Rot, Spots, and Tiny Worms: A Soybean Disease Update

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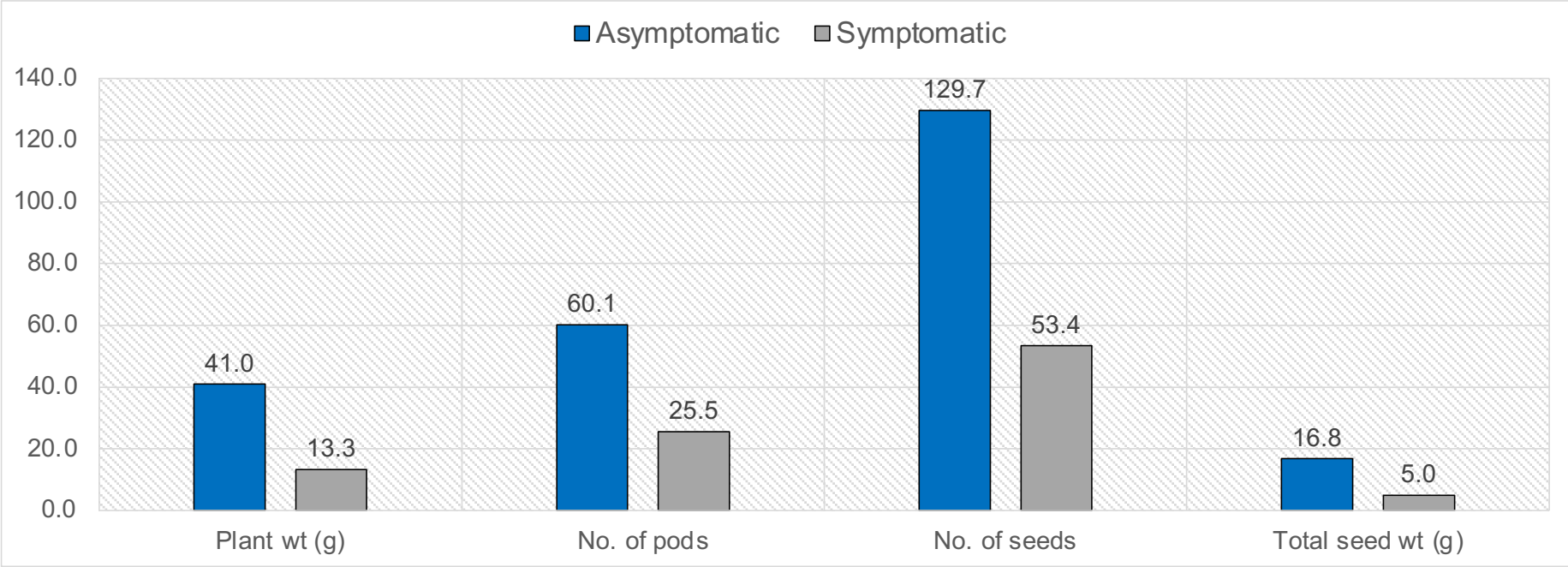
SCN DIAGNOSTICS

Integrated Pest Management
University of Missouri

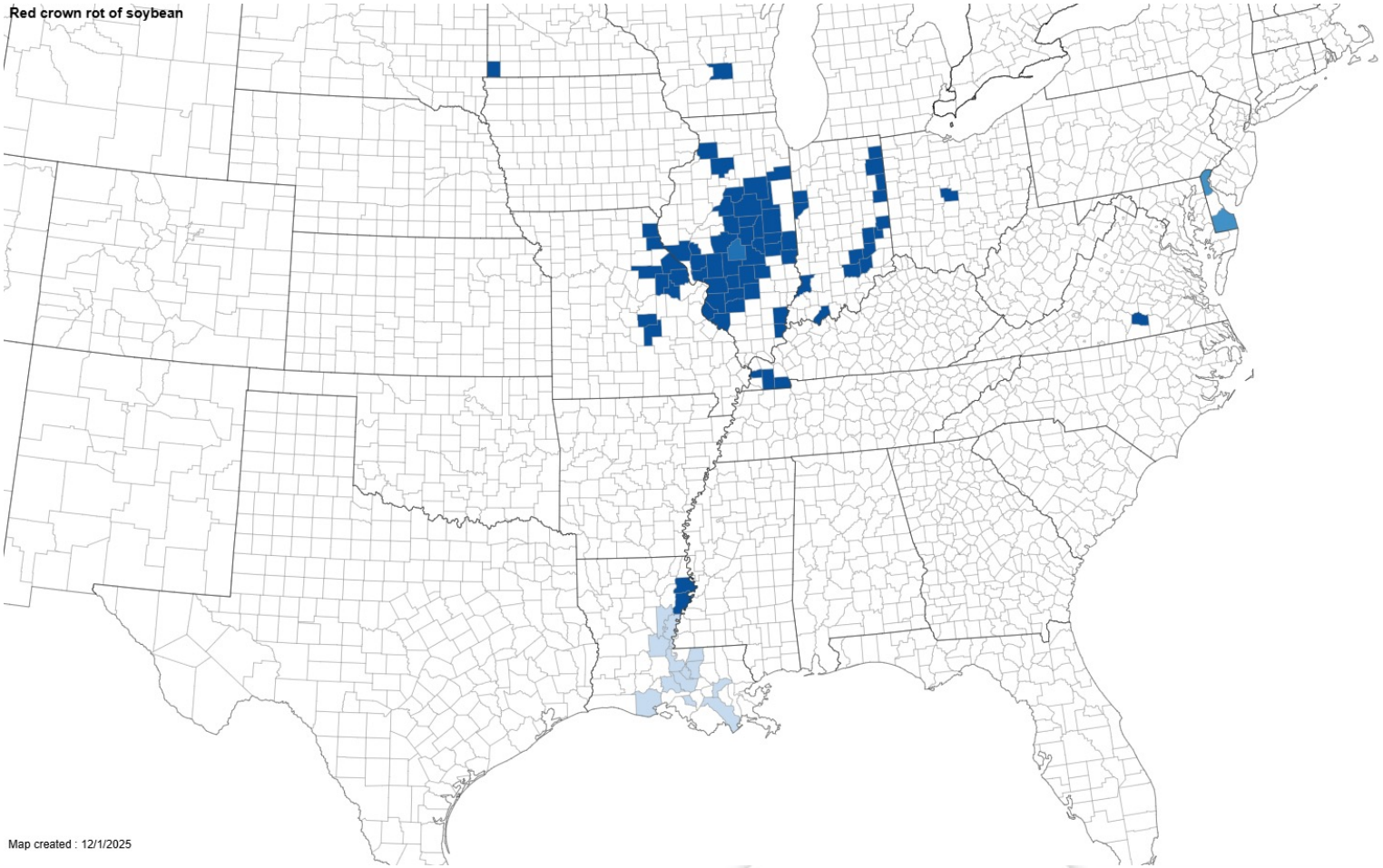

Red Crown Rot
MISSOURI
SOYBEANS

Measured yield components on symptomatic vs. asymptomatic-selected plants (Graves Co., KY – 2021)



Neves et al. 2023. Plant Health Progress 24:303-305.

Red crown rot of soybean



EDDMapS
find · map · track

Legend

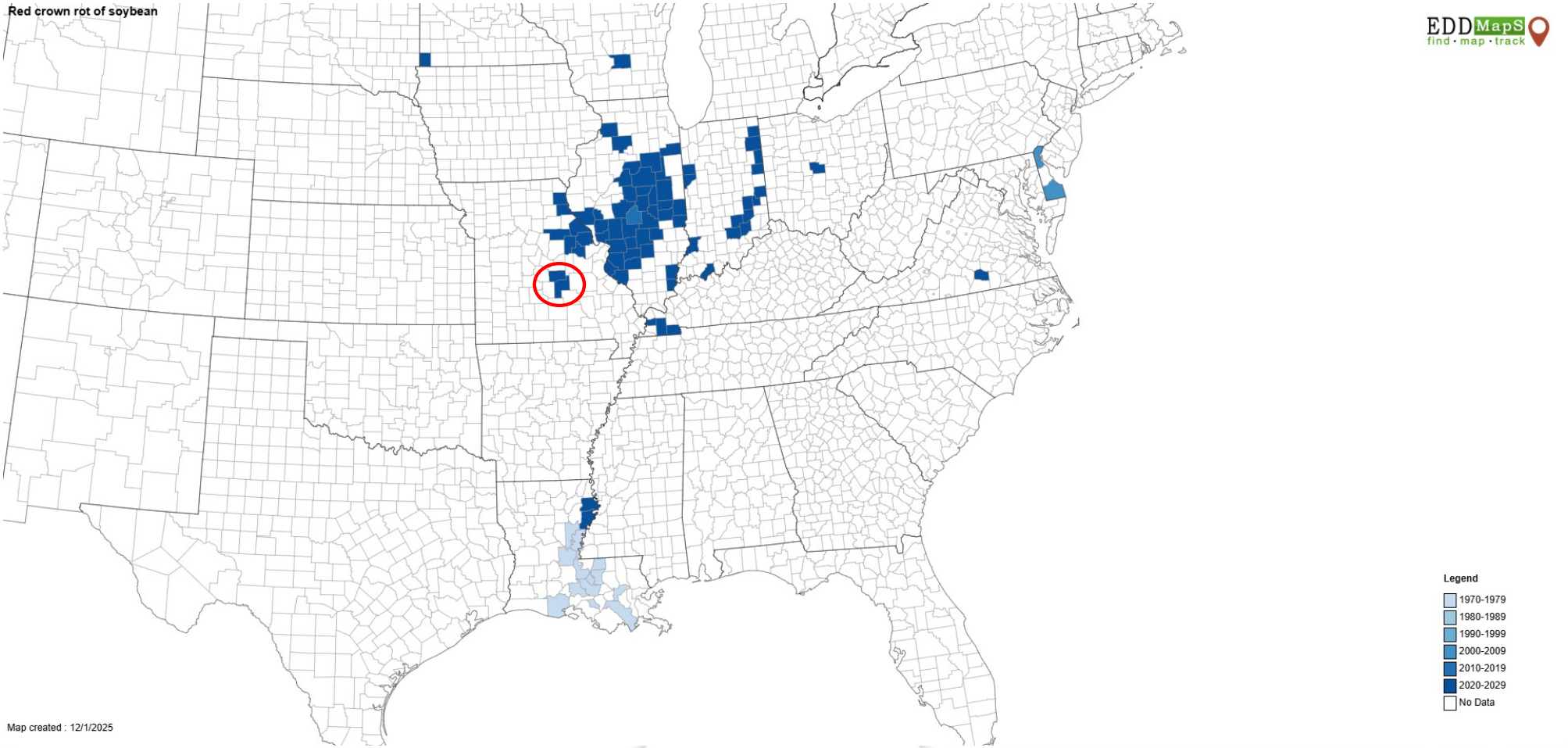
- 1970-1979
- 1980-1989
- 1990-1999
- 2000-2009
- 2010-2019
- 2020-2029
- No Data

