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Wisconsin Waterhemp and Dicamba: Research and Stake-Holder Survey

2019 *Wisconsin Agribusiness Classic*

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Weed Science

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Outline

- Weed management survey
- Waterhemp research
- Dicamba survey
- Off-target dicamba movement research

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Research and Extension Program

College of Agricultural & Life Sciences
UNIVERSITY OF WISCONSIN–MADISON

Extension
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Agricultural Research Stations
UNIVERSITY OF WISCONSIN-MADISON

NPM

2018 Summary:

- 65 field & 6 greenhouse studies
- Arlington, Janesville, Lancaster & Bloomer
- 51 acres (796 treatments, >3000 plots)

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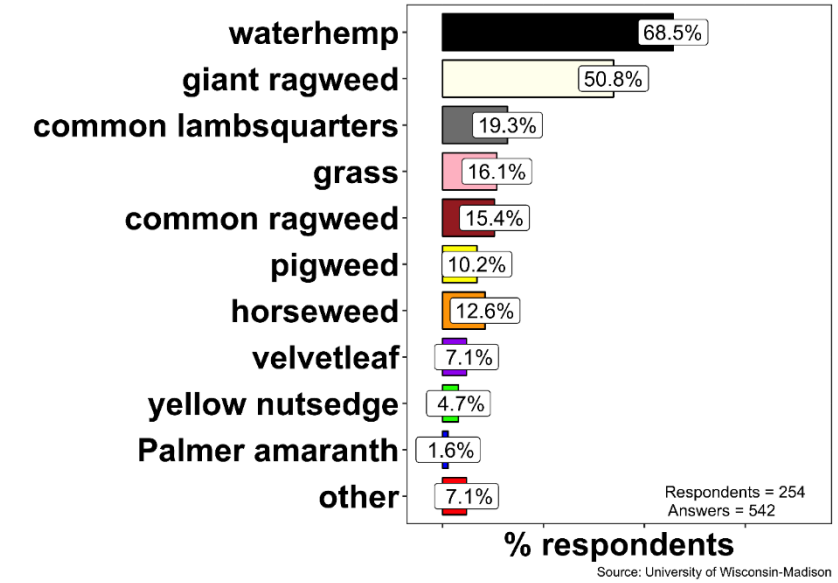
Funding:

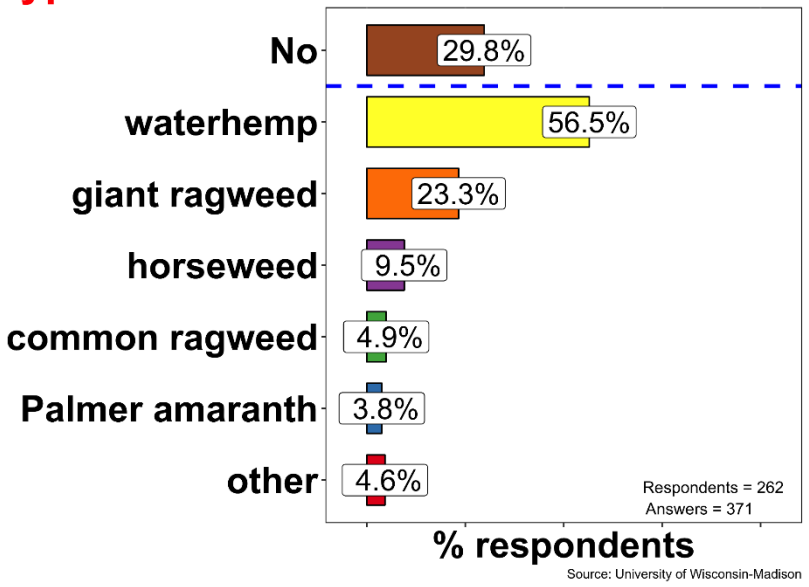
- UW-Madison College of Ag & Life Sciences
- Wisconsin Soybean Marketing Board
- United Soybean Board
- Monsanto → Bayer
- Chemical companies

