

Influence of Airborne *Stemphylium vesicarium* Spore Concentrations and Cover Crops on Disease Development in Commercial Michigan Onion Fields

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Stemphylium Leaf Blight (SLB) *Stemphylium vesicarium*



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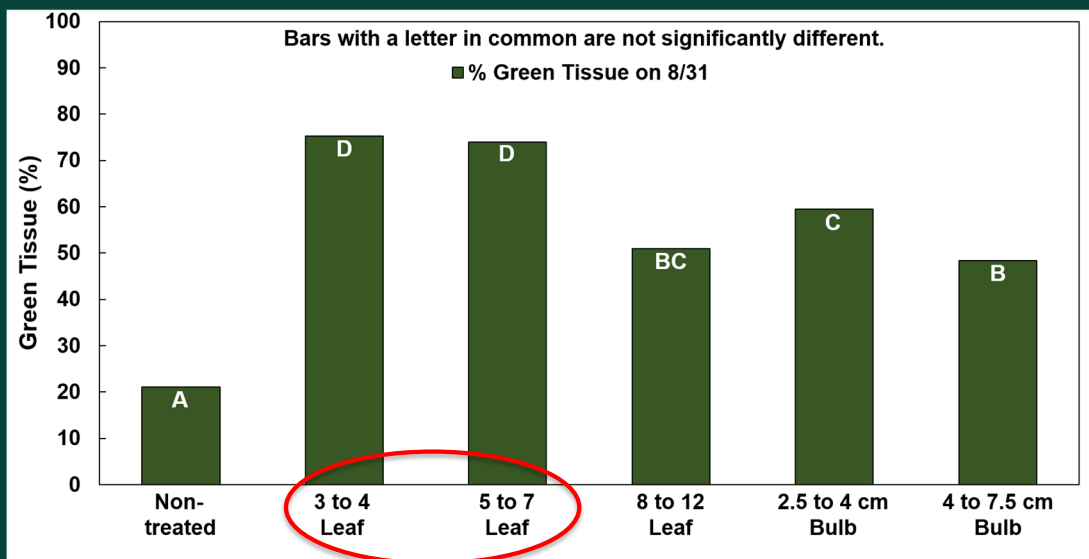
Stemphylium Has Been Difficult to Manage for Michigan's Onion Growers

Lessons Learned from Field Research

- Initiate fungicide programs early - no later than the 5-leaf stage
- Apply effective fungicides early in the season - don't save the 'good stuff'
- Alternate among fungicides with different modes of action
- Apply fungicides every 7 days

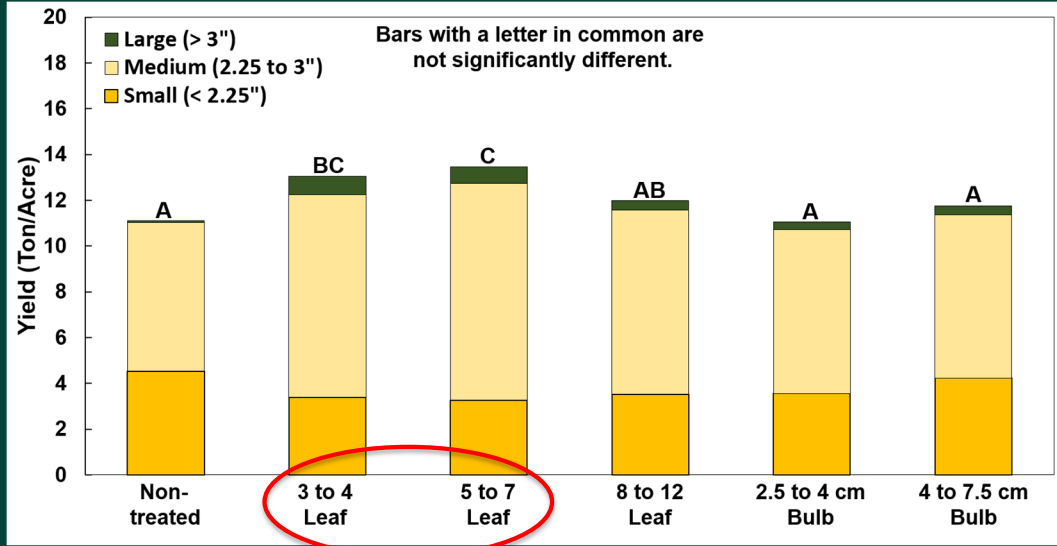
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Protect the Leaves and Apply Fungicides Early



