Cercospora Leaf Spot: Where We Are and What's Next

Linda Hanson and Jaime Willbur

USDA-ARS & MSU Research Programs

February 5, 2026

USDA

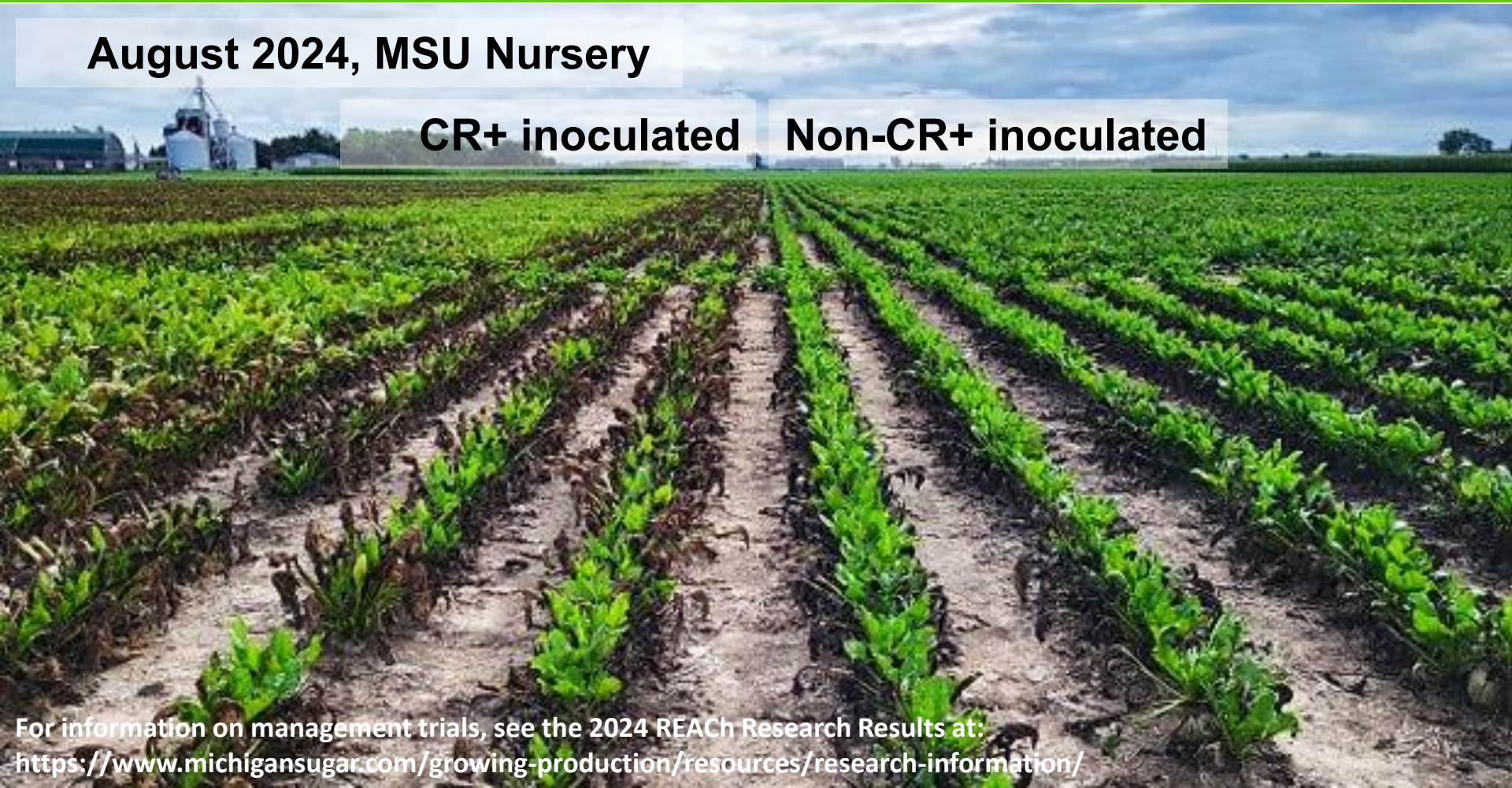
MICHIGAN STATE UNIVERSITY

MICHIGAN STATE UNIVERSITY | Extension

What we are seeing

- Continue to see resistance breakdown for CR+ in region
- Reported in more areas
- Varieties differ for disease response – both CR+ and non-CR+ with varied background
- BEETcast underpredictions at initiation and in-season intervals
- Fungicide resistance may be increasing
- Other leaf spots present, but lower than Cercospora leaf spot

2020, USDA Nursery



For information on management trials, see the 2024 REACh Research Results at:
https://www.michigansugar.com/growing-production/resources/research-information/