Map created : 12/1/2025

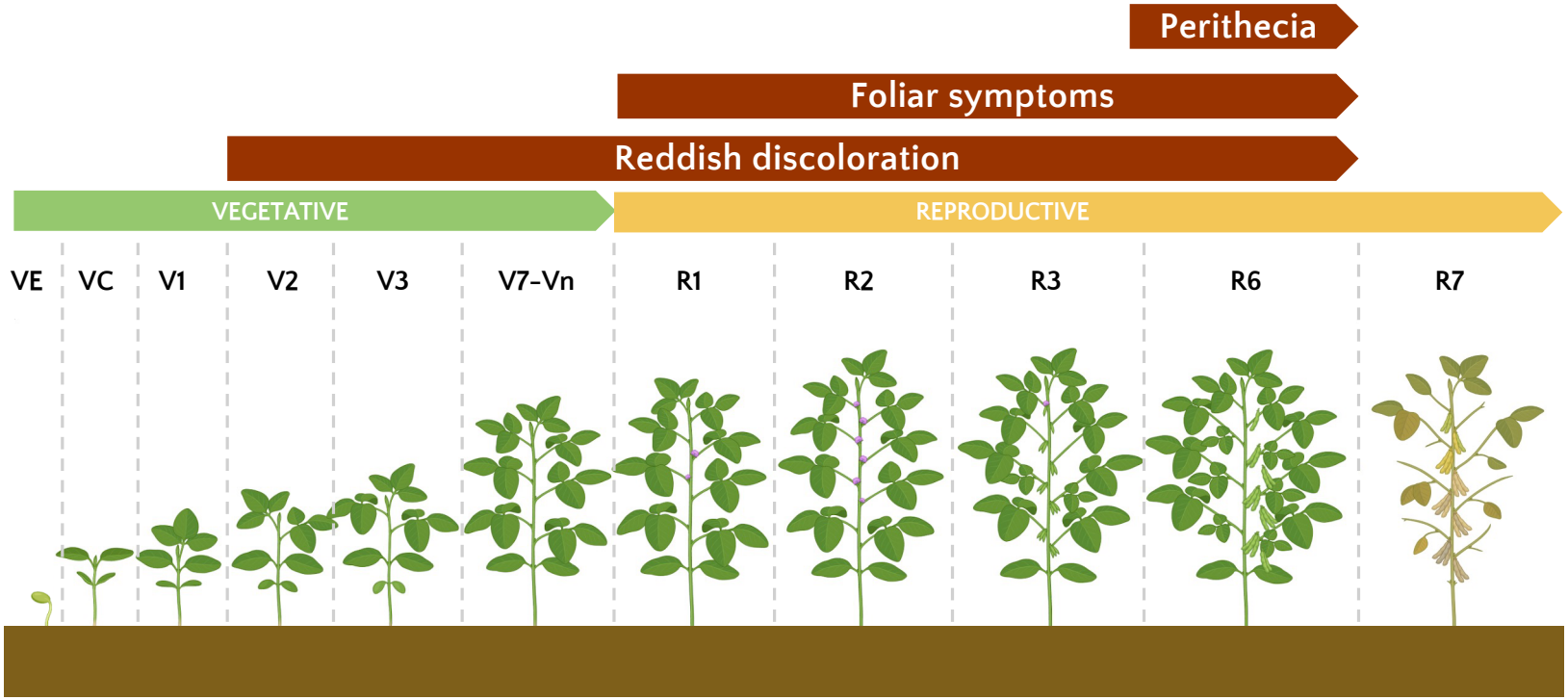
“Historical” geographical footprint of red crown rot in the U.S.

- Map shows approximate distribution of red crown rot in the U.S. around 2014

Map image from: *A Farmer’s Guide to Soybean Diseases* (American Phytopathological Society, 2016)



