

OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER

Corn College and Soybean School

Corn Disease Management: Emphasis on Tar Spot, Gibberella Ear Rot, and Vomitoxin

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Tar Spot and its Management with Fungicides



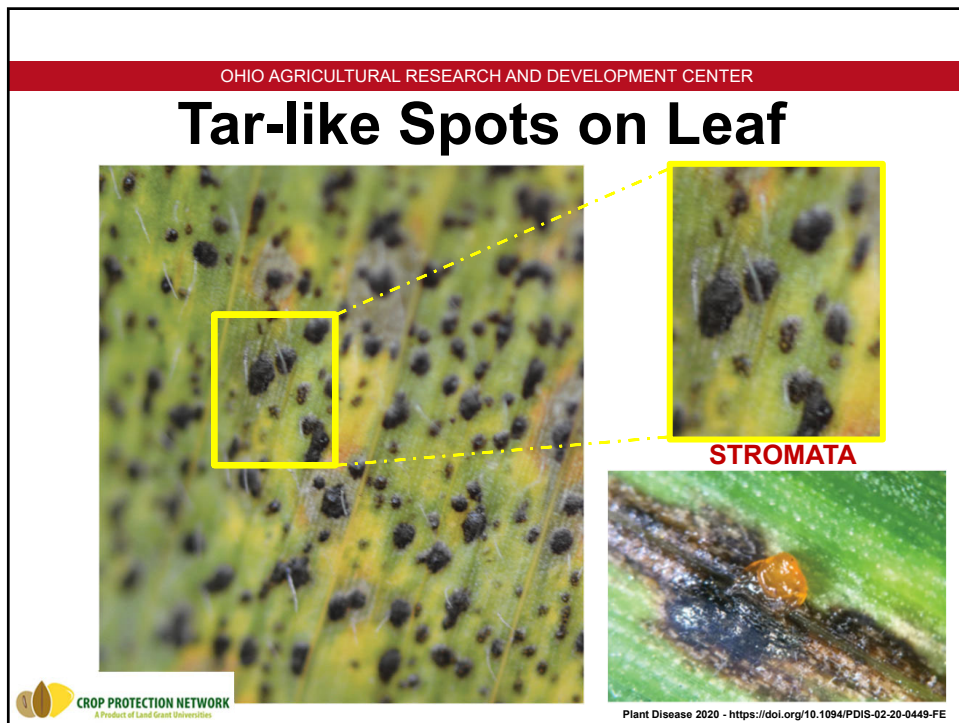
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COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

Dr. Pierce A. Paul
Professor and Extension Specialist
Department of Plant Pathology

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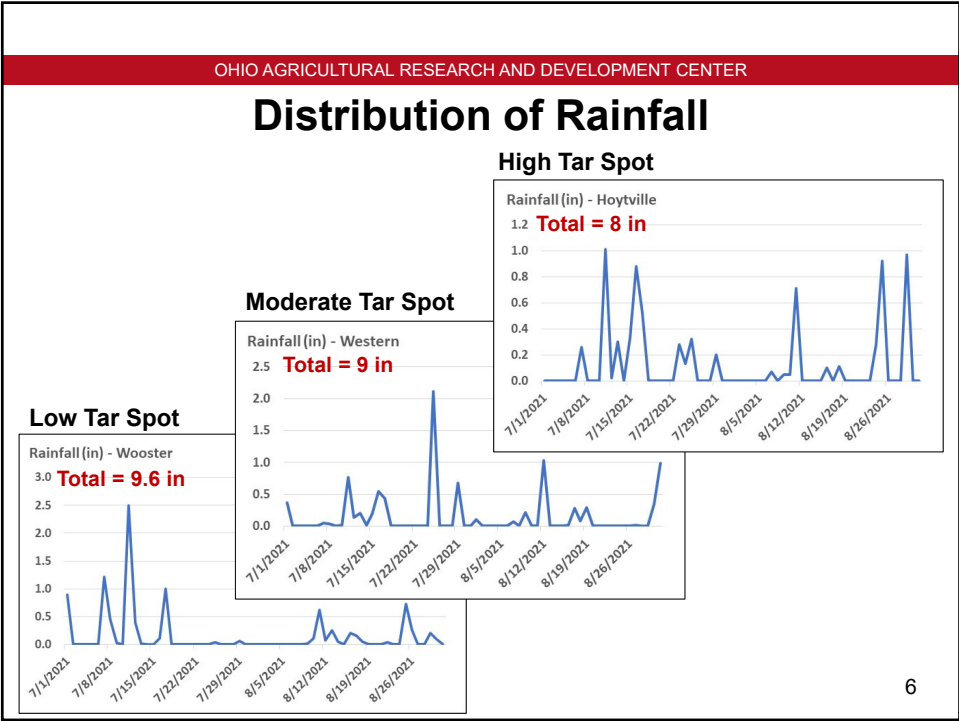
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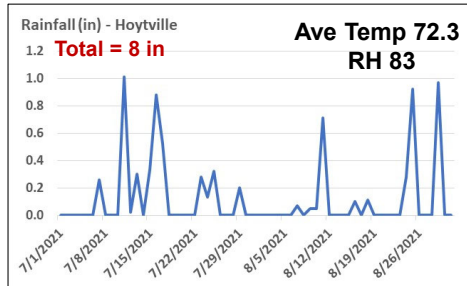
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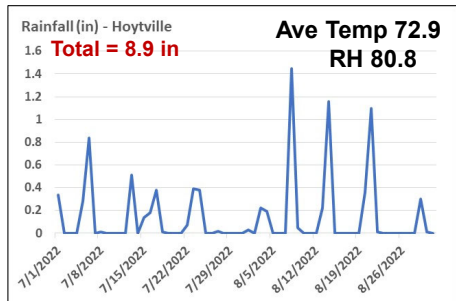
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... but Rainfall Distribution is not all that matters

