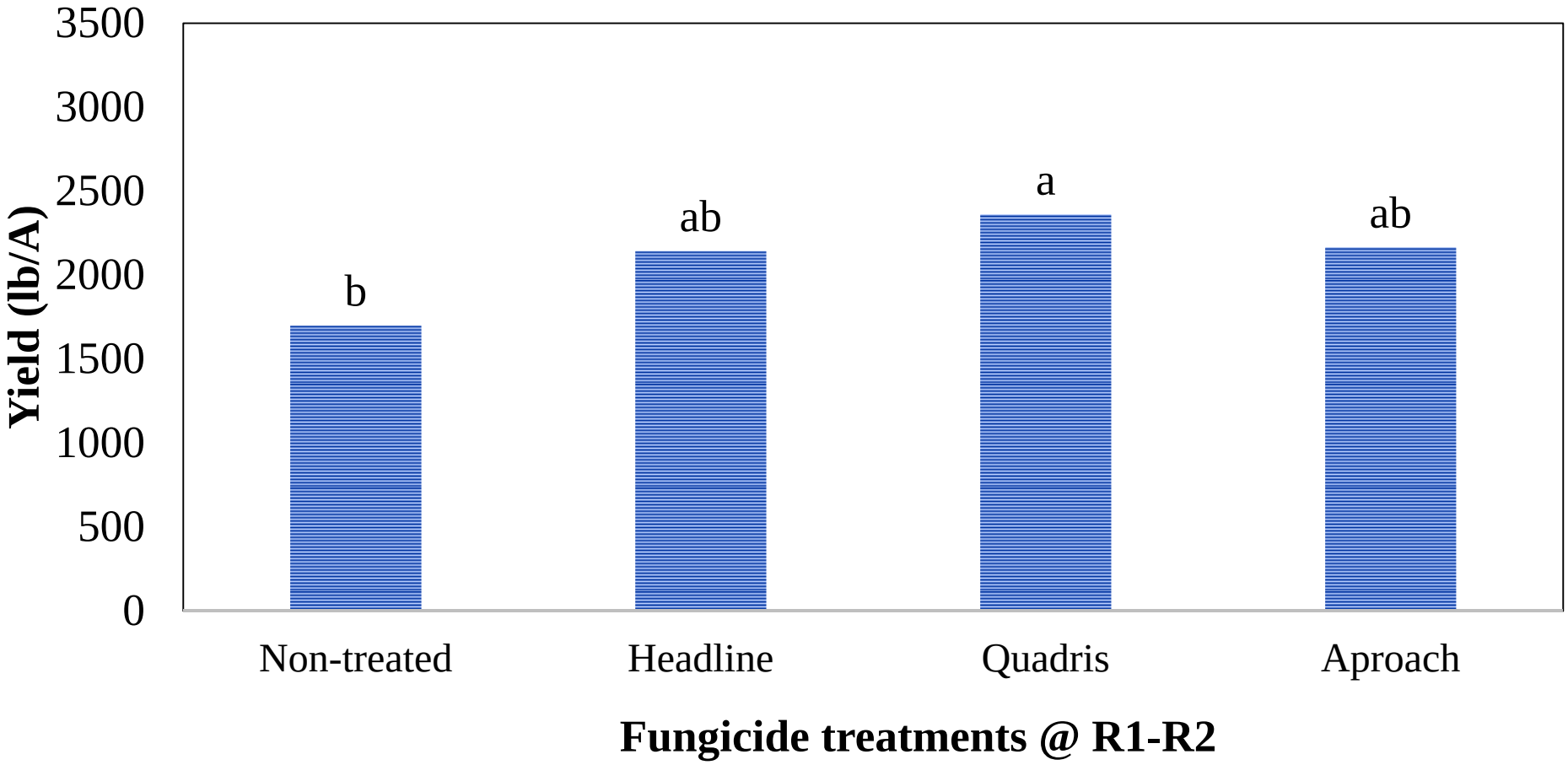
2015 & 2016

- Fungicide efficacy trials were established at a total of five to six locations (ND, NE and SD).

- Disease severity index and yield data were obtained.

