Cercospora leaf blight of soybean: Using the disease cycle to target disease management

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Cercospora leaf blight (CLB), major production constraint in the mid-South

- Late season disease, first symptoms in late reproductive growth stage
- Variety of symptoms on leaf, petioles, seeds, ultimately defoliation
- Some resistance in commercial cultivars, dependent on field testing
- New effective fungicide products available, history of fungicide resistance

Research suggests important role of airborne spores in CLB outbreak

Symptomatic/ asymptomatic seeds

Infected seeds

Soybean planting

Vegetative growth stages

Reproductive growth stages

Soybean harvest

Symptoms appear

Cercosporin produced

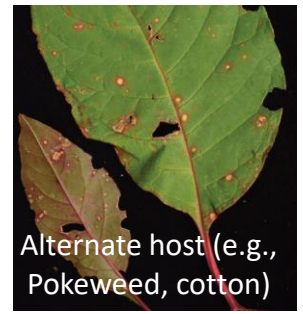
Latent infection

Airborne spores?

e-Xtra*

Development of a Quantitative Polymerase Chain Reaction Detection Protocol for *Cercospora kikuchii* in Soybean Leaves and Its Use for Documenting Latent Infection as Affected by Fungicide Applications

A. K. Chanda, N. A. Ward, C. L. Robertson, Z.-Y. Chen, and R. W. Schneider



***Cercospora* cf. *flagellaris* and *Cercospora* cf. *sigesbeckiae* Are Associated with Cercospora Leaf Blight and Purple Seed Stain on Soybean in North America**

S. Albu, R. W. Schneider, P. P. Price, and V. P. Doyle

Cause: *Cercospora kikuchii* → 2016 → Cause: *Cercospora* cf. *flagellaris, Cercospora* cf. *sigesbeckiae*

Weekly spore trapping conducted during season (multiple years, locations), processed to detect spore peaks