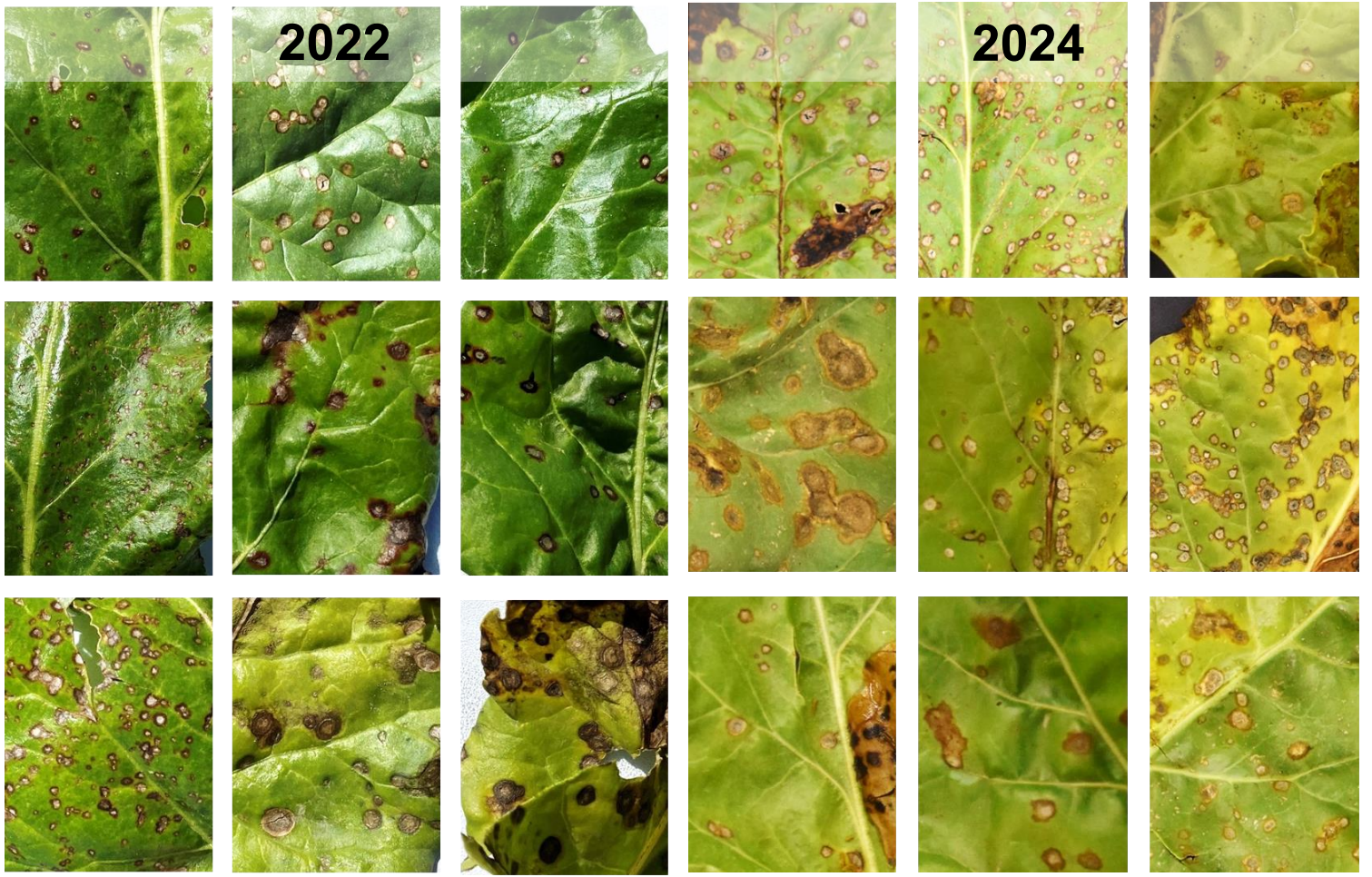
August 2025, MSU Nursery

For information on management trials, see the 2025 REACh Research Results at:
https://www.michigansugar.com/growing-production/resources/research-information/

Multigene resistance still holding up

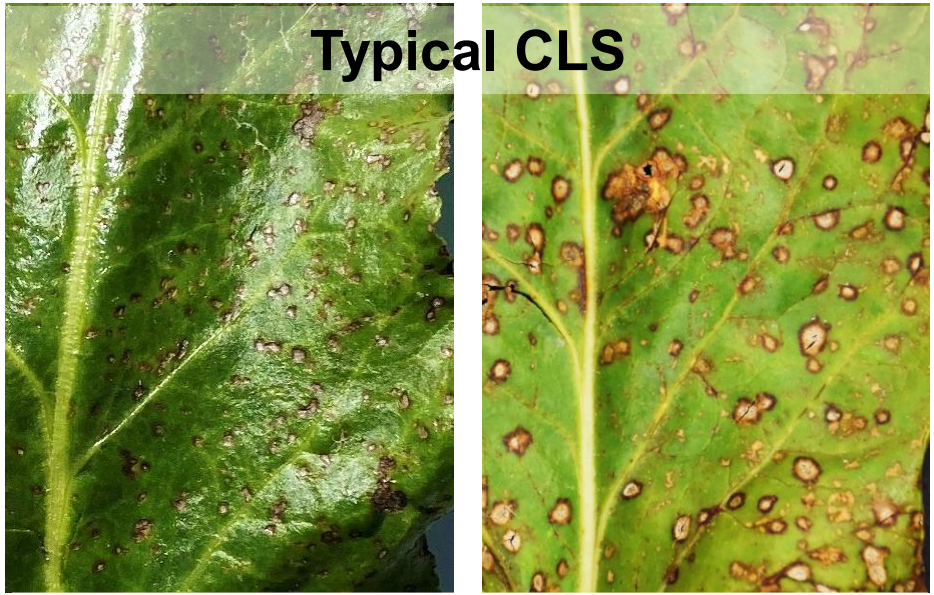
- Line on the left has been in nursery testing for over 15 years
- Line in middle susceptible commercial variety
- Line on the right susceptible check (not approved in MI), majority of green is new growth

