

Corn Disease Update

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Session Goals

- At the end of this session participants will be able to identify several important diseases affecting corn and the conditions favoring their development
- Participants will anticipate which diseases are expected to develop in 2021.
- Attendees will be familiarized with disease management options.



Bacterial leaf streak

History

- Caused by *Xanthomonas vasicola* pv. *vasculorum*
- Confirmed in 2016 in Nebraska (first time in the U.S.)

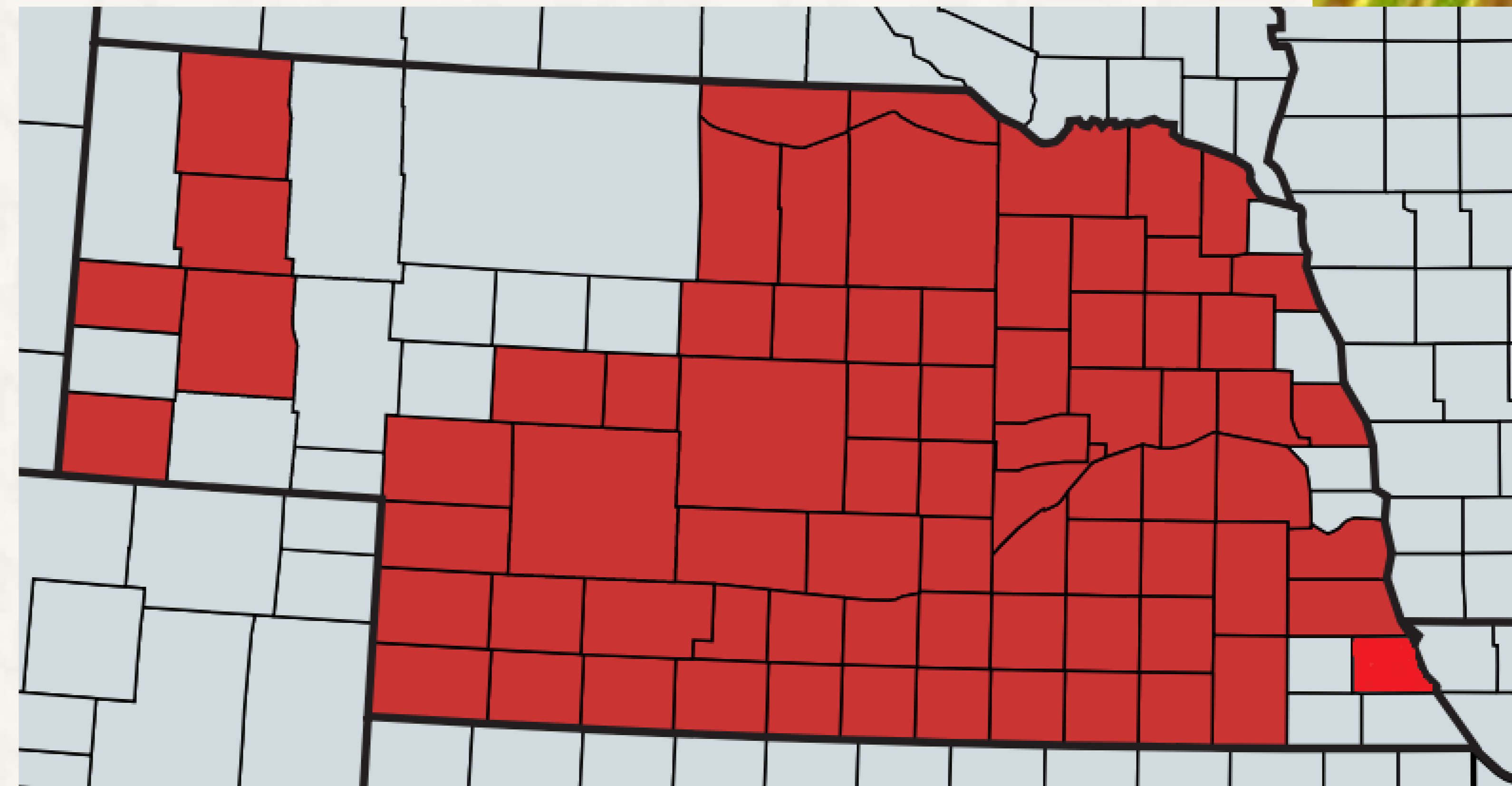
Symptoms

- Interveinal brown to yellow streaks
- Appear strikingly yellow when backlit
- May develop on the **lower leaves initially**
- May develop **mid- to upper canopy later**



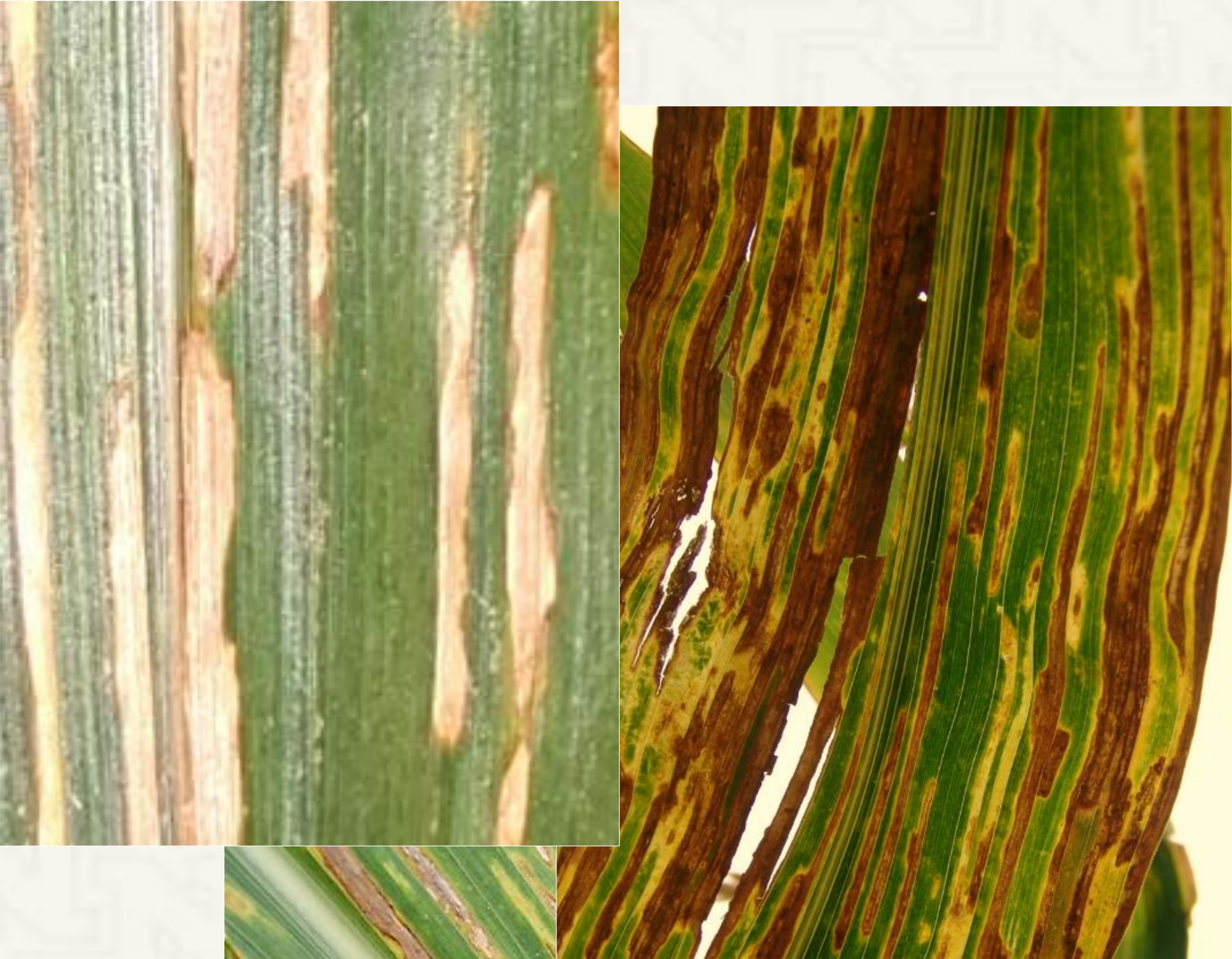
Bacterial leaf streak

- 75 NE counties confirmed since 2016
- Misidentification as gray leaf spot (and other diseases) has led to misapplication of foliar fungicides