Troublesome Weeds in Wisconsin

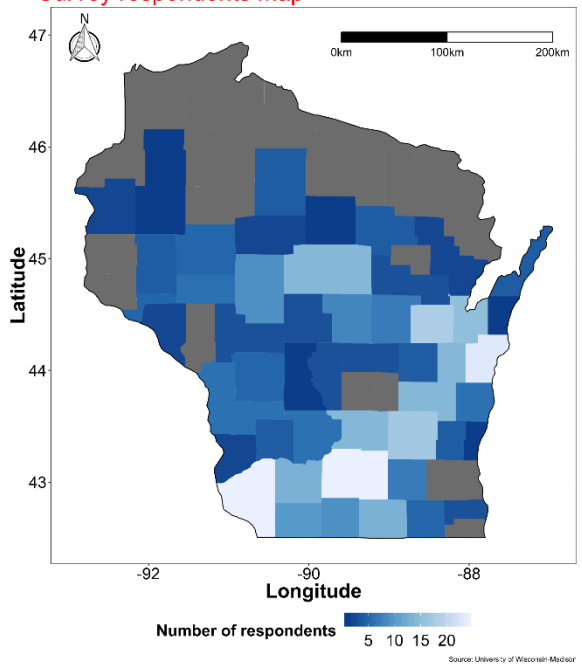
Most troublesome weeds



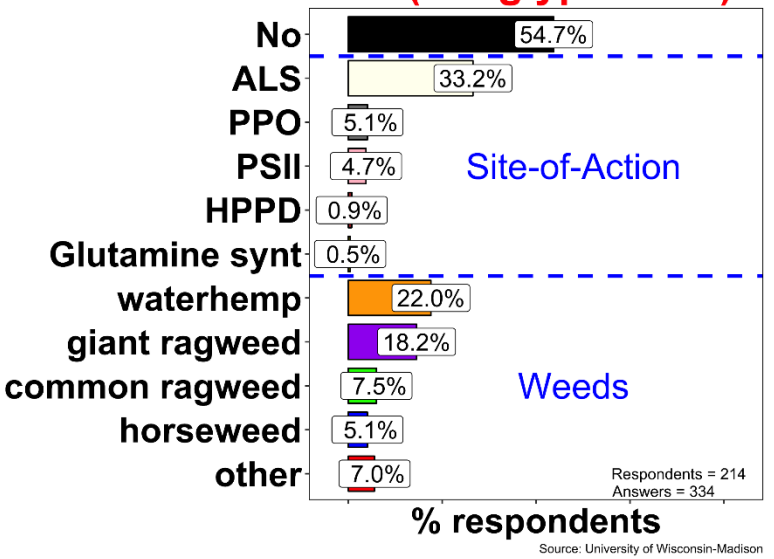
Glyphosate-resistance



Survey respondents map



Herbicide-resistance (not glyphosate)



