

Foliar fungicide considerations for corn and soybean



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@dsmuelle

For more information on field crop diseases



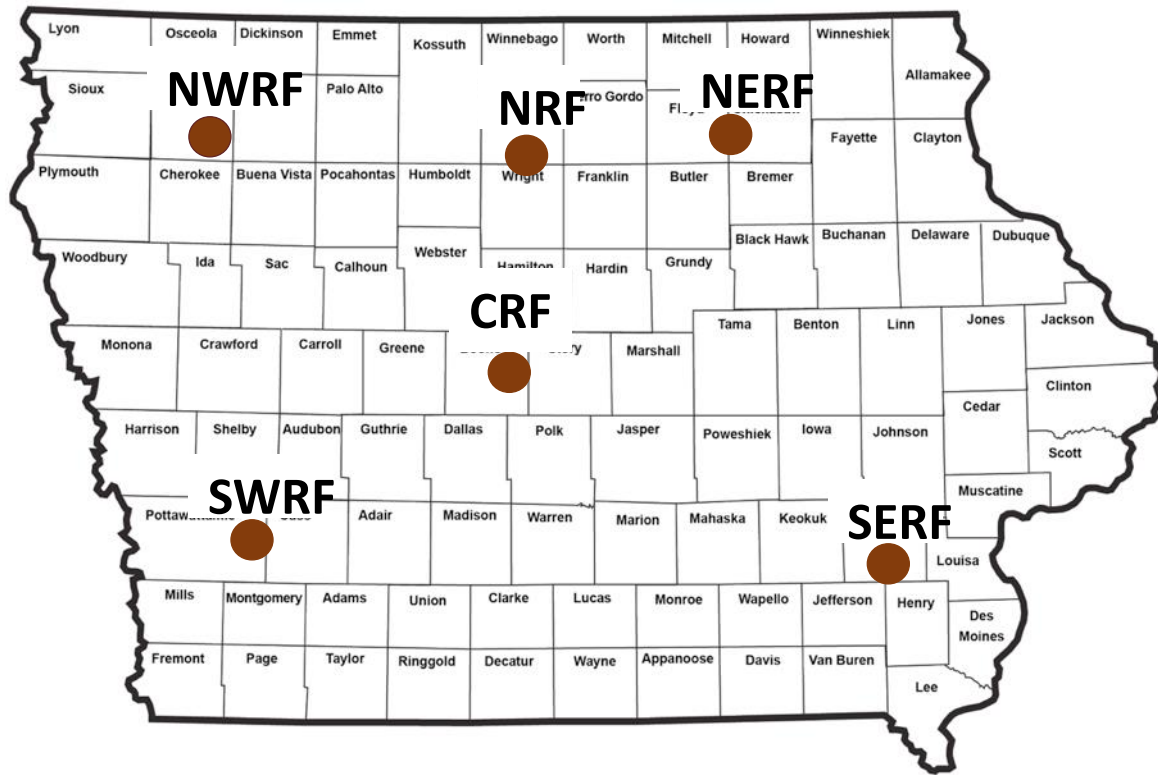
CropProtectionNetwork.org

Corn diseases affected by foliar fungicides

- Northern corn leaf blight
- Gray leaf spot
- Common rust
- Southern rust
- Tar spot
- Physoderma leaf spot



2019 statewide corn fungicide trials



Product	floz/A	Company	V12	R1	R3
No spray					
TrivaPro	13.7	Syngenta	X	X	
Miravis Neo	13.7	Syngenta	X	X	X
Veltyma	8	BASF	X	X	X
Quilt Xcel	10.5	Syngenta		X	X
Headline Amp	10	BASF		X	
Lucento	5	FMC	X	X	
VJR90-R002	9	FMC	X	X	
TopGuardEQ	5	FMC		X	
USF0411	8	Bayer		X	

V12 = mid July; **R1** = end July; **R3** = mid Aug

Effect of fungicides on disease – 2019

Predominant disease at R5 = Gray leaf spot

Low severity : ~0.1 % CRF and NRF to ~14% SWRF

Applications at **V12 and R1 reduced disease** more than at R3

No differences among products

Effect of fungicides on disease – 2019

	SWRF	SERF	CRF	NWRF	NRF	NERF*	Mean
V12	17.2	-1.1	8.5	-1.3	-0.1	7.9	5.3
R1	18.2	3.9	11.4	2.3	6.0	9.8	8.6
R3	19.6	8.1	11.8	2.8	1.6	10.4	9.0
Mean	18.3	3.2	10.6	1.4	3.4	8.8	7.7