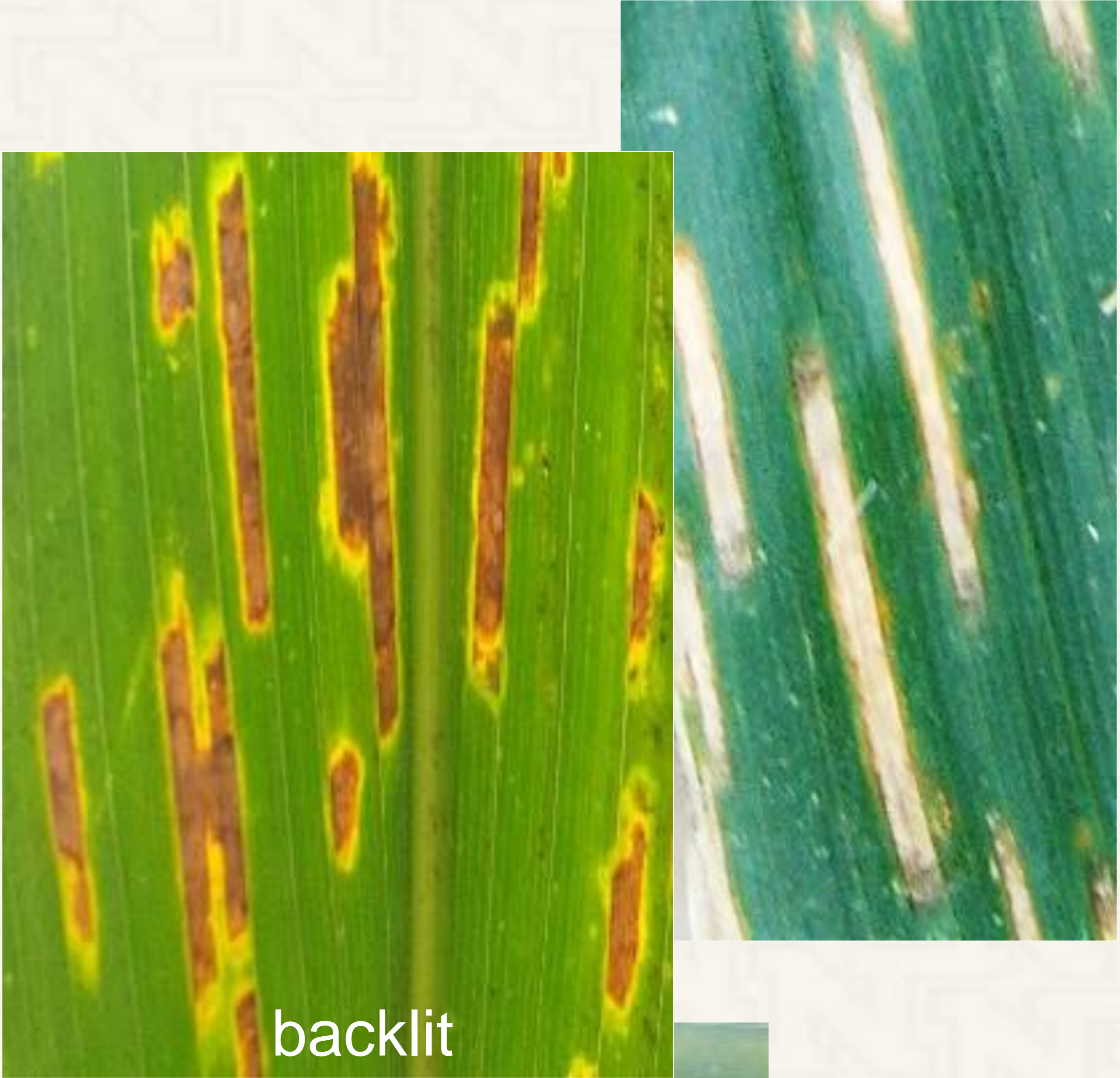


Bacterial Leaf Streak

Gray Leaf Spot (fungal)



