

## What's New in Plant Pathology!

Melissa Bartels – Extension Educator

Sarah Sivits – Extension Educator

Tamra Jackson-Ziems – Extension Plant Pathologist

Amy Timmerman – Extension Educator

Stephen Wegulo – Extension Plant Pathologist

Kyle Broderick – Coordinator of Plant Diagnostic Clinic

Bob Harveson – Extension Plant Pathologist

## What's New!

- Personnel update
- Additions to the Guide for Weed, Disease, and Insect management in Nebraska
- New products for corn, soybean, sugarbeets, and wheat
- New and emerging diseases
- Plant and Pest Diagnostic Clinic
  - Sample fee update
  - Recommendations on How to submit a sample

## Plant Pathology Team

- Specialists (statewide)
  - Tamra Jackson-Ziems – Corn, Sorghum, Soybean
  - Soybean Pathologist
  - Stephen Wegulo – Small grains, Forages
  - Bob Harveson – Specialty Crops
- Educators
  - Kyle Broderick – Plant & Pest Diagnostic Clinic
  - Amy Timmerman – Holt and Boyd Counties
  - Sarah Sivits – Dawson, Buffalo, and Hall Counties
  - Melissa Bartels – Butler and Polk Counties
  - Jenny Rees – York and Seward Counties

## Additions to the Disease Management Section

- New Fungicide content
  - Potato – seed, soil, and foliar applied
  - Corn – column added to foliar fungicide table
    - Field, sweet, seed and/or popcorn
  - Alfalfa – foliar fungicides

## CORN: New disease management products

Trade Name	Active Ingredient(s)	Fungicide Class(es)
Lucento	Flutriafol 26.5% + Bixafen 15.6%	Mixed Modes of Action (Groups 3 + 7)
Miravis Neo	Propiconazole 11.6% Pydiflumetofen 7.0% Azoxystrobin 9.3%	Mixed Modes of Action (Groups 3 + 7 + 11)
Revytek	Mefentrifluconazole 11.61% Pyraclostrobin 15.49% Fluxapyroxad 7.74%	Mixed Modes of Action (Groups 3 + 7 + 11)
Veltyma	Mefentrifluconazole 17.56% Pyraclostrobin 17.56%	Mixed Modes of Action (Groups 3 + 11)
Xyway 3D	Flutriafol 26.4%	DMI Triazole (Group 3)

## SOYBEAN: New disease management products

Trade Name	Active Ingredient(s)	Fungicide Class(es)	Application
Lucento	Flutriafol 26.5% + Bixafen 15.6%	Mixed Modes of Action (Groups 3 + 7)	Foliar
Miravis Neo	Propiconazole 11.6% Pydiflumetofen 7.0% Azoxystrobin 9.3%	Mixed Modes of Action (Groups 3 + 7 + 11)	Foliar
Revytek	Mefentrifluconazole 11.61% Pyraclostrobin 15.49% Fluxapyroxad 7.74%	Mixed Modes of Action (Groups 3 + 7 + 11)	Foliar
Veltyma	Mefentrifluconazole 17.56% Pyraclostrobin 17.56%	Mixed Modes of Action (Groups 3 + 11)	Foliar
Saltro	Pydiflumetofen 41.7%	SDHI (Group 7)	Seed treatment

## WHEAT: New disease management products

Trade Name	Active Ingredient(s)	Fungicide Class(es)
Lucento	Flutriafol 26.5% + Bixafen 15.6%	Mixed Modes of Action (Groups 3 + 7)
Miravis Ace	Propiconazole 11.4% Pydiflumetofen 13.7%	Mixed Modes of Action (Groups 3 + 7)
Delaro SC	Prothioconazole (16.0%) + Trifloxystrobin (13.7%)	Mixed Modes of Action (Groups 3 + 11)

Trade Name	Registered Crops	Applications & Rates	Comments
<b>PRESTOP WG</b> <i>Gliocladium</i> <i>catenulatum</i> J1446 (93%)	Greenhouse or field grown vegetables, ornamentals, cereals, legumes, fruits, and turf	Foliar spray, drench, and mixing with growth substrate. Rates may vary, see label	Biofungicide against seed- borne fungal diseases including damping-off, root and stem rot, and wilt