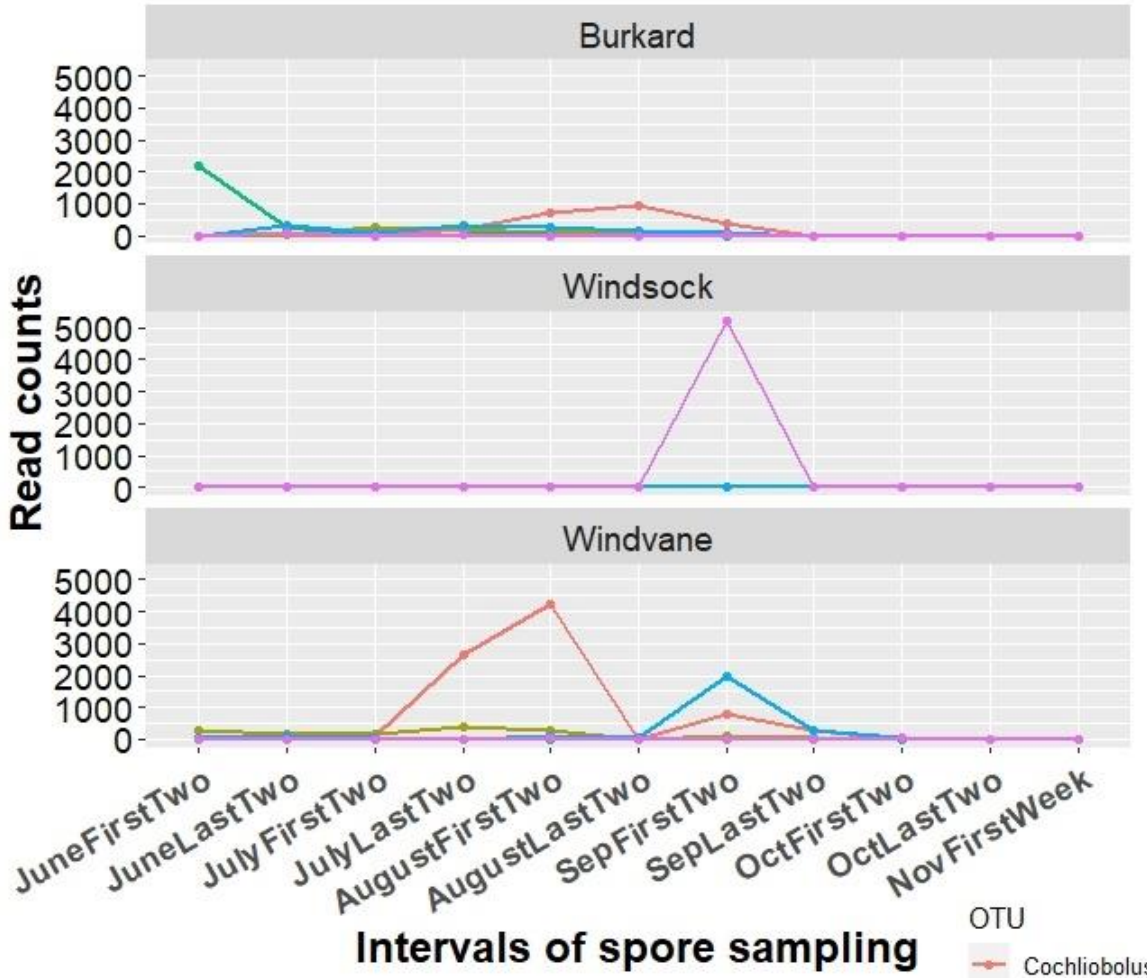
Nelomie Galagedara

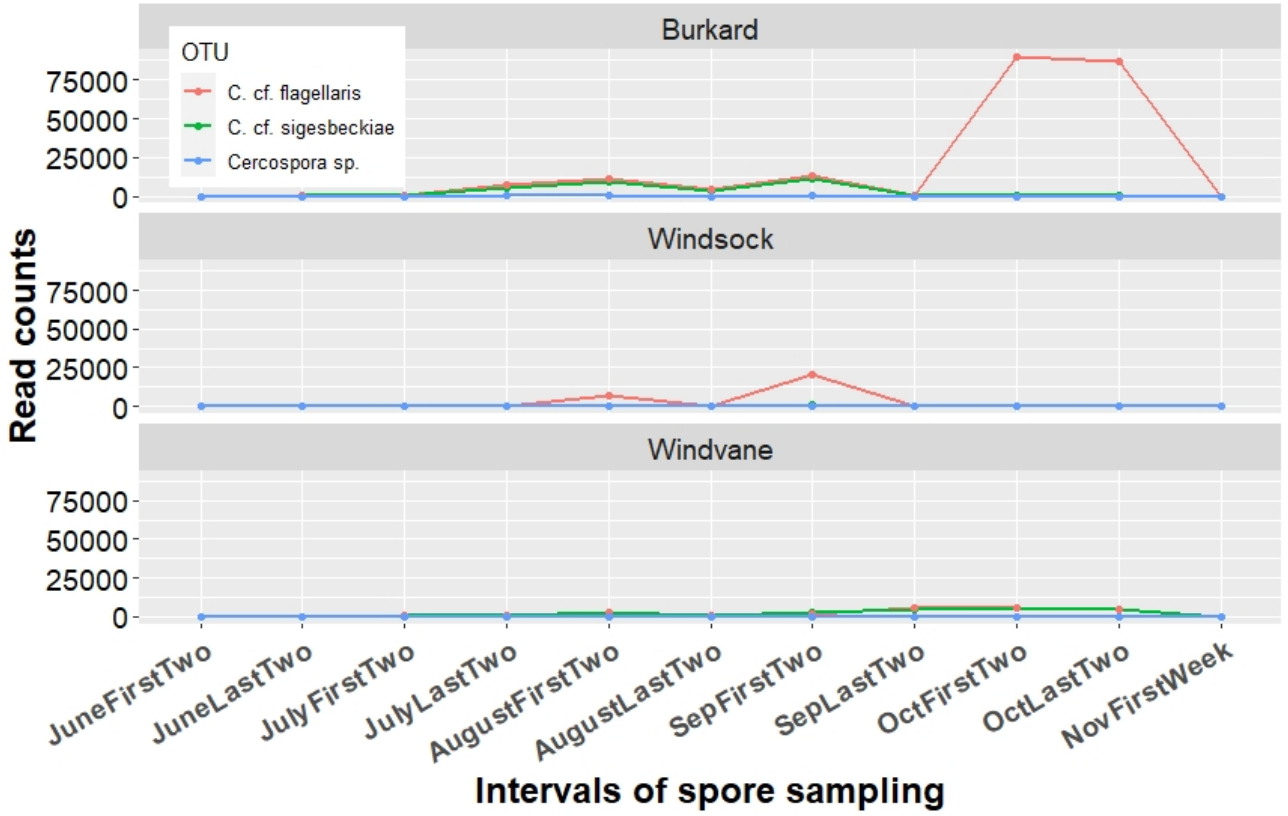
Qesada et al., 2018

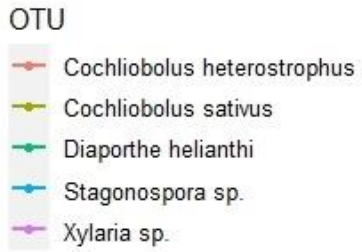
Year	Location	Burkard spore trap	Windvane spore trap	Windsock spore trap	Garden motor spore trap
2019	Winnsboro (MRRS)	✓	✓	✓	-

Two peaks of CLB pathogen spores observed prior to symptom observation in the field