backlit

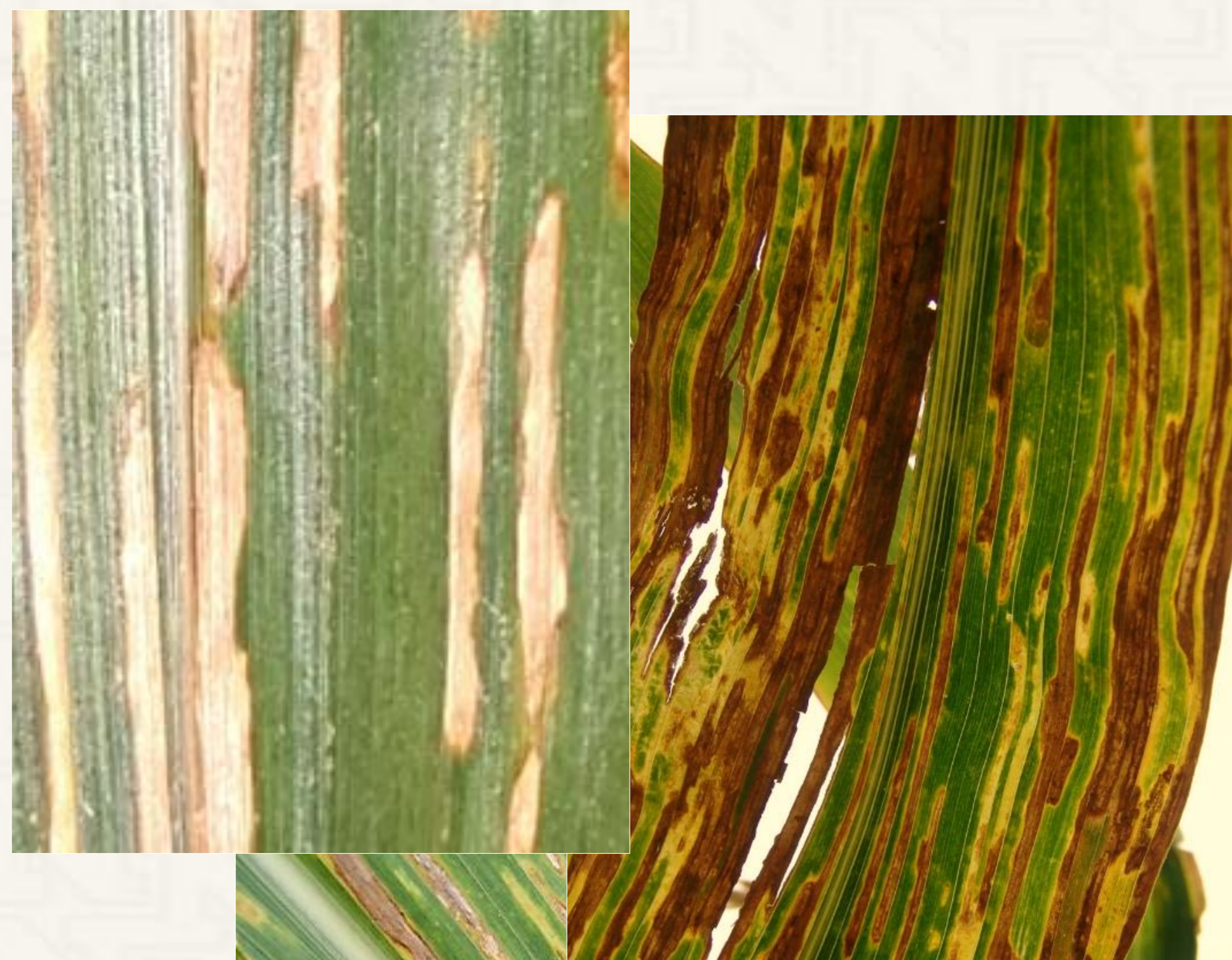


backlit

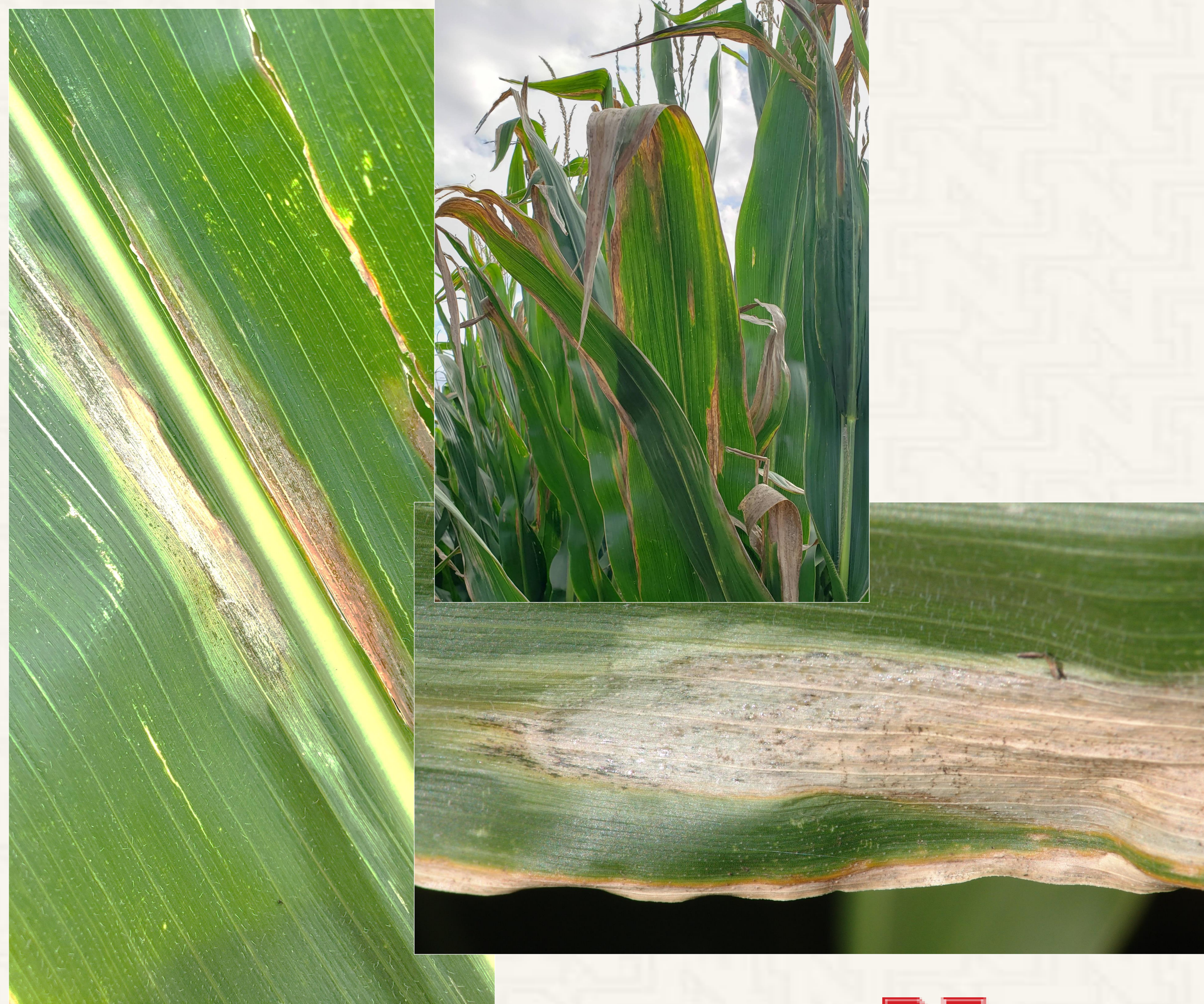


Bacterial Leaf Streak

Goss's Bacterial Wilt & Blight



backlit



Bacterial Leaf Streak (BLS) of Corn

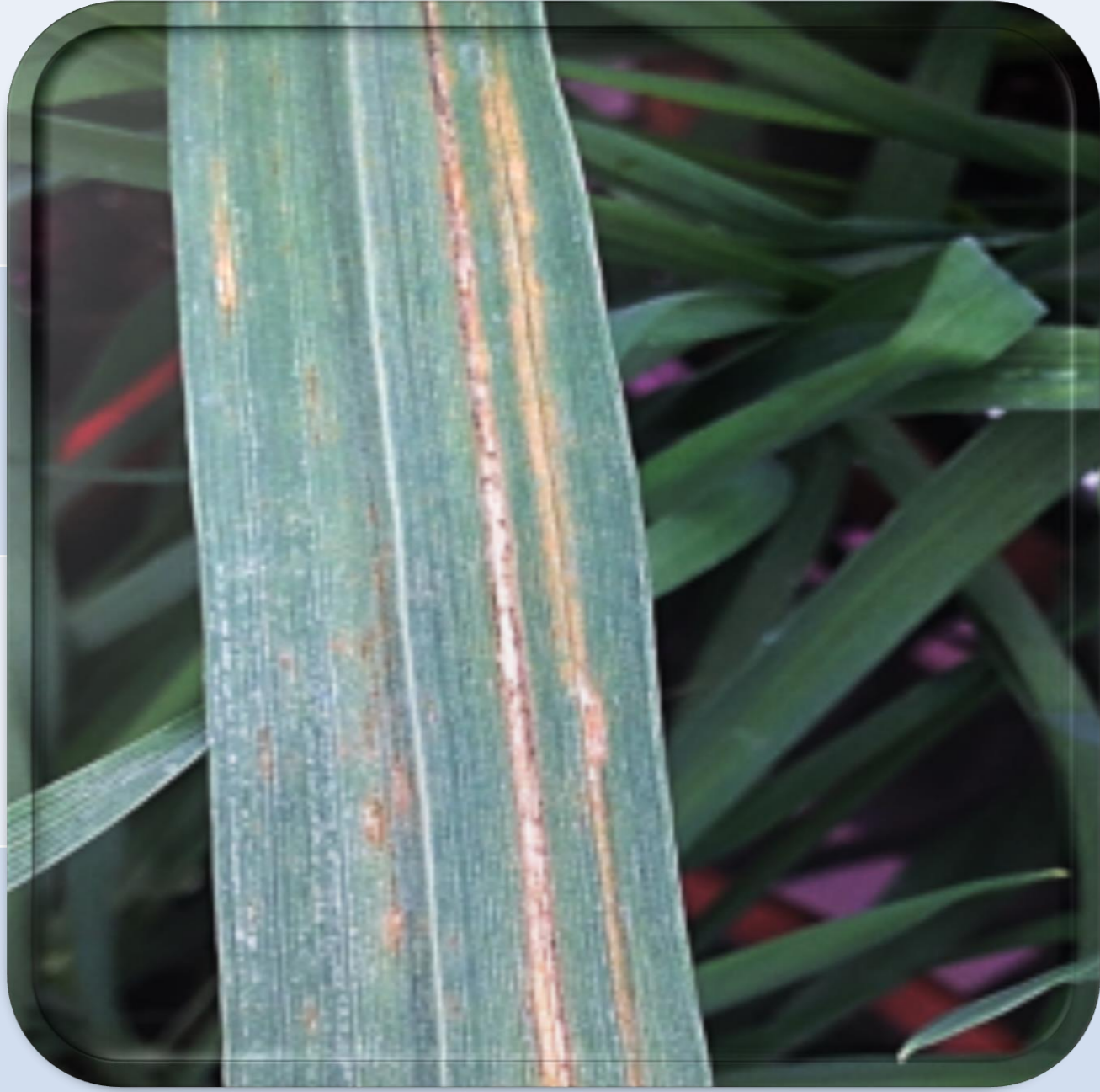
- Caused by *Xanthomonas vasicola* pv. *vasculorum*
- Other reported hosts:
 - Several palm and grass species
 - Coconut
 - Sorghum species
 - Grain sorghum
 - Johnson- and Sudan grass



Lang, J.M., E. DuCharme, J. Ibarra Caballero, E. Luna, T. Hartman, M. Ortiz-Castro, K. Korus, J. Rascoe, T.A. Jackson-Ziems, K. Broders, and J.E. Leach. 2017. Detection and characterization of *Xanthomonas vasicola* pv. *vasculorum* nov. causing bacterial leaf streak of corn in the United States. *Phytopathology* (accepted June 2017).

Host Range Testing

ANNUAL CEREAL CROPS*

Symptomatic**	Asymptomatic	Non-hosts
Oat, 'Jerry'	None	Barley
Rice, 'Jupiter'		Switchgrass
		Cereal rye
		Foxtail millet
		Wheat
		Triticale


*greenhouse

**2017 field tests

Hartman et al., 2019. *Phytopathology*. (accepted)

Host Range Testing

Perennial Pasture, Turf and Landscape Plants*

Symptomatic**	Asymptomatic	Non-hosts
Big bluestem***, 'Champ'	Tall fescue	Annual ryegrass, bluegrama, creeping bentgrass, creeping foxtail, crested wheatgrass, festulolium, green needle, junegrass, meadow brome, prairie sandreed, pubescent wheatgrass, reed canary, sand dropseed, sideoats grama, slender wheatgrass, tall wheatgrass, thickspike wheatgrass, Virginia wild rye, bermudagrass, buffalograss, daylily, Kentucky bluegrass, ornamental pearl millet, perennial ryegrass, zoysiagrass
Indiangrass, 'Holt'	Western wheatgrass	
Little bluestem, 'Blaze'		
Orchardgrass, 'Latar'		
Sand blustem		
Timothy, 'Climax'		
 Big bluestem	<div style="border: 1px solid black; background-color: yellow; padding: 10px; text-align: center;"> <p>Reproduction of Xvv bacteria without causing visible disease symptoms</p> </div>	

*greenhouse testing, **2017 field tests, ***symptomatic in field tests

Hartman et al., 2019. Phytopathology. (accepted)

Host Range Testing



WEEDS*

Symptomatic**	Asymptomatic	Non-hosts	
Bristly foxtail***	Downy brome	Palmer amaranth	
Green foxtail		Smooth brome	
Johnsongrass		Sandbur	
Shattercane		Large crabgrass	
Yellow nutsedge NOT A GRASS Cyperaceae DIFFERENT plant family		Reproduction of Xvv bacteria without causing visible disease symptoms	Barnyard grass
			Fall panicum
		Giant foxtail	
		Yellow foxtail	

*greenhouse testing, **2017 field tests, ***symptomatic in field tests

Hartman et al., 2019. Phytopathology. (accepted)

Bacterial leaf streak

- Management
 - Hybrid selection – screening is difficult. Consult seed company reps
 - Crop rotation
 - Residue management or tillage (*as appropriate*)
 - Weed management?



Bacterial leaf streak

- Additional experiments are underway
 - Yield loss estimates
 - Mitigation experiments
 - Impacts of tillage x crop rotation
 - Screening for resistance in USDA GEM lines