High Tar Spot - 2021



Very low Tar Spot - 2022



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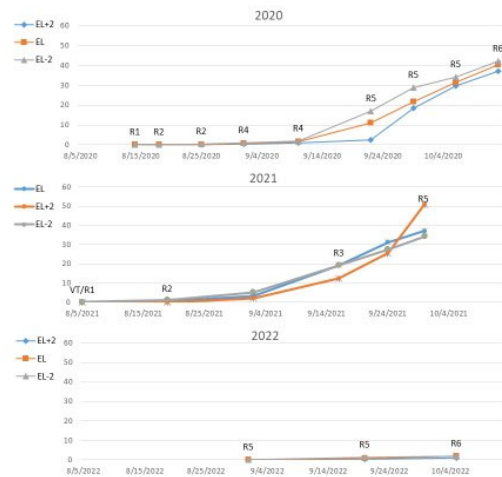
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Tar spot development
 at research site – Porter
 County, IN.

First detected:
 13 July 2019
 28 July 2020
 3 July 2021
 1 Sept 2022

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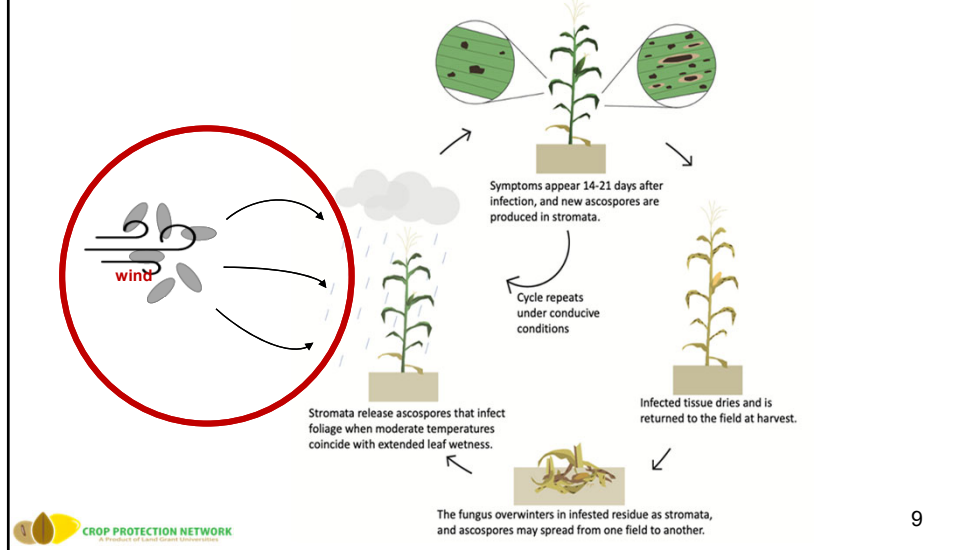


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Tar Spot more widespread than in past years



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Fungicide effects on Tar Spot in High vs Low Disease Year