## SUGER BEET: New disease management products Products

Trade Name	Active Ingredient(s)	Fungicide Class(es)
Veltyma	Mefentrifluconazole 17.56% Pyraclostrobin 17.56%	Mixed Modes of Action (Groups 3 + 11)



## Nematicides

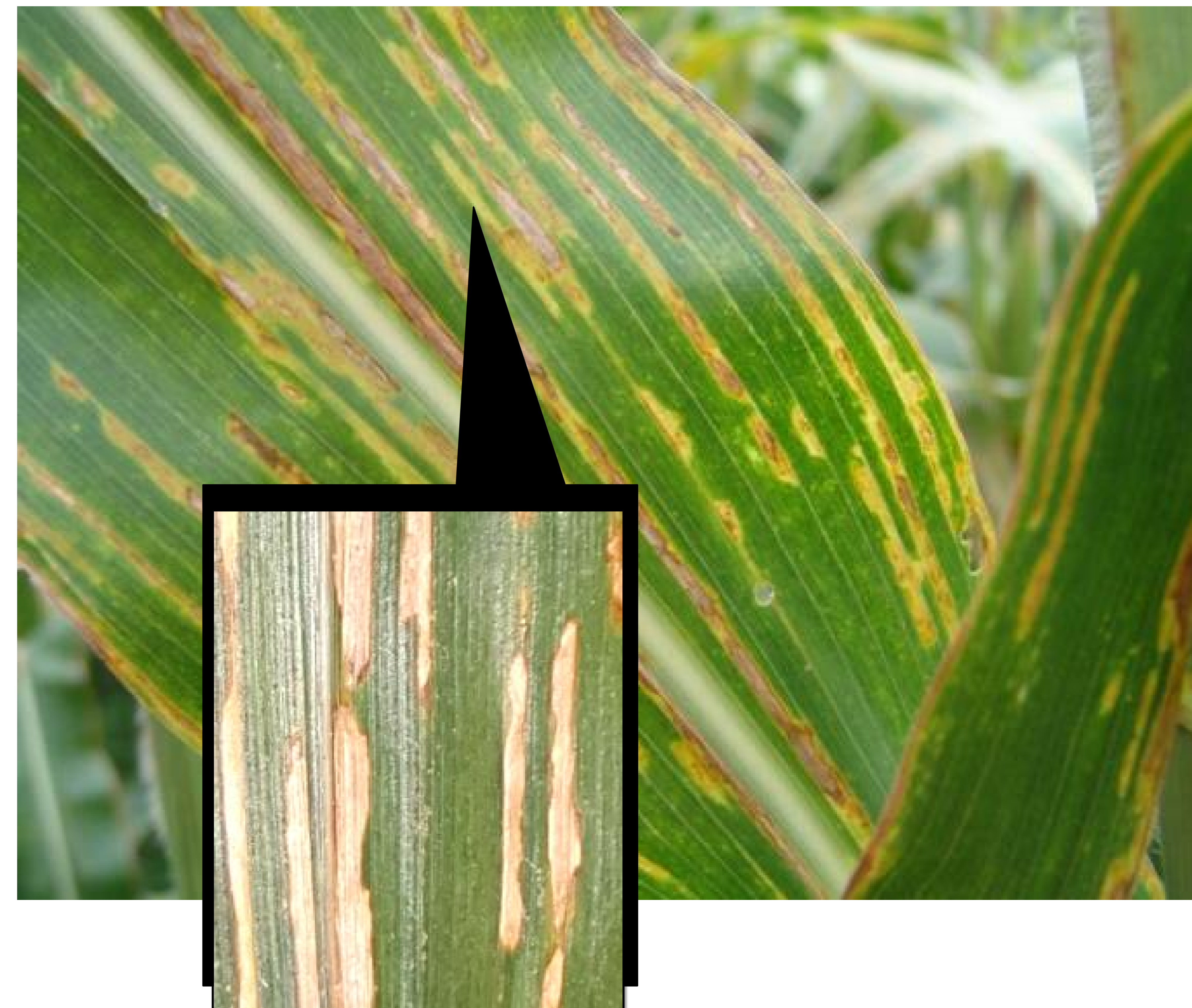
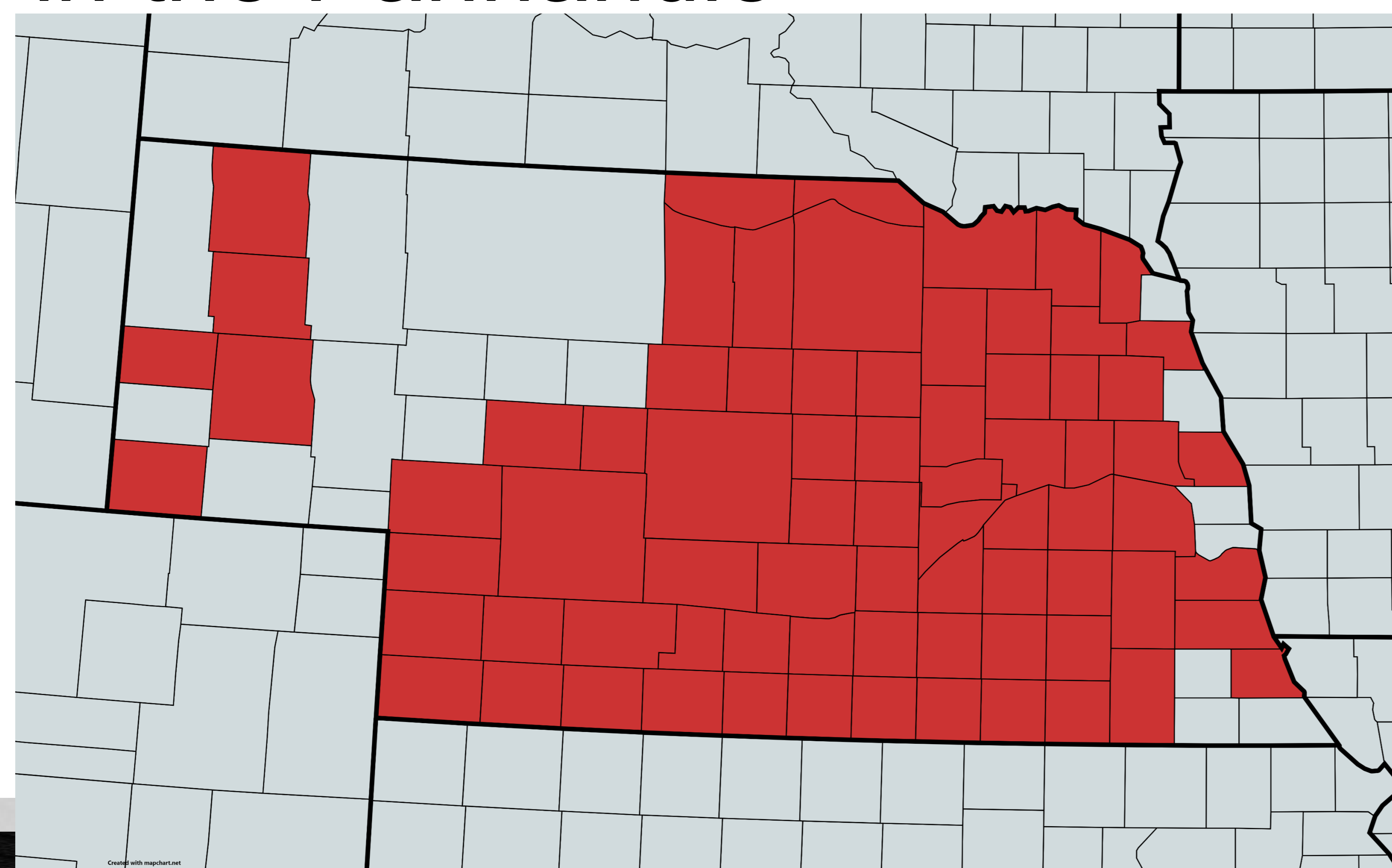
Trade Name	Registered Crops	Applications & Rates
<b>Aveo EZ Nematicide</b> <i>Bacillus amyloliquefaciens</i> – PTA-4838	Corn, soybean	Seed treatment, Commercially applied
<b>Biost Nematicide 100</b> Head-killed <i>Burkholderia rinojensis</i> A396 (94.46%) + fermentation media	Corn (field, popcorn, seed, sweet), sorghum, soybean, wheat	Foliar, seed, soil, Rates see label varies by crop
<b>Trunemco</b> <i>Bacillus amyloliquefaciens</i> MBI600 (1.00%) cis-Jasmone (0.88%)	Corn, soybean	Seed treatment, Commercially applied
<b>Saltro</b> Pydiflumetofen (41.7%)	Soybean	Seed treatment, 1.52 fl oz/100 lbs seed 0.714 fl oz/140,000 seed