*Significant differences in yield

Soybean fungicide update



Soybean diseases affected by foliar fungicides

- Frogeye leaf spot
- Brown spot
- Cercospora leaf blight
- Soybean rust
- White mold



Known fungicide resistance for soybean

Pathogen	Disease	Comments
<i>Phakopsora pachyrhizi</i>	Soybean rust	DMI (2008)
<i>Cercospora sojina</i>	Frogeye leaf spot	QoI (2010)
<i>Rhizoctonia solani</i>	Aerial blight	QoI (2011)
<i>Cercospora kikuchi</i>	Cercospora leaf blight	QoI (2014)
<i>Septoria glycines</i>	Brown spot	QoI (2014)
<i>Corynespora cassiicola</i>	Target spot	QoI (2017)

www.frac.info

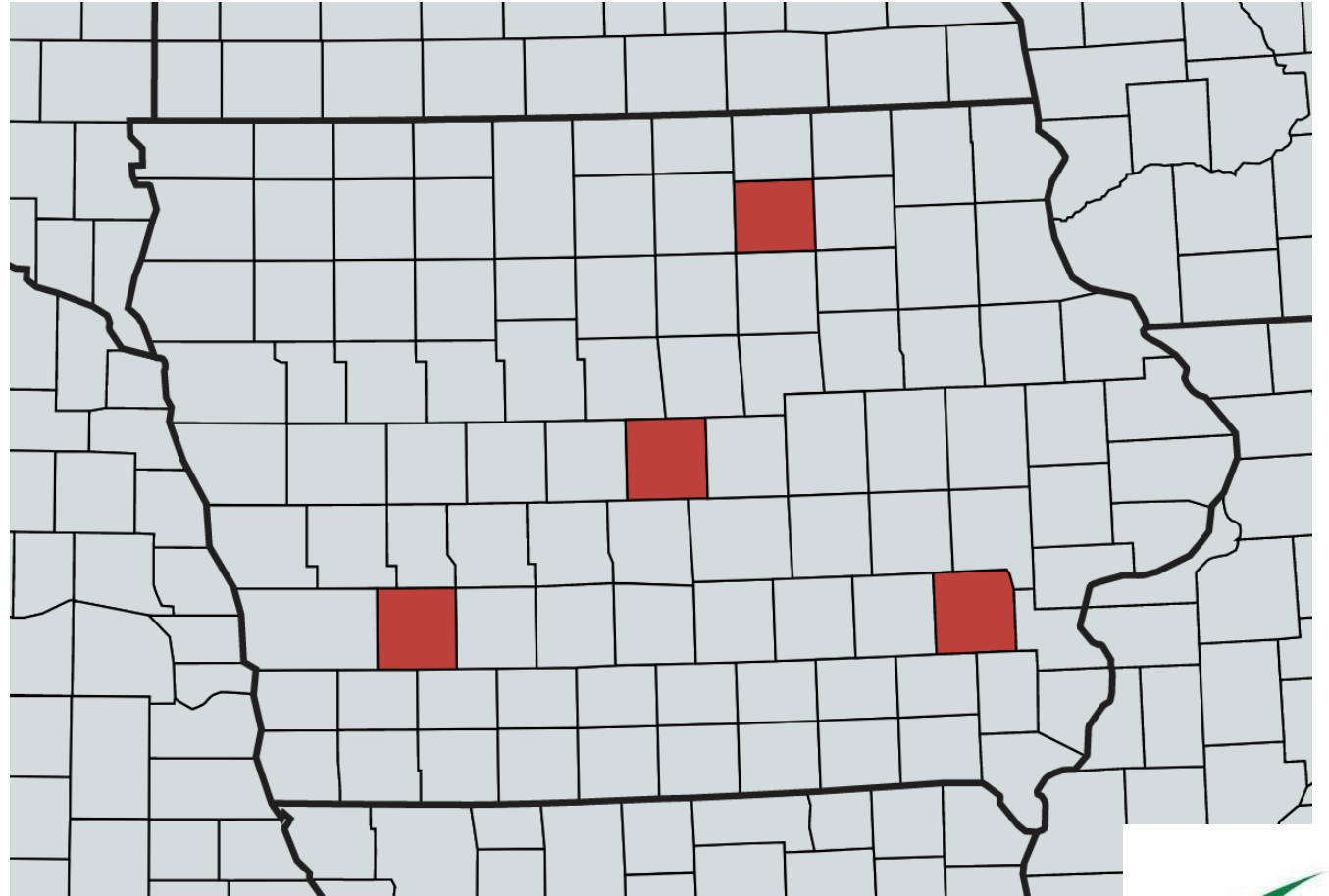
Frogeye leaf spot

- Can be found in all soybean growing areas, but *historically* more of a problem in southern regions
- Average loss in Midwestern states
 - 1996-2000: ~460,000 bushels/year (\$0.04/ac)
 - 2014-2018: ~15.7 million bushels/year (\$2.06/ac)
- Resistant cultivars available
- Now a main target of foliar fungicides across the U.S.

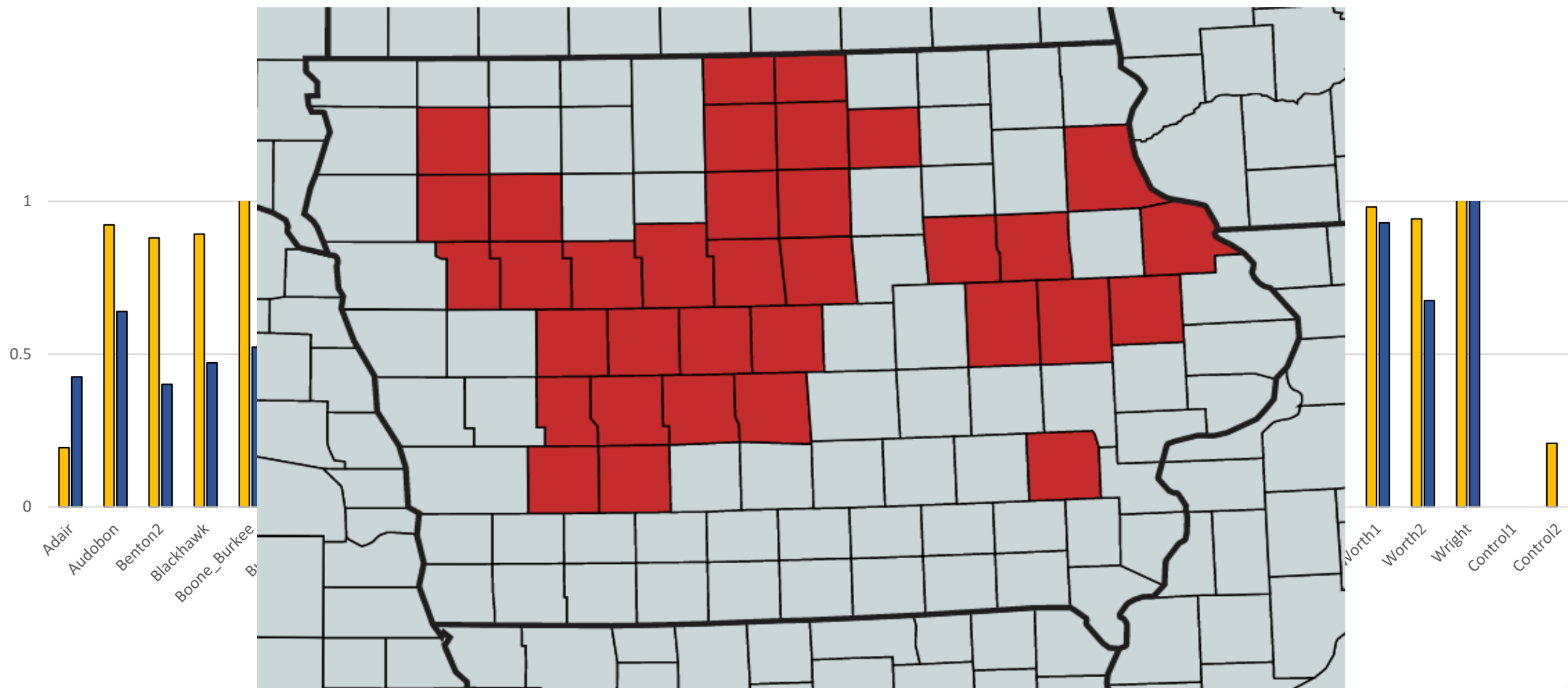


Fungicide resistance in Iowa

- Qol resistant strains
- *Cercospora sojina* in four counties in 2017
- *Septoria glycines* in 2018