**2018 Wisconsin Cropping Systems Weed Science Survey – Where Are We At? Werle and Oliveira (2018) WiscWeeeds.Info*

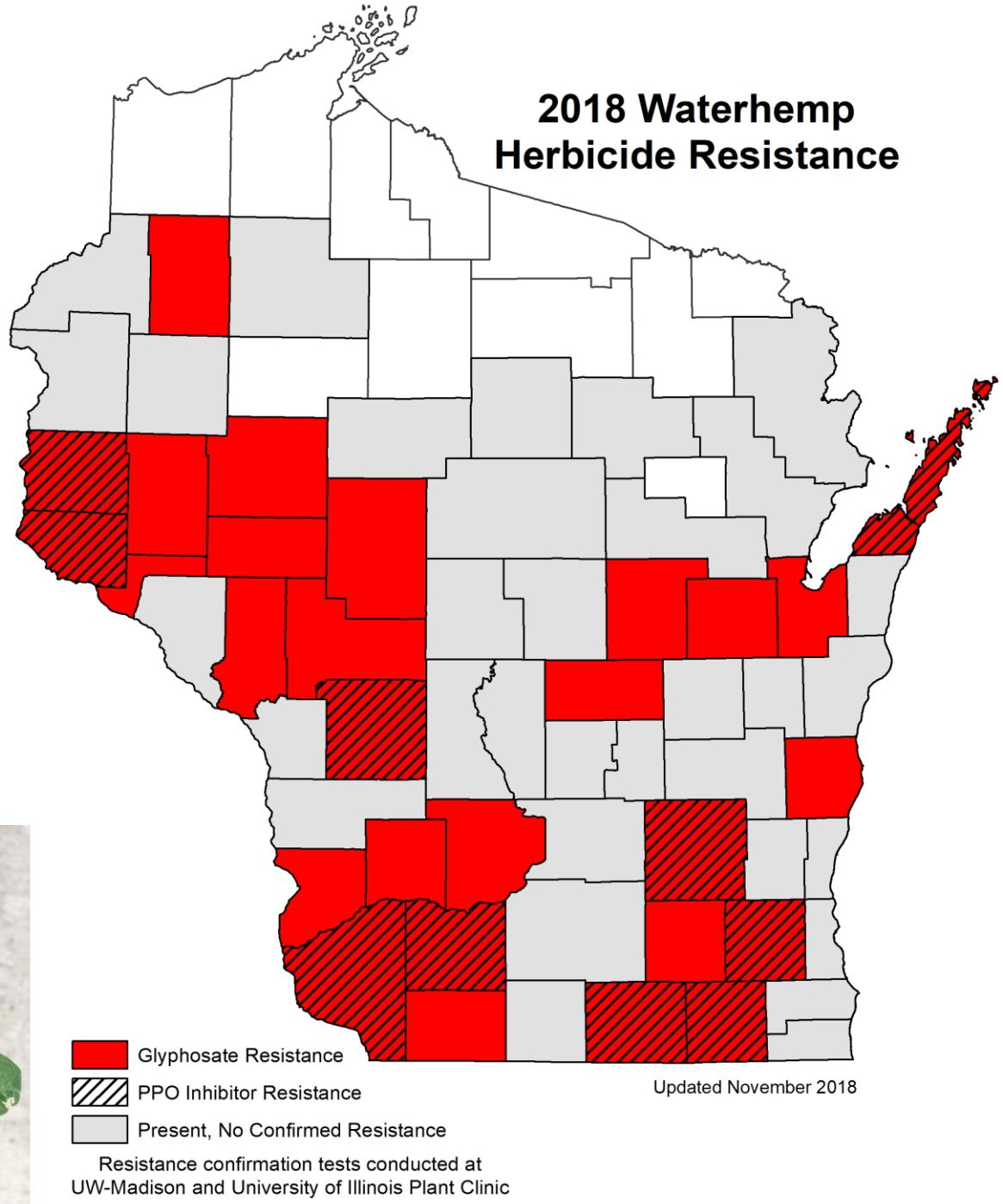
Waterhemp

2018

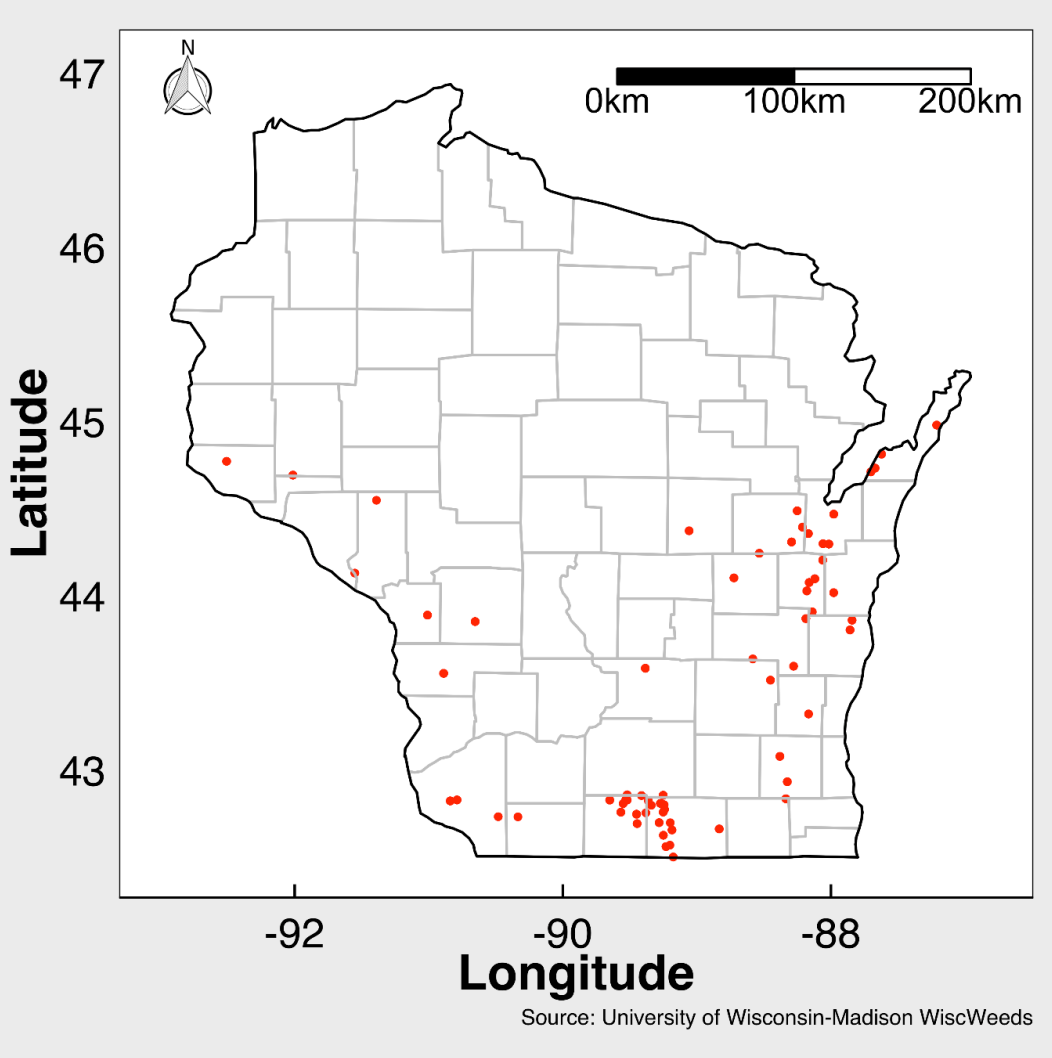
- Present: 61 counties
- GLY-R: 28 counties
- PPO-R: 10 counties