Southern Rust

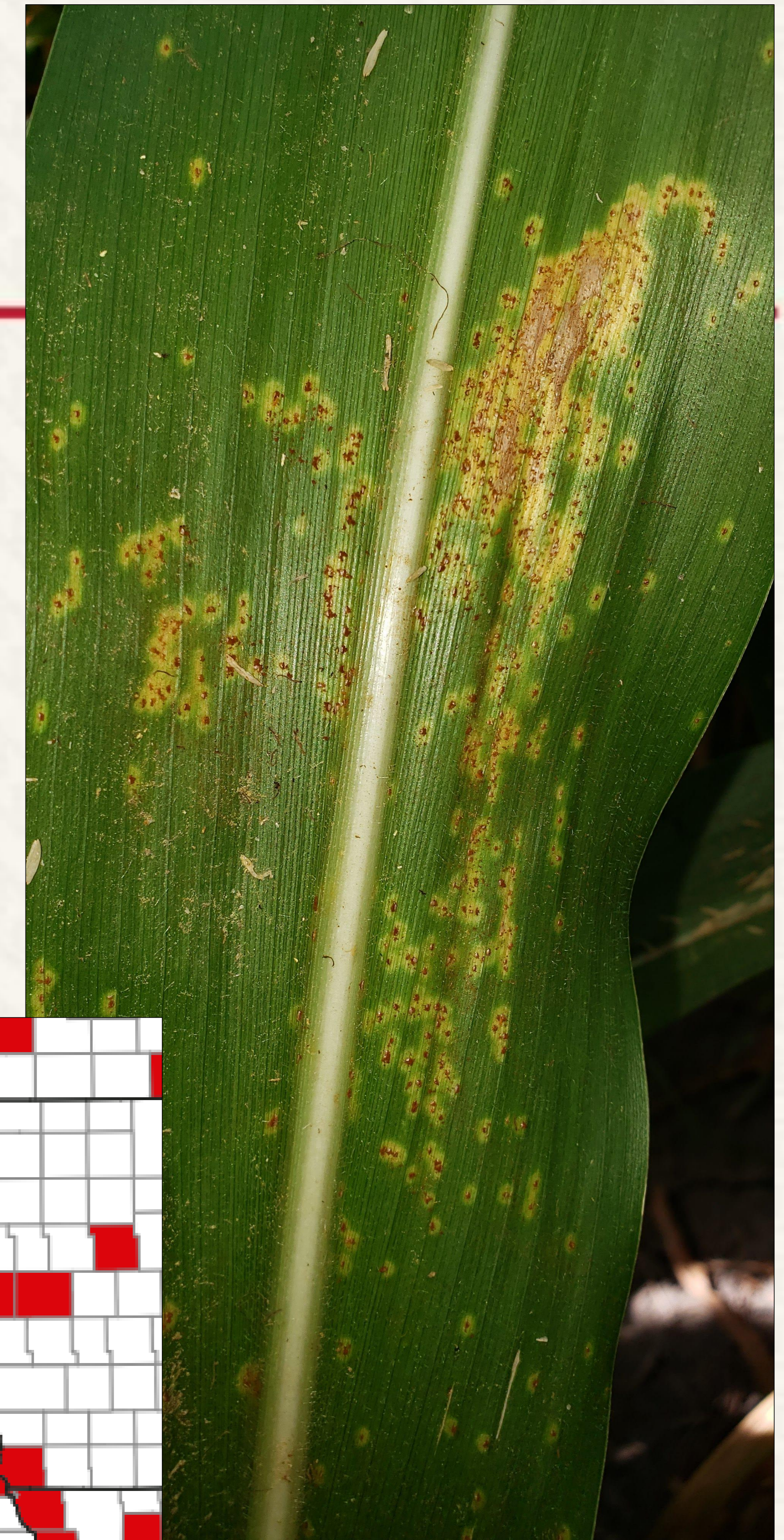
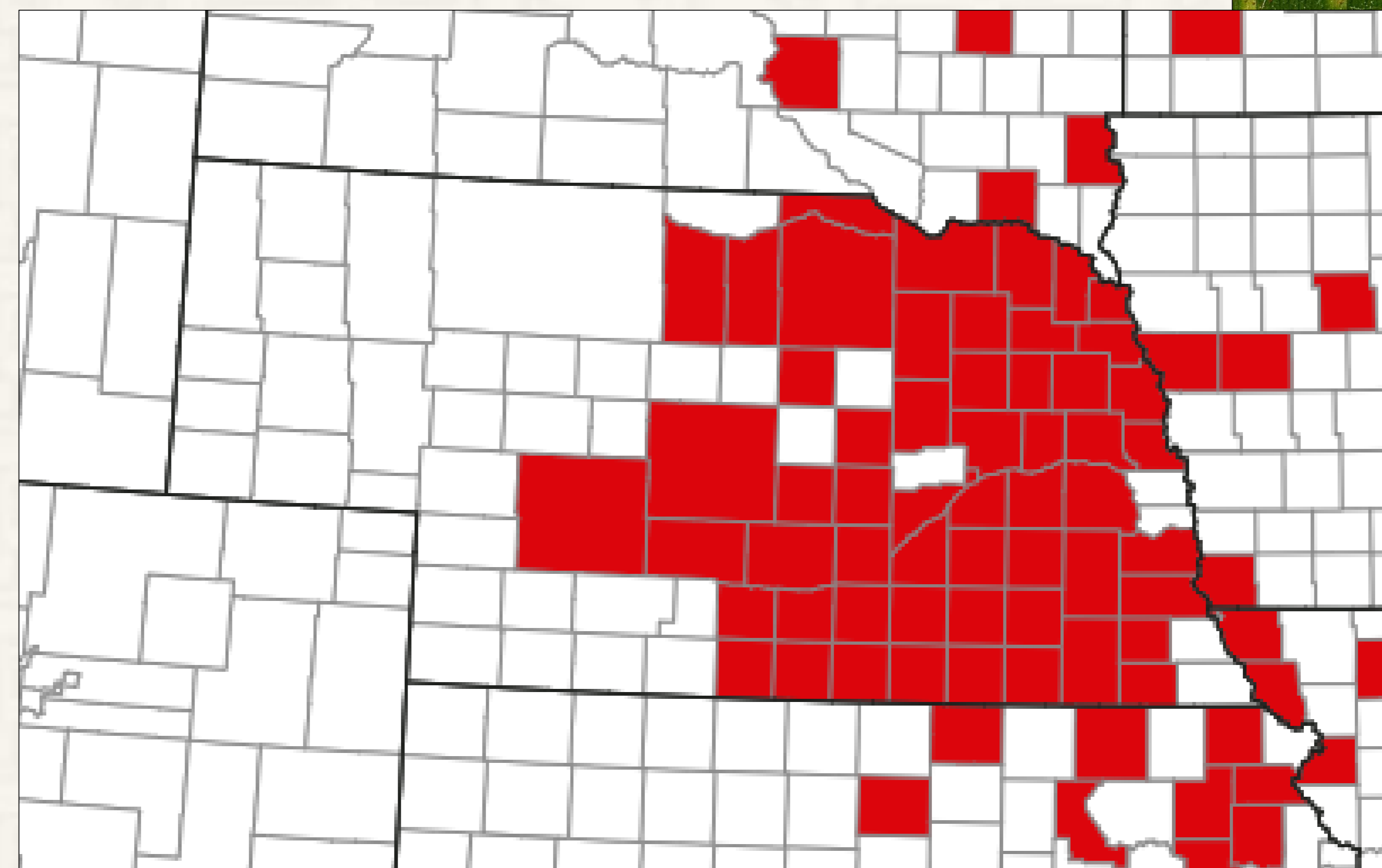
- Confirmed July 14, 2020
- Lots of rust in southern states + high sustained south winds in June