## New and emerging diseases and issues

- Corn
  - Bacterial leaf streak
  - Physoderma brown spot – node rot phase
  - Tar spot
- Soybean
  - Frogeye leaf spot – fungicide resistance confirmed
  - Sudden death syndrome
- Wheat
  - *Fusarium boothii* causing head blight

## Corn Disease Update - Bacterial leaf streak

- Caused by *Xanthomonas vasicola* pv. *vasculorum*
- Confirmed in 2016 in Nebraska (first time in the U.S.)
  - 75 NE Counties with 2019 expansion in the Panhandle



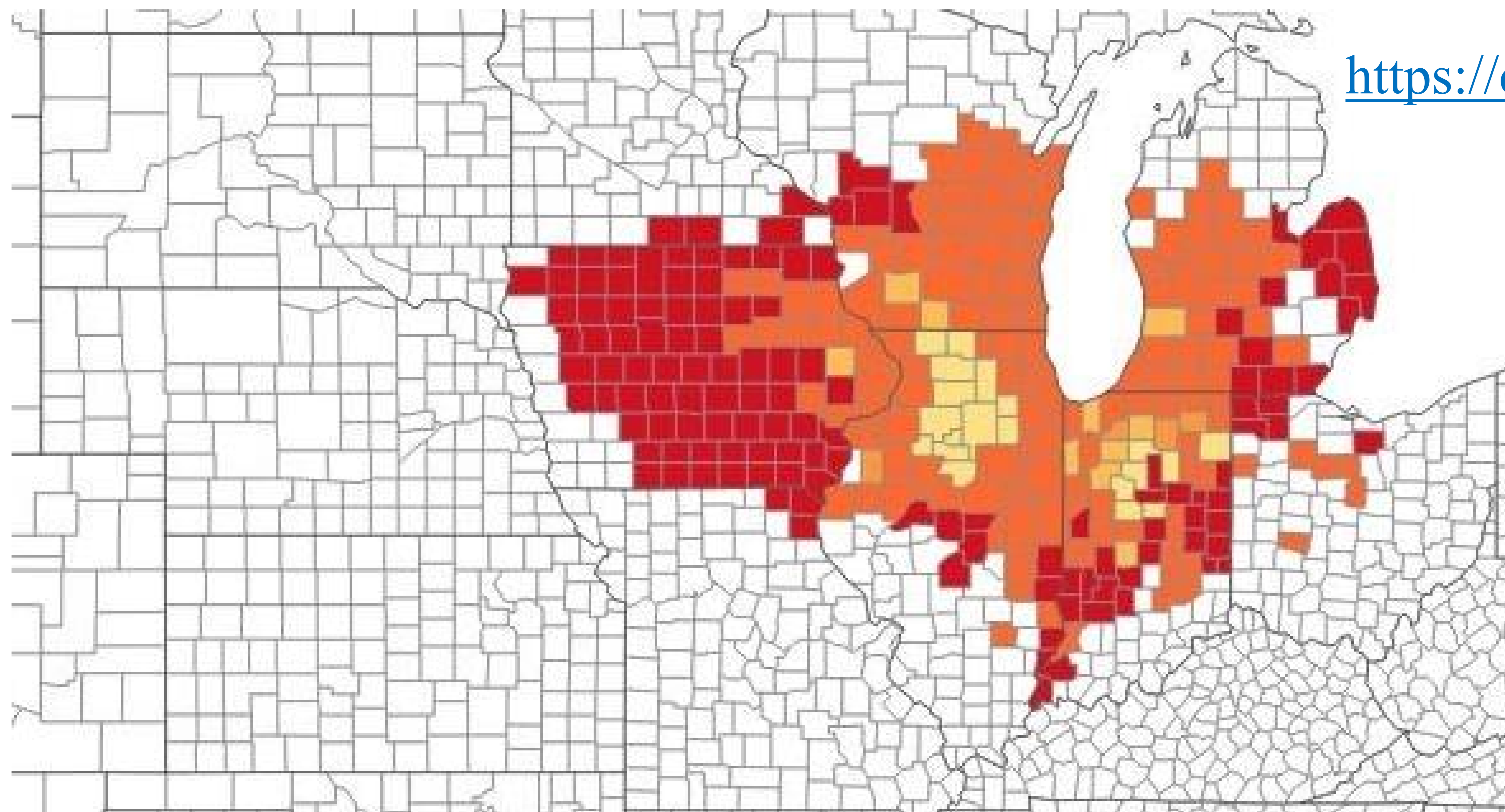
## Corn Disease Update – Watch for Tar Spot in 2021