2019, Winnsboro





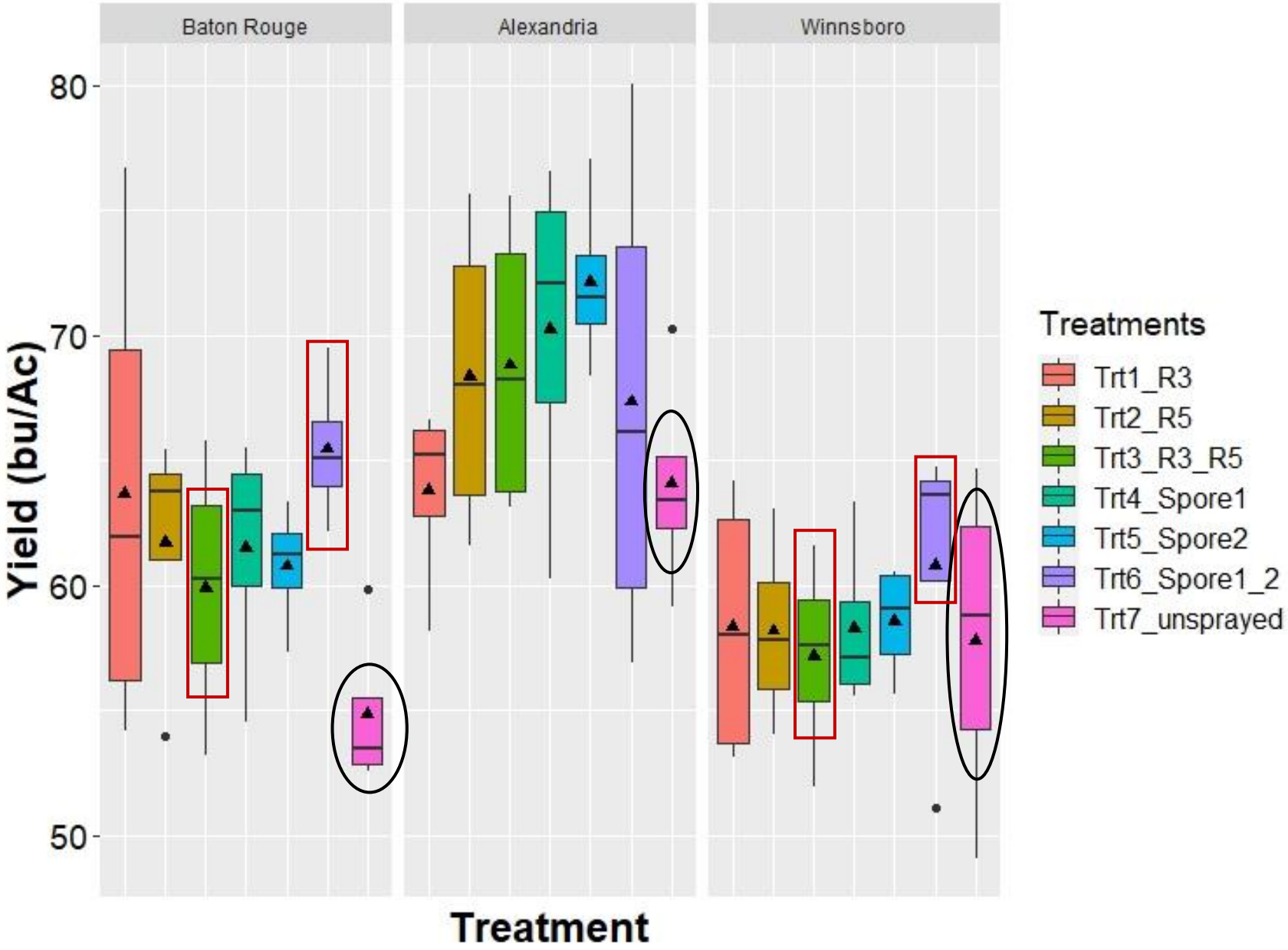


Fungicide trials conducted to target CLB pathogen spore peaks in 2021

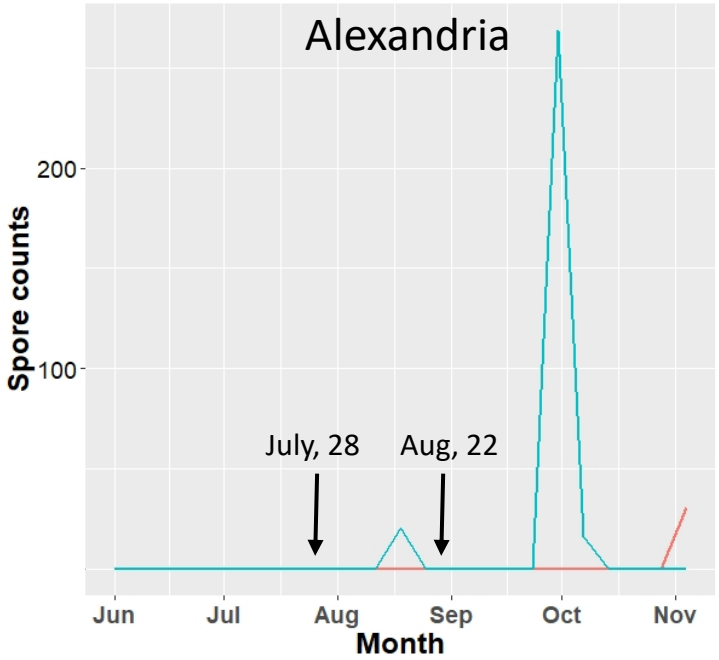
- Trials conducted at Winnsboro, Baton Rouge, Alexandria
- CLB susceptible cultivar (P53A67X, MG 5.3) planted at all locations, May end/early June
- Spore peak applications based on 2019 data from Winnsboro