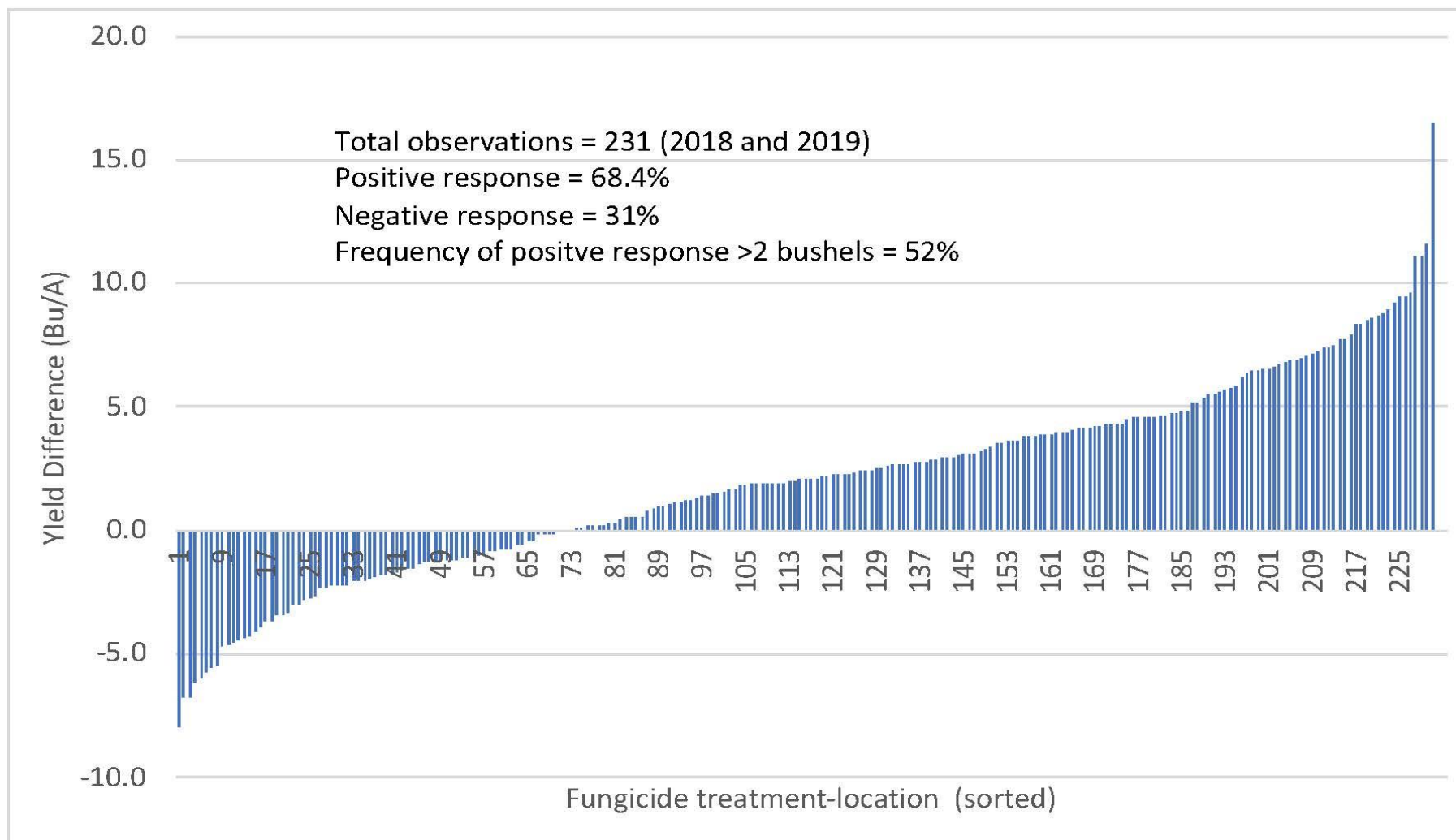
Fungicide resistance – *Cercospora sojina*