Timing of Red Crown Rot Symptoms



Red Crown Rot

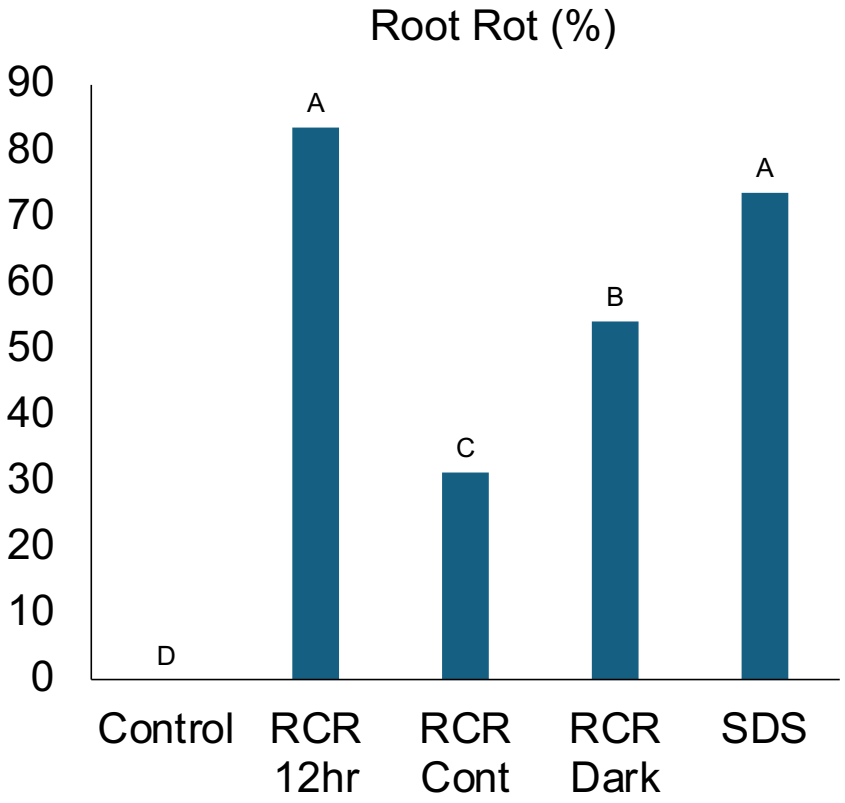
Reddish Discoloration

V1 to R6


Foliar Symptoms R1 to R6


Base of Stem & Root R3 to R6

Red Crown Rot an Aggressive Root Rotter

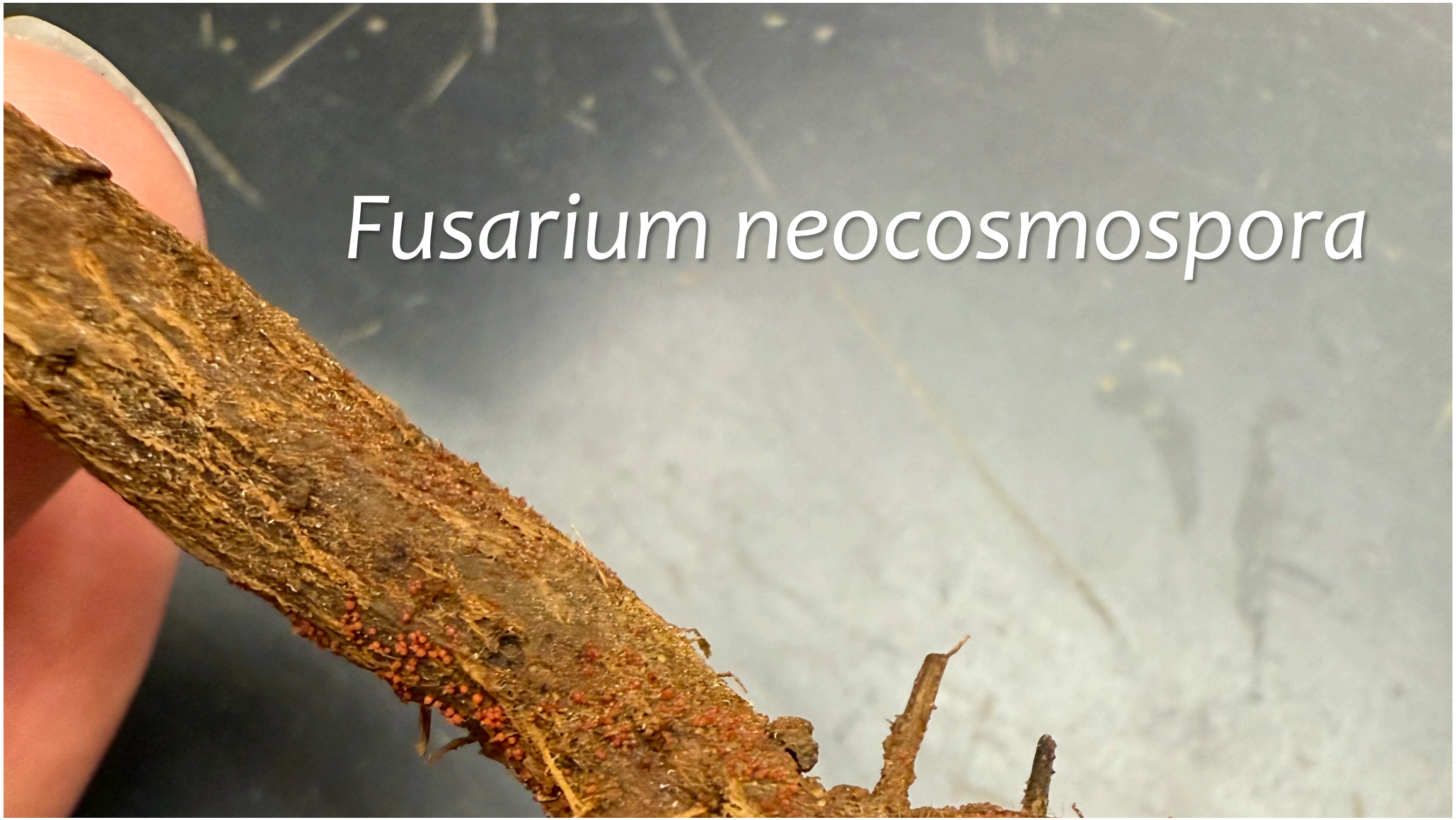


Haafke and Bish (2025) Preliminary Data

Image via Carl Bradley, University of Kentucky


Clonostachy rosea


Clonostachy rosea


Fusarium neocosmospora

Images via Jessica Argenta, University of Missouri

Sudden death syndrome

Brown stem rot

Stem canker

Dectes stem borer

Triazole Fungicide Injury

Seed Treatments and RCR Root Rot

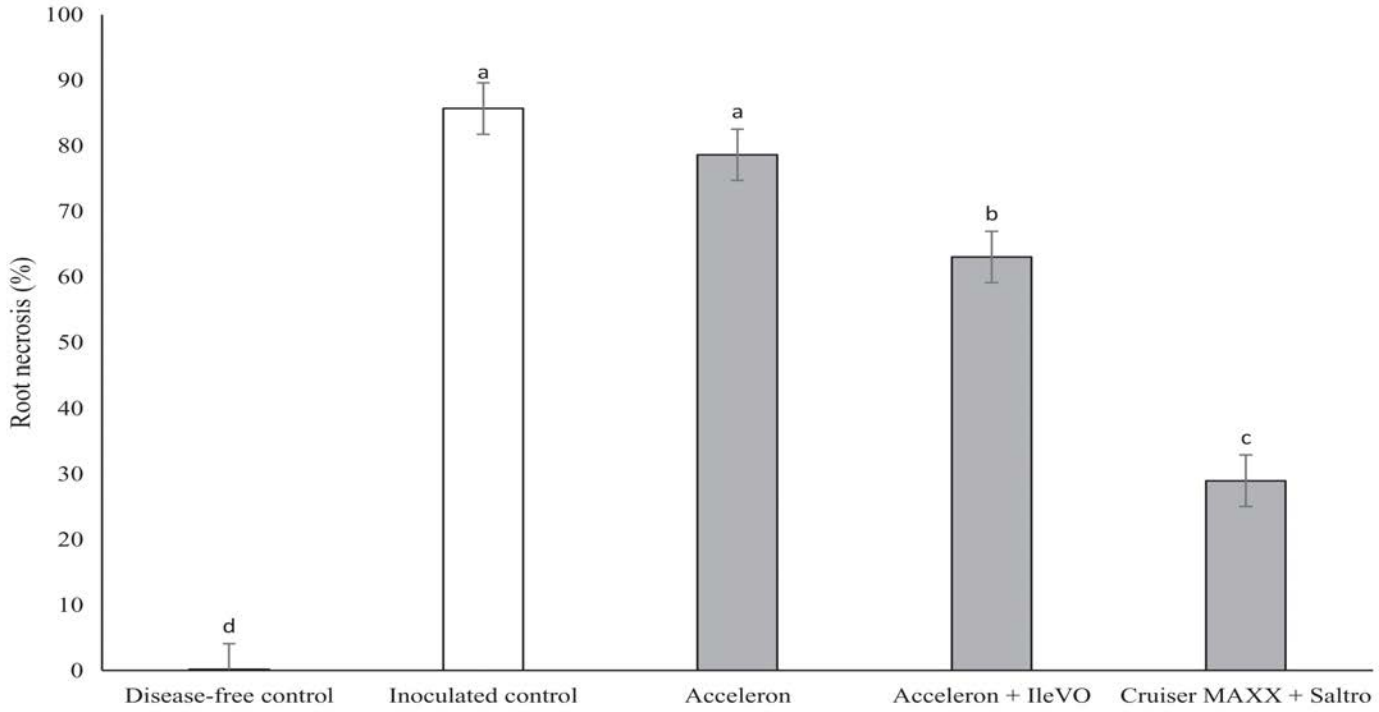


Fig. 3. The percentage of root necrosis for soybeans grown under a light bank for 21 days and inoculated with *Calonectria ilicicola*. Data represent two experimental replications. Data were arcsine square root transformed prior to analysis, and back-transformed data are presented here. Different letters indicate significant mean differences using Fisher's least significant difference (α = 0.05).

Published in: Nathan Kleczewski; Seth Geisler; *Plant Disease* 2022, 106, 2060-2065.
 • DOI: 10.1094/PDIS-10-21-2237-RE

PEANUT DISEASE CONTROL

PEST	FUNGICIDE	MOA	AMOUNT PER ACRE	REI/PHI (Hours or Days)	REMARKS AND PRECAUTIONS
FOLIAR DISEASES *(continued)*					
Cylindrocladium Black Rot (CBR)	*metam sodium* 42%	M3	10 gal/A		To be effective, the fumigant *metam sodium* must be applied very carefully. To avoid injury to the seed and the seedlings, the fumigant must be applied at least 14 days before planting to a depth of 8-10". *Metam sodium* should be applied only when the soil temperature is greater than 60°F and when the soil moisture is like it would be for suitable seed germination. It is critical to get a good seal on the chisel trace left after fumigation so that the *metam sodium* does not escape directly into the atmosphere. The rows must be marked so that seed can be planted directly above where the fumigant was applied. **Growers who are using this treatment for the first time may want to consult with their local county Cooperative Extension agent.**
	prothioconazole Proline 480SC	3	0.4 fl oz/1000 row ft 5.7 fl oz/A	48 H/ 14 D	Proline 480SC is applied in-furrow for the management of CBR. See label for rate information and additional application strategies for management of CBR and perhaps white mold (stem rot). Maximum rate is 22.8 fl oz/A/season.
	tebuconazole Abound 2.08F tebuconazole 3.6F Priaxor Headline Provost Fontelis Elatus	 11 3 11 + 7 11 3 7 11 + 3	 18.5-24.6 fl oz 7.2 fl oz 12-15 fl oz 8-10.7 fl oz 8 fl oz/A 16-24 fl oz 7.3-9.5 fl oz	12 H/ 14 D Except Headline – 4 H	Provost *tebuconazole*, Abound, Elatus, Fontelis, Priaxor, and Headline are labeled for the "suppression" of CBR. This means that they may have some limited benefit to the grower in the management of this disease. However neither is likely to result in significant reduction in CBR when compared to the benefits of *metam sodium*.