<https://corn.ipmpipe.org/southerncornrust/>

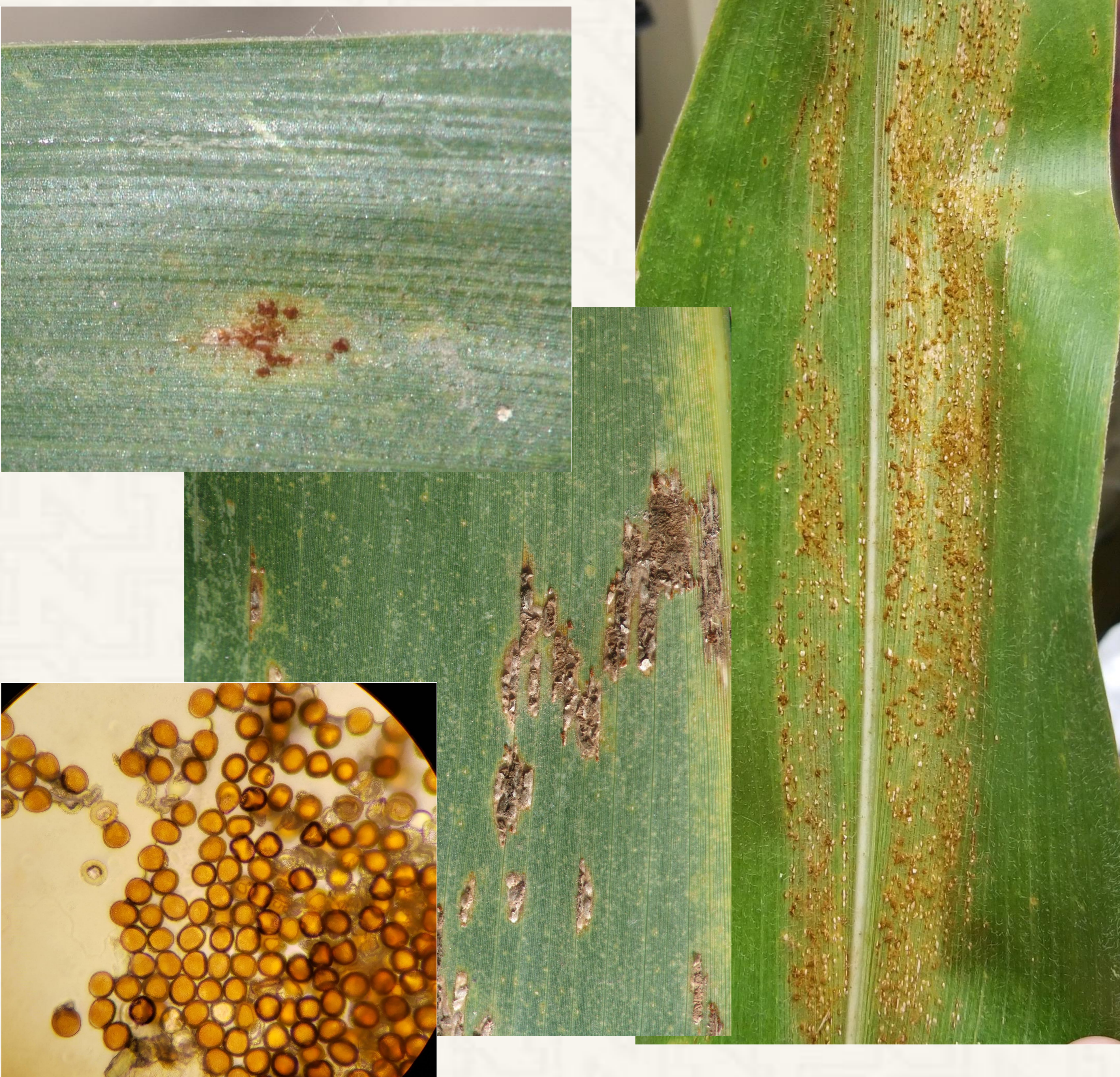
- Monitoring site



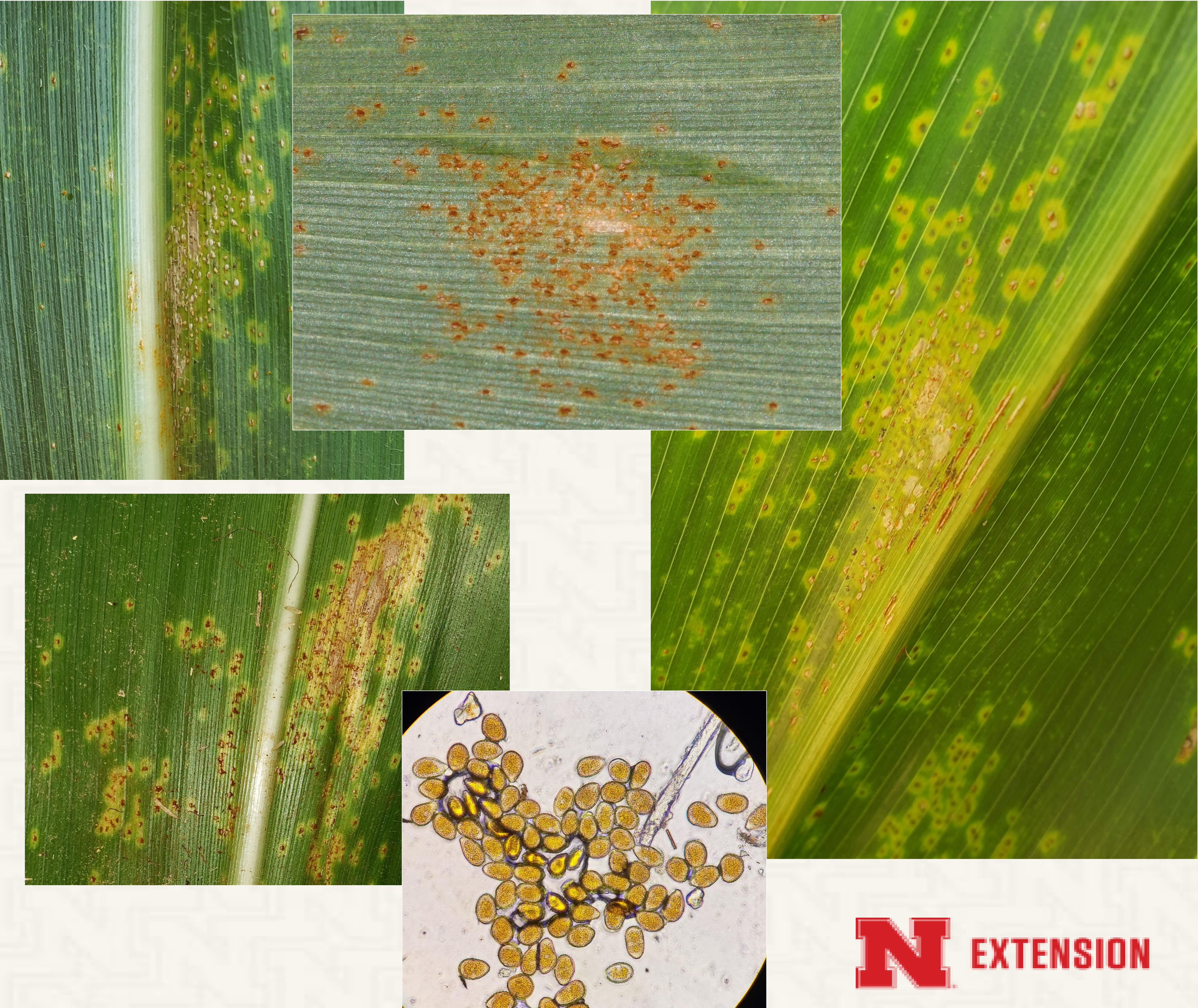
- See progression of disease



Common Rust



Southern Rust



Southern Rust – black teliospores



- Survival spores produced at the end of the season
- (still won't overwinter)
- Don't confuse with black spores of tar spot

Photos courtesy of Brad Copple

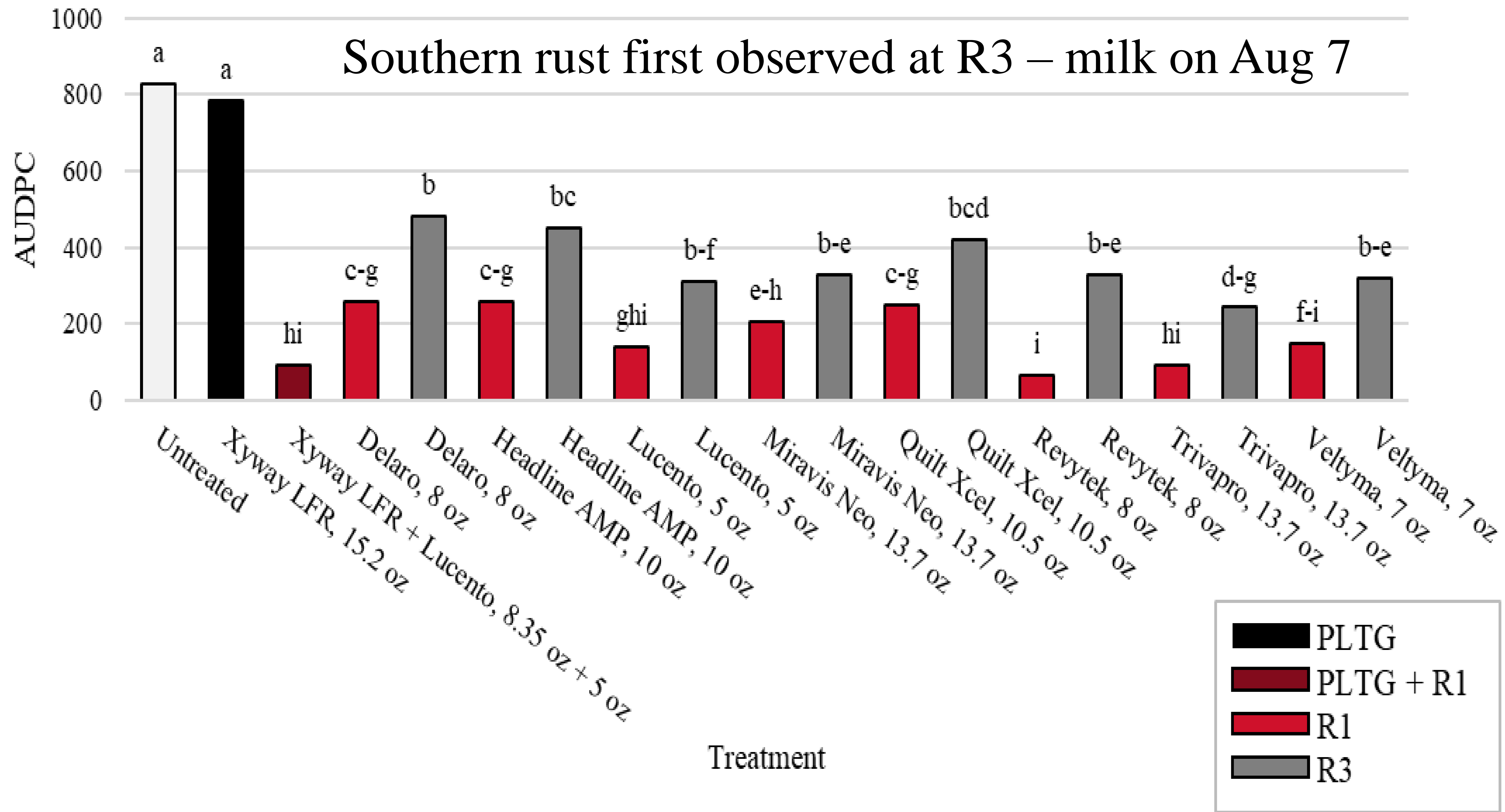
2020 Fungicide Timing Trial

- Collaboration with the U.S. Corn Disease Working Group
- Conducted at the UNL-SCAL near Clay Center, NE
- 6 reps
- 40' x 10' plots
- DKC 60-67 planted May 5
- 3 application times
 - Planting (in-furrow)
 - R1 (July 21)
 - R3 (August 11)
 - Observed rust!
- Harvested Oct. 16