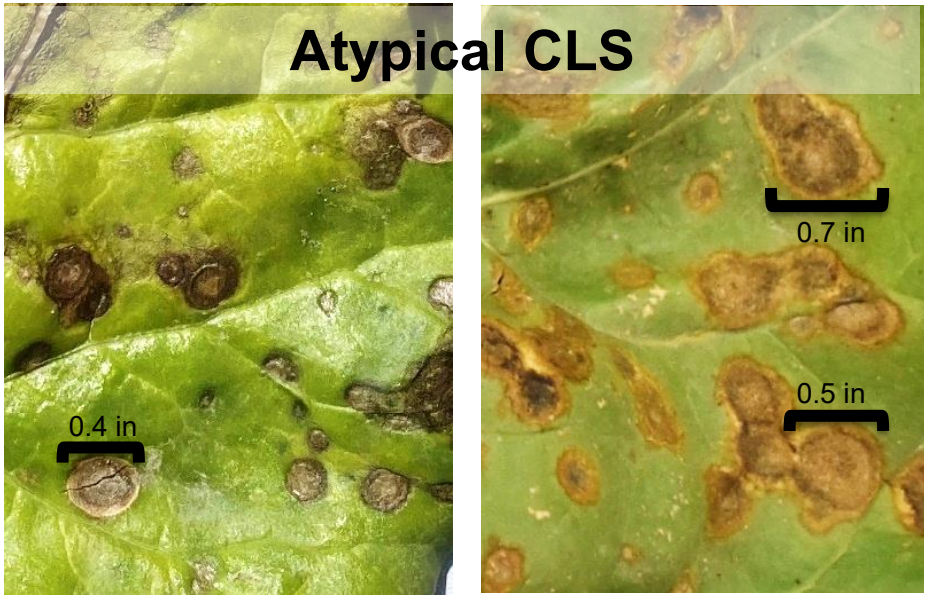
Cerco-spora leaf spots vary by variety



(USDA Nursery 2022, MSU PSBP samples 2024)

Notably larger lesion sizes, frequently on CR+





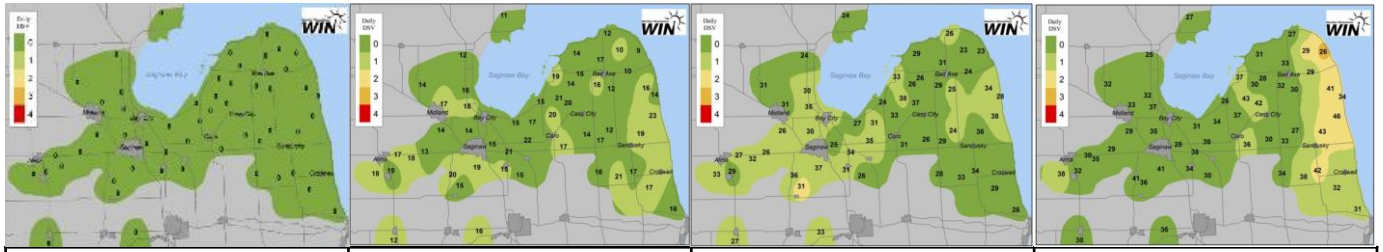
Up to 1/8 to 1/4” diameter

(USDA Nursery 2022, MSU PSBP samples 2024)

CR+ *Cercospora* isolates cause typical lesions on non-CR+ beets (USDA testing in progress)

BEETcast trends and predictions

2024

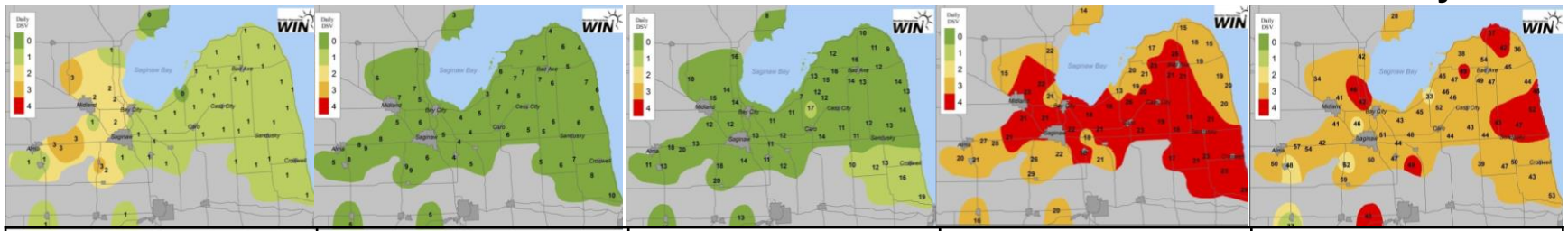


May 15 (0 DSVs)	June 1 (9-23)	June 15 (24-38)	June 19 (25-46)