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Tar Spot Uniform Fungicide Trial

Trials in Illinois, Indiana, Michigan, and Wisconsin in 2019 and 2020 (8 environments)

Trade name	Active ingredient (%)	Rate/A	FRAC Group
Approach Prima 2.34SC®	cyproconazole (7.17%) picoxystrobin (17.94%)	6.8 fl oz	3 11
Delaro 325SC®	prothioconazole (16.0%) trifloxystrobin (13.7%)	8.0 fl oz	3 11
Headline 2.09SC®	pyraclostrobin (23.6%)	6.0 fl oz	11
Headline AMP 1.68SC®	pyraclostrobin (13.6%) metconazole (5.1%)	10.0 fl oz	11 3
Lucento 4.17SC®	flutriol (19.3%) bixafen (15.55%)	5.0 fl oz	3 7
Miravis Neo 2.5SE®	pydiflumetofen (7.0%) azoxystrobin (9.3%) propiconazole (11.6%)	13.7 fl oz	7 11 3
Proline 480SC®	prothioconazole (41.0%)	5.7 fl oz	3
Quilt Xcel 2.2SE®	azoxystrobin (13.5%) propiconazole (11.7%)	14.0 fl oz	11 3
Revytek 3.33LC®	mefenitruconazole (11.61%) Pyraclostrobin (15.49%) Fluxapyroxad (7.4%)	8.0 fl oz	3 11 7
Topgard EQ 4.29SC®	azoxystrobin (25.30%) flutriol (18.63%)	7.0 fl oz	3 11
Tilt 3.6EC®	propiconazole (41.8%)	4.0 fl oz	3
Trivapro 2.21SE®	benzovindiflupyr (2.9%) azoxystrobin (10.5%) propiconazole (11.9%)	13.7 fl oz	7 11 3
Veltima 3.24S®	mefenitruconazole (17.6%) pyraclostrobin (17.6%)	7.0 fl oz	3 11

*FRAC group – 3=Strol biosynthesis inhibitor; DMI fungicides; 7=Inhibitor of respiration in complex II at SDH; SDHI or carboxamide fungicides; 11=Inhibitor of respiration in complex III at QoI; QoI or strobilurins

All treatments were applied at R1, except for one location in Illinois where treatments were applied at R3.

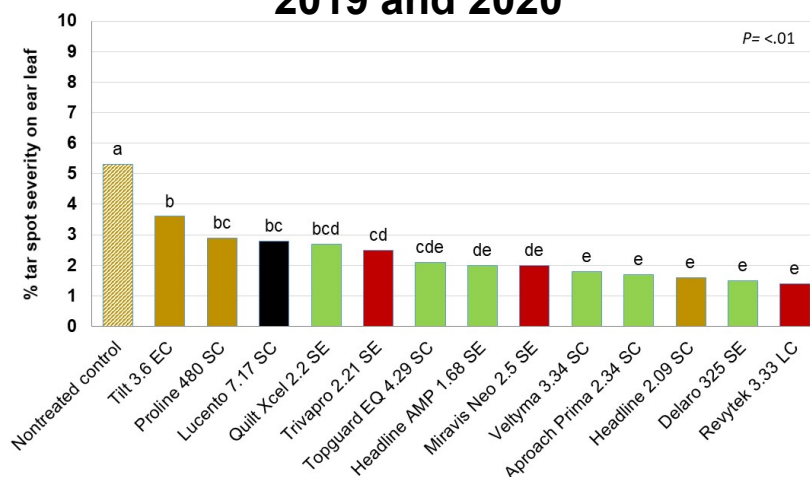
Source: Telenko et al. (2021). Fungicide efficacy on tar spot and yield of corn in the Midwestern United States. Plant Health Progress. In press.