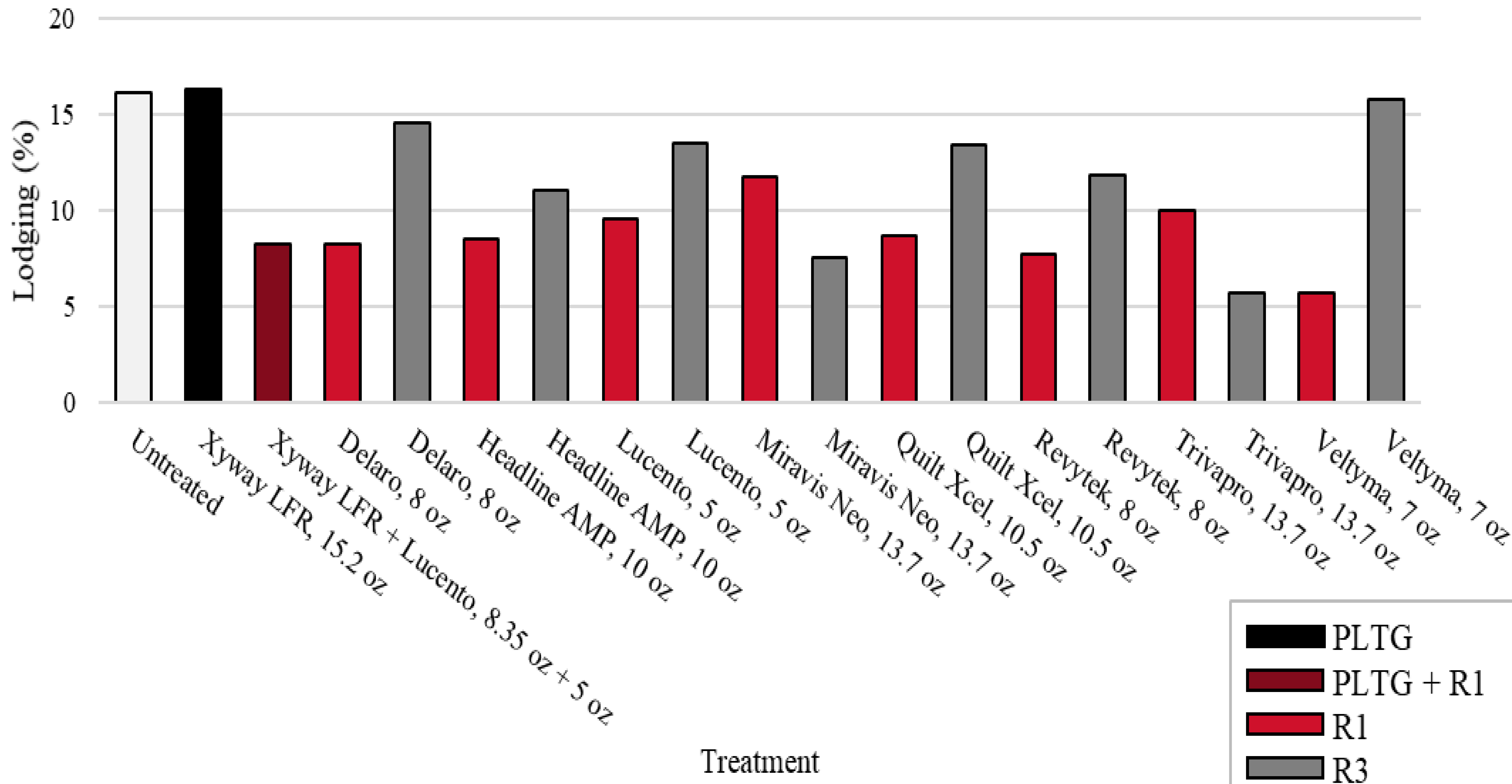
2020 Fungicide Timing Trial-Southern Rust Severity

UNL-SCAL
DKC 60-67
planted May 5

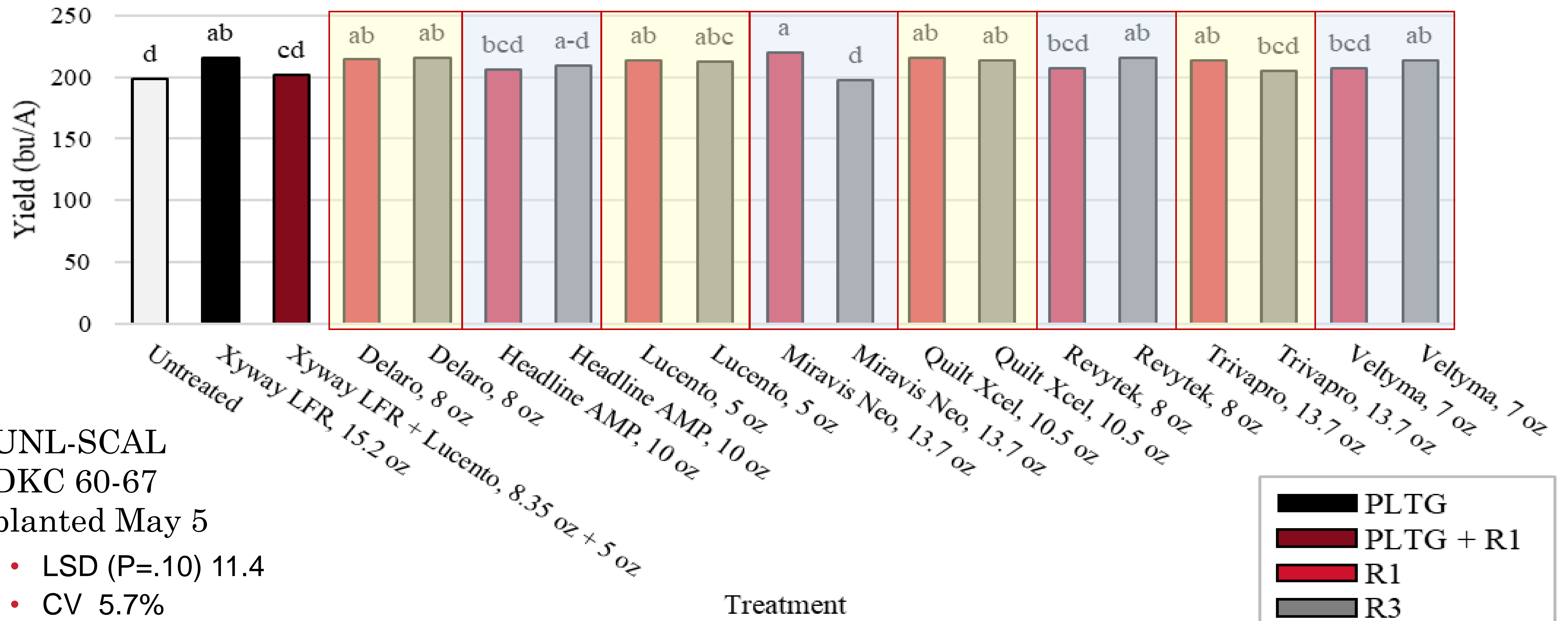


2020 Fungicide Timing – Stalk Lodging

UNL-SCAL
DKC 60-67
planted May 5



2020 Fungicide Timing Trial - Yield



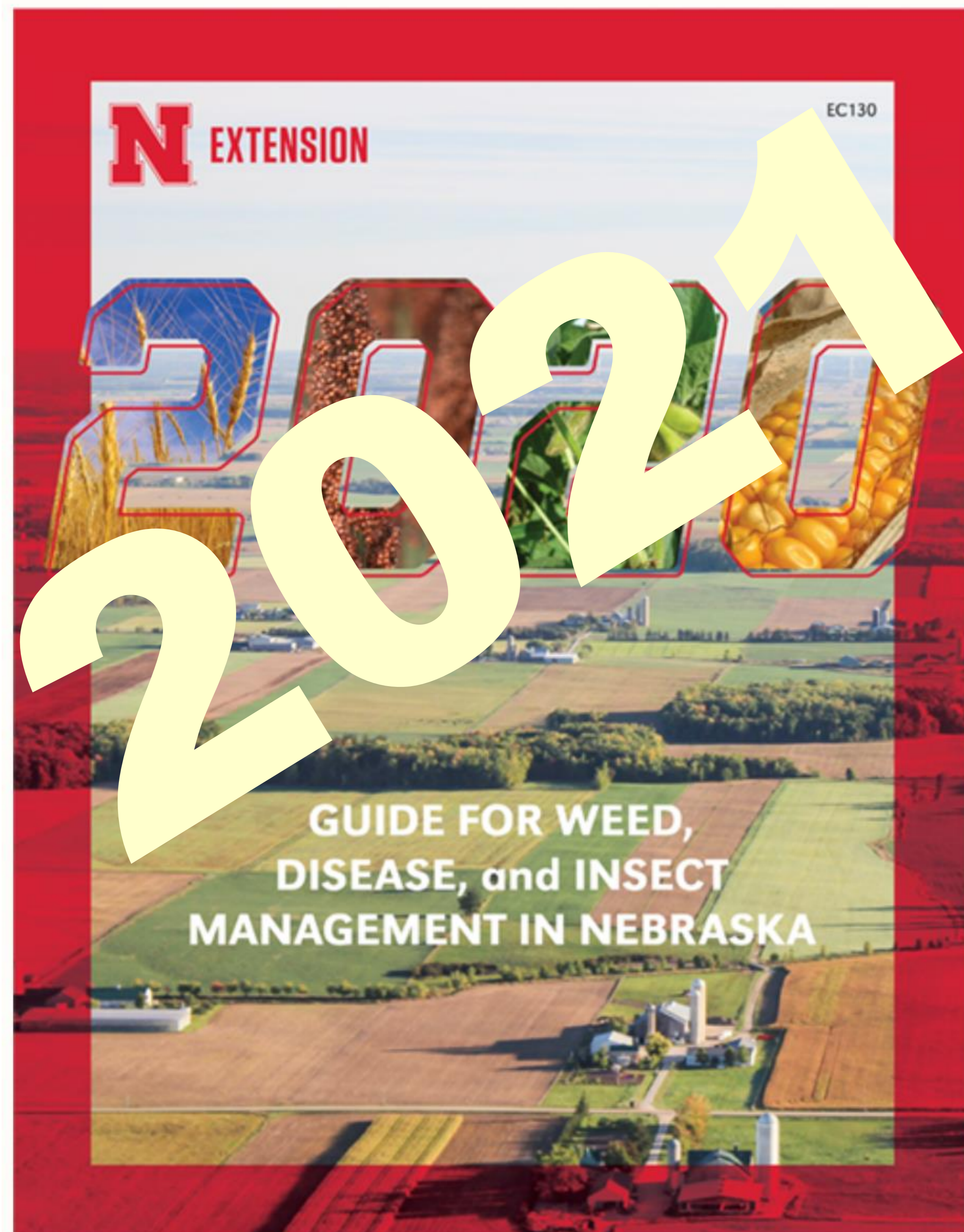
UNL-SCAL

DKC 60-67

planted May 5

- LSD (P=.10) 11.4
- CV 5.7%

2021 GUIDE FOR WEED, DISEASE, AND INSECT MANAGEMENT Changes to the Disease Management Section



- New Section Editor added –
 - Dr. Melissa Bartels, Educator – Butler and Polk Counties
- Addition of the “Alfalfa: Foliar Fungicide and Bactericide Product Information” table
- Recent changes summarized in the “What’s New in Plant Pathology” presentation