1st spots: late June

1st spots: July 2

2025

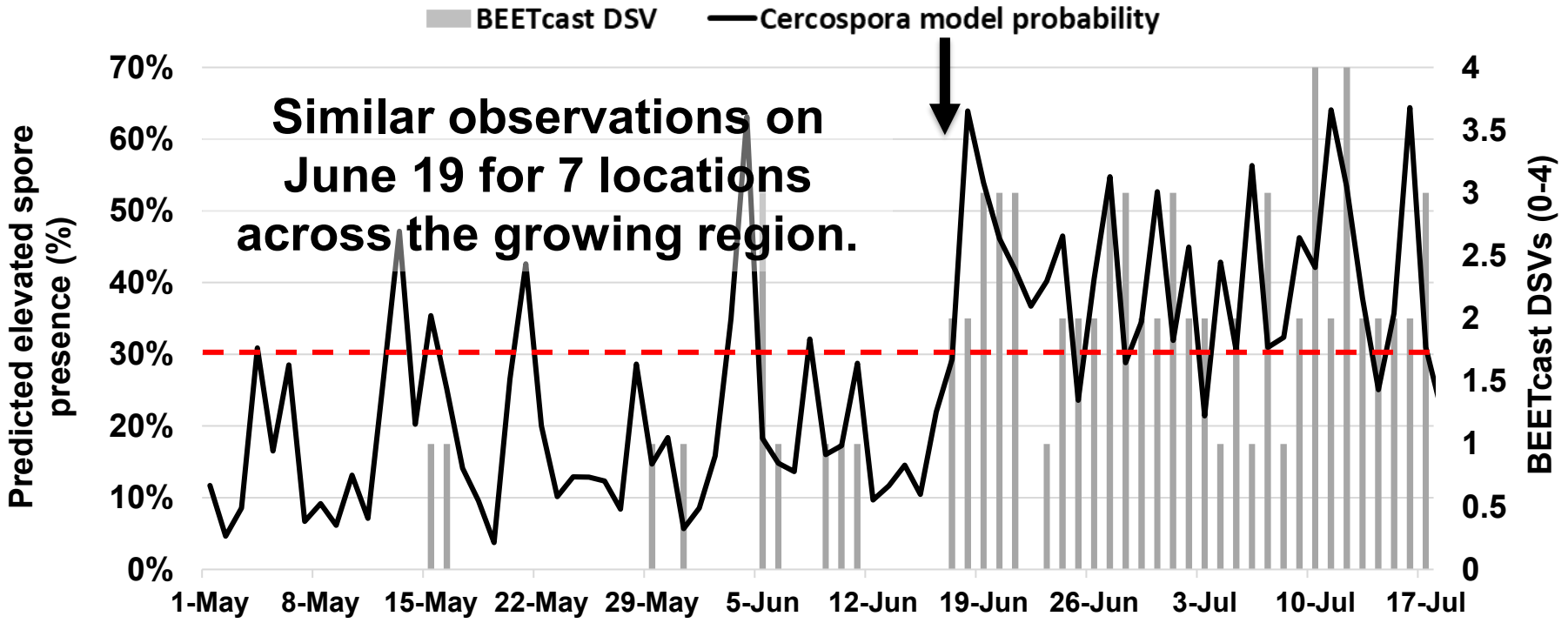


May 15 (0-3 DSVs)	June 1 (3-10)	June 15 (7-20)	June 19 (13-29)	July 1 (28-59)

Available at: http://www.michiganbeets.com/dsv.cfm

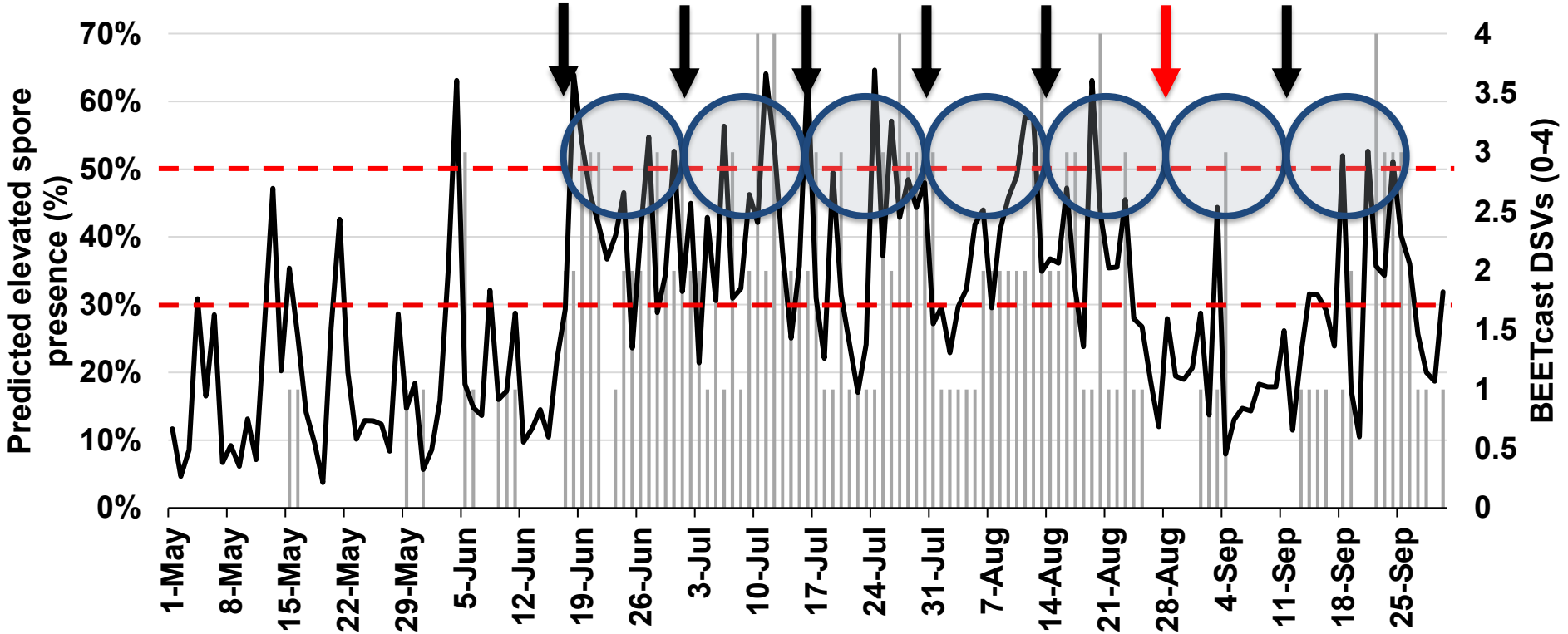
Cumulative BEETcast DSVs have been unreliable initiation predictors.