Statewide fungicide trial

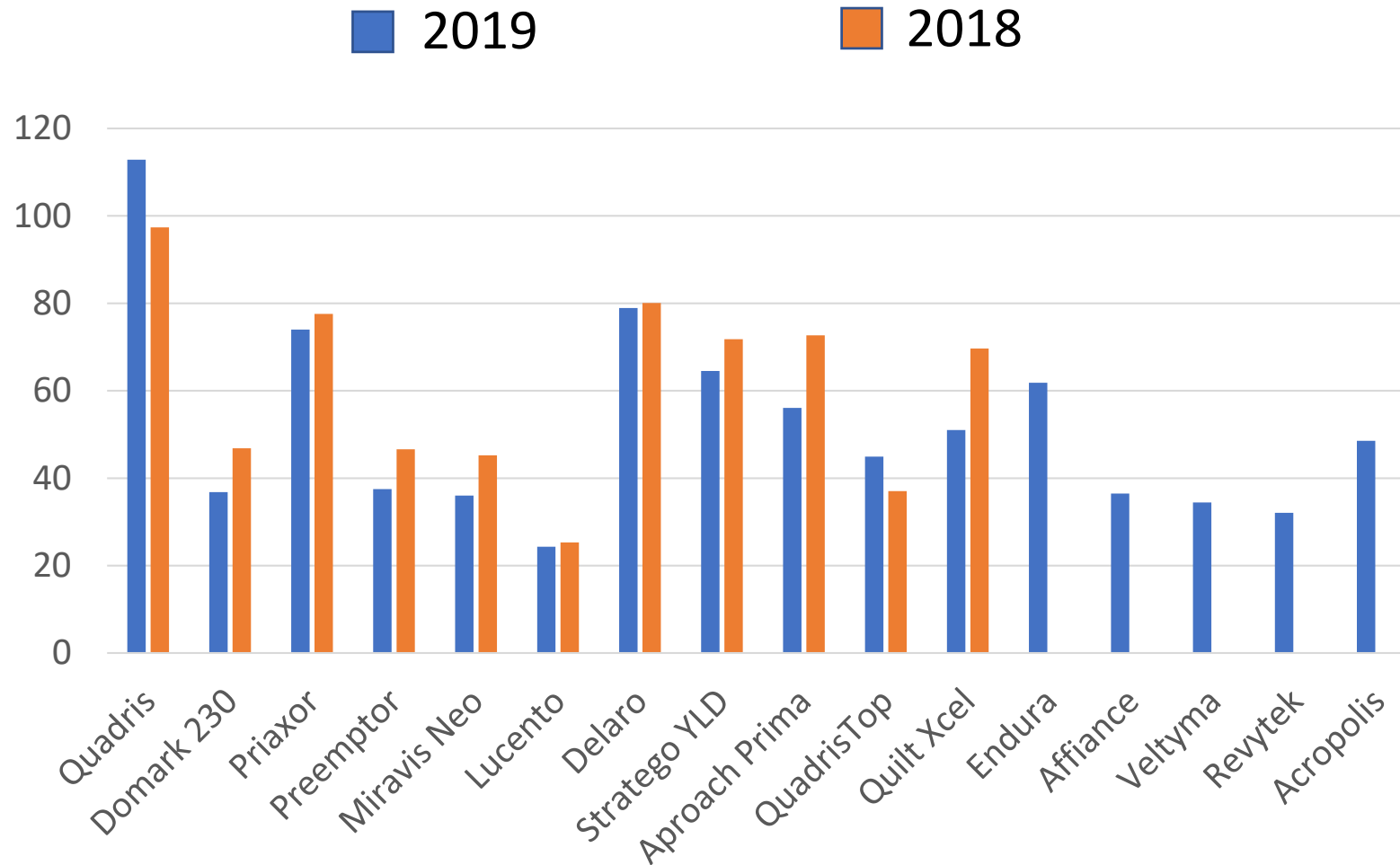


Statewide fungicide trial



Average = 2.2 bu/A

Percentage of frog-eye leaf spot compared to UTC



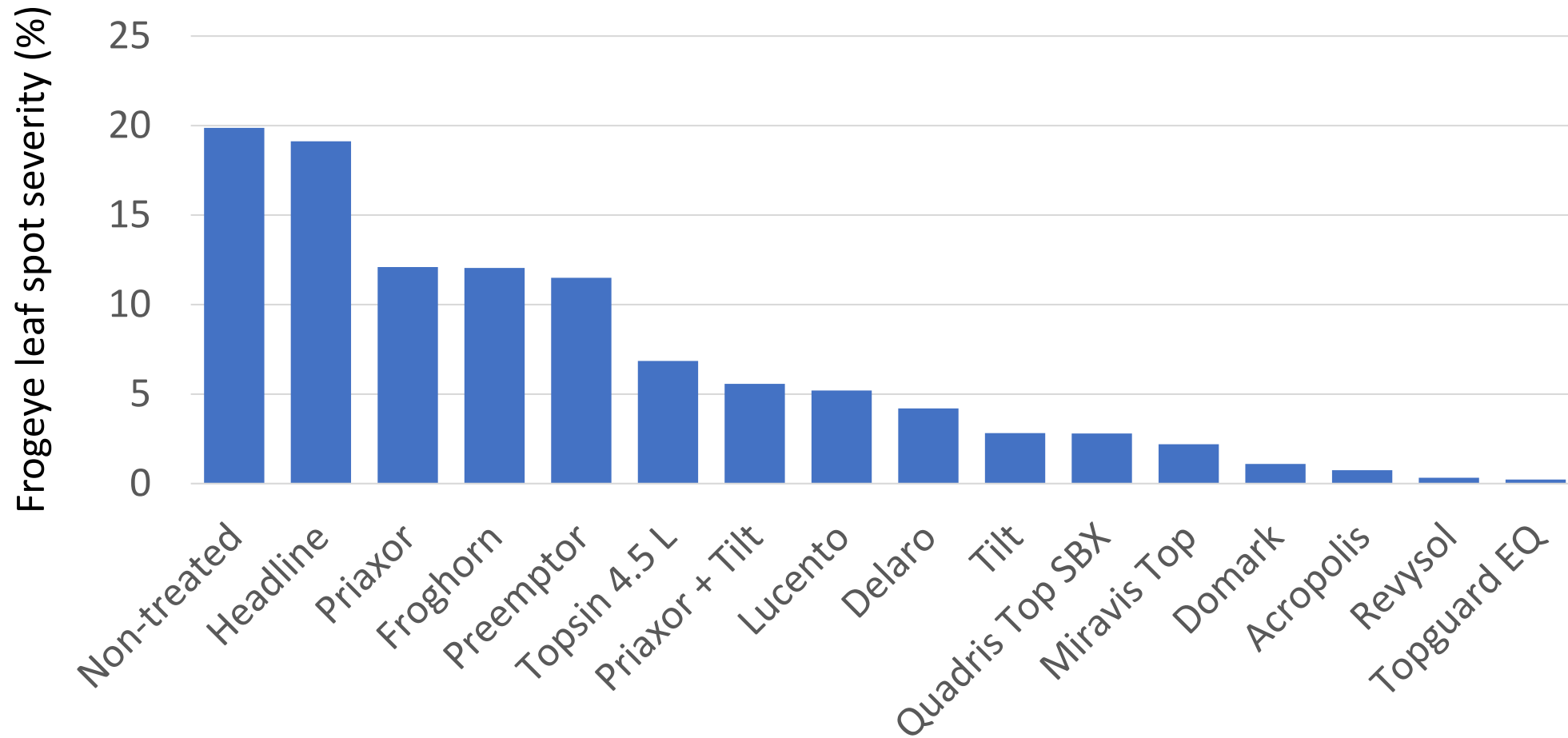
Averaged across 7
locations each year

Non-treated control

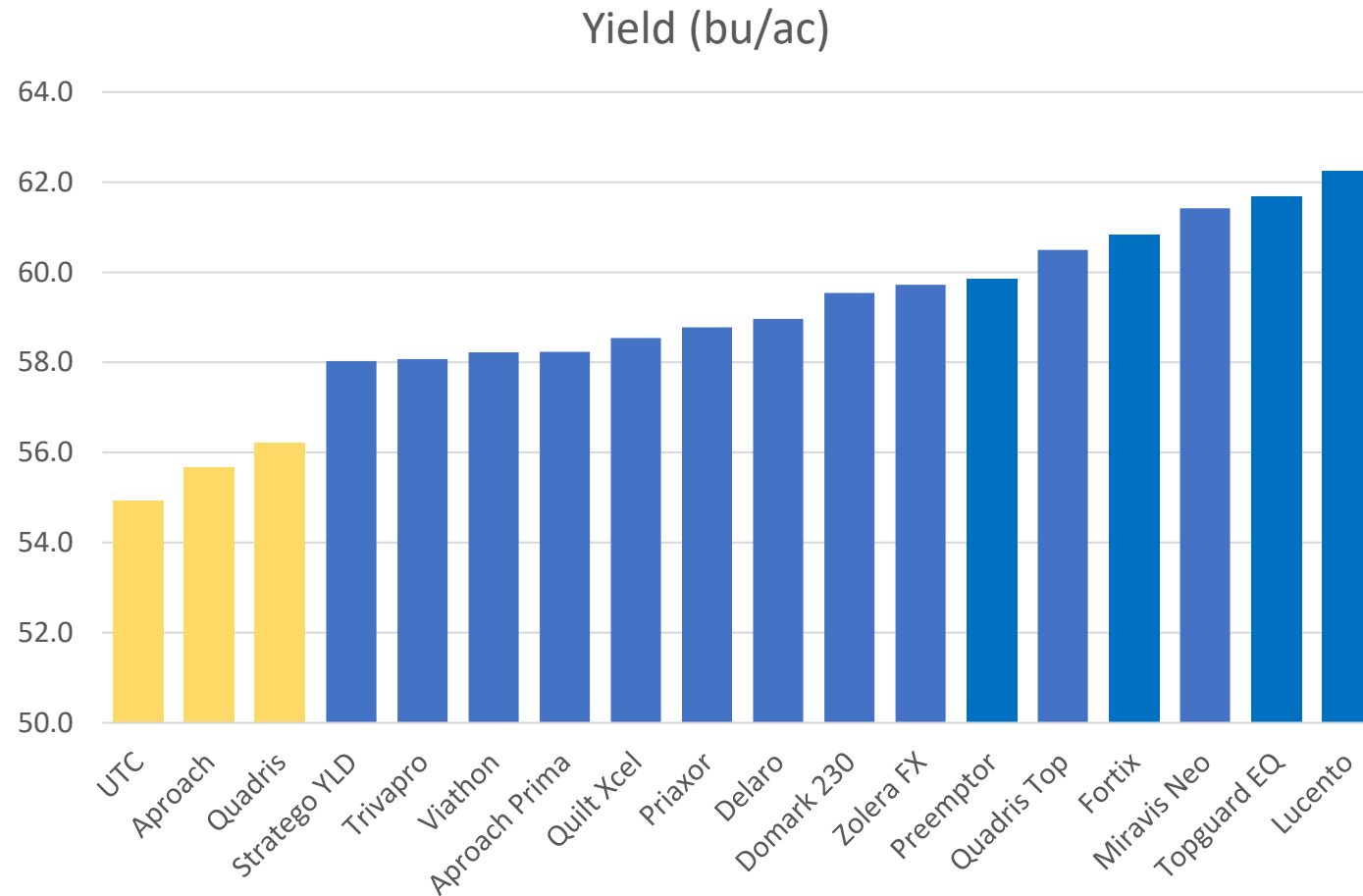
2018 = 7.9

2019 = 1.1

2019 frogeye product evaluation study



2018 statewide trials – yield



Products vary in effectiveness



SOYBEAN DISEASE MANAGEMENT

CPN-1019-W



Fungicide Efficacy for Control of Soybean Foliar Diseases

Fungicide Efficacy for Control of Soybean Foliar Diseases¹

FUNGICIDE(S)				Aerial Web Blight	Anthracnose	Brown Spot ²	Cercospora Leaf Blight ³	Frogeye Leaf Spot ⁴	Diaporthe (Pod and Stem Blight)	Soybean Rust	Target Spot	White Mold ⁵	Harvest Restriction ⁶
Class	Active Ingredient (%)	Trade Name	Rate/A fl. oz.)										
QoI Strobilurins Group 11	azoxystrobin 22.9%	Quadris 2.08SC* multiple generics ⁷	6.0-15.5	VG	VG	P-G	P	P	U	G-VG	P-F	P	14 days
	fluoxastrobin 40.3%	AfterShock 480SC* Evito 480SC*	2.0-5.7	VG	G	P-G	P	P	U	U	U	NL	RS (beginning seed) 30 days