Rothsay, MN

2015 & 2016



- Rothsay, MN
- Mycogen hybrids
- Fungicides @ 6 fl oz/A

2015 & 2016

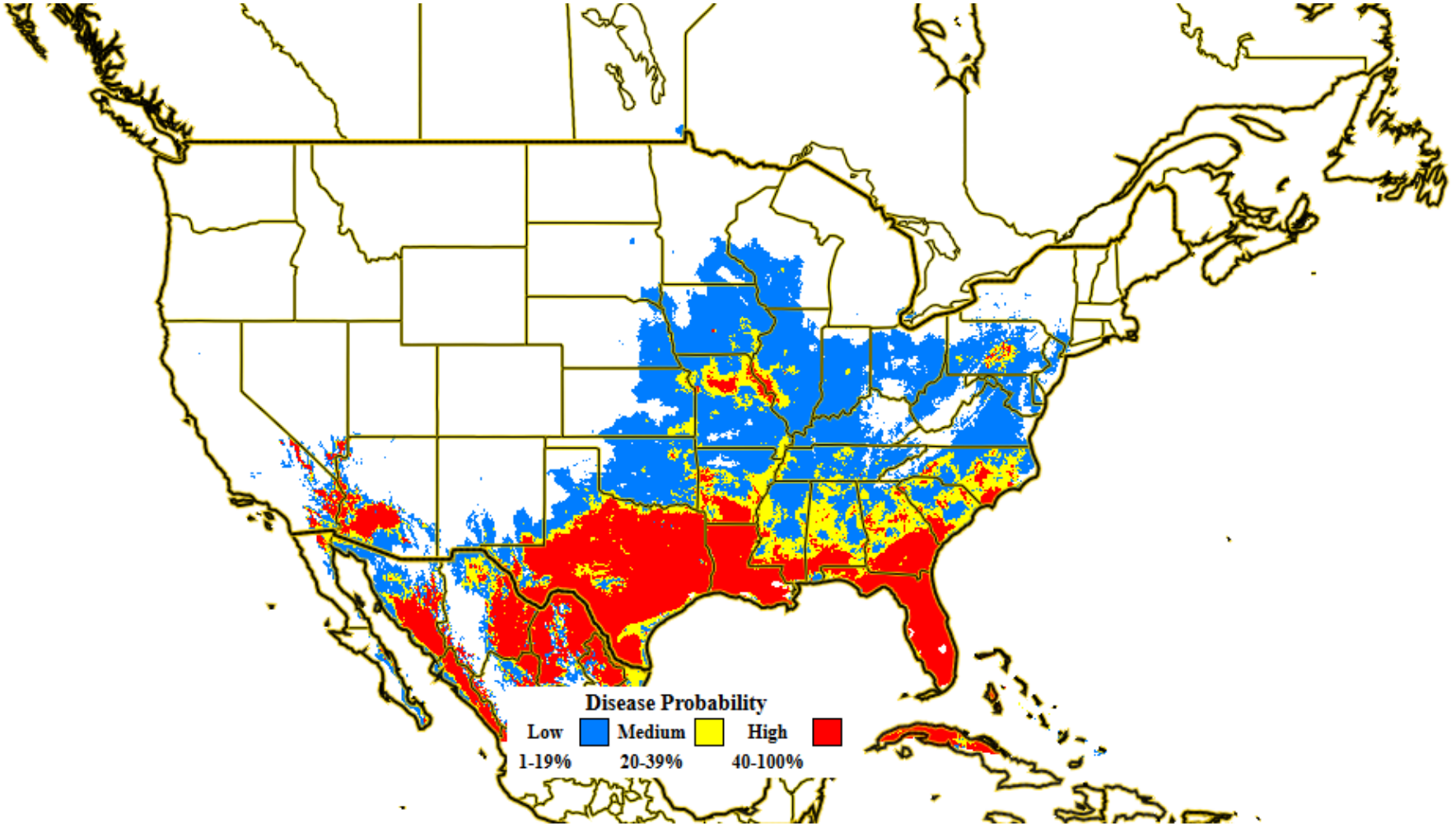
S. No.	Treatment[a]	Susceptible[b]	
		DSI[c] (%)	Yield (kg/ha)
1	NTC	94.1 a	736.9 a
2	Quadris @ V12	86.9 ab	751.2 a
3	Quadris @ R1	84.1 ab	804.6 a
4	Quadris @ R3	93.8 a	564.5 a
5	Quadris @ V12 + R1	85.9 ab	711.5 a
6	Quadris @ R1 + R3	90.3 ab	688.4 a
7	Quadris @ V12 + R3	88.4 ab	778.2 a
8	Quadris @ V12 + R1 + R3	75.9 b	706.7 a
LSD @ $P \leq 0.05$		**16.6**	**320.7**
CV		**12.9**	**30.4**