Red crown rot management, *then* and *now*

Management practice	"Then"	"Now"
Plant resistant varieties	X	?
Rotate with non-host crops	X	X
Planting date (soil temperature)	X	X, ?
Manage other diseases and stresses	X	X
Prevention – clean equipment	X	X

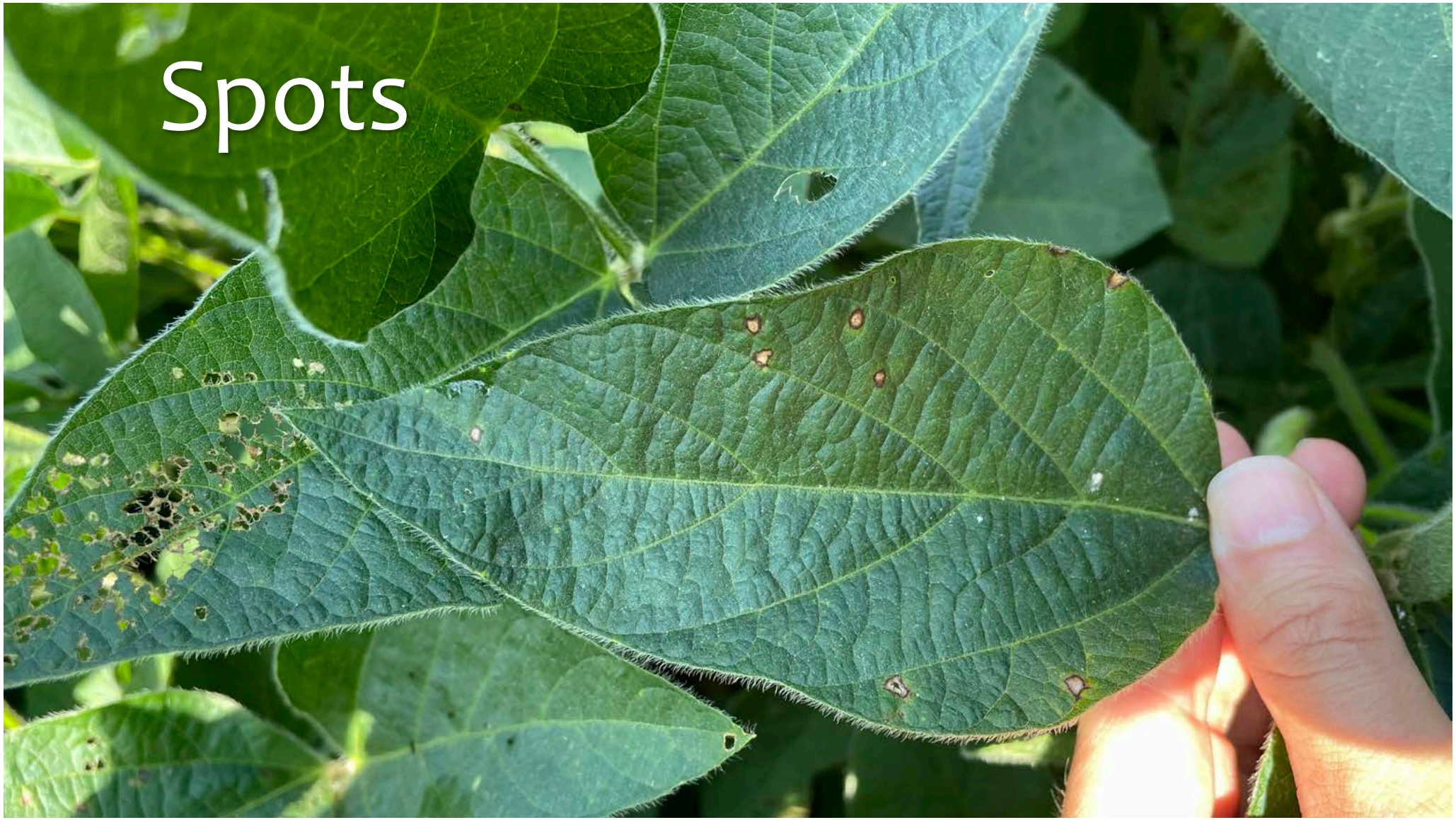
Host range in addition to soybean

Genera:

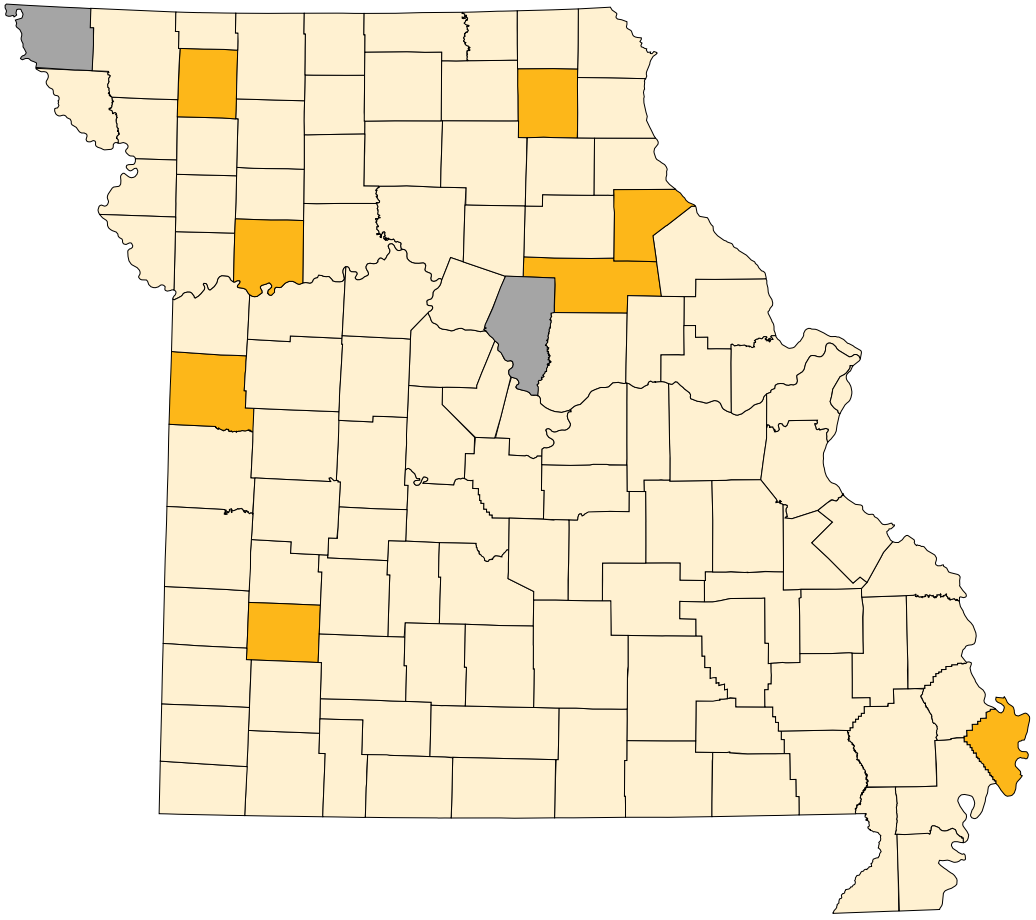
- *Acacia*
- *Arachis* (peanut)
- *Carica*
- *Crotalarioa*
- *Eucalyptus*
- *Howea*
- *Ilex*
- *Leea*
- *Medicago* (alfalfa)
- *Nerium*
- *Persea*
- *Vaccinium*

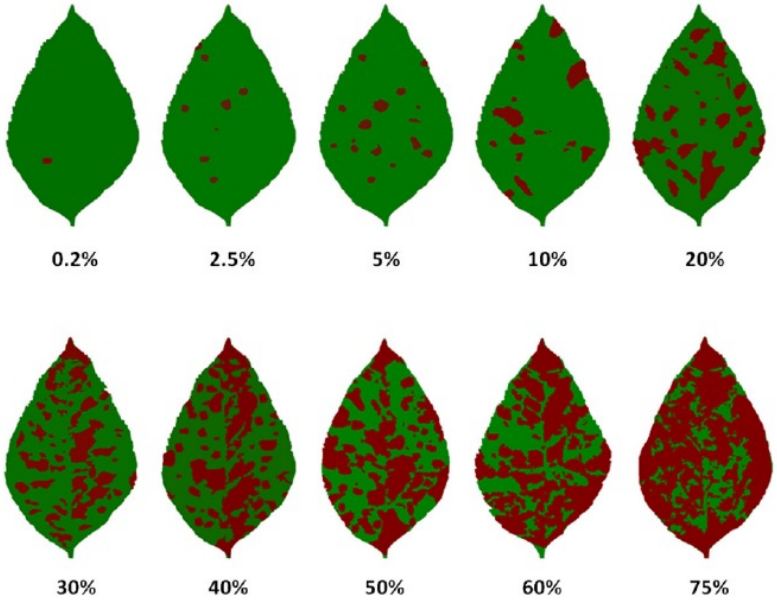
RCR Management Thoughts

- On Seed Treatments
- Differences in Variety Susceptibility
- Corn is a non-host crop
- Moving infested soil will spread the pathogen
- Planting in cooler temperatures