2025 Richville/Frankenmuth Early Season



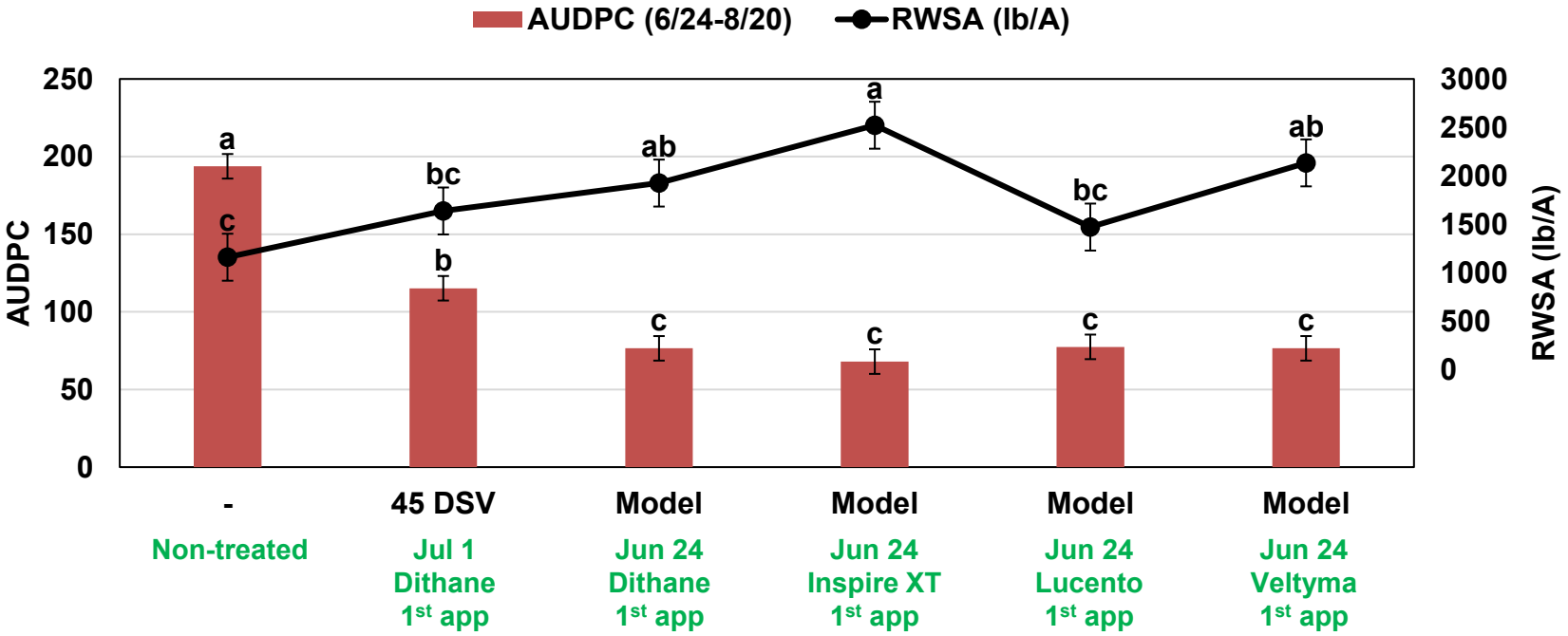
Cercospora model predictions calculated from MSU Enviroweather data.

2025 Richville/Frankenmuth Full Season



Cercospora model predictions calculated from MSU Enviroweather data.

2025 Cercospora Spore Model Validation



[a] Application at the following dates: A=Jul 1, B=Jul 15, C=Jul 29, D=Aug 14, E=Aug 26, F=Sep 9; for model-based dates: G=Jun 24, H=Jul 8, I=Jul 22, J=Aug 5, K=Aug 20, L=Sep 2. MasterLock 0.25% V/V was added to all treatments.

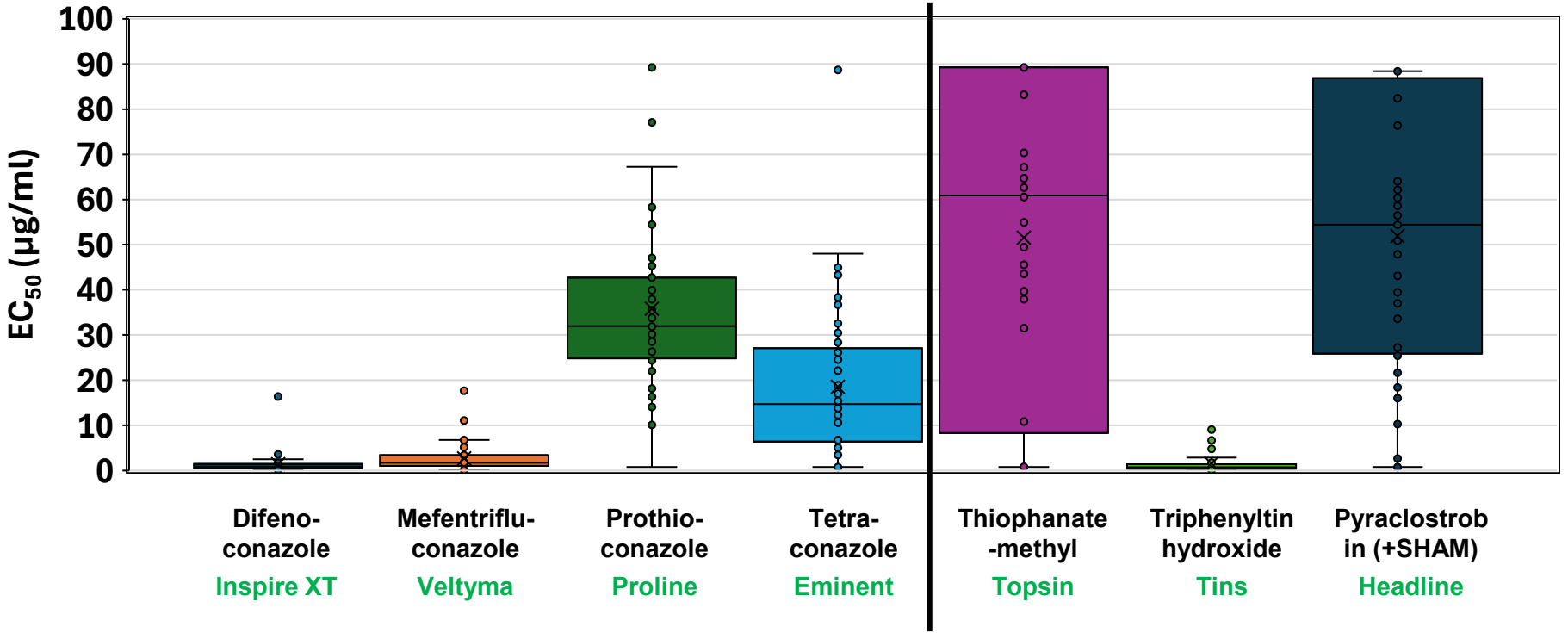
[b] Area under the disease progress curve based on disease severities collected Jun 24, Jul 29, Aug 13, and Aug 20.