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For Increased Yield Apply Fungicides Early



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Why Are Early Fungicides So Important? *Stemphylium* Gets an Early Start in MI Volunteer and Cull Onions and Celery Can Be Hosts



Conidia found on volunteer onions on May 5 and on cull onions May 17

Stemphylium leaf spot symptoms observed on celery plants adjacent to volunteer onions

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Stemphylium Found Early in the Spring Grower Farm (May 2, 2024)

- Conidiophores consistent with Stemphylium observed on **barley samples** (n=17)
- Stemphylium conidia observed on **onion volunteer samples** (n=7)



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Can Cover Crops be a Host for Stemphylium?

- Barley
- Oat
- Wheat
- Ryegrass
- Winter rye



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Greenhouse Research

Are Cover Crops a Source of *Stemphylium* Inoculum in MI Onion Fields?

Four *S. vesicarium* isolates; two (Farm 1) and two (Farm 2) were used to inoculate two varieties of barley, one rye and one ryegrass



Cover crops growing in greenhouse before inoculation



Inoculated cover crops under high humidity

Stemphylium Symptoms on Barley

‘Robust’



‘Quest’



Stemphylium Symptoms on Wheat and Oat

Wheat



Oat



Stemphylium Symptoms on Rye

Winter Rye

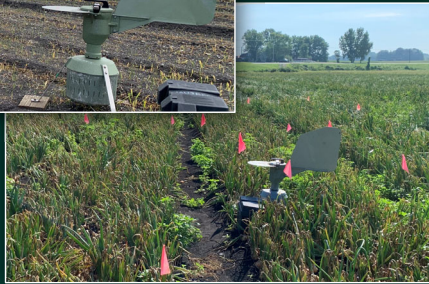


Ryegrass

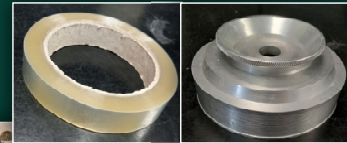


Monitoring Airborne Spore Concentrations

2024 Spore Trapping:
Two MI Locations
May 2 - Aug 21



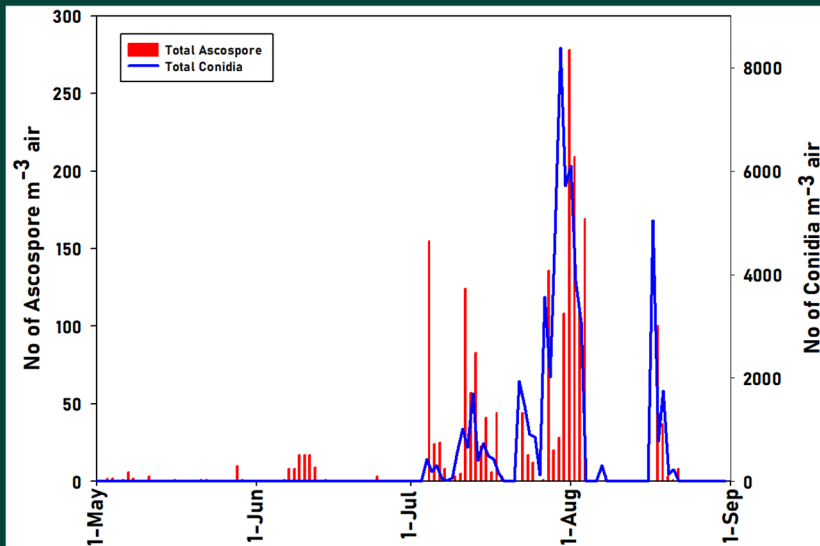
Burkard Volumetric Spore Traps in Onions



Spore Trap Reel Processing

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When Can Stemphylium Spores be Found in the Air?