	picoxystrobin	Approach 2.08SC*	6.0-12.0	VG	G	P-G	P	P	U	G	U	G-VG ⁸	14 days
	pyraclostrobin 23.6%	Headline 2.09EC/SC*	6.0-12.0	VG	VG	P-G	P	P	U	VG	P-F	NL	21 days
DMI Triazoles Group 3	cyproconazole 8.9%	Alto 100SL*	2.75-5.5	U	U	VG	F	F	U	VG	U	NL	30 days
	flutriafol 11.8%	Topguard 1.04SC*	7.0-14.0	U	VG	VG	P-G	VG	U	VG-E	P	F	21 days
	propiconazole 41.8%	Tilt 3.6EC* multiple generics ⁷	4.0-6.0	P	VG	G	NL	F	NL	VG	U	NL	RS (beginning seed)
	prothioconazole 41.0%	Proline 480SC* ⁹	2.5-5.0	NL	NL	NL	NL	G-VG	NL	VG	U	F	21 days
	tetraconazole 20.5%	Domark 230ME*	4.0-5.0	NL	VG	VG	P-G	G-VG	U	VG-E	P	F	RS (beginning seed)
MBC Thiophanates Group 1	thiophanate-methyl	Topsin-M* multiple generics	10.0-20.0	U	U	U	F	VG	U	G	U	F	21 days
2,6-dinitro-anilines Group 29	fluzazinam 40.0%	Omega 500DF*	0.75-1.0 pints	NL	NL	NL	NL	NL	NL	NL	U	G	R3 (beginning pod)
SDHI Carboxamides Group 7	boscalid 7.0%	Endura 0.7DF*	3.5-11.0	U	NL	VG	U	P	NL	NL	U	VG	21 days
	azoxystrobin 25.3%	Topguard EQ 4.29SC*	5.0-7.0	U	U	VG	U	G-VG	U	U	P	U	21 days
	flutriafol 18.63%												