[c] Bars and points with the same letter not significantly different based on Fisher's Protected LSD (α=0.05).

Hernandez et al. 2025 REACh

Cercospora resistance in Michigan

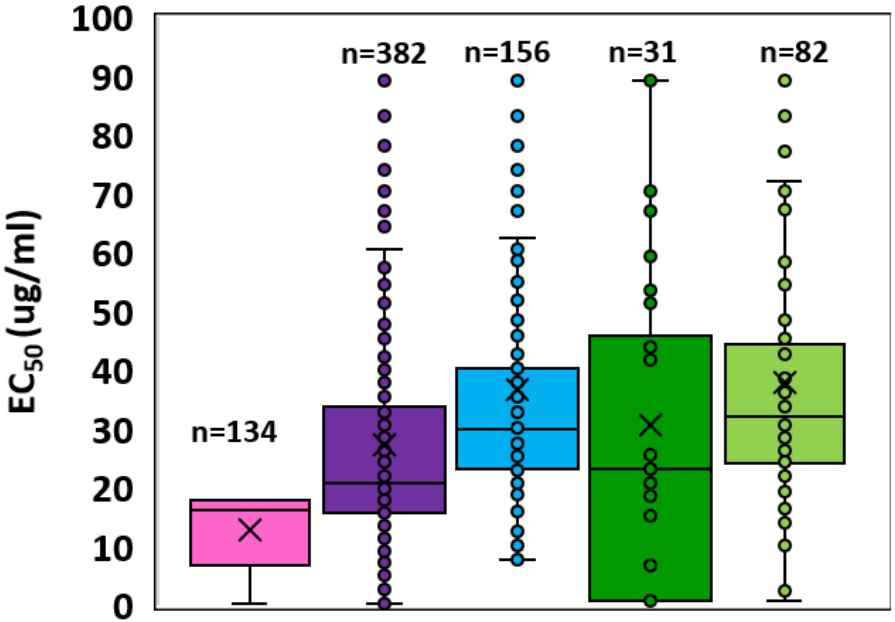
2025 *C. beticola* fungicide sensitivity (n = 50-64 isolates, testing in progress)



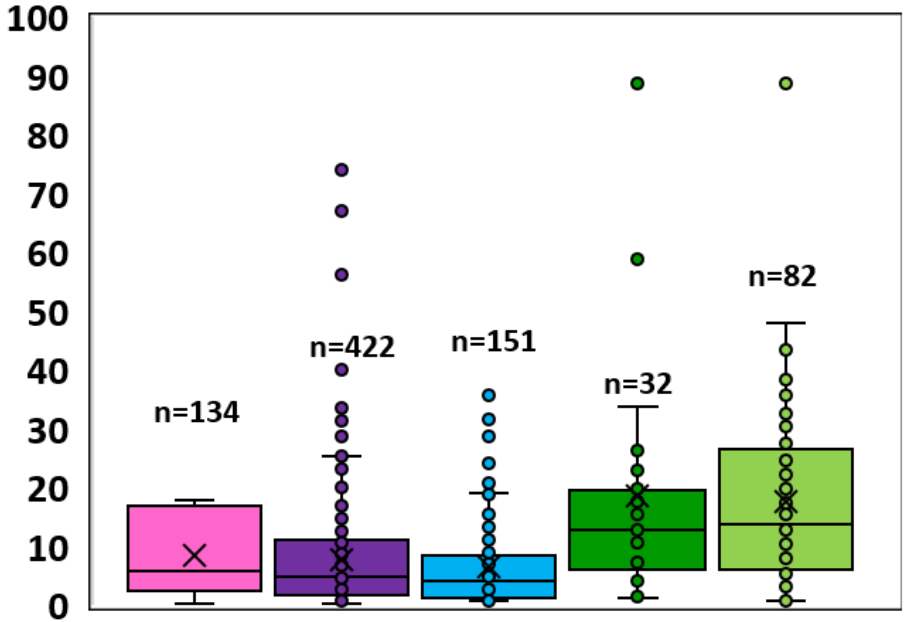
Hernandez et al. 2025, Weedon et al. REACh 2025

Cercospora resistance in Michigan (2021-2025)