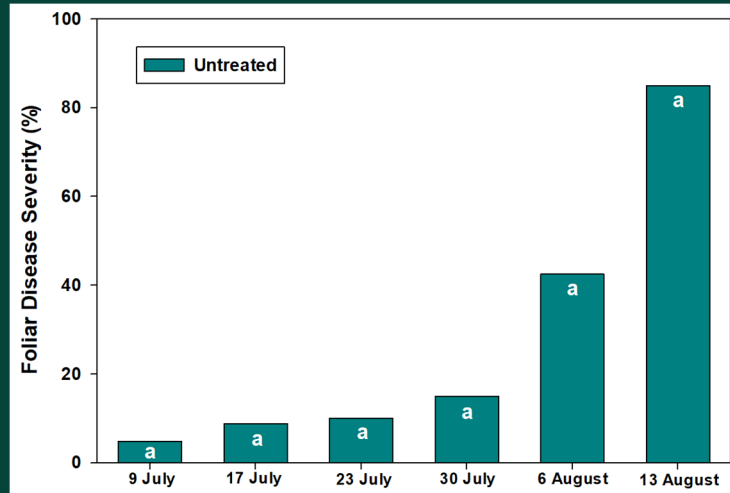


2024 Results



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Stemphylium Leaf Blight on Onion 2024 Growing Season



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Observations in MI Fields: 2025

Onion Field

- Onion and barley cover crop planted: April 11
- Spore traps deployed: March 18 to November 10
- Barley cover crop sampled: May 14 to August 25
 - 30 - 40 barley samples collected weekly from onion field (2 - 10 leaf stage)
- Onions sampled June 20 - August 5
 - 24 onion samples collected weekly

Celery Field

Previously planted to onions: 2024

- Volunteer onion and cover crop sampling dates: March 18, June 4, 24
 - 20 - 30 samples each were collected for cover crops and volunteer onions
- Spore trap deployed: May 14 to November 10

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Volunteer Onion and Barley Samples from MI Celery Field: March 18, 2025