Spots

Foliar Disease Scouting in Missouri

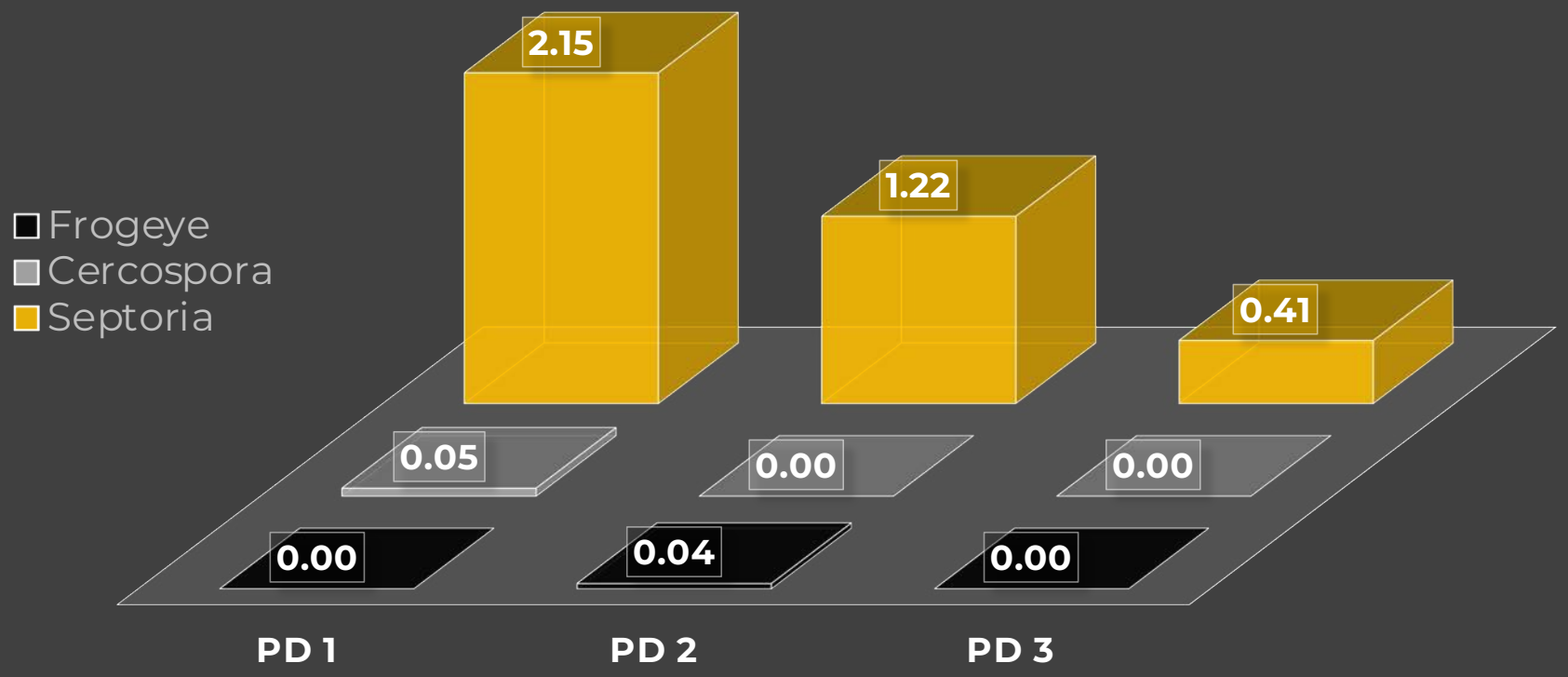




Source: Moreira *et. al*, 2018.