C) Prothioconazole



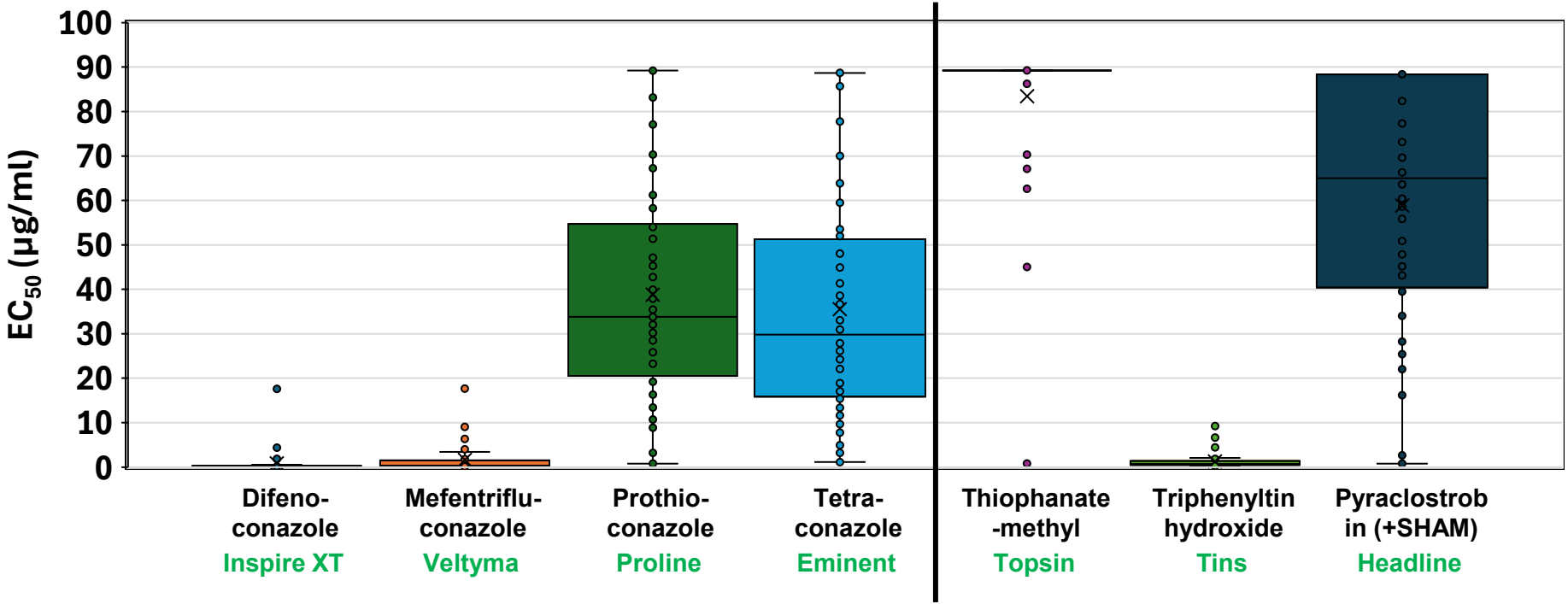
D) Tetraconazole



Hernandez et al. 2025, Weedon et al. REACh 2025

Alternaria resistance in Michigan

2025 *Alternaria* spp. fungicide sensitivity (n = 30-51 isolates, testing in progress)

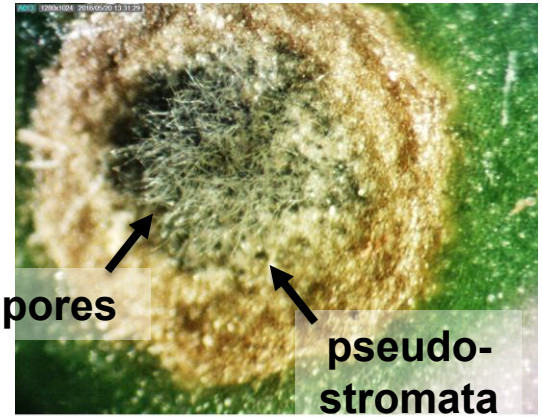


Weedon et al. 2025 REACh

Cercospora beticola survival

- **Pigmented structures survive longer than non-pigmented (Lynch & Geoghegan 1979)**
  - *C. beticola* spores survive 11 days or less loose in soil (Lynch and Geoghegan 1979, Solel 1970, etc.)
  - Pigmented structures survived < 6 months alone in soil (Lynch and Geoghegan 1979)
  - *C. beticola* pseudostromata in leaf debris survives varying time depending on conditions
    - ~22 months on the soil surface, 10 months buried in North Dakota (Khan et al. 2008)
    - ~39 months on soil surface, 8-9 months buried in Isreal (Solel 1970)
    - > 10 months (max tested) on soil surface, 5-6 months buried in Colorado (Pool and McKay 1916)

- ***Cercospora beticola* survives between crops**
  - In seed
  - In weeds or other hosts
  - In soil, mostly in leaf debris – most important (Mitchell 1912, Pool and McKay 1916, Solel 1970, etc.)
  - Supported as increased issues as moved to minimum-till and no-till systems.