- Revytek (BASF, 15 fl oz per Acre)

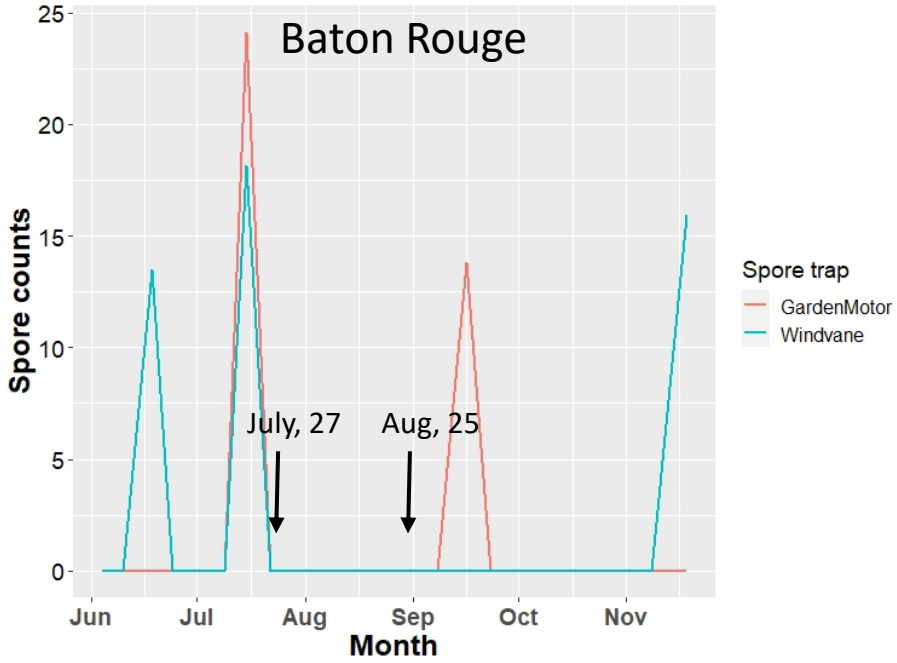
	Fungicide application timing		
Growth stage based application	Treatment 1	R3	
	Treatment 2		R5
	Treatment 3	R3	R5
Spore peak based application	Treatment 4	Spore 1 (July end)	
	Treatment 5		Spore 2 (August end)
	Treatment 6	Spore 1 (July end)	Spore 2 (August end)
Control (unsprayed)	Treatment 7	-	-