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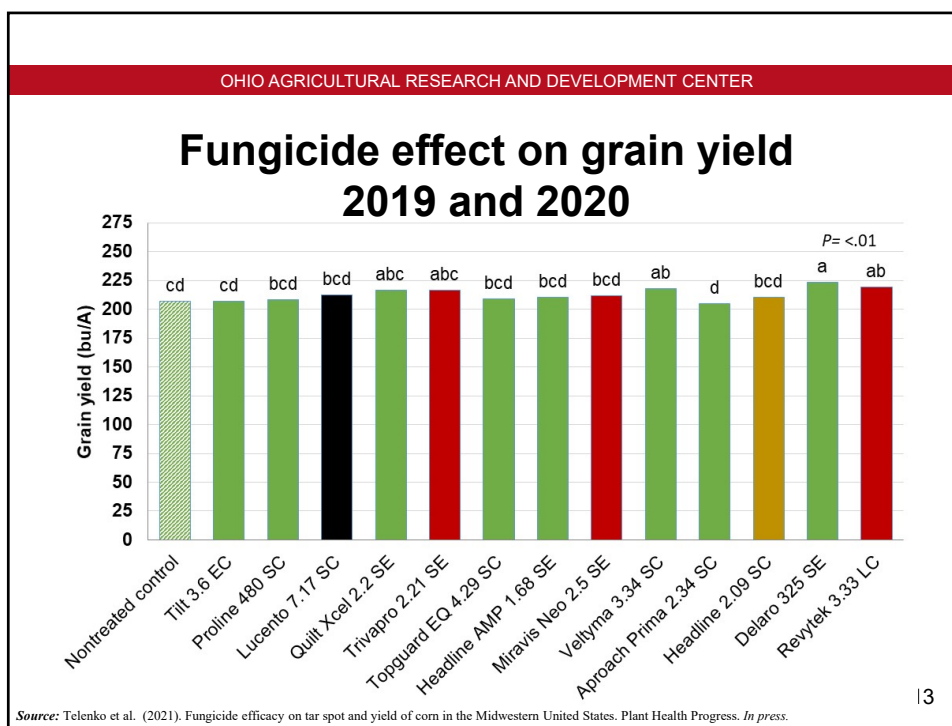
Fungicide effect on tar spot severity 2019 and 2020



Source: Telenko et al. (2021). Fungicide efficacy on tar spot and yield of corn in the Midwestern United States. Plant Health Progress. In press.

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Uniform Fungicide Trials on Tar Spot, 2022

2022 trials conducted in Indiana, Michigan, Wisconsin, Iowa and Ontario, CA (5 environments)

Treatment, rate/A and timing^z

Nontreated control
Veltyma 7 fl oz at VT/R1
Approach Prima 6.8 fl oz at VT/R1
Miravis Neo 13.7 fl oz at VT/R1
Delaro Complete 8 fl oz at VT/R1
Headline AMP 10 fl oz at VT/R1
Veltyma 7 fl oz at VT/R1 fb Headline AMP 10 fl oz at 3WAT
Approach Prima 6.8 fl oz at VT/R1 fb Headline AMP 10 fl oz at 3WAT
Miravis Neo 13.7 fl oz at VT/R1 fb Headline AMP 10 fl oz at 3WAT
Delaro Complete 8 fl oz at VT/R1 fb Headline AMP 10 fl oz at 3WAT
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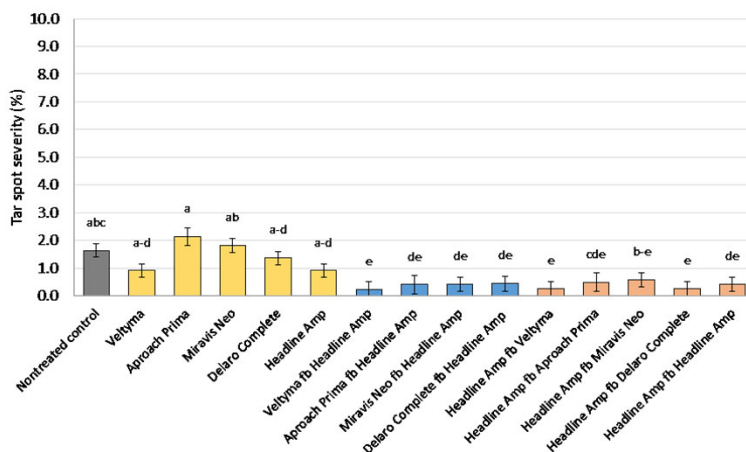
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Uniform Fungicide Trials on Tar Spot – Disease Severity 2022



^a Values are least squares means. Values with different letters are significantly different based on least square means test ($\alpha=0.05$).

^b Tar spot severity was rated by visually assessing the percentage of the symptomatic leaf area on the ear leaf at the mature growth stage (R6).