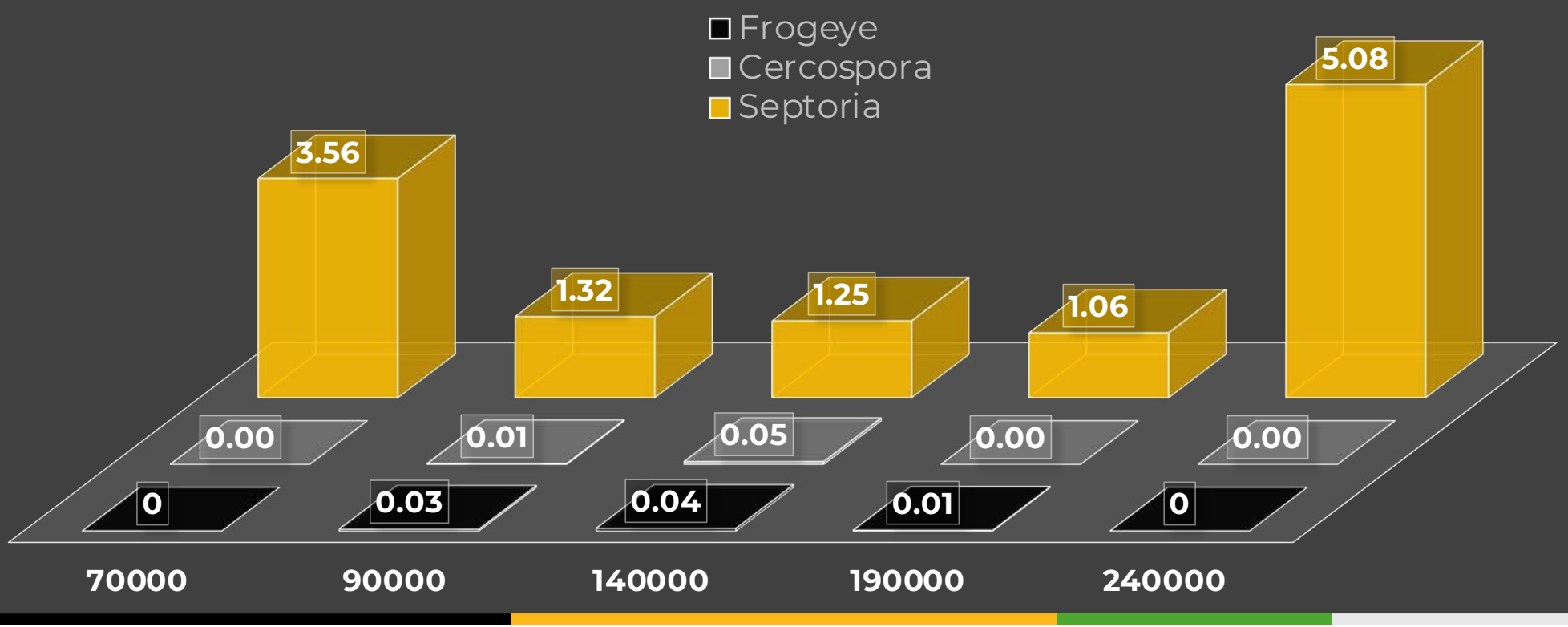
Mizzou

PLANTING DATE X SEVERITY



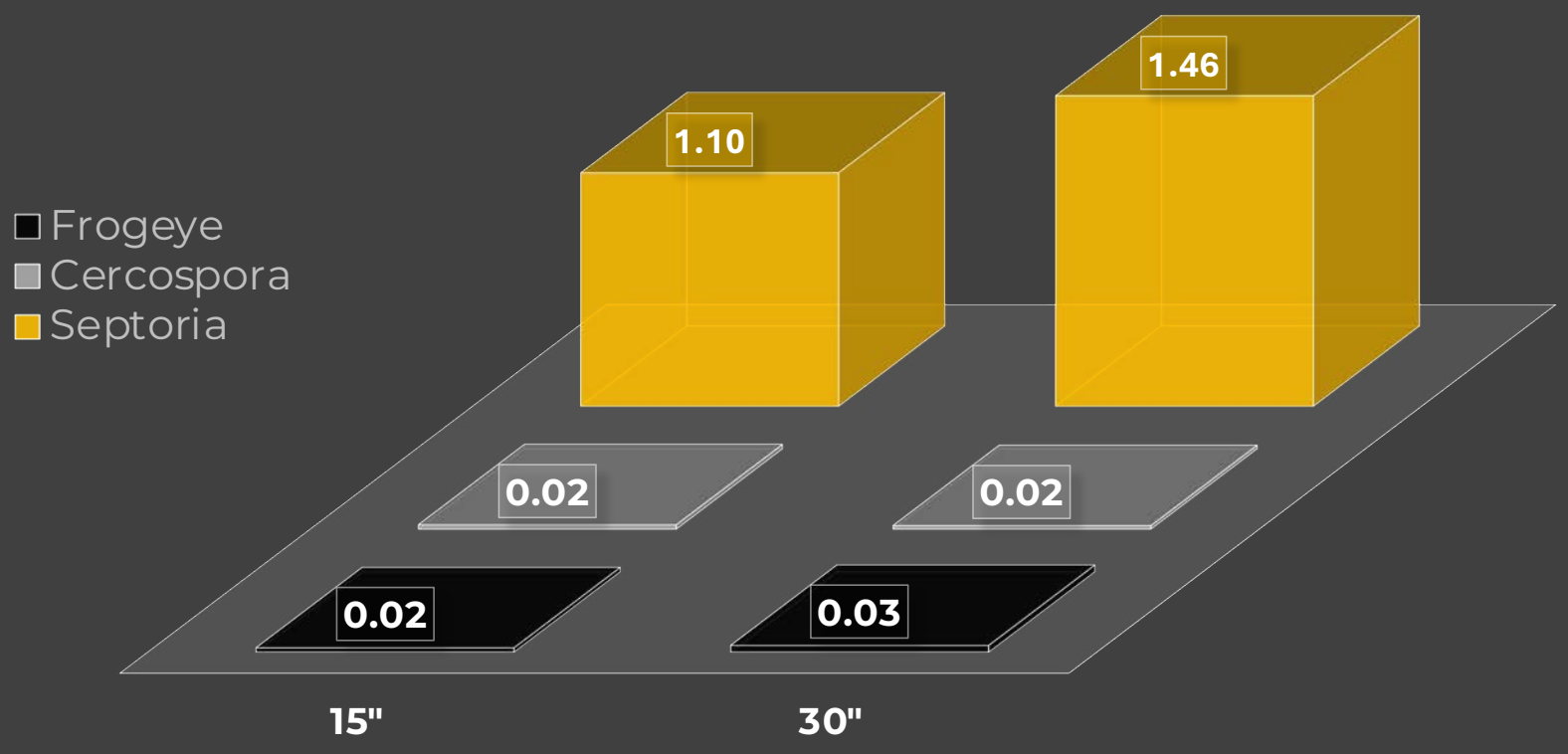
Mizzou

POPULATION X SEVERITY

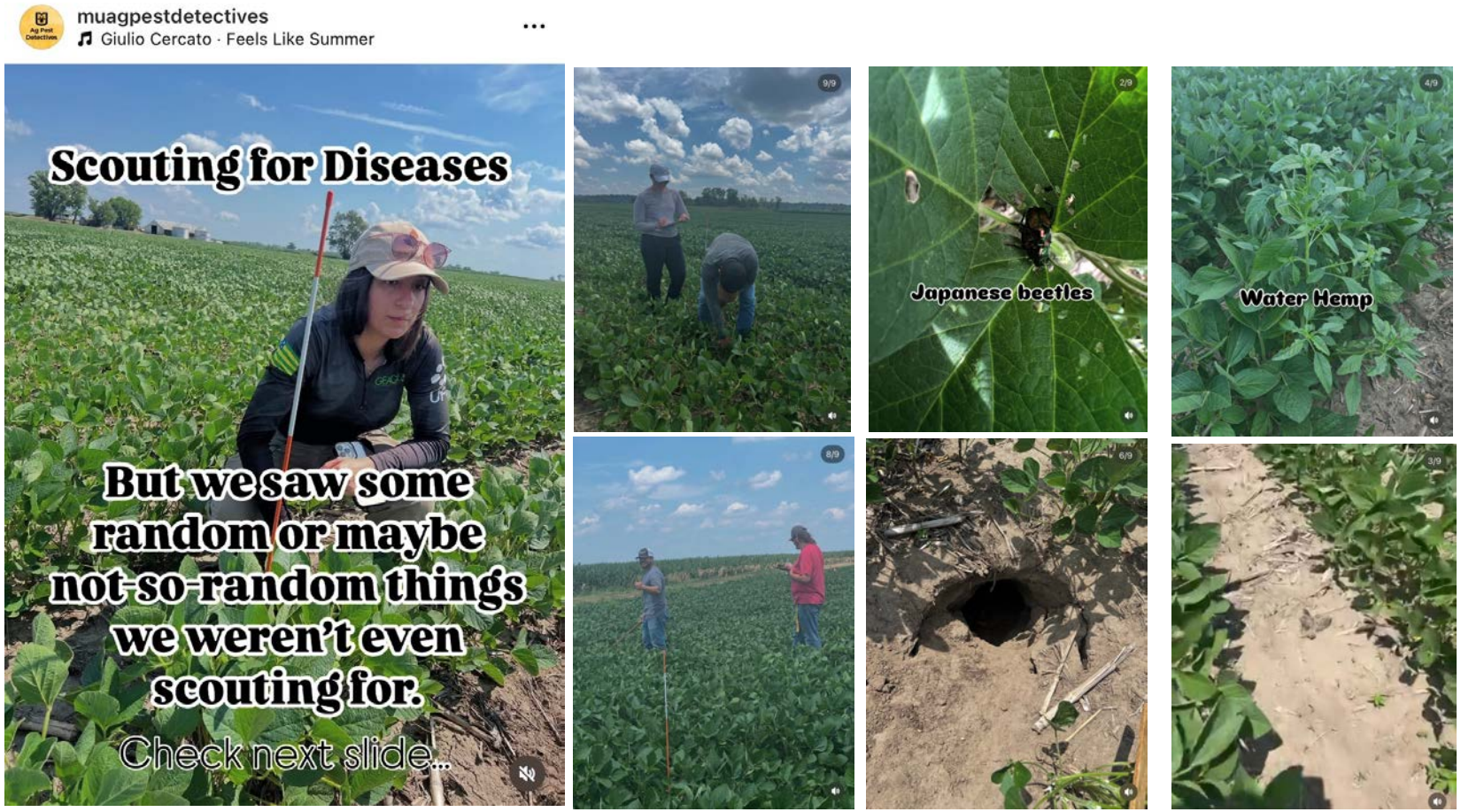


Mizzou

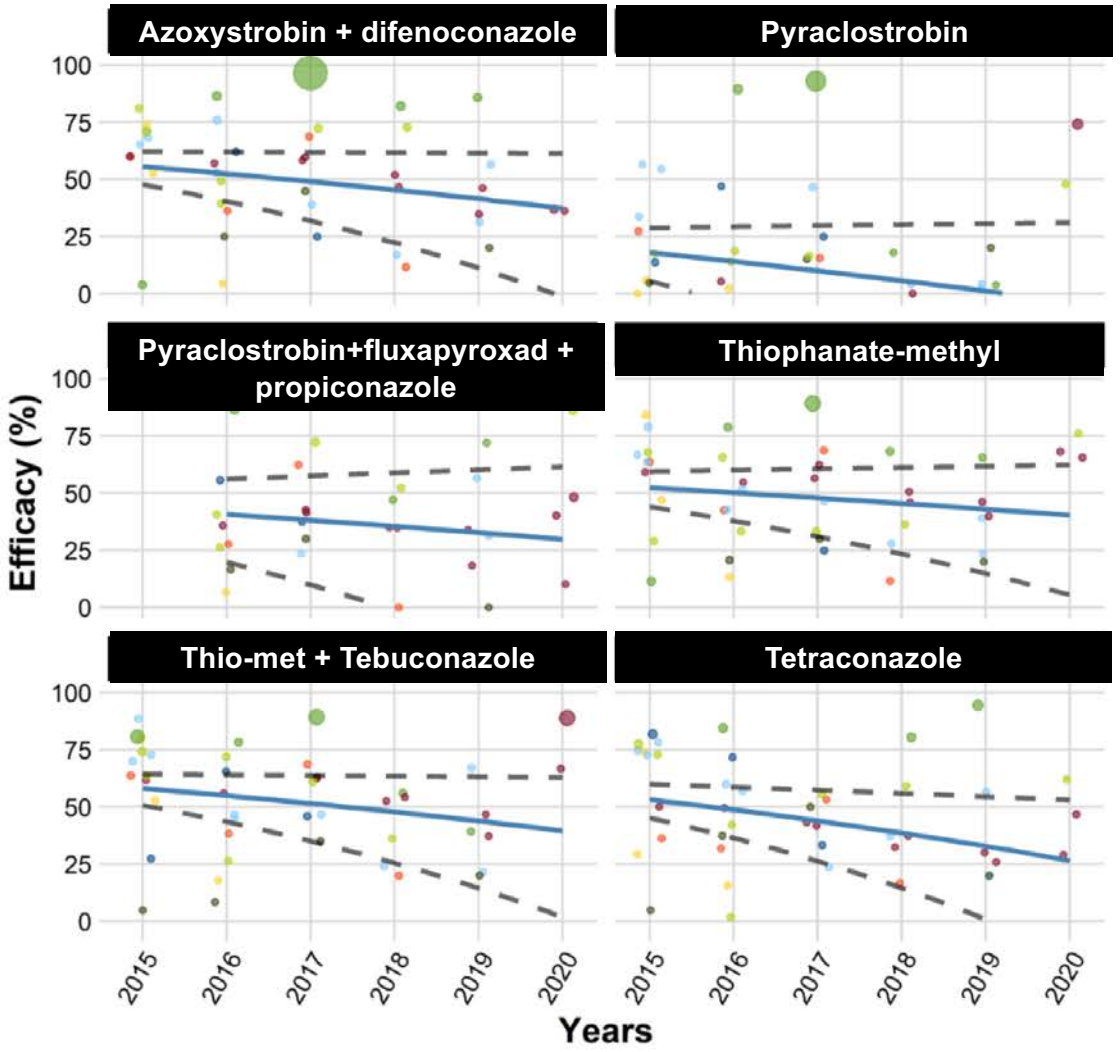
ROW SPACE X SEVERITY



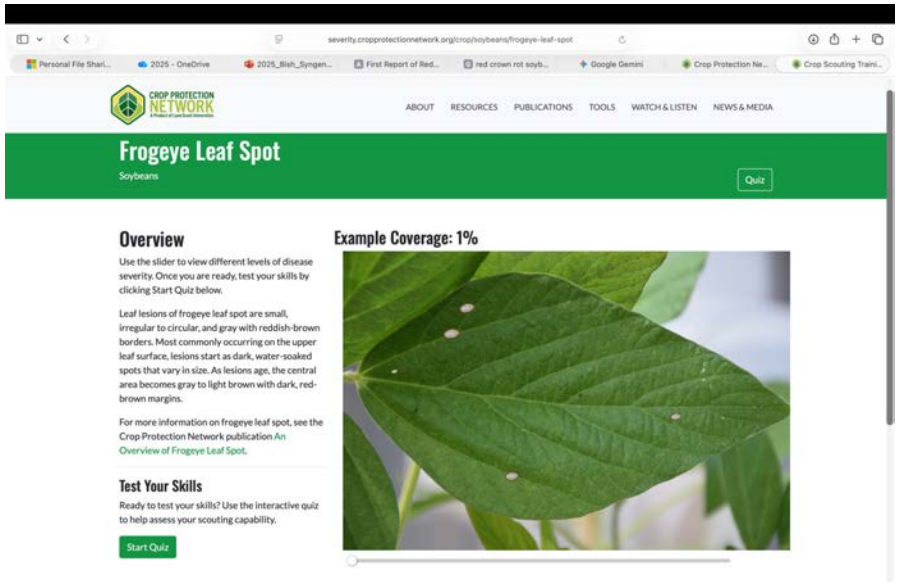
Mizzou

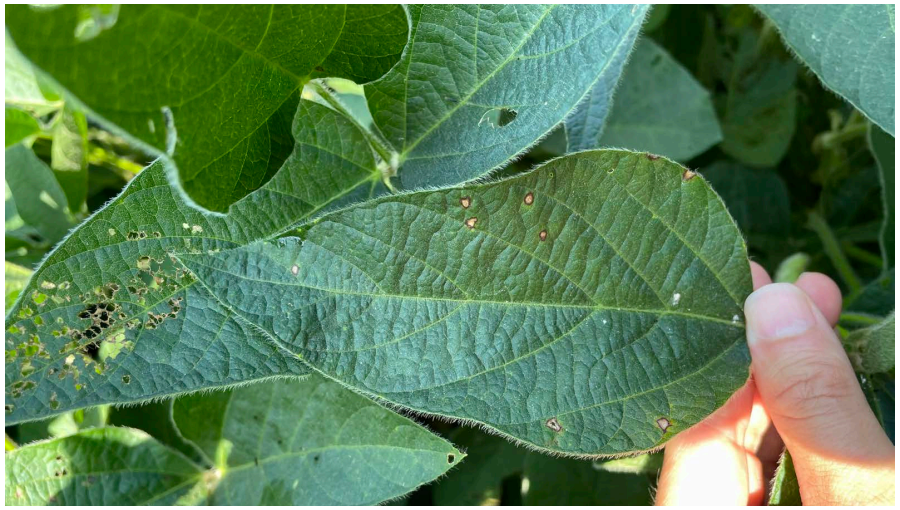

muagpestdetectives
Giulio Cercato · Feels Like Summer
Scouting for Diseases
But we saw some random or maybe not-so-random things we weren't even scouting for.
Check next slide...
9/9
2/9
Japanese beetles
4/9
Water Hemp
8/9
6/9
3/9

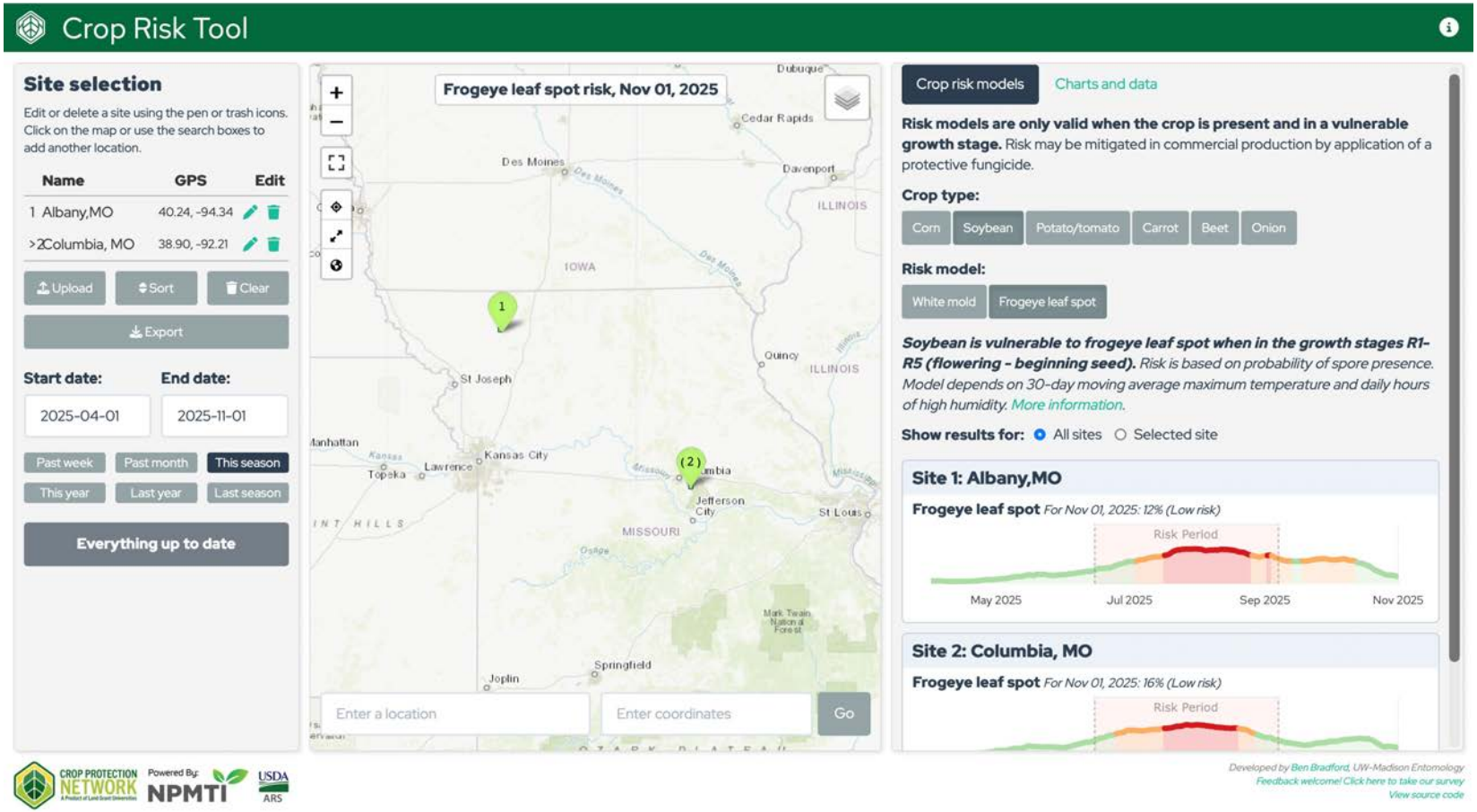
Decreased Efficacy on Frogeye Leaf Spot Over Time



Barro et al. (2023) Plant Disease 107:3487-3496


severity.cropprotectionnetwork.org/crop/soybeans/frogeye-leaf-spot
Personal File Shari...
2025 - OneDrive
2025_Bish_Syngen...
First Report of Red...
red crown rot soyb...
Google Gemini
Crop Protection Ne...
Crop Scouting Traini...
CROP PROTECTION NETWORK
ABOUT
RESOURCES
PUBLICATIONS
TOOLS
WATCH & LISTEN
NEWS & MEDIA
Frogeye Leaf Spot
Soybeans
Quiz
Overview
Use the slider to view different levels of disease severity. Once you are ready, test your skills by clicking Start Quiz below.
Leaf lesions of frogeye leaf spot are small, irregular to circular, and gray with reddish-brown borders. Most commonly occurring on the upper leaf surface, lesions start as dark, water-soaked spots that vary in size. As lesions age, the central area becomes gray to light brown with dark, red-brown margins.
For more information on frogeye leaf spot, see the Crop Protection Network publication An Overview of Frogeye Leaf Spot.
Test Your Skills