- *Phyllachora maydis* (and/or *Monographella maydis* in Latin America)
- Confirmed in U.S. 2015
- **Symptoms**
  - Black dots (ascomata)
  - “Fisheye” rings
  - < 50% yield loss

Send samples to:  
UNL Plant & Pest Diagnostic Clinic  
<http://go.unl.edu/plantclinic>



## Corn Disease Update – Tar Spot in the United States



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

### Legend

- No Data
- 2015
- 2016
- 2017
- 2018
- 2019

## Soybean Disease Update – Frogeye Leaf Spot

- *Cercospora sojina* (fungus)
- Most soybean-producing areas of the U.S.

### Symptoms

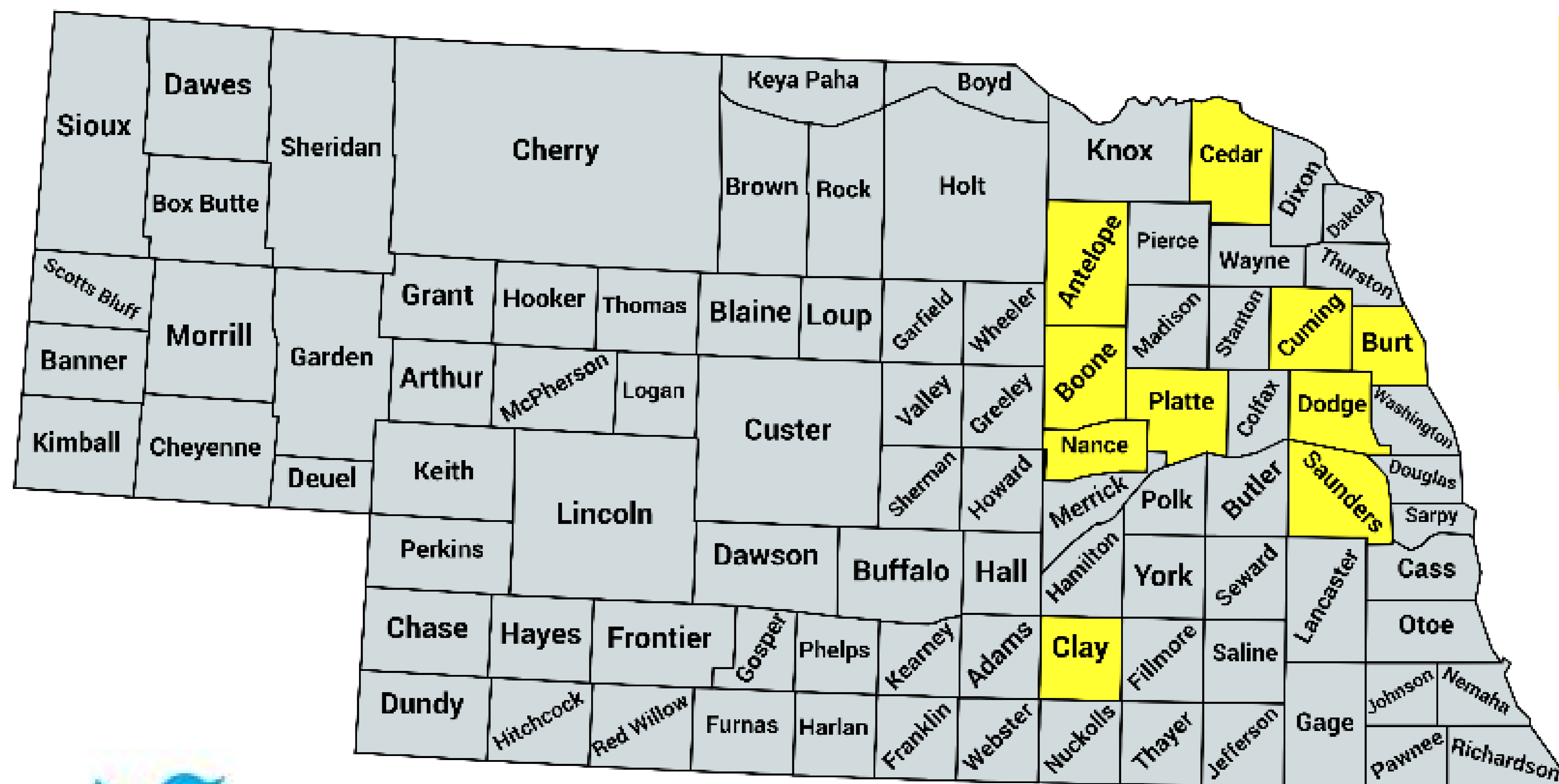
- Small tan/gray lesions
- Red/purple border
- Upper leaves