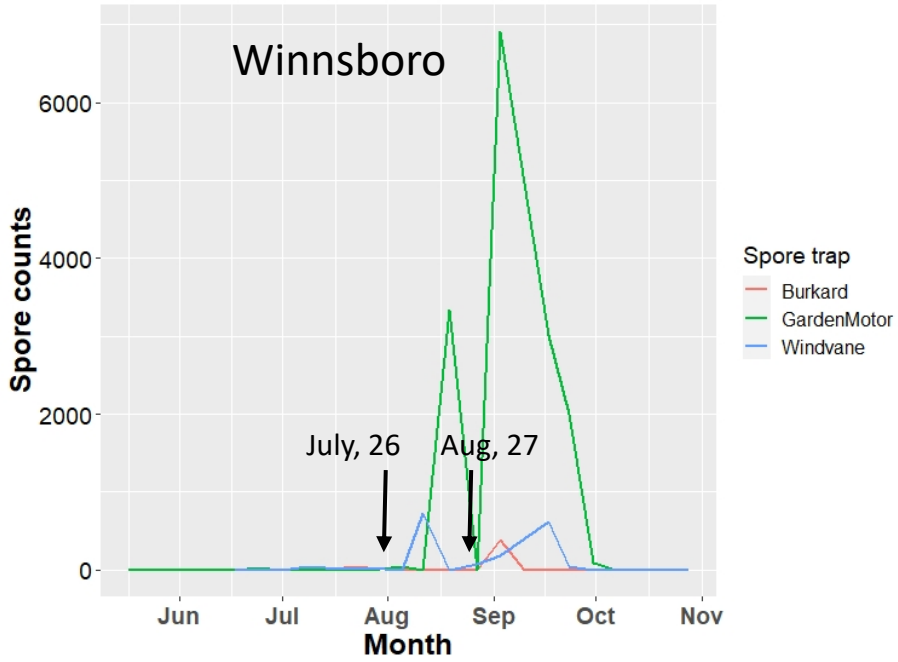
Although no statistical differences in yield, promising numerical trends observed



qPCR tools developed to detect *C.* cf. *flagellaris*, indicate similar but slightly earlier peaks







More fungicide trials planned based on research findings, expanding to new locations

- Will earlier spore peak based applications (early July, early August) provide greater efficacy against CLB?
- Would similar fungicide applications be necessary for cultivars resistant/intermediate to CLB?
- Would spore trapping and fungicide trials in other locations (Stoneville, MS; Kelso, AR) provide comparable results?
- What return of investment does CLB fungicide applications provide?

Two peaks of CLB pathogen spores observed in July and August, prior to symptom observation

Spore peaks may serve as windows of susceptibility that can be targeted for fungicide application

Acknowledgements

<u>Collaborators on project</u>

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Dr. Trey Price
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Mississippi State University: Dr. Tom Allen

University of Arkansas: Dr. Terry Spurlock
Dr. Lawson Connor

<u>Other Key Contributors</u>

Dr. Heather Kelly (University of Tennessee)
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