Ready to test your skills? Use the interactive quiz to help assess your scouting capability.
Start Quiz
Example Coverage: 1%




Crop Risk Tool
Site selection
Edit or delete a site using the pen or trash icons. Click on the map or use the search boxes to add another location.
Name
GPS
Edit
1 Albany,MO
40.24, -94.34
>2Columbia, MO
38.90, -92.21
Upload
Sort
Clear
Export
Start date:
End date:
2025-04-01
2025-11-01
Past week
Past month
This season
This year
Last year
Last season
Everything up to date
Frogeye leaf spot risk, Nov 01, 2025
Dubuque
Cedar Rapids
Des Moines
Davenport
ILLINOIS
IOWA
Quincy
St Joseph
Kansas City
Topeka
Lawrence
Jefferson City
St Louis
MISSOURI
Springfield
Joplin
Enter a location
Enter coordinates
Go
Crop risk models
Charts and data
Risk models are only valid when the crop is present and in a vulnerable growth stage. Risk may be mitigated in commercial production by application of a protective fungicide.
Crop type:
Corn
Soybean
Potato/tomato
Carrot
Beet
Onion
Risk model:
White mold
Frogeye leaf spot
Soybean is vulnerable to frogeye leaf spot when in the growth stages R1-R5 (flowering - beginning seed). Risk is based on probability of spore presence. Model depends on 30-day moving average maximum temperature and daily hours of high humidity. More information.
Show results for:
All sites
Selected site
Site 1: Albany,MO
Frogeye leaf spot For Nov 01, 2025: 12% (Low risk)
Risk Period
May 2025
Jul 2025
Sep 2025
Nov 2025
Site 2: Columbia, MO
Frogeye leaf spot For Nov 01, 2025: 16% (Low risk)
Risk Period
CROP PROTECTION NETWORK
Powered By:
NPMTI
USDA ARS
Developed by Ben Bradford, UW-Madison Entomology
Feedback welcome! Click here to take our survey
View source code