- Brookings, SD
- CHS hybrids
- Quadris @ 6 fl oz/A

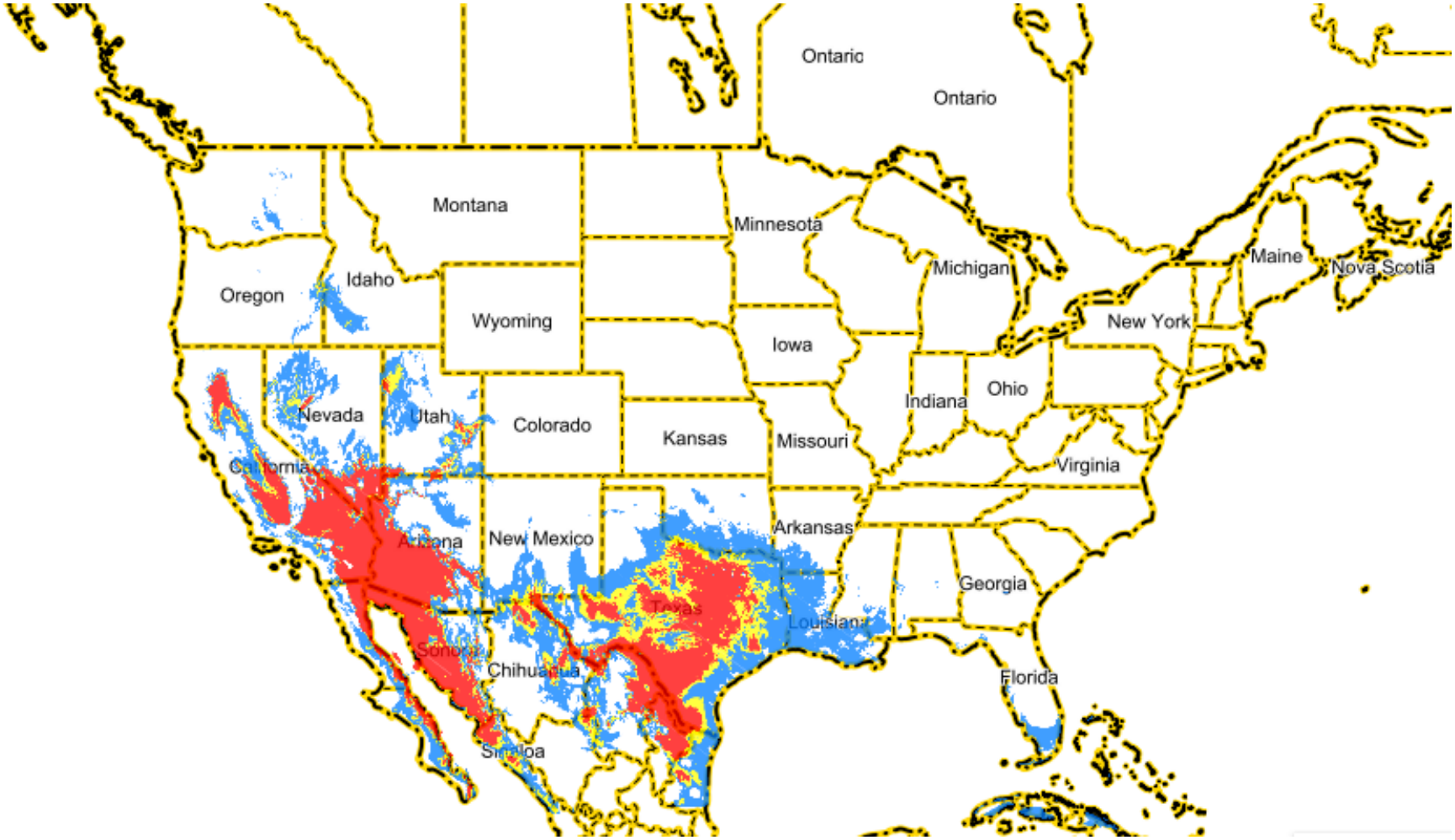
2017 & 2018

- The model was validated by setting up field trials at a total of five to six locations (ND, NE and SD).
- Growth stage based application was compared to that predicted by the model.
- Disease severity index was obtained.