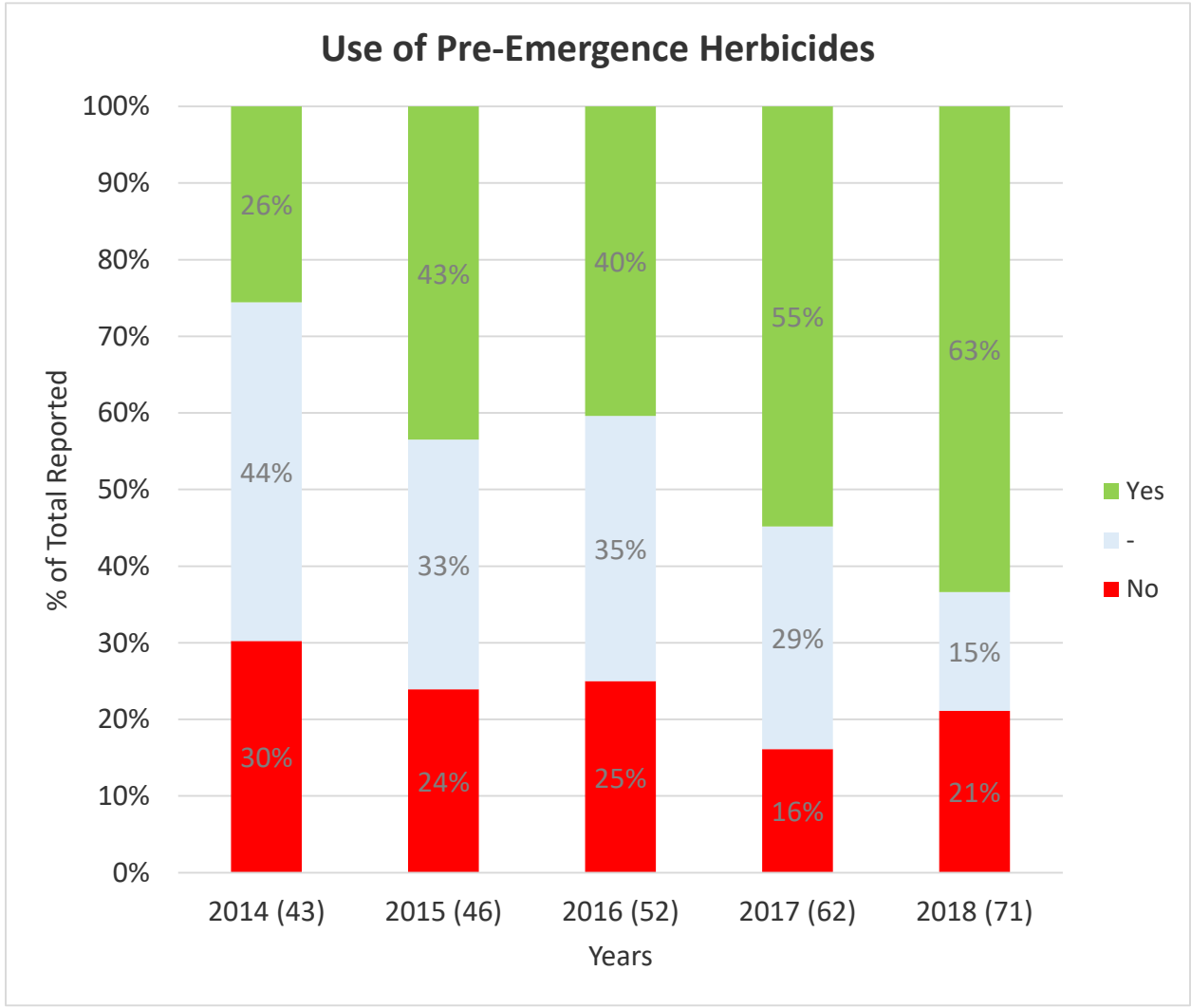
2018 University of Illinois Plant Clinic Lab:

- 20 WI samples (12 counties)
- 11 GLY and PPO-R
- 8 GLY-R
- 1 Susceptible



Waterhemp Resistance Screening



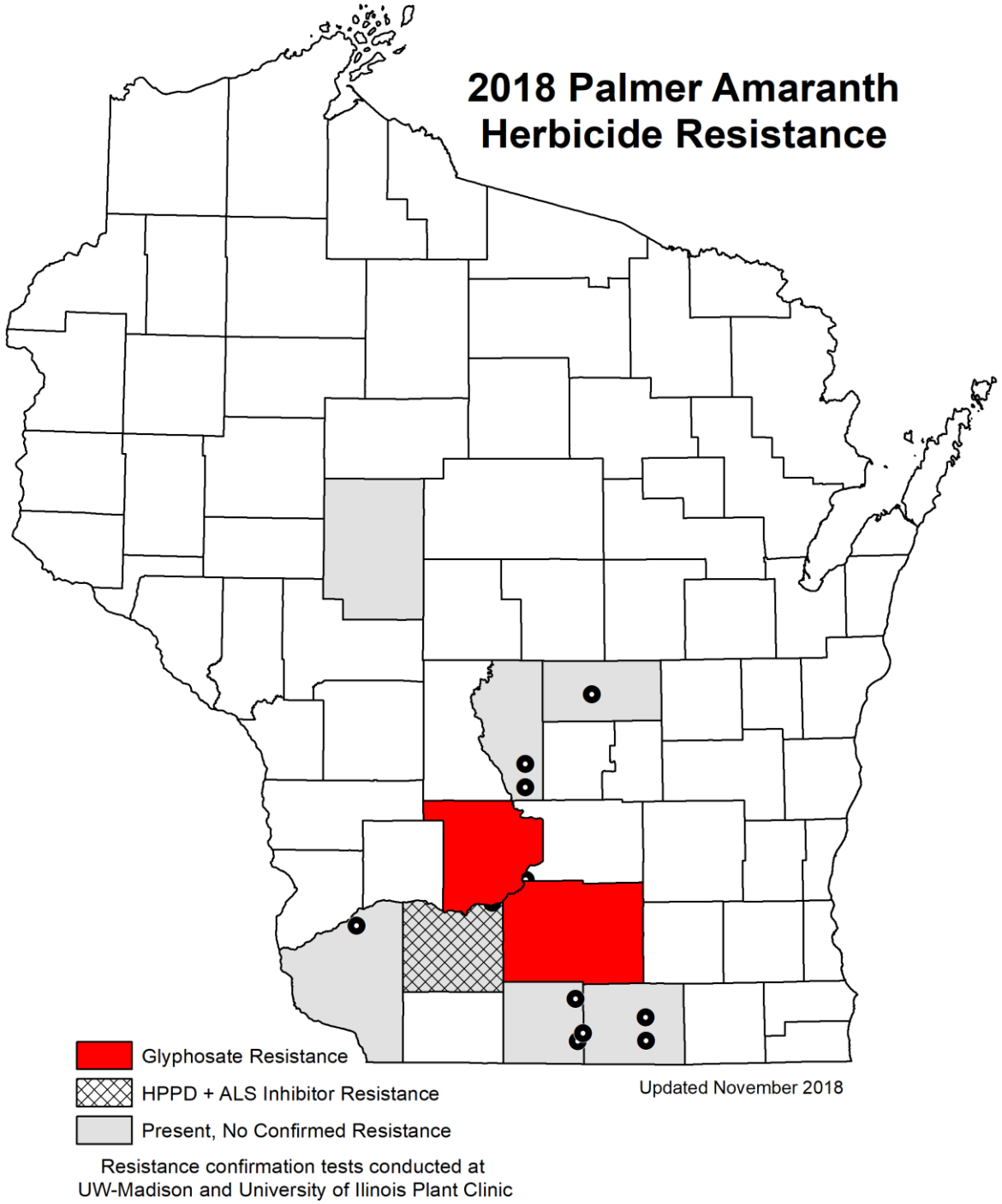


MS Research: Felipe Faleco, UW-Madison WiscWeeds Program

Palmer amaranth

2018

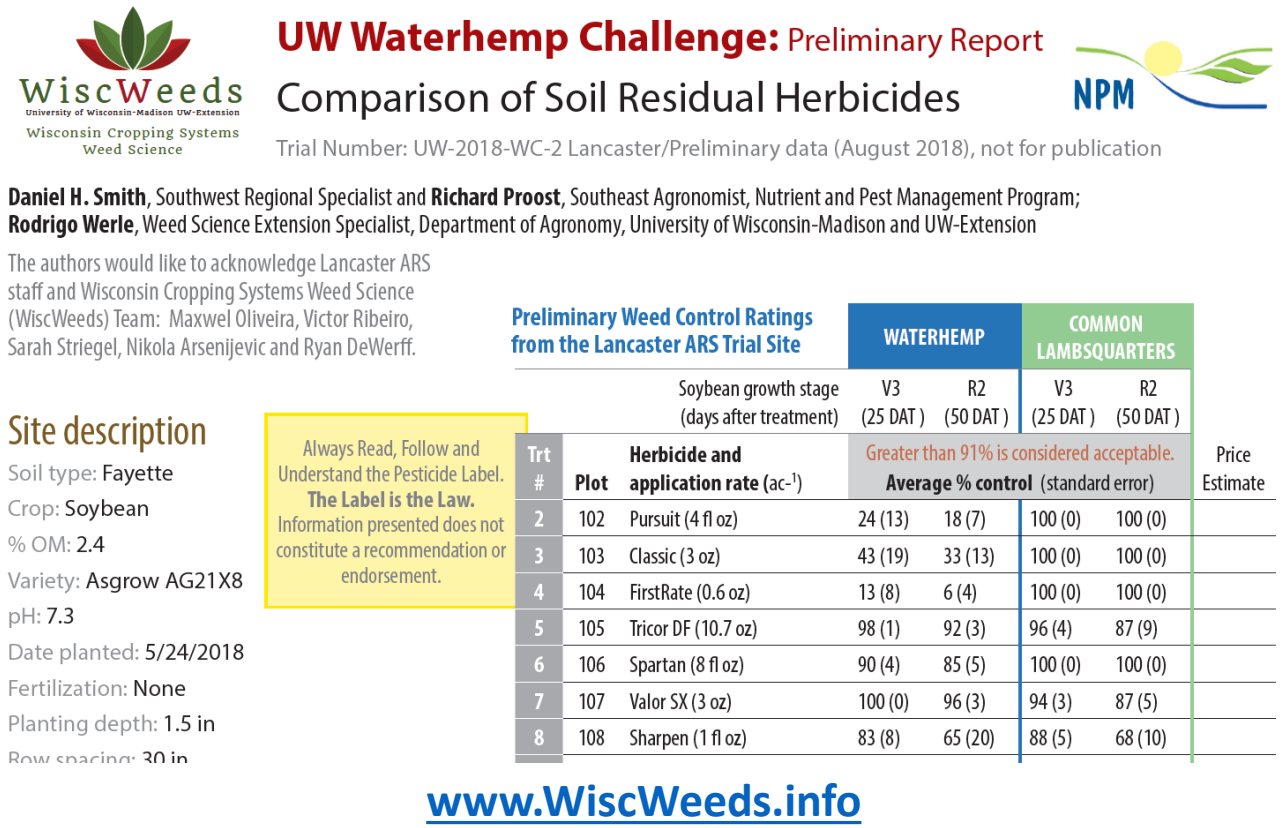
- Present: 9 counties
- GLY-R: 2 counties
- HPPD & ALS-R: 1 county



Comparison of Soil Residual Herbicides

Lancaster Ag Research Station

- 29 herbicides
- Soybeans planted: 05/24/2018
- Treatments sprayed: 05/25/2018



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UW Waterhemp Challenge: Preliminary Report

Comparison of Soil Residual Herbicides

NPM

Trial Number: UW-2018-WC-2 Lancaster/Preliminary data (August 2018), not for publication

Daniel H. Smith, Southwest Regional Specialist and **Richard Proost**, Southeast Agronomist, Nutrient and Pest Management Program; **Rodrigo Werle**, Weed Science Extension Specialist, Department of Agronomy, University of Wisconsin-Madison and UW-Extension

The authors would like to acknowledge Lancaster ARS staff and Wisconsin Cropping Systems Weed Science (WiscWeeds) Team: Maxwel Oliveira, Victor Ribeiro, Sarah Striegel, Nikola Arsenijevic and Ryan DeWerff.

Site description

Soil type: Fayette
Crop: Soybean
% OM: 2.4
Variety: Asgrow AG21X8
pH: 7.3
Date planted: 5/24/2018
Fertilization: None
Planting depth: 1.5 in
Row spacing: 30 in

Always Read, Follow and Understand the Pesticide Label. **The Label is the Law.** Information presented does not constitute a recommendation or endorsement.