### Favorable Conditions

- Warm, moist/humid

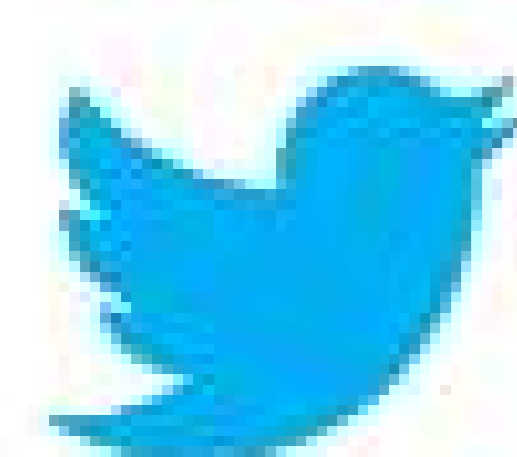


## 2019 - QoI Fungicide Resistance Confirmed in *Cercospora sojina* causing Frogeye Leaf Spot in 10 Nebraska Counties



**FUNGICIDE  
RESISTANCE IS  
HERE!**

- Resistance confirmed in 111 out of 113 *C. sojina* isolates (98%)



[#IRPests](https://twitter.com/IRPests)

## First Report of *Fusarium boothii* Causing Head Blight of Wheat in the United States

- In 2015 there were widespread *Fusarium* head blight (FHB) epidemics in Nebraska wheat fields
- Symptomatic wheat heads were collected during wheat disease surveys across the state

Stephen Wegulo  
Esteban Valverde-Bogantes  
Carlos Bolanos-Carriel  
Heather Hallen-Adams  
Andreia Bianchini  
Niki McMaster  
David G. Schmale III

Plant Disease Online  
September 28, 2018



- Pure isolates of *Fusarium* were obtained from the heads
- Traditional and molecular methods were used to identify the isolates
- Three isolates from western Nebraska were identified as *Fusarium boothii*, two from Chase County and one from Box Butte County
- The rest were identified as *F. graminearum*

- This is the first report of *F. boothii* causing FHB of wheat in the United States
- Previously *F. graminearum* was the only known cause of FHB in the U.S.
- Both pathogens belong the *Fusarium graminearum* species complex (FGSC) that is made up of 16 different species of Fusarium
- *F. boothii* has been reported in Texas and South Dakota on corn and as the cause of FHB of wheat and *Gibberella* ear rot of corn in several countries including Mexico and South Africa