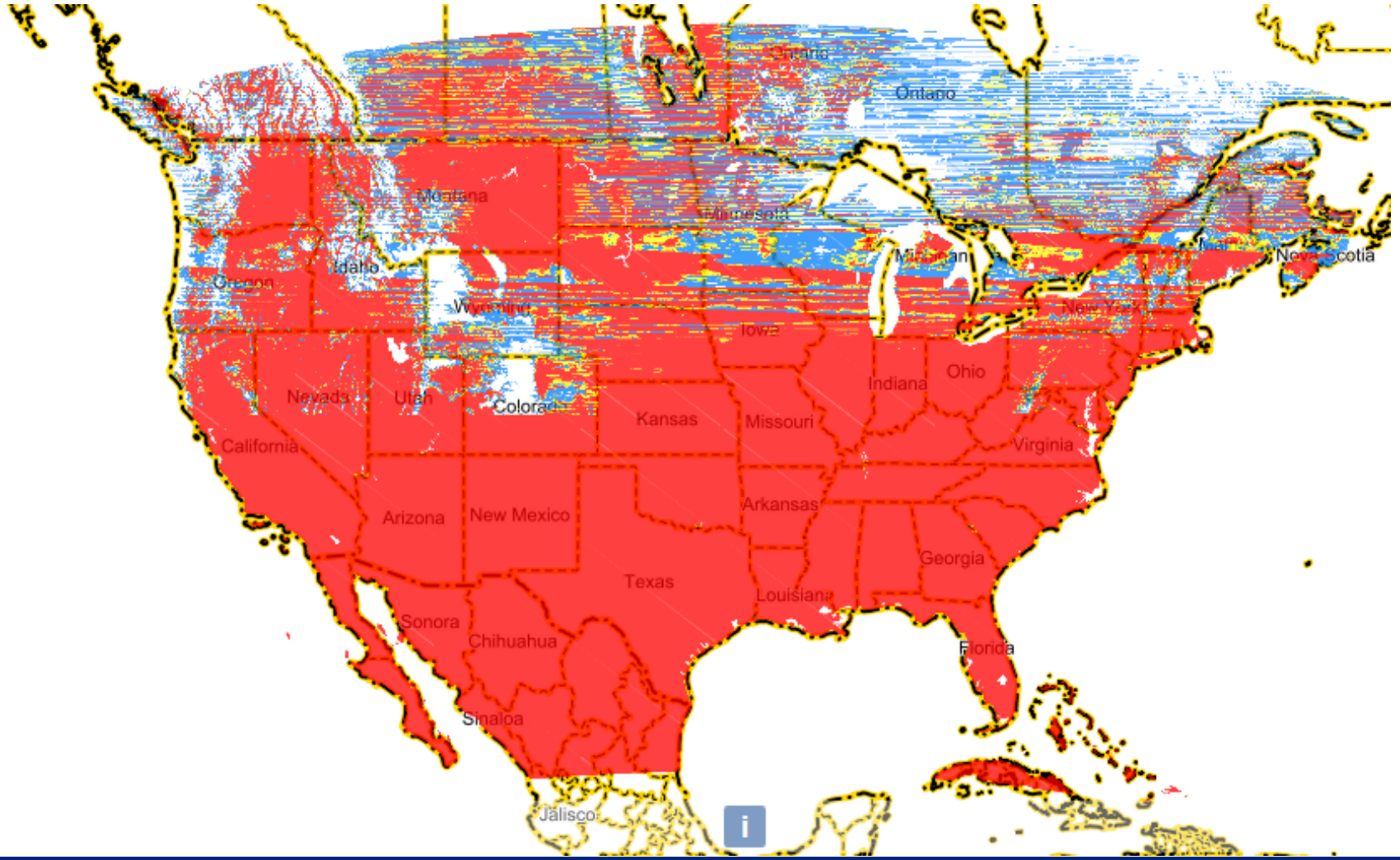
2018 – June 6



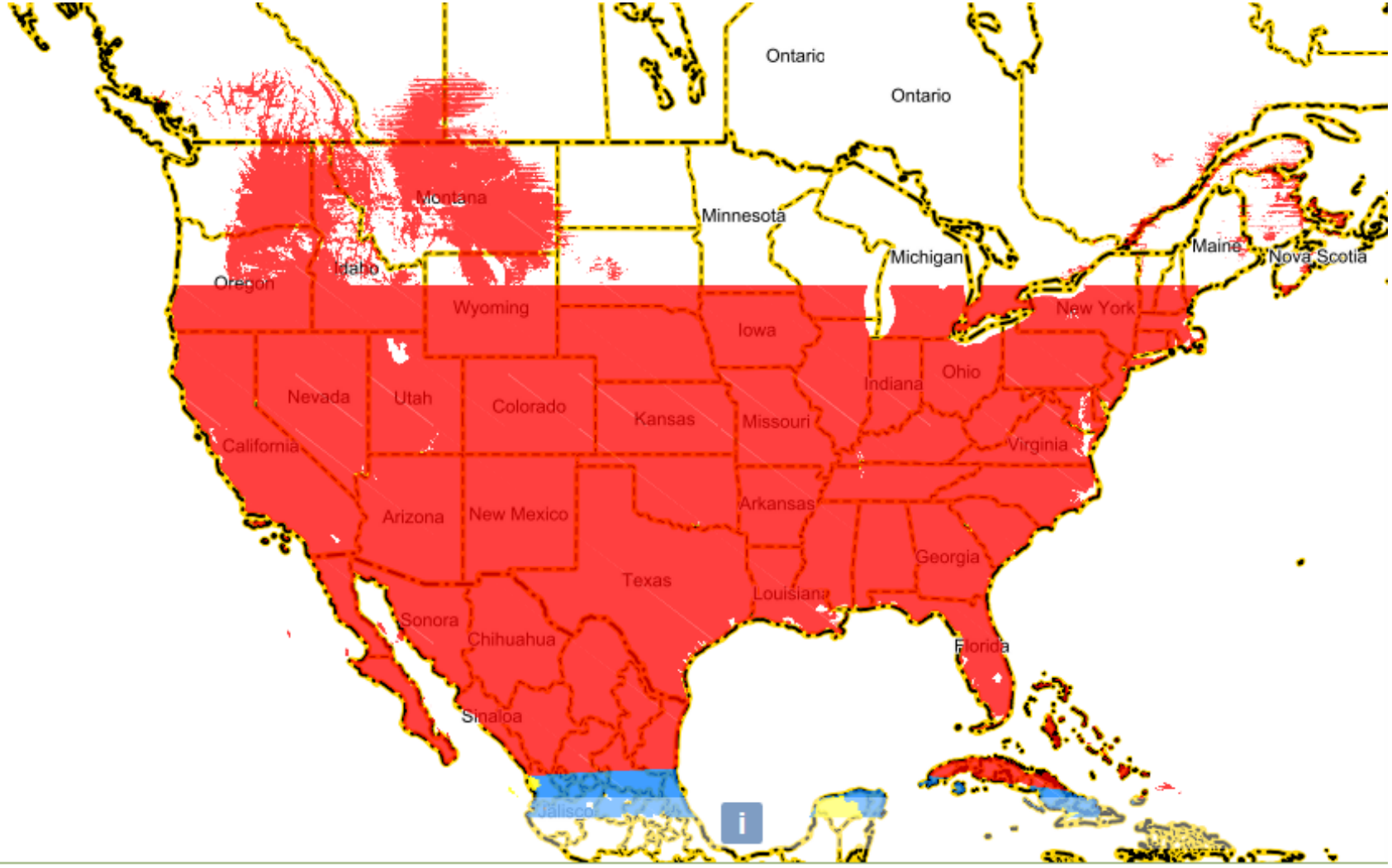
2018 – August 3



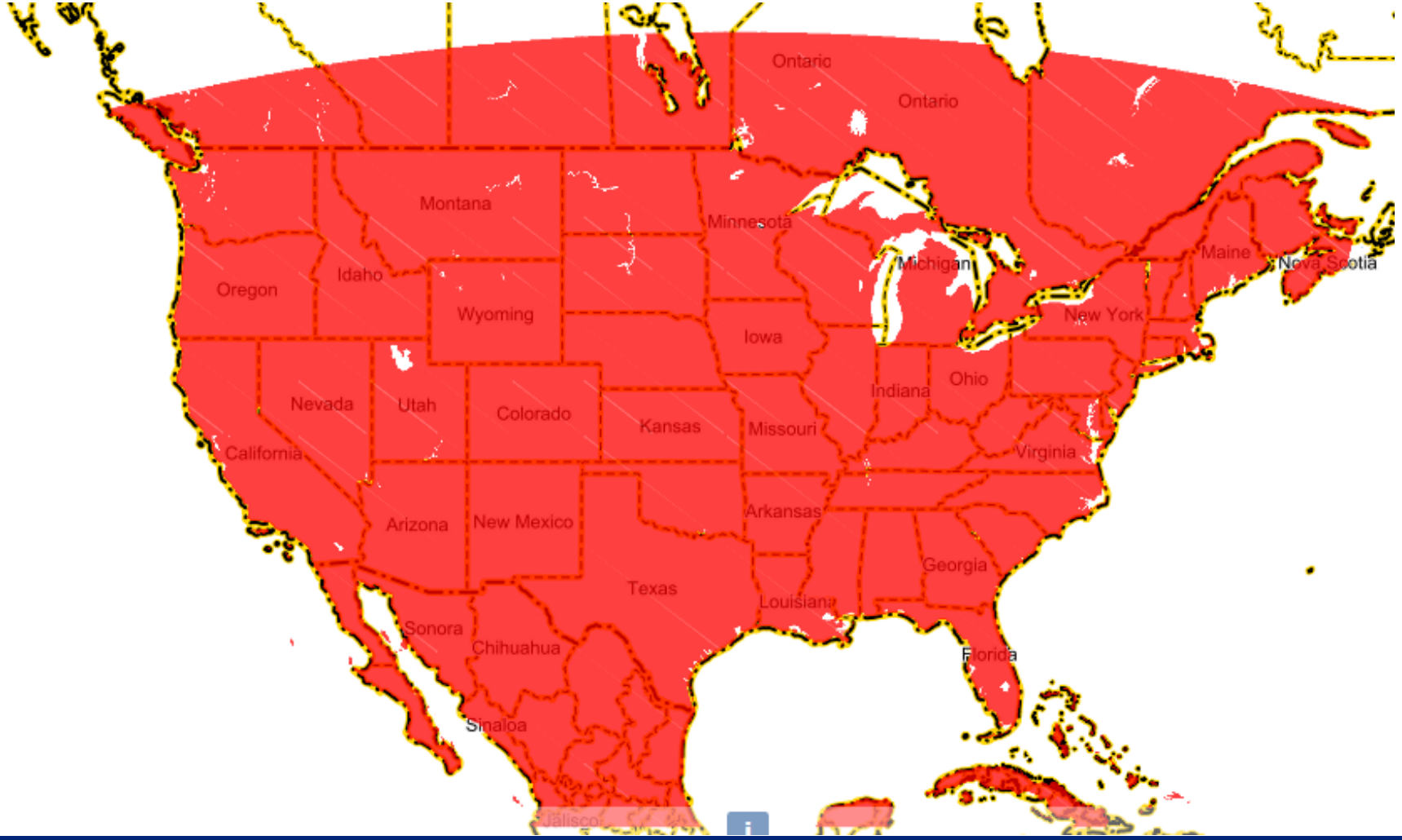
2018 – August 13

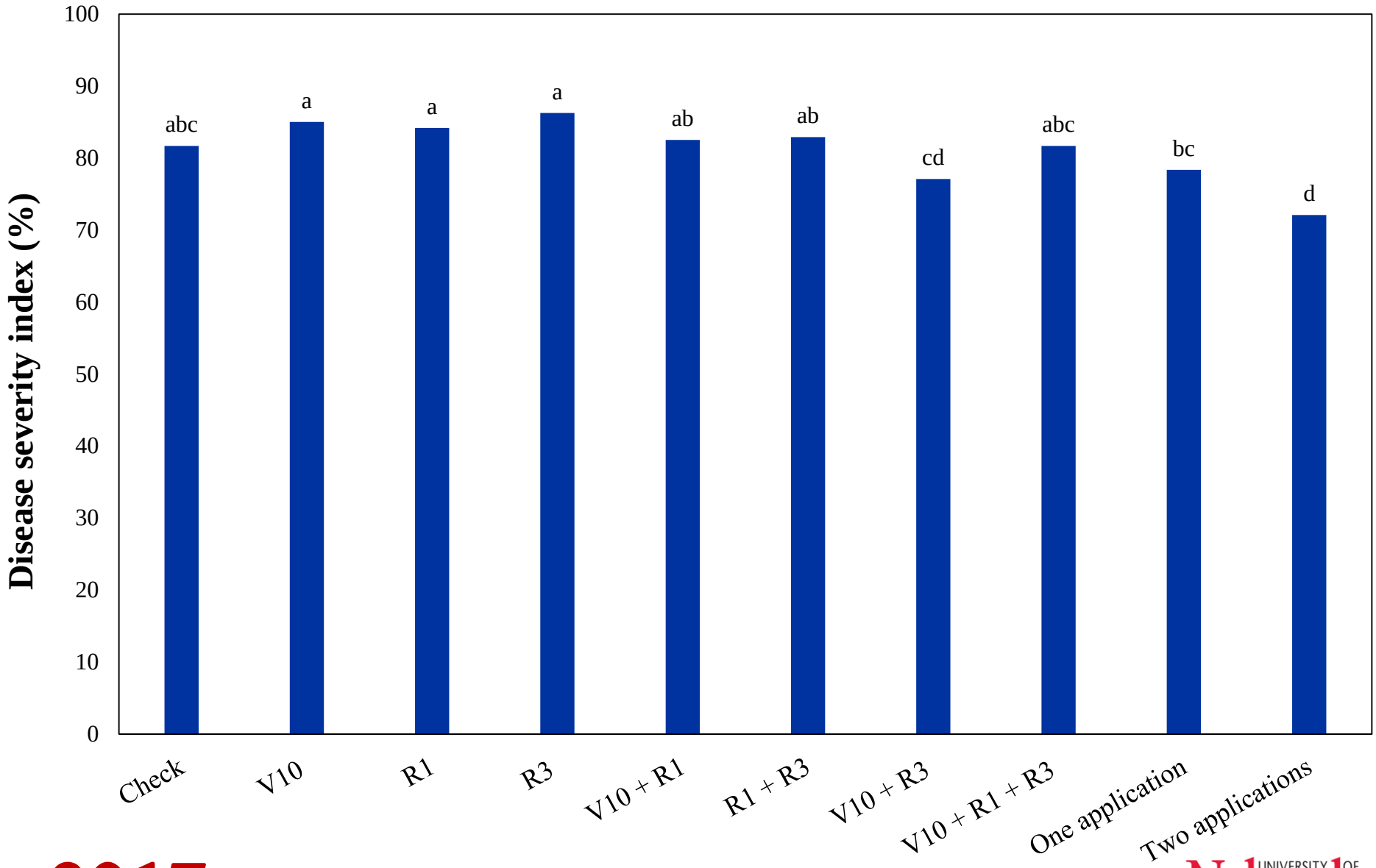


2018 – September 3



2018 – September 7