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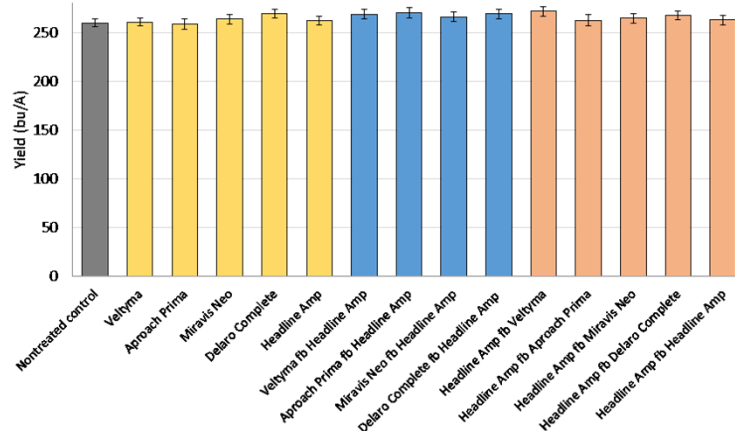


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Uniform Fungicide Trial on Tar Spot - Yield 2022



^a Values are least squares means. Values with different letters are significantly different based on least square means test ($\alpha=0.05$).

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Take-home message on Tar Spot

- **Fungicides are effective against tar spot, but product and application timing are extremely important.**
- **Products consisting of two- or three-way mixtures of AIs (DMI + QoI or DMI + QoI + SDHI) seem to be more effective than those consisting of a single AI. Applications made between VT and R2 seem to be the most consistent in terms of efficacy and yield response in tar spot-affected fields.**
- **Two applications resulted in lower levels of tar spot, but the yield response was not statistically significant when disease levels were low.**

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Acknowledgments

Dr. Darcy Telenko

Department of Botany and Plant Pathology,
Purdue University

Dr. Martin Chilvers

Department of Plant, Soil and Microbial
Sciences, Michigan State University

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Department of Plant Pathology, University
of Wisconsin-Madison

Dr. Nathan Kleczewski

Department of Crop Sciences,
University of Illinois

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<h2 style="color: #800000; margin: 0;">Additional Information</h2>	<h2 style="color: black; margin: 0;">BACK</h2>
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Agronomic Crops Network

Ohio State University Extension
<https://agcrops.osu.edu/newsletter/corn-newsletter>



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GER and Vomitoxin:

Development and Management



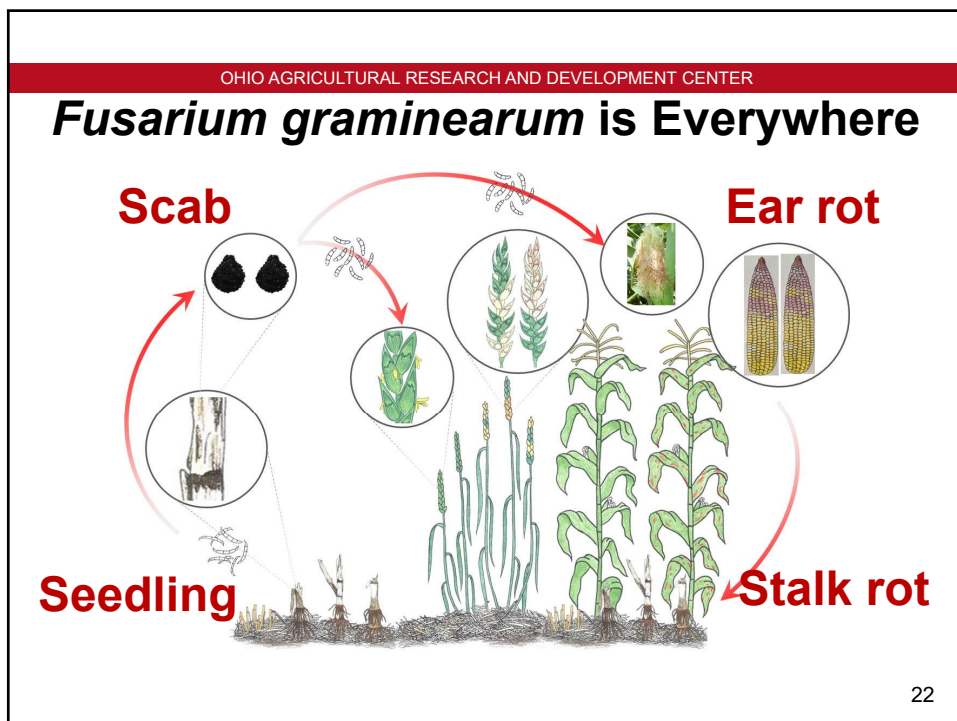
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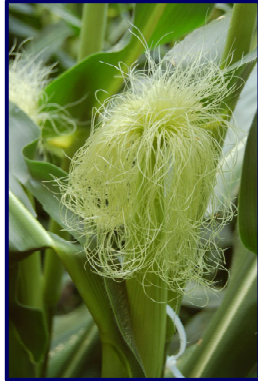