**Management of FHB caused by *F. boothii* is the same as that for *F. graminearum***

- Cultivar resistance
- Crop rotation
- Residue management
- Irrigation management
- Chemical control

## Plant and Pest Diagnostic Clinic Fee Increase

- Credit card payments are now accepted
  - Due to associated costs, there will be a slight increase in clinic fees
- Basic diagnosis costs \$20
  - Includes visual and microscopic pathogen ID and management recommendations
- More intensive diagnostic tests typically require additional \$10 – \$40
  - Corn nematode testing: \$40
  - SCN testing: FREE
- Confirmation of uncommon pathogens may require testing at outside labs, which may carry additional charges

## Services provided by Plant and Pest Diagnostic Clinic

- ID and provide management for biotic and abiotic diseases
  - Biotic: Fungi, bacteria, nematodes, viruses
  - Abiotic: Environmental stresses, nutrient deficiencies, etc.
- ID arthropod pests and provide management recommendations
  - Insects, mites, etc.
- ID unknown weeds
- Diagnose herbicide injury based on visual symptoms

## Services Not Provided

- Herbicide injury is determined solely on a visual inspection and no chemical analysis is performed
  - If more testing is desired, clients will be directed to outside labs that provide residue analysis
- The clinic is unable to provide soil nutrient testing or residue testing
- The clinic is not set up to test for mycotoxins. Fungal pathogens known to produce mycotoxins can be ID'd, but further analysis will need to be done at an outside lab

## Recommendations on how to submit a good sample

- Send several whole plants, roots and all stages of the symptoms
- Include “normal” plants
- Enclose the root ball in a plastic bag separate from the leaf material
- Place entire sample into a plastic bag
- Provide as much information as possible
  - Crop growth stage
  - Symptom distribution
  - Description of the symptom
  - How many plants in area affected?
- Mail sample Monday through Wednesday via FedEx or UPS

## How to submit a sample

- DON'T Add water
  - If there is excess water with the sample add dry towels to absorb the moisture
- DON'T Leave sample on the dash of the pickup
  - Keep samples cool. Store in a refrigerator overnight/weekend if needed
- DON'T Place samples in paper bags (especially leaf samples)
- DON'T Mail Thursday or Friday



# Crop Production Clinics



**Plant & Pest Diagnostic Clinic**  
**Specimen Identification Form**  
 448 Plant Science Hall  
 Lincoln, NE 68583-0722

For Lab Use Only

Lab No. \_\_\_\_\_

Condition on arrival  
 Excellent  Good  Fair  Poor

Cash  Check No. \_\_\_\_\_

Amt. \_\_\_\_\_ Date: \_\_\_\_\_

Called (Date & Initials): \_\_\_\_\_

SUBMITTER	CLIENT
Name: _____	Name: _____
Business Name: _____	Business Name: _____
Address: _____	Address: _____
City/State/Zip: _____	City/State/Zip: _____
Phone: _____ Cell: _____	Phone: _____ Cell: _____
E-mail: _____	E-mail: _____

Mail reply to: <input type="checkbox"/> Sub. <input type="checkbox"/> Client	<b>Services Requested:</b> <input type="checkbox"/> Plant ID <input type="checkbox"/> Plant Disease <input type="checkbox"/> Insect <input type="checkbox"/> Chemical Injury <input type="checkbox"/> Weed ID <input type="checkbox"/> Other/Unknown	<b>Sample Fee:</b> <input type="checkbox"/> Perform only basic diagnosis (\$10.00) <input type="checkbox"/> Please notify if advance analysis is needed (over \$10.00) <input type="checkbox"/> Perform advance testing needed (up to \$70.00)
E-mail reply to: <input type="checkbox"/> Sub. <input type="checkbox"/> Client		
Send bill to: <input type="checkbox"/> Sub. <input type="checkbox"/> Client		

Make checks payable to "University of Nebraska"

Crop or Plant: \_\_\_\_\_ Variety/Cultivar: \_\_\_\_\_

Date collected: \_\_\_\_\_ County of Origin: \_\_\_\_\_ Symptoms developed in: \_\_\_\_\_  
 \_\_\_\_\_ Days \_\_\_\_\_ Weeks \_\_\_\_\_ Months