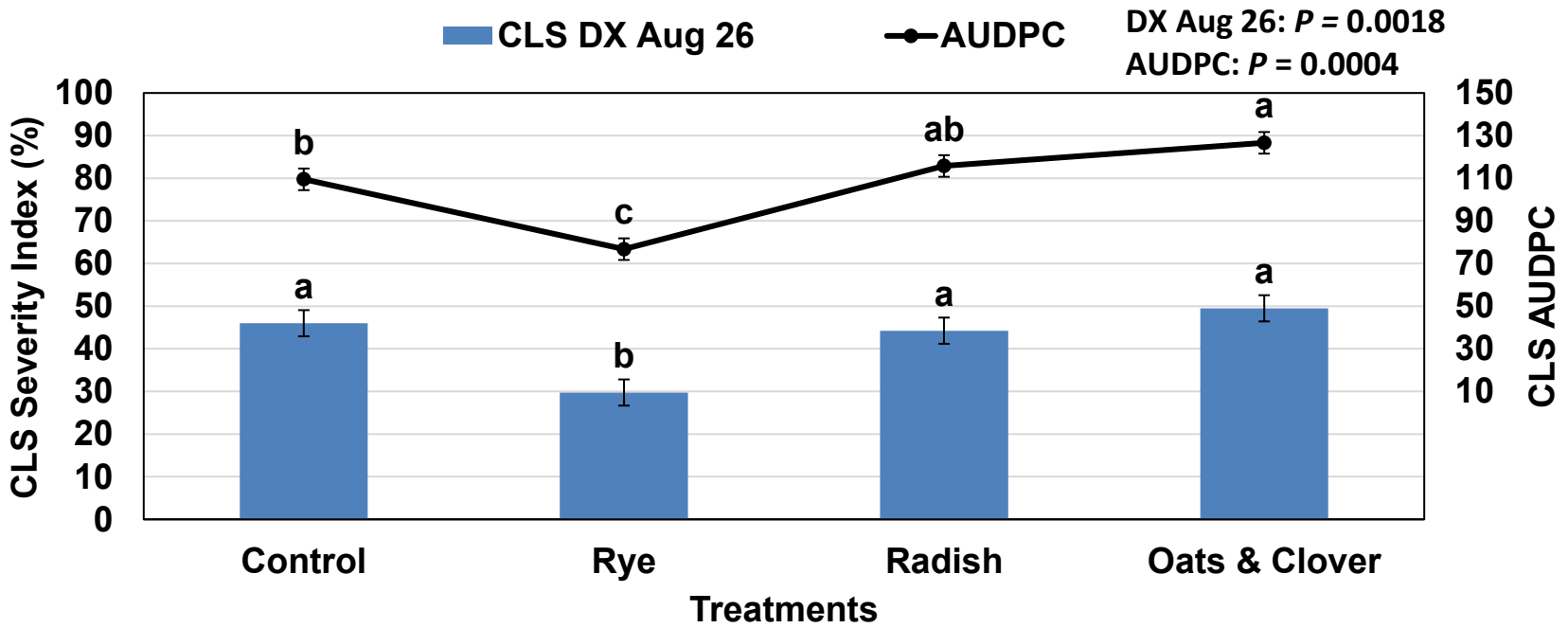
Take-away:
***C. beticola* can survive in leaf debris for up to 39 months (~2-3 years) on soil surface, dependent on soil conditions.**

Management practices other than fungicides

- Research in 1912 (Mitchell) showed debris in the soil was the most important inoculum source. If managed in an area/region, the disease pressure was low.

- Leaf removal
- Crop rotation with weed management
- Anything that helps with leaf breakdown (tillage, composting, etc.)

2024-25 MSU cover crop study



[b] Area under the disease progress curve based on disease severities collected Jun 24, Jul 29, Aug 13, and Aug 20.

[c] Bars and points with the same letter not significantly different based on Fisher's Protected LSD (α=0.05).

Hernandez et al. 2025 REACh

Experimental management practices

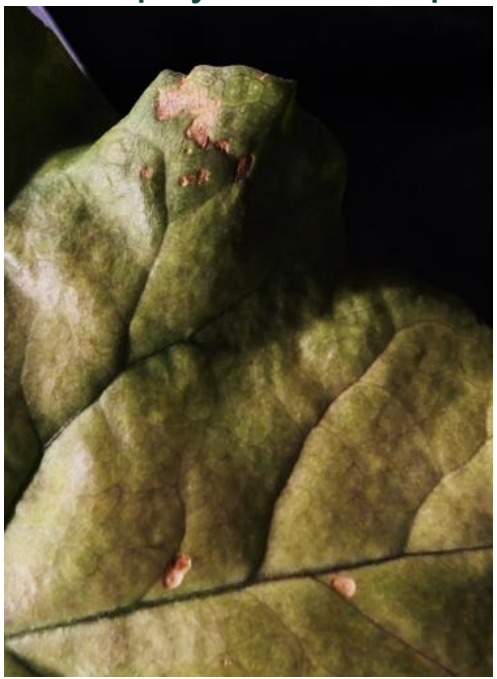
- **To reduce survival**
  - **Heat treatment**
    - *C. beticola* killed at 104 F or higher.
    - Needs time for impact (Hernandez et al. 2023)
  - **UV treatment**
    - *C. beticola* spores very susceptible, pigmented tissue less sensitive
    - In table beet, UV-C germicidal light treatment reduced spread in the season (Pethybridge et al. 2024). Caused some phytotoxicity.
  - **Antagonists**
    - Various bacteria and fungi proposed as antagonists (Collins & Jacobsen 2003, Lartey & Caesar 2005, Galletti et al. 2007, Esh et al. 2011, Derbalah 2013, El-Fawey et al. 2018, Kappel et al. 2022, Ahmed et al. 2023, Housni et al 2024, Elfattah et al 2025, Witta et al. 2025, etc.)
    - Some with other potential interactions (Lartey & Caesar 2005)
    - Some tests in the field showing potential (Collins & Jacobsen 2003, Galletti et al. 2007, Derbalah et al. 2013, Ahmed et al. 2023)
    - No reports of widespread and consistent activity

Other Diseases

Alternaria leaf spot

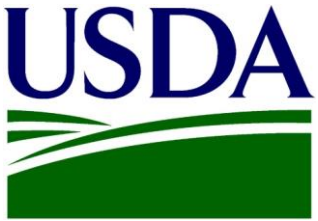
Anthracnose

Stemphylium leaf spot



Weedon et al. 2024

Special thanks to our sugar beet industry support!



Questions?

Linda Hanson, Ph.D.
USDA-ARS Plant Pathologist

Jaime Willbur, Ph.D.
Associate Professor
Potato & Sugar Beet Pathology

Plant, Soil and Microbial Sciences
612 Wilson Rd, 35; 37
East Lansing, MI 48824

willbur1@msu.edu; linda.hanson@usda.gov
(517)355-4754; (517)353-0208
@SpartySpudNBeet
canr.msu.edu/psbp