2017

University of Nebraska Lincoln

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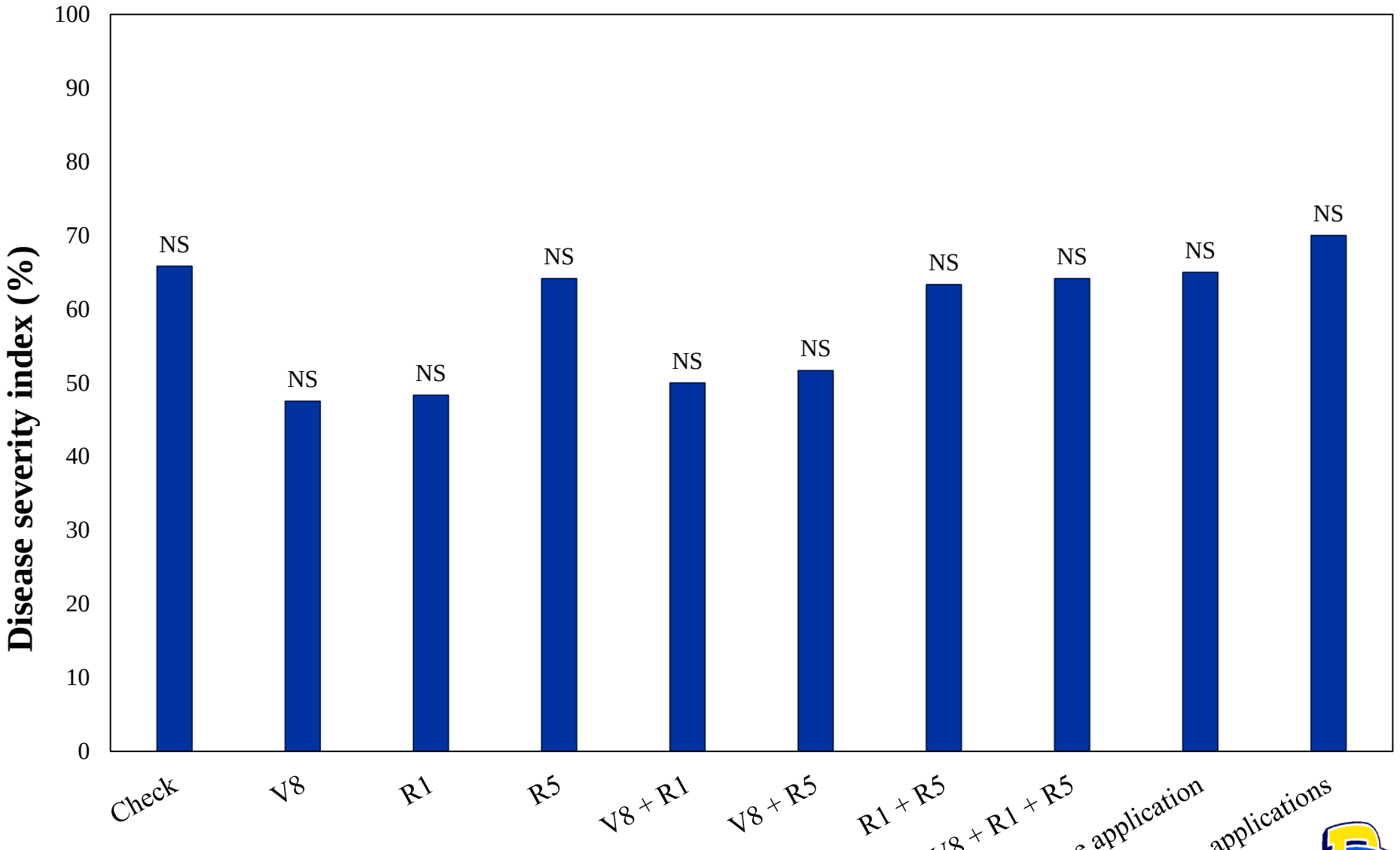
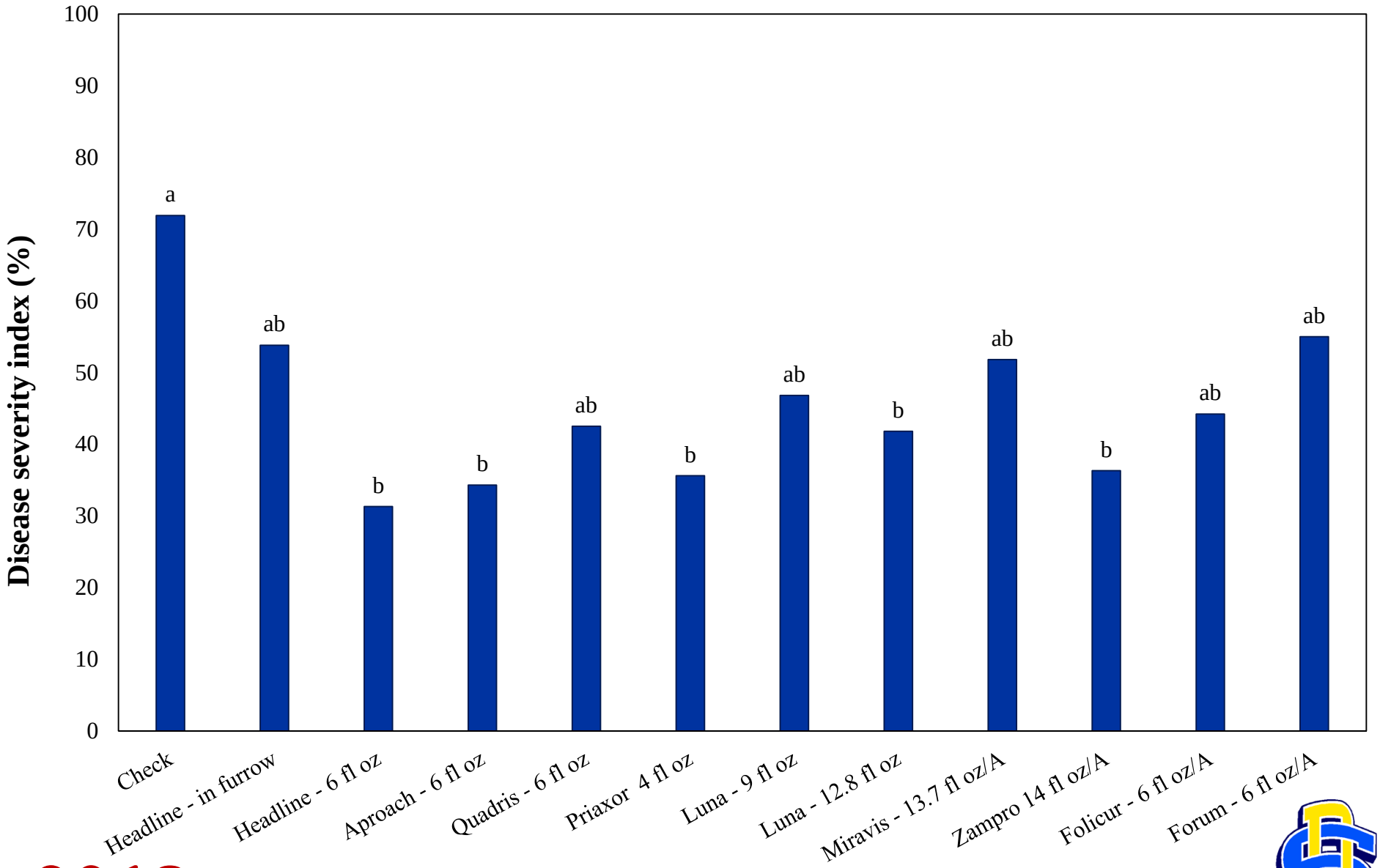
B. Harveson, *personal communication*
Scottsbluff, NE


Disease severity index (%)
100
90
80
70
60
50
40
30
20
10
0
NS
NS
NS
NS
NS
NS
NS
NS
NS
NS
Check
V8
R1
R5
V8 + R1
V8 + R5
R1 + R5
V8 + R1 + R5
One application
Two applications

2018

2018

- Efficacy of nine fungicides were tested on sunflower in Brookings, SD.
- Fungicides with single mode and multiple mode of action were used.
- Disease severity index was obtained.



2018

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Brookings, SD

Future plans

- Fungicide application at R1 maybe effective, but we need more location-years of data and test more chemistries.

- Examine disease etiology

NDSU

UNIVERSITY OF Nebraska Lincoln

USDA

South Dakota OILSEEDS COUNCIL

Dow AgroSciences Mycogen SEEDS

DOW DUPONT

CORTEVA agriscience

nuSEED

syngenta

BASF The Chemical Company

CHS

BAYER

National Sunflower ASSOCIATION