Preliminary Weed Control Ratings from the Lancaster ARS Trial Site

			WATERHEMP		COMMON LAMBSQUARTERS		
		Soybean growth stage (days after treatment)	V3 (25 DAT)	R2 (50 DAT)	V3 (25 DAT)	R2 (50 DAT)	
Trt #	Plot	Herbicide and application rate (ac-1)	Greater than 91% is considered acceptable. Average % control (standard error)				Price Estimate
2	102	Pursuit (4 fl oz)	24 (13)	18 (7)	100 (0)	100 (0)	
3	103	Classic (3 oz)	43 (19)	33 (13)	100 (0)	100 (0)	
4	104	FirstRate (0.6 oz)	13 (8)	6 (4)	100 (0)	100 (0)	
5	105	Tricor DF (10.7 oz)	98 (1)	92 (3)	96 (4)	87 (9)	
6	106	Spartan (8 fl oz)	90 (4)	85 (5)	100 (0)	100 (0)	
7	107	Valor SX (3 oz)	100 (0)	96 (3)	94 (3)	87 (5)	
8	108	Sharpen (1 fl oz)	83 (8)	65 (20)	88 (5)	68 (10)	

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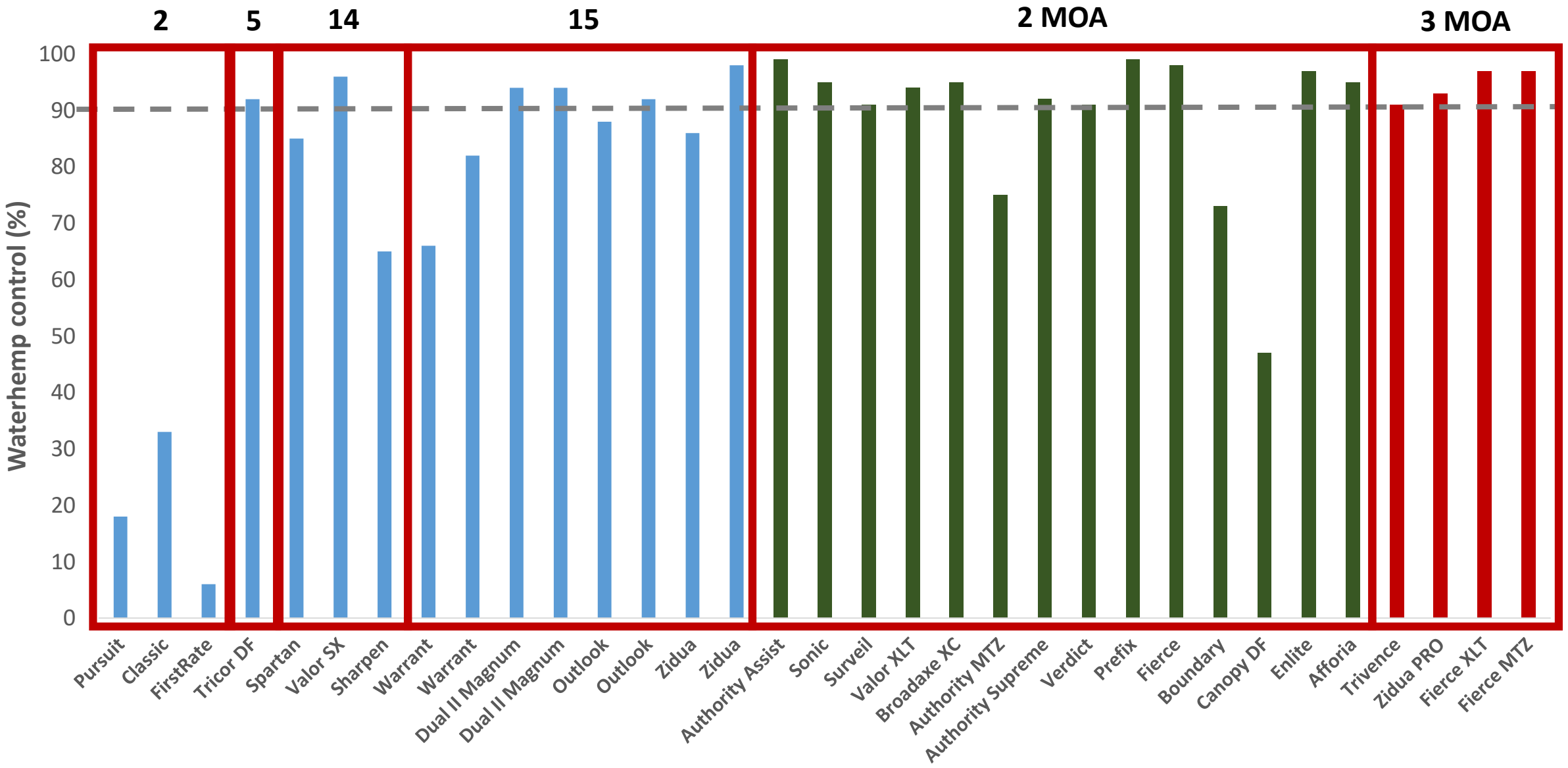
Tillage adopted

Smith et al. (2018)