Target Spot

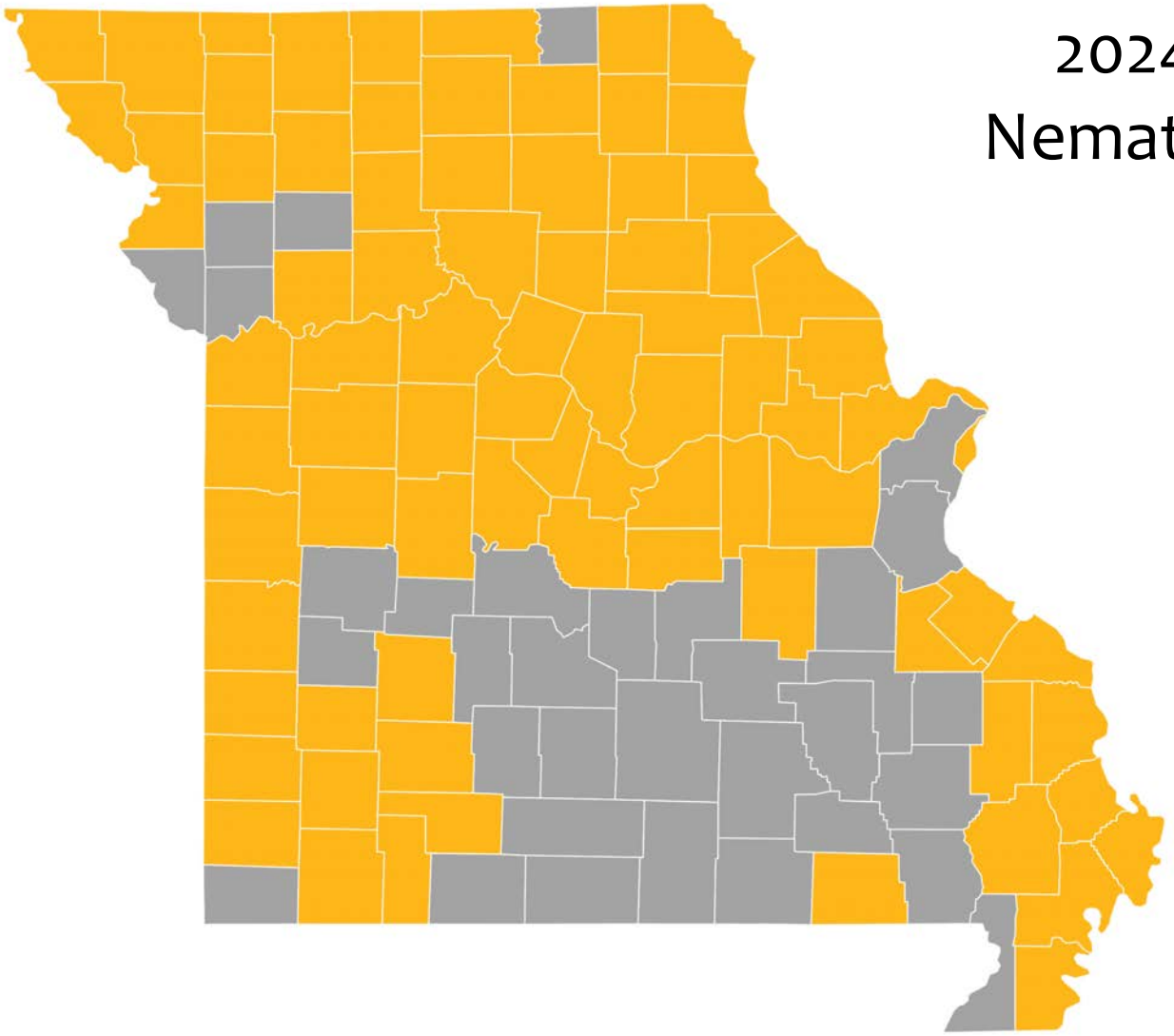
Images via Tom Allen and Travis Faske via Crop Protection Network

Foliar Disease Thoughts

- Are you confident that you are seeing a positive return on investment?
- You can run your own strip trial.
- How concerned are we with fungicide resistance becoming an issue?
- Are we starting to see a few more diseases in central to northern Missouri?

Tiny Worms

Images via Jeff Barizon, University of Missouri



2024-2025 Plant Parasitic Nematode Survey in Soybean

MISSOURI SOYBEANS

2024-2025 Soybean Cyst Nematode Numbers by Region

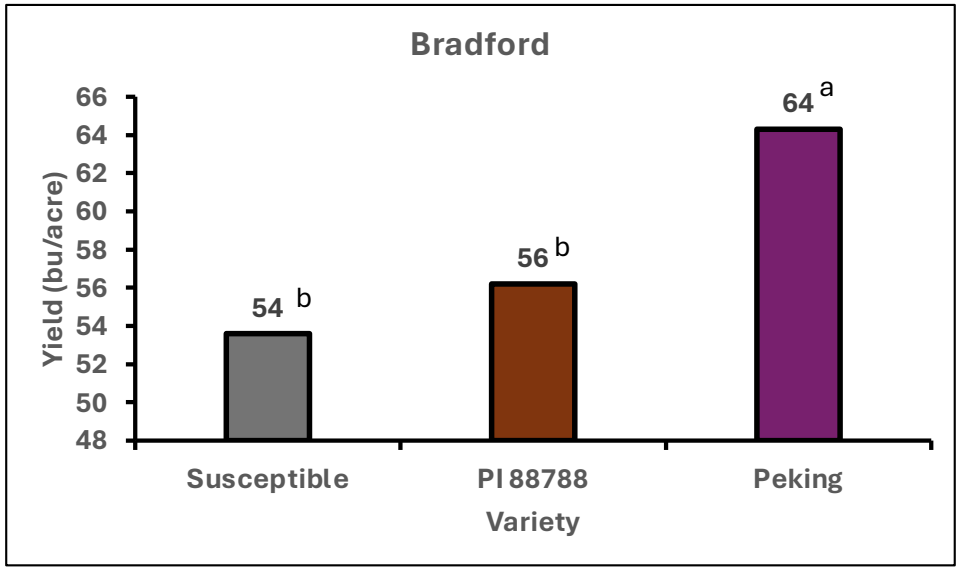
Region	# Samples	% Positive	Average (100 cc)	Median (100 cc)	Highest (100 cc)
Northwest	27	81.5	2,982	2,000	22,000
North Central	29	79.3	2,467	1,000	20,200
Northeast	30	93.3	1,922	1,300	4,900
West Central	16	81.3	5,046	3,200	17,400
Central	27	74.1	4,050	2,850	14,200
East Central	27	70.4	4,110	2,200	17,750
Southwest	24	50.0	11,067	10,200	33,900
South Central	-	-	-	-	-
Southeast	21	90.5	7,163	2,800	33,800
Missouri	201	77.6	**4,317**	2,100	33,900

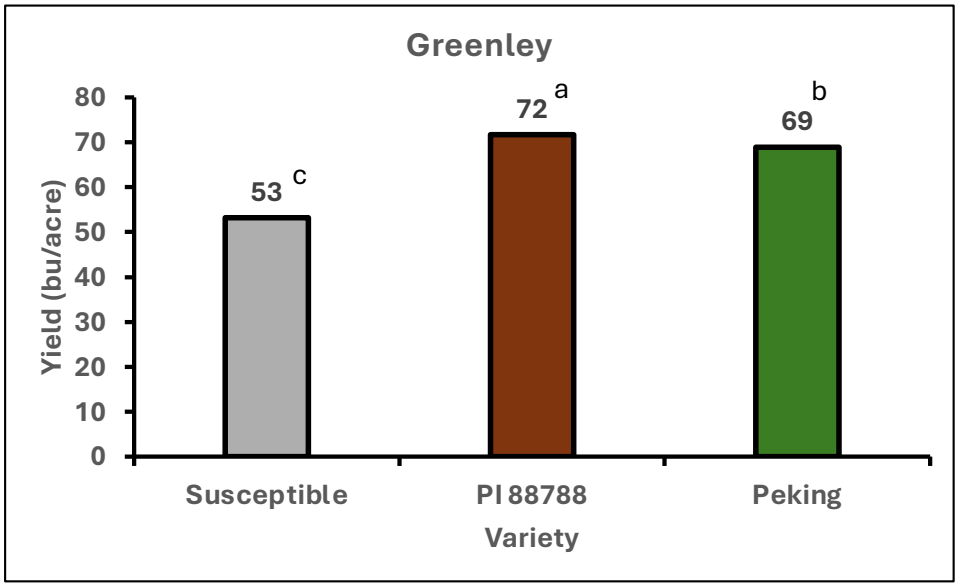
SCN Estimated Losses – Field Level

Region	SCN Eggs (100 cc)	% Sand	pH	Female Index PI88788	Average Yield (bu/a)	Estimated Losses*
Northwest	2,800	11	7.5	66%	43	11.2%
North Central	1,000	15	6.7	66%	46	9.7%
Northeast	1,500	3	7.1	71%	49	8.8%
West Central	3,200	10	6.3	70%	40	9.0%
Central	2,900	6	7.3	73%	40	10.7%
East Central	2,300	5	6.5	77%	49	9.1%
Southwest	10,200	13	6.1	44%	21	7%
Southeast	2,200	21	5.6	87%	48	12.6%

*Profit losses were estimated with the SCN Coalition Profit Checker tool using $11.27 per bushel as the price of soybean.
https://www.thescncoalition.com/profitchecker/calculator/

Yields – Commercial PI 88788 and Peking Soybean





n= 60

Female Index
PI 88788 - 95
Peking – 5.5

SCN = 6000 eggs per 100 cm3 soil

n=60

Female Index
PI 88788 – 64.9
Peking – 25.2

SCN eggs = 4000 eggs per 100 cm3 soil

MISSOURI SOYBEANS

SCN Diagnostics is Getting a Makeover

Plant Pathology Resources

- SCN Diagnostics: MU Nematode Testing Services www.scndiagnostics.com
- MU Plant Diagnostic Clinic https://extension.missouri.edu/programs/plant-diagnostic-clinic
- Crop Protection Network https://cropprotectionnetwork.org
  - Yield Loss Estimates
  - Disease Severity Training Tools
- SCN Profit Checker https://www.thescncoalition.com/profitchecker/calculator/
- MU Extension IPM YouTube Channel: Field Crops Playlist https://www.youtube.com/@MUIPM

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SCN Diagnostics

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Mizzou Ag Pest Detectives