Turfgrass: Year established: \_\_\_\_\_  Sod  Seed  Plugs  
 \_\_\_\_\_ Occurred in previous years

Trees/shrubs/ornamentals: Aprox age \_\_\_\_\_ Height: \_\_\_\_\_ Number of years at site: \_\_\_\_\_

Location	Incidence	Symptoms	Parts Affected	Distribution	Field History
<input type="checkbox"/> Field	_____ Acres	<input type="checkbox"/> Abnormal growth	<input type="checkbox"/> Branches _____ %	<input type="checkbox"/> Certain variety	Soil pH: _____
<input type="checkbox"/> Pasture	_____ Sq. ft	<input type="checkbox"/> Dead areas	<input type="checkbox"/> Entire plant	<input type="checkbox"/> Edge of planting	Soil Drainage: <input type="checkbox"/> Good <input type="checkbox"/> Poor
<input type="checkbox"/> Nursery/Orchard	_____ % of area	<input type="checkbox"/> Dieback	<input type="checkbox"/> Flowers	<input type="checkbox"/> General	
<input type="checkbox"/> Golf Course	_____ --Or--	<input type="checkbox"/> Leaf drop	<input type="checkbox"/> Fruits/seeds	<input type="checkbox"/> High areas	Previous Crop Yr 1: _____ Yr 2: _____ Yr 3: _____
<input type="checkbox"/> Lawn/Turfgrass	_____ # of plants	<input type="checkbox"/> Leaf spot	<input type="checkbox"/> Leaves _____ %	<input type="checkbox"/> Low areas	
<input type="checkbox"/> Landscape	_____ % of plants	<input type="checkbox"/> Rot	<input type="checkbox"/> Roots	<input type="checkbox"/> Scattered	
<input type="checkbox"/> Garden		<input type="checkbox"/> Stunted	<input type="checkbox"/> Stems	<input type="checkbox"/> Shaded areas	
<input type="checkbox"/> Home-Structural		<input type="checkbox"/> Wilted	<input type="checkbox"/> Trunk	<input type="checkbox"/> Spots	
<input type="checkbox"/> Other:		<input type="checkbox"/> Yellowed	<input type="checkbox"/> Other:	<input type="checkbox"/> Sunny areas	
		<input type="checkbox"/> Other:		<input type="checkbox"/> Wet areas	
				<input type="checkbox"/> Other:	

Planting date: \_\_\_\_\_

Chemical history: Please provide chemical name, application dates, and rates:

Fertilizer: \_\_\_\_\_

Seed treatment: \_\_\_\_\_

Herbicide: \_\_\_\_\_

Fungicide: \_\_\_\_\_

Insecticide: \_\_\_\_\_

Tillage: \_\_\_\_\_ Irrigated:  Yes  No

Please describe problem. Include any details not covered above. Attach photos if possible. (Please use reverse side for more space)

Available on-line at:  
<https://bit.ly/2Aw2DTo>

Kyle Broderick,  
 Diagnostician



@UNLPlantClinic

Plant & Pest Diagnostic Clinic  
 Website QR Code



## Crop Disease Resources



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



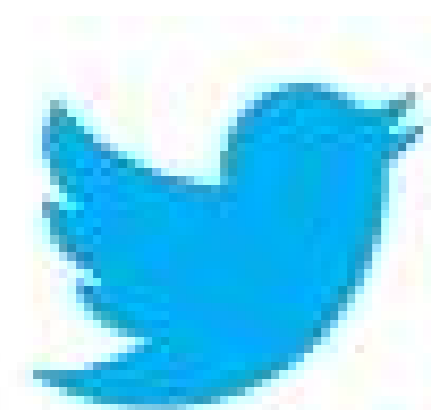
- Market Journal – weekly episode or see videos at:  
<http://marketjournal.unl.edu/>



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



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



- Twitter: @Crops\_MelissaB, @tjcksn, @UNLPlantClinic, @centralNE\_crop, @AmyTimmerman2, @swegulo2, @jenreesources
- Contact local county Extension office