Mixed Modes of Action	azoxystrobin 18.2%	Quadris Top 2.725C*	8.0-14.0	U	U	G-VG	P-G	VG	F-G	VG	P	NL	14 days
	difenoconazole 11.4%												
	azoxystrobin 19.8%	Quadris Top SBX 3.76SC*	7.0-7.5	U	U	G-VG	P-G	VG	F-G	VG	F-G	U	14 days
	difenoconazole 19.8%												
	azoxystrobin 7.0%	Quilt 1.665C* multiple generics ⁷	14.0-20.5	U	U	G	F	F	U	VG	U	NL	21 days
	azoxystrobin 13.5%	Quilt Xel 2.25E ¹	10.5-21.0	E	VG	G	F	F	U	VG	P	NL	R6
	propiconazole 11.7%												



CROP PROTECTION NETWORK

A Product of Land Grant Universities

Can improving coverage help?

- 3-year study comparing an undercover sprayer to a traditional sprayer
- 8 locations (6 small plot and 2 on-farm)
- Priaxor applied at R3 using 20 GPA



Undercover vs. traditional sprayers

- Measured spray coverage (2 methods), frogeye, brown spot and yield



Spray cards



PTSA Tracer Dye



Undercover vs. traditional results

- Detecting differences in coverage was inconsistent using both methods, but in general, undercover sprayer improved spray distribution
- No differences in brown spot, frog-eye, or yield between application methods

		Tracer dye spray distribution (% of total spray)		
Plot size	Sprayer	Upper	Middle	Lower
Small plots	Traditional	50	33	17
	Undercover	35	34	31
<i>P</i> -value		0.023	0.603	<0.001
On-farm	Traditional	64	26	10
	Undercover	35	47	18
<i>P</i> -value		0.305	0.487	0.786

Foliar fungicide summary

- No fungicide resistance issues with corn pathogens yet
- Fungicide resistance for the frogeye leaf spot pathogen is widespread
 - Should be a factor when selecting fungicides
- Remember: fungicide-resistant strains of the brown spot and *Cercospora* leaf blight pathogens have also been found
- Improving fungicide coverage cannot compensate for reduced efficacy from fungicide resistance

THANKS!

- **Alison Robertson, Yuba Kandel, Josh Viggers, Stith Wiggs:**
Iowa State University



A photograph of a soybean field. The plants are green with large, trifoliate leaves and small purple flowers. The ground is dry and brown. The sky is blue with some light clouds. A black circle with white text is overlaid on the right side of the image.

Thank
you!