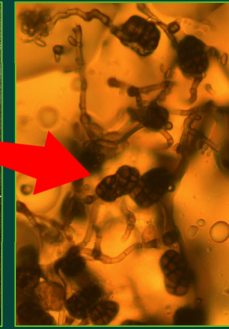
Volunteer onions



Volunteer onions
Barley planted fall 2024



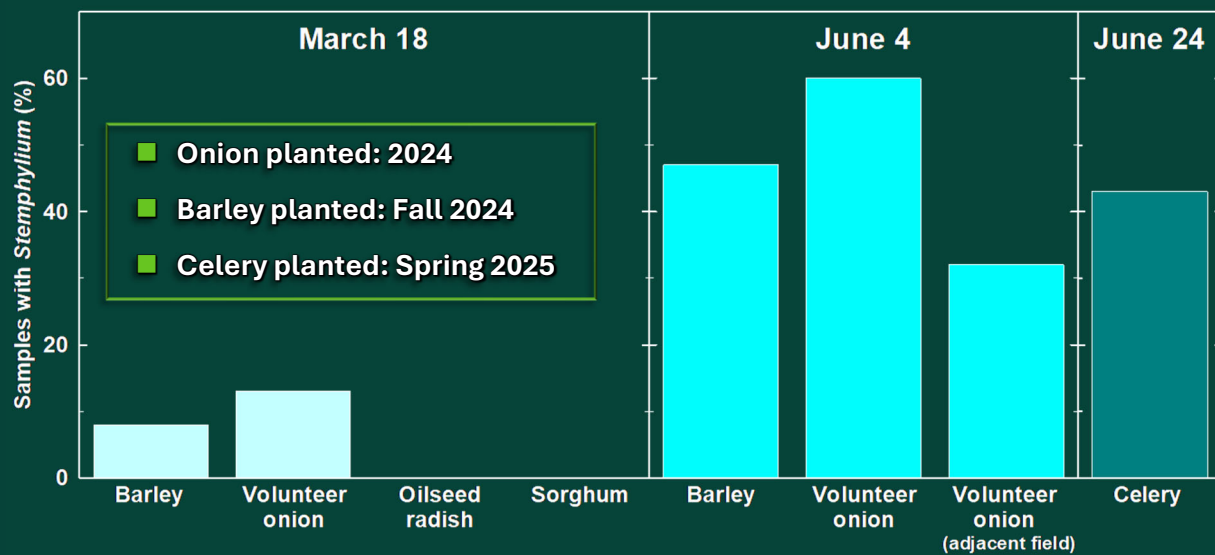
Barley leaves



Stemphylium
conidia

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Volunteer Onion & Barley Samples: Celery 2025



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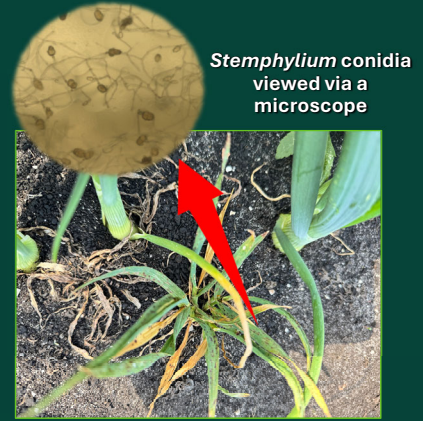
Barley Sampling in MI Onion Fields May to July 2025