Foliar disease management products for disease control on Corn

Trade Name	Active Ingredient(s)	Fungicide Class(es)	Change(s) Made
Lucento	Flutriafol 26.5% + Bixafen 15.6%	Mixed Modes of Action (Groups 3 + 7)	Added to corn, sorghum, soybean, and wheat tables for foliar disease management
Miravis Neo	Propiconazole 11.6% Pydiflumetofen 7.0% Azoxystrobin 9.3%	Mixed Modes of Action (Groups 3 + 7 + 11)	Added to corn and soybean tables for foliar disease management
Revytek	Mefentrifluconazole 11.61% Pyraclostrobin 15.49% Fluxapyroxad 7.74%	Mixed Modes of Action (Groups 3 + 7 + 11)	Added to corn and soybean tables for foliar disease management
Veltyma	Mefentrifluconazole 17.56% Pyraclostrobin 17.56%	Mixed Modes of Action (Groups 3 + 11)	Added to corn, potato, soybean, sugar beet tables for foliar disease management
Xyway 3D	Flutriafol 26.4%	DMI Triazole (Group 3)	Added to corn table for foliar disease management in-furrow

*Taken from supplemental presentation “What’s New in Plant Pathology”

Additional content can also be found in the “2021 Guide for Weed, Disease, and Insect Management”

Tar Spot

- *Phyllachora maydis*
- and/or *Monographella maydis* in Latin America
- Confirmed in U.S. 2015

Symptoms

- Black dots (ascomata)
- “Fisheye” rings
- < 50% yield loss

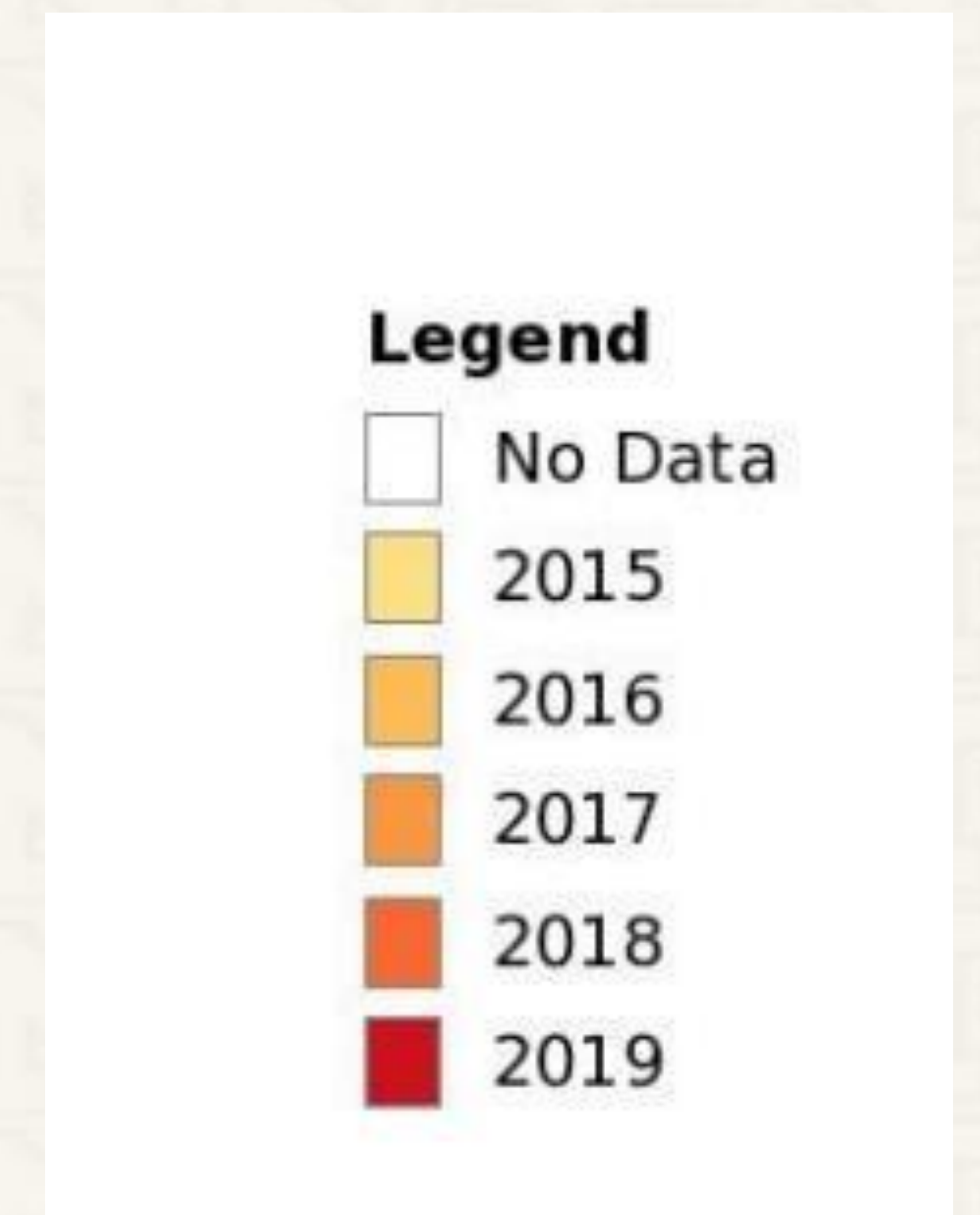
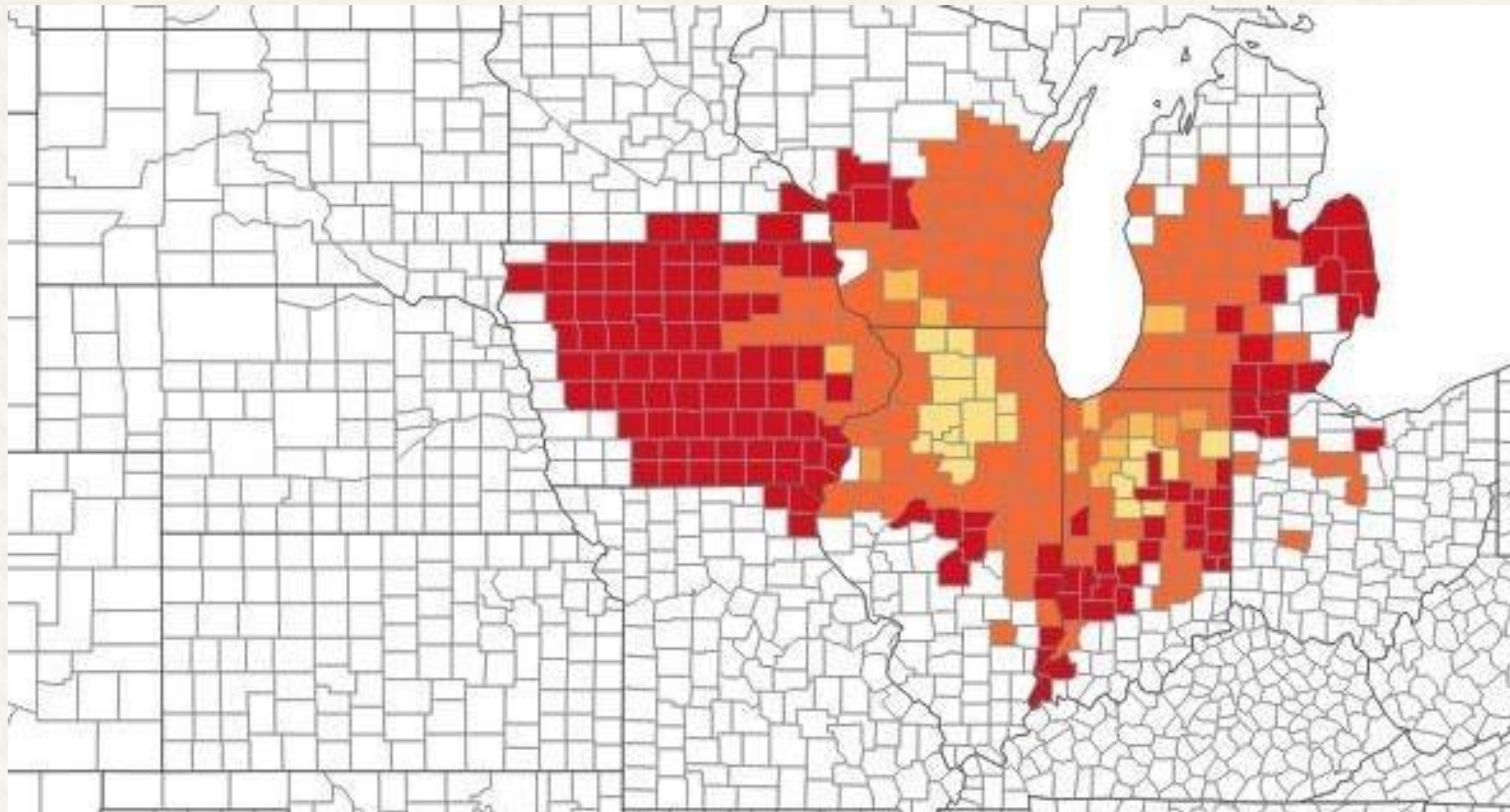