Waterhemp Control 50 DAT (soybeans R2 stage)
Lancaster, WI 2018



Waterhemp Control 25 DAT (V3)
Lancaster, WI - 2018

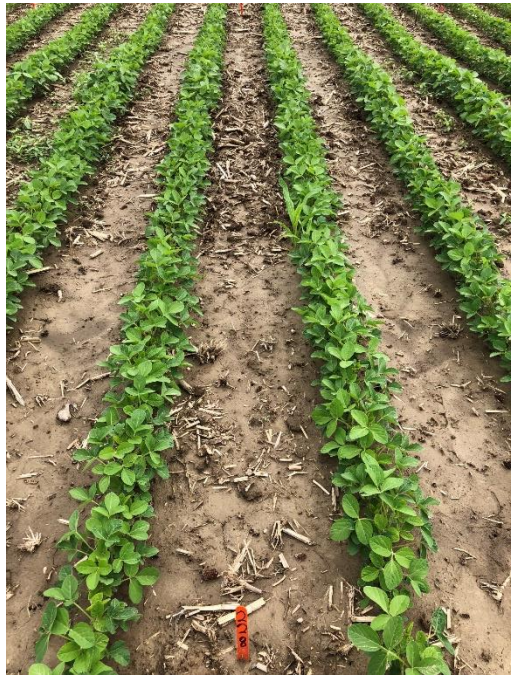
Trt 1. Untreated Control

0% (±0%)

Trt 2. Pursuit (4 fl oz)
Group 2
24% (±13%)

Trt 8. Sharpen (1 fl oz)
Group 14
83% (±8%)

Trt 15. Zidua (1.5 oz)
Group 15
92% (±4%)

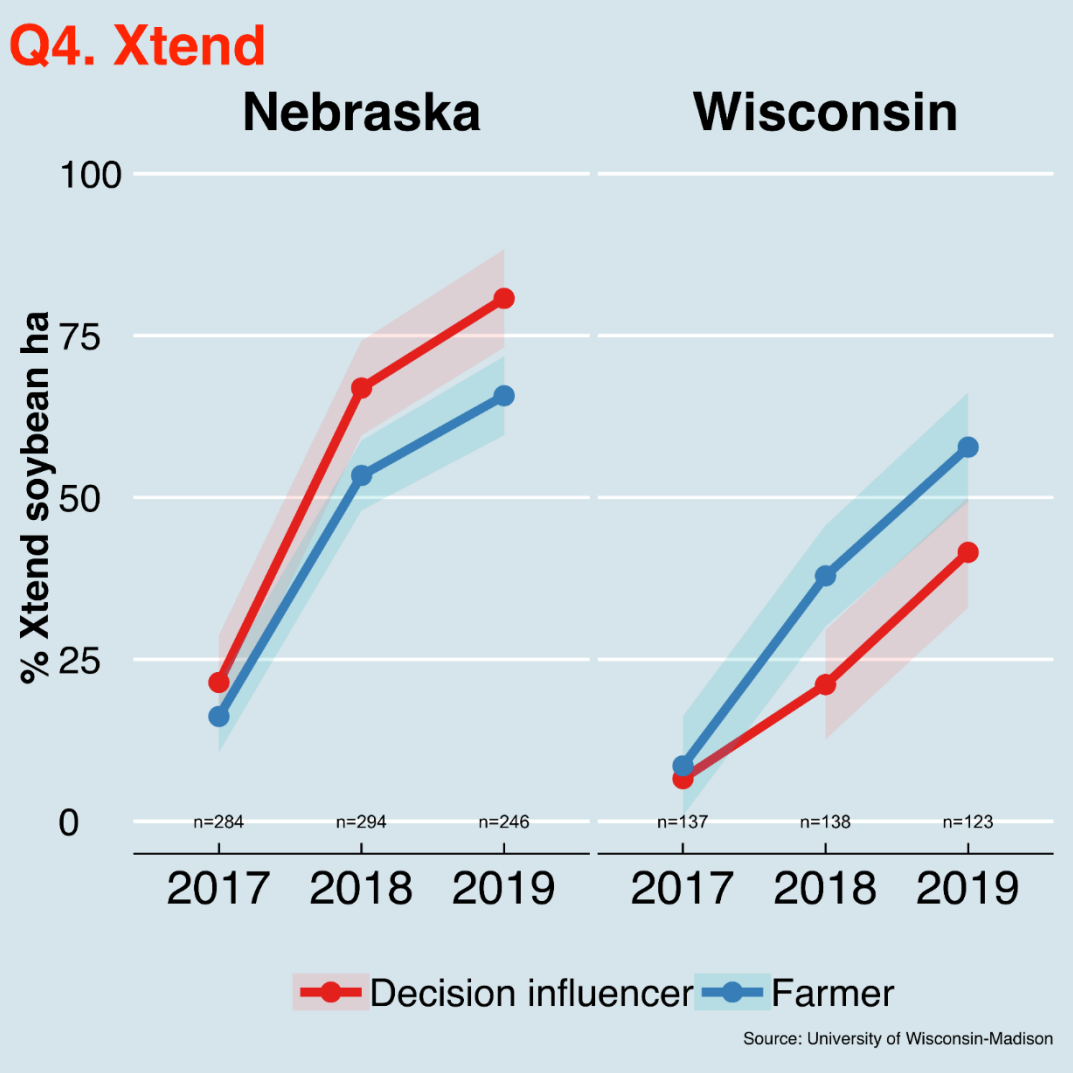


Trt 32. Zidua PRO (6 fl oz oz)
Groups 2+14+15
99% (±1%)

Pursuit (4 fl oz)
Sharpen (1 fl oz)
Zidua (2 oz)

Studies will be replicated in 2019 (STAY TUNED FOR FIELD DAYS!)