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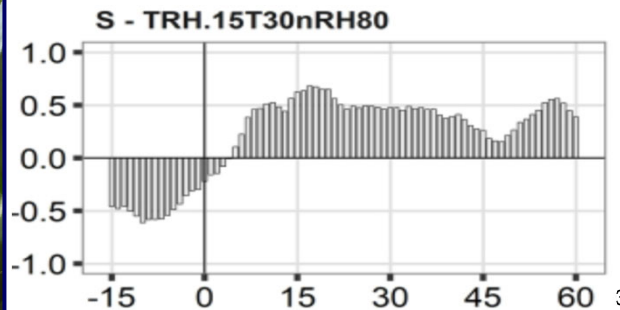
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Drivers of GER and Vom Contamination

- Hybrid susceptibility
- Corn-after-corn
- No-till production



➤ Weather around silking



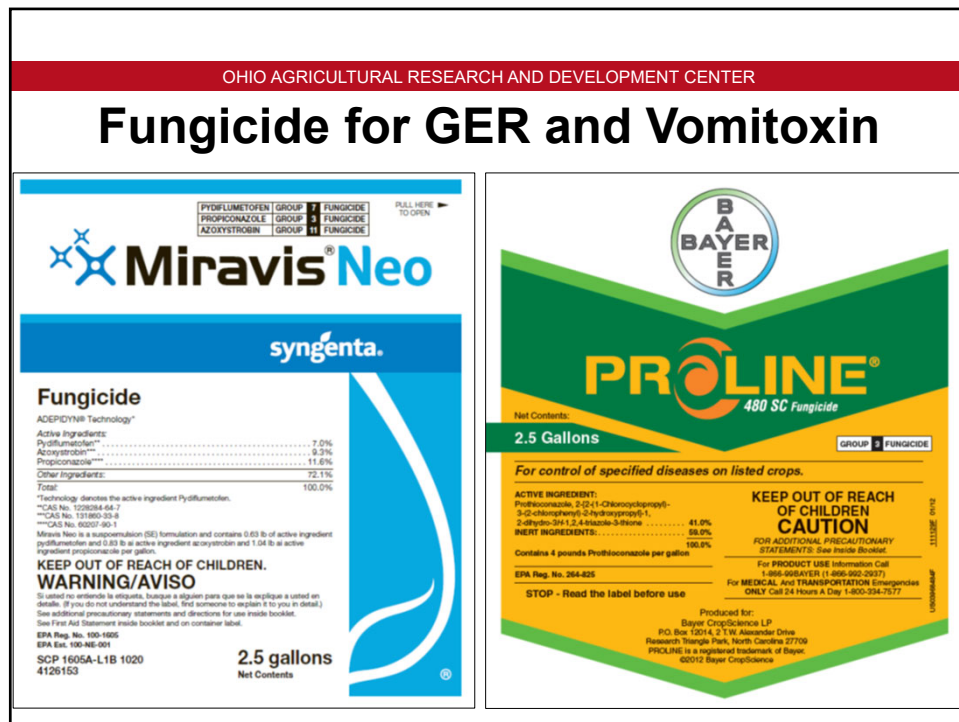
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Fungicide for GER and Vomitoxin