Barley at 2-3 onion leaf stage on May 14

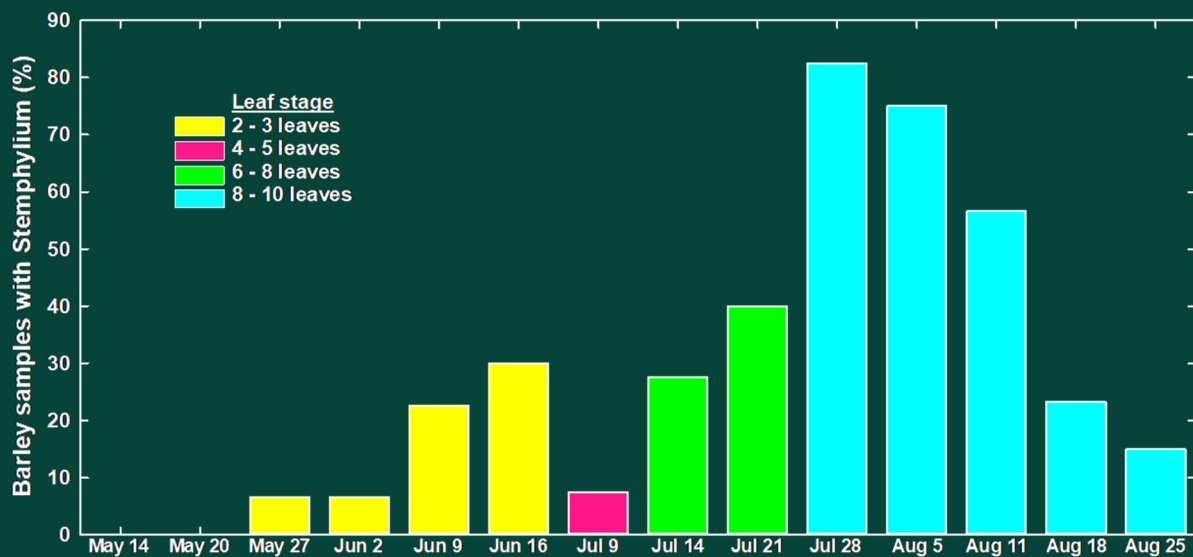


Barley killed following herbicide application on May 27

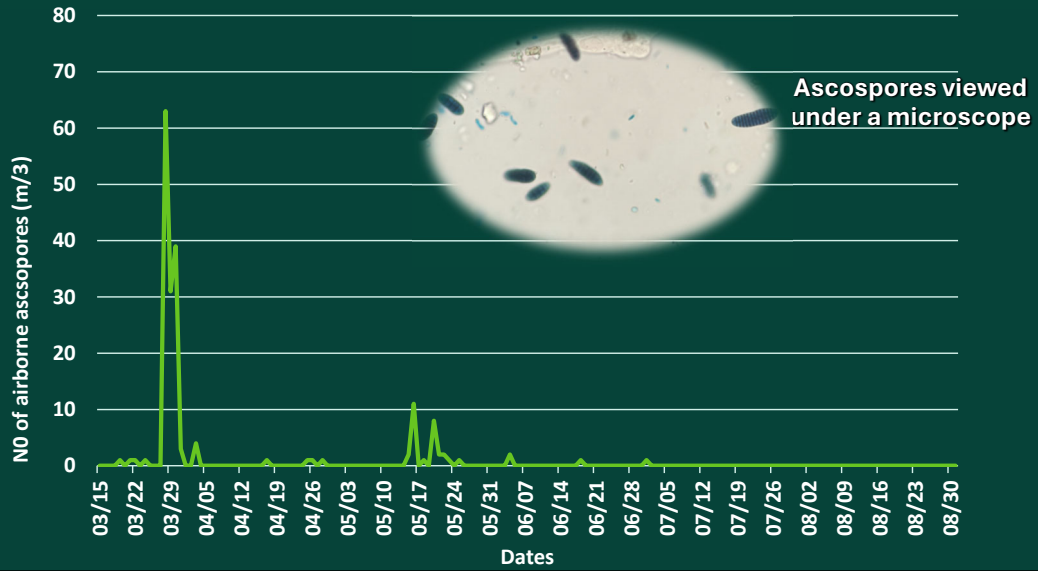


Barley when onion crop is at 6-10 leaf stage on July 9

Barley Samples in Onion Field: 2025

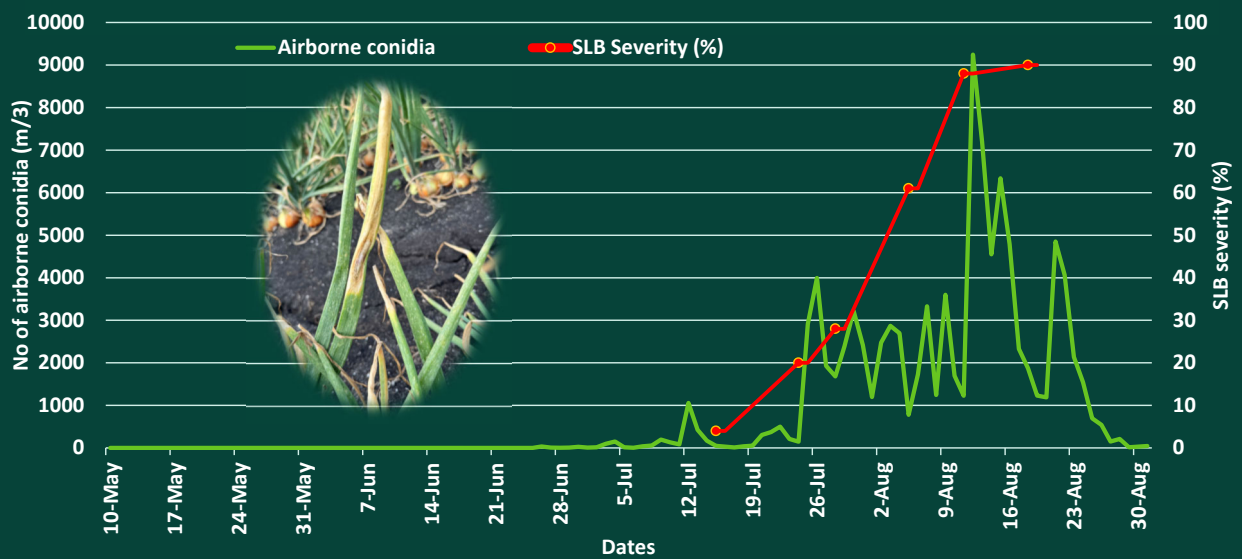


Monitoring Airborne Ascospore Concentrations