D. Smith, Univ. of Wisconsin



M. Chilvers,
Michigan State Univ.

2015-2019 Tar Spot Expansion in the United States

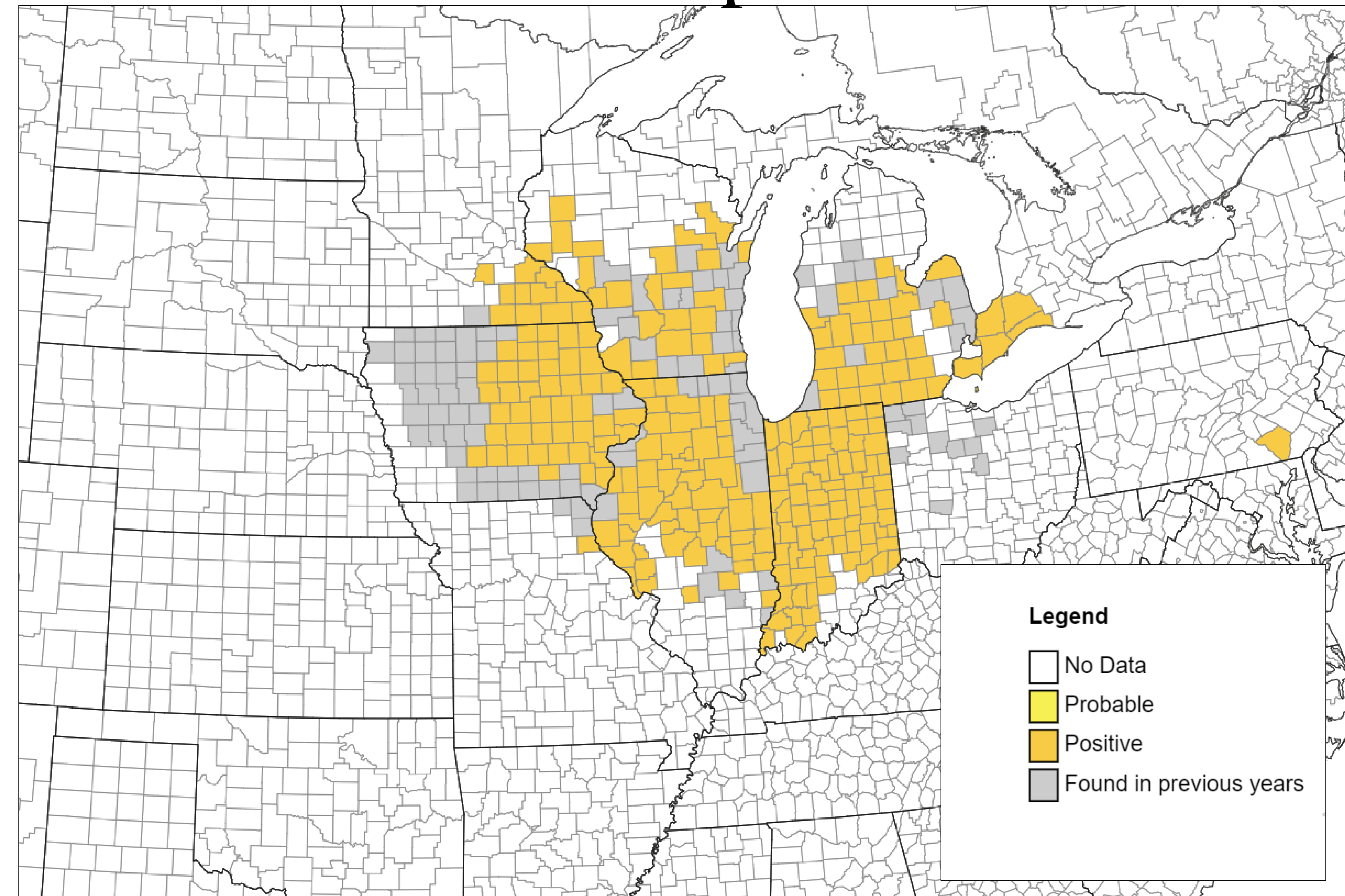


D. Telenko, Purdue Univ.

Tar Spot

2020 Tar Spot Distribution

- NOT confirmed in Nebraska (yet)
- 2019 confirmed in western Iowa
 - Conditions were cool, wet
- 2020 dry conditions limited development and spread
- 2021 – monitor for tar spot symptoms



What to watch for: Tar Spot in Nebraska

Send samples to:

UNL Plant & Pest Diagnostic Clinic

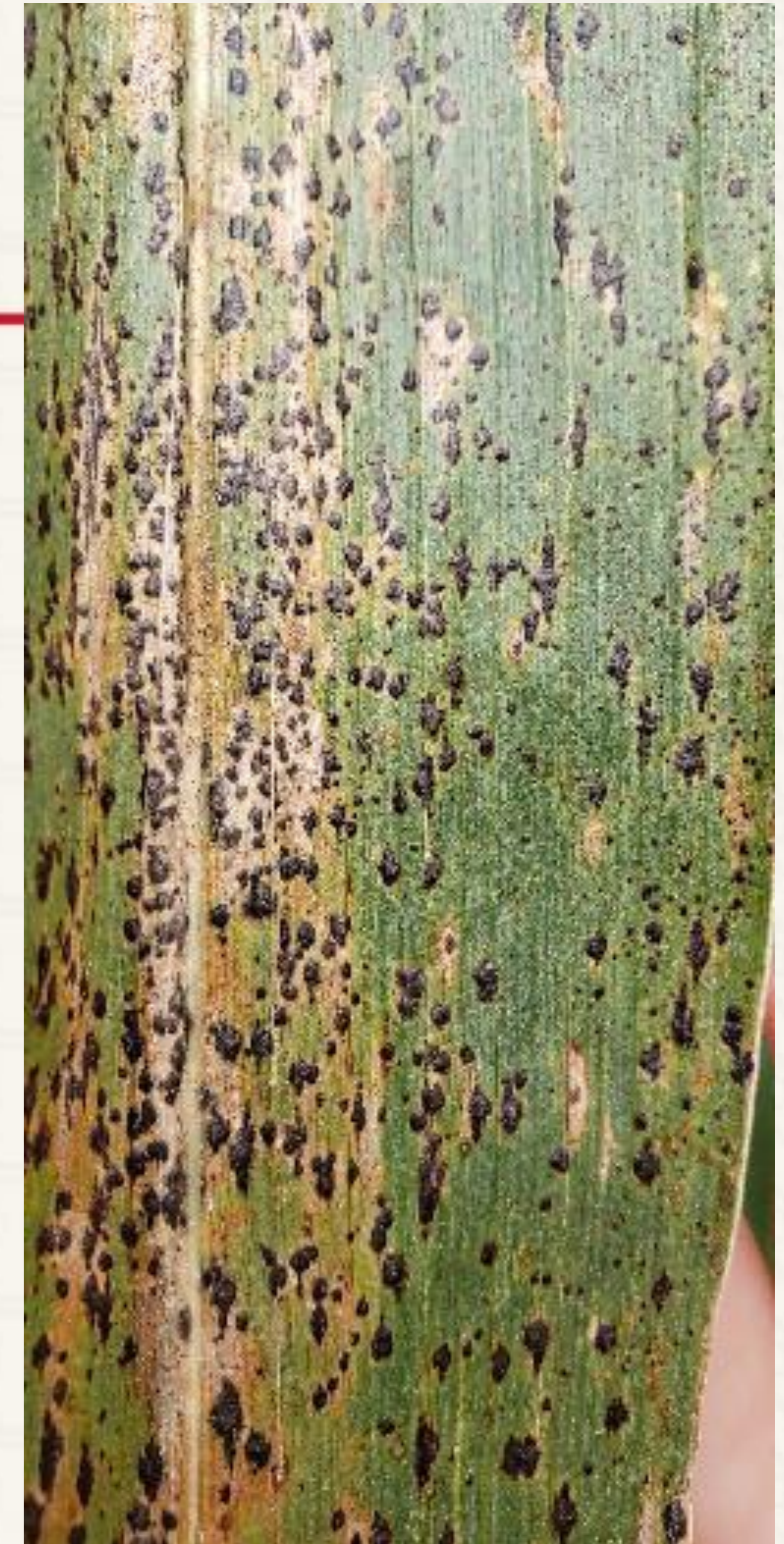
<http://go.unl.edu/plantclinic>



Tar Spot

Management

- FUNGICIDES
 - When?
 - How?
 - Which ones?
- Hybrid resistance??
- Cultural practices? Crop rotation? Residue management?



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UNL Plant & Pest Diagnostic Clinic

<http://go.unl.edu/plantclinic>

Crop Disease Resources



- Crop Watch - <http://cropwatch.unl.edu/>
 - Newsletter, efficacy trial data, and publications



- Market Journal – weekly episode or see videos at: <http://marketjournal.unl.edu/>



- Videos – YouTube – UNL CropWatch channel
 - short Corn and Soybean Disease videos



- Crop Protection Network <http://cropprotectionnetwork.org>



- Tamra Jackson-Ziems on Twitter - @tjcksn
- Contact local county Extension office

Take Home Points

- Southern rust development in Nebraska depends on:
 - Disease in Southern states
 - Movement of spores here
 - Local conditions.
- Tar spot expected to develop in eastern Nebraska. Please notify us in Nebraska Extension if you find suspicious symptoms.



Frequently Asked Questions

- When should you begin scouting for diseases?
- If fungicides aren't effective, how can I manage bacterial leaf streak?
- When is the best time to spray for southern rust management?