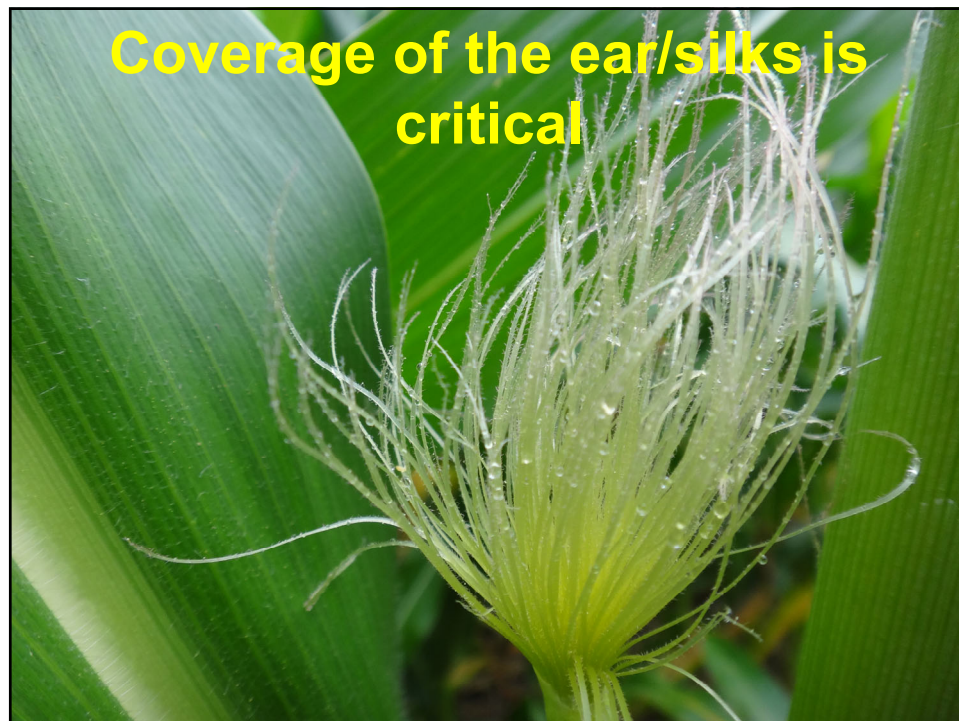
- Choose the correct product
- Apply at the correct growth stage
- Placement/coverage
 - ❖ Application technology

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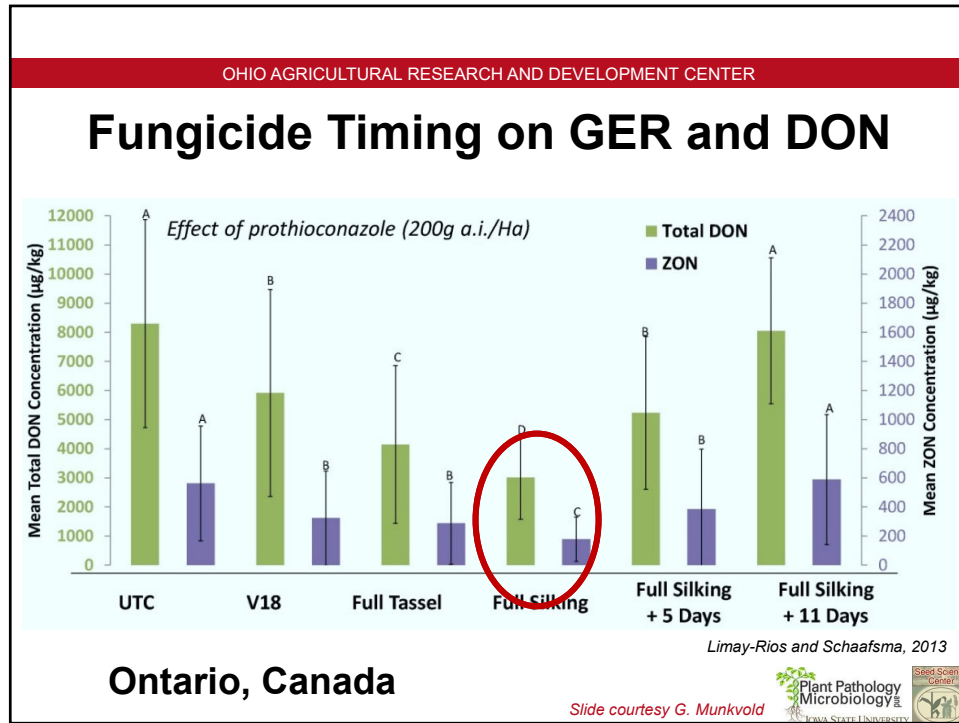
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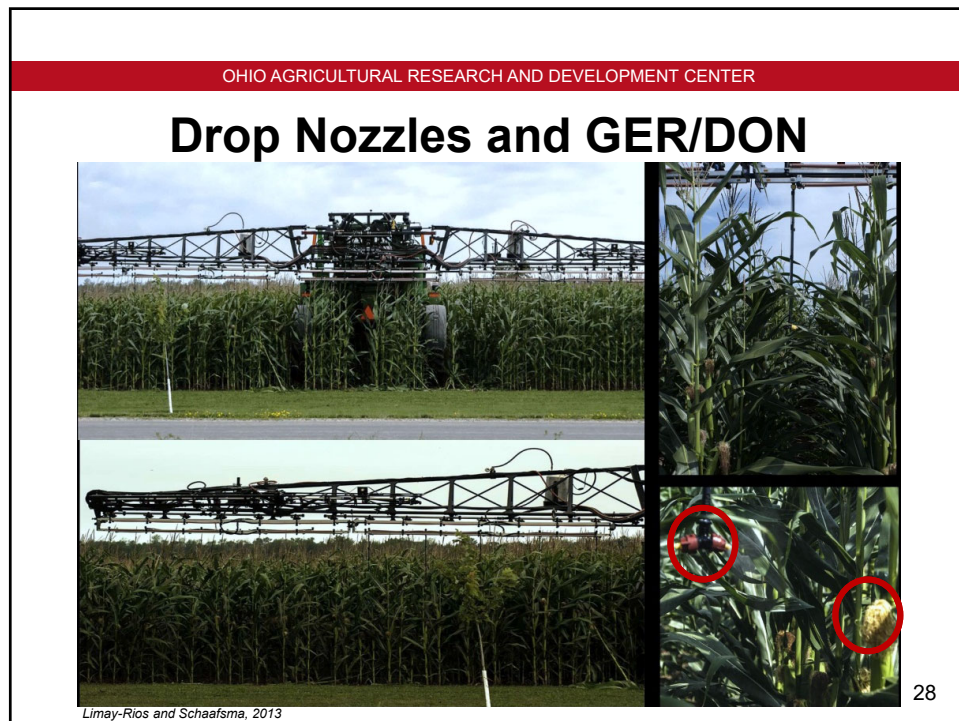
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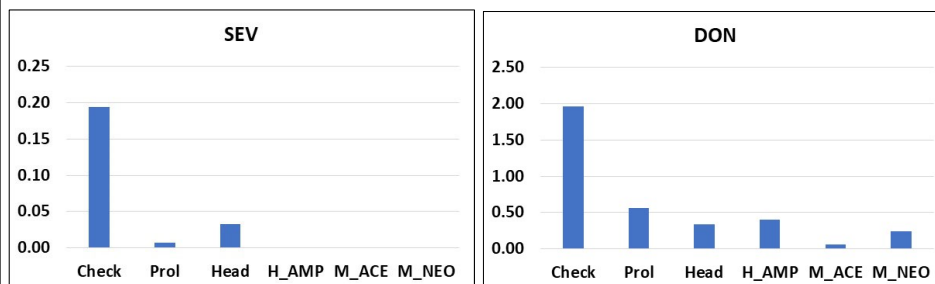