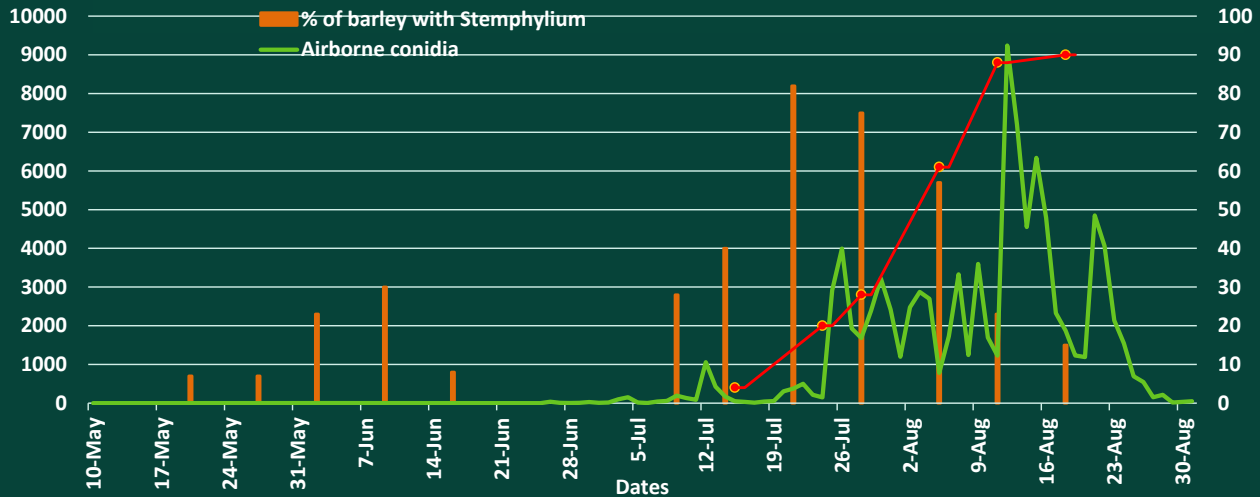
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Airborne Conidial Concentrations & Onion SLB



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Barley Samples with Stemphylium, Airborne Conidial Concentrations, and Onion SLB



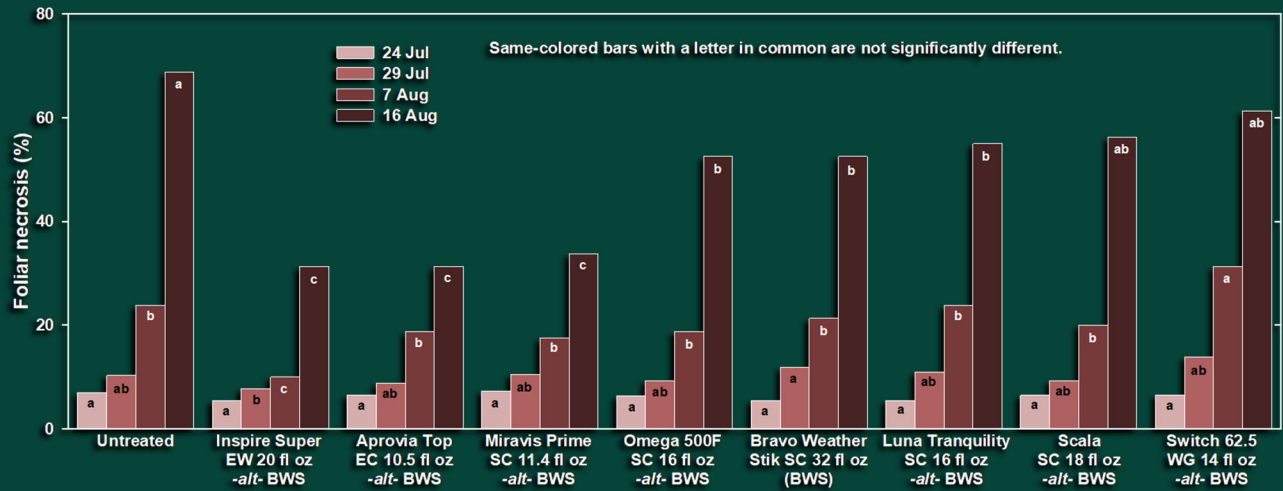
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Stemphylium Fungicide Trial 2025

Trade Name	Active Ingredient	FRAC	Rate/A	Labeled
Bravo Weather Stik SC	chlorothalonil	M5	32.0 fl oz	yes
Aprovia Top EC	benzovindiflupyr + difenoconazole	7 + 3	10.5 fl oz	yes
Inspire Super EW	difenoconazole + cyprodinil	3 + 9	20.0 fl oz	yes
Miravis Prime SC	pydiflumetofen + fludioxonil	7 + 12	11.4 fl oz	yes
Omega 500F SC	fluazinam	29	16.0 fl oz	yes
Luna Tranquility SC	pyrimethanil + fluopyram	9 + 7	16.0 fl oz	yes
Scala SC	pyrimethanil	9	18.0 fl oz	yes
Switch 62.5 WG	cyprodinil + fludioxonil	9 + 12	14.0 fl oz	yes

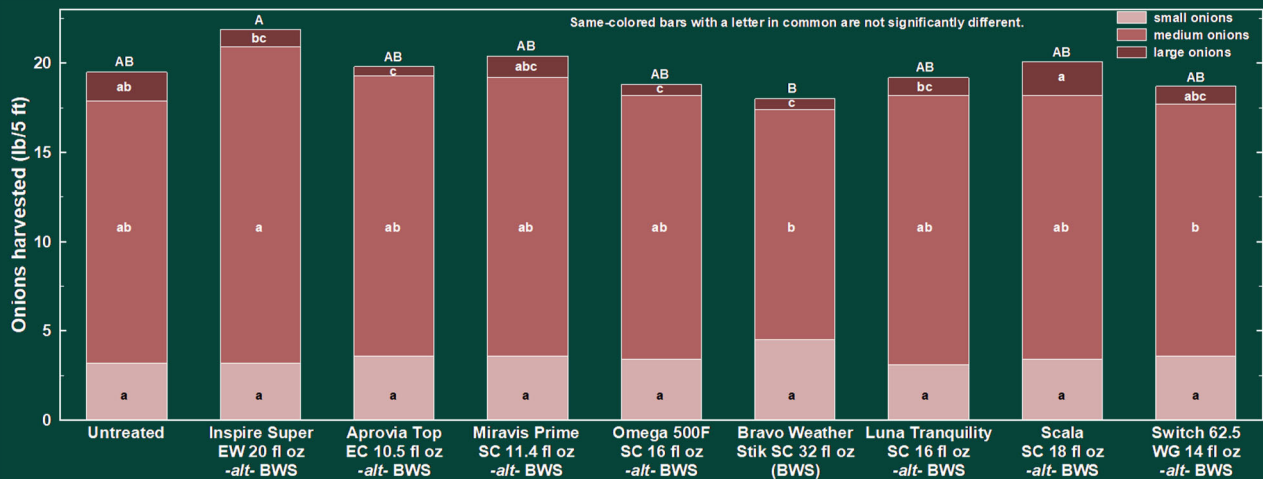
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Stemphylium Fungicide Trial 2025



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Stemphylium Fungicide Trial 2025



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Research Summary

Alternate *Stemphylium* Hosts

- *S. vesicarium* conidia found on barley leaves planted in an onion cropping system
- The pathogen was isolated from barley killed by herbicide and from volunteer barley not killed by herbicides
- *S. vesicarium* isolates infect onion and barley
- Immature pseudothecia developed on inoculated barley
- The role that barley plays in the disease cycle of *Stemphylium* has not been elucidated
- SLB control in MI onions has improved with early timing of effective fungicides. Pathogen resistance is of concern.



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Thank You! Questions?

Acknowledgements

- Cooperators: Eding Farms, Mike Bosch, and the Vogels
- Lab members: David Perla and Cheryl Engfehr
- Former lab members: Dr. Doug Higgins
- Undergraduate students



Funding

- Michigan Onion Committee
- Michigan Specialty Crop Block Grant and the MI Onion Committee
- MSU AgBio Research Project GREEN



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