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Fungicides effects on GER/Vomitoxin

Low Disease Level



Drop Nozzle and Inoculated
Wooster, OH 2018

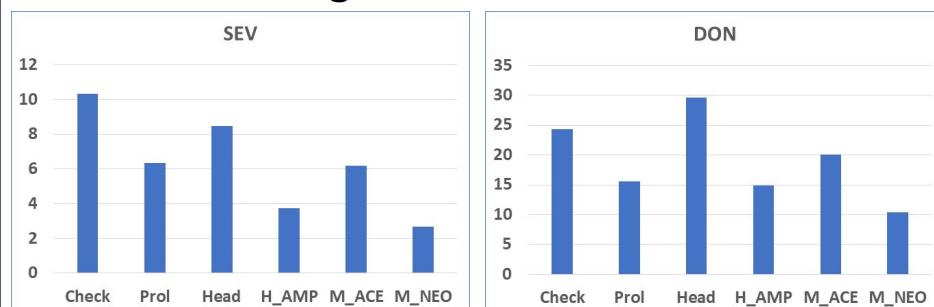
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Fungicides effects on GER/Vomitoxin

High Disease Level



Drop Nozzle and Inoculated
South Charleston, OH 2018

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Why are fungicide results so variable?

- Deposition and coverage
 - Application method
 - Silking variability
- Baseline levels of GER/VOM
 - Ear position

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Take-home message on GER/VOM

- Fungicides show promising but variable results.
- Fungicides tend to provide higher percent VOM reduction when baseline levels are relatively low.
 - ❖ More resistant hybrids
 - ❖ Tillage and crop rotation
- Drop nozzles may provide the most consistent results.
- More on-farm research is needed to evaluate application methods.

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Additional Information**BACK**

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