2018 Dicamba Survey



2018: WI Xtend acres (%): 15-20% *(2.3 M total)*

Source: Boyd Carey, PhD, Bayer

2019: ~50% Xtend acres to be sprayed with dicamba POST

>65% own a sprayer & spray herbicide programs

Low-Tunnel Dicamba Volatility Trials

- **2017:** AMS increases dicamba volatilization *(Reynolds et al.)*

- **2018:** formulation of tank-mix partners can increase dicamba volatilization
  - Durango (dimethylamine salt of glyphosate)
  - Liberty (glufosinate-ammonium)

Large-Scale Dicamba Drift Study

Field size = 30 acres
Xtend block = 7 acres (AG21X7)
Non-Xtend area = 23 acres (AG2035)
GPS: 43 19 32 N; 89 19 45 W

Field cultivation = 06/04/2018
Planting date = 06/05/2018
Seeding rate = 140k/acre (30-inch row spacing)
Seeding depth = 1 ¼ inch

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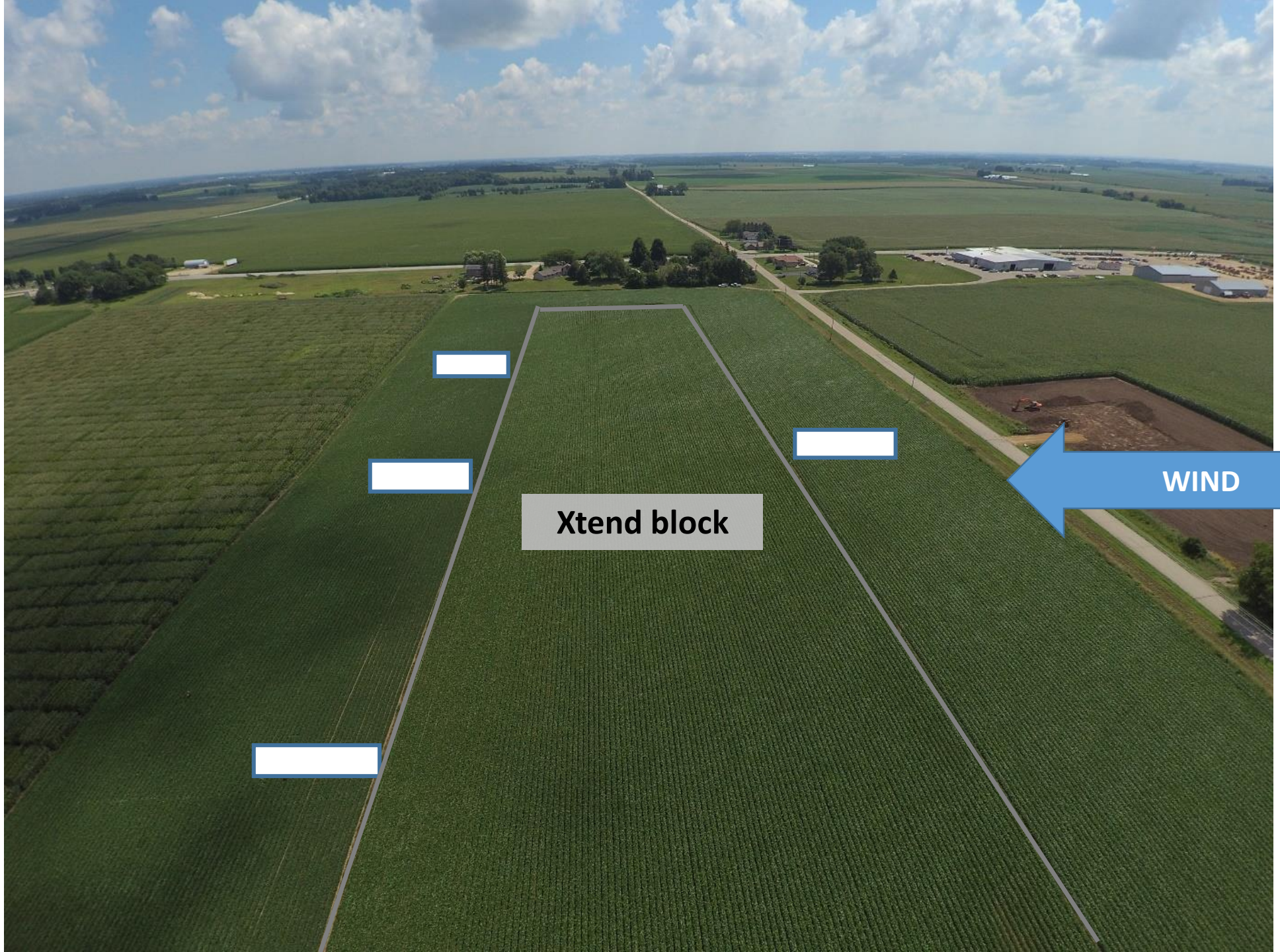

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Large-Scale Dicamba Drift Study

Covered area (plastic; 10 X 50 ft long – 20 rows)

Particle Drift Samples:
13, 26, 52, 101 & 147 ft

Large-Scale Dicamba Drift Study

Treatment	Rate
Roundup PowerMax	32 fl oz/A
Xtendimax	22 fl oz/A
Intact	0.5% v/v
TTI11004; 15 GPA; Boom height = 32-inches; Nozzle spacing = 20-inches; Boom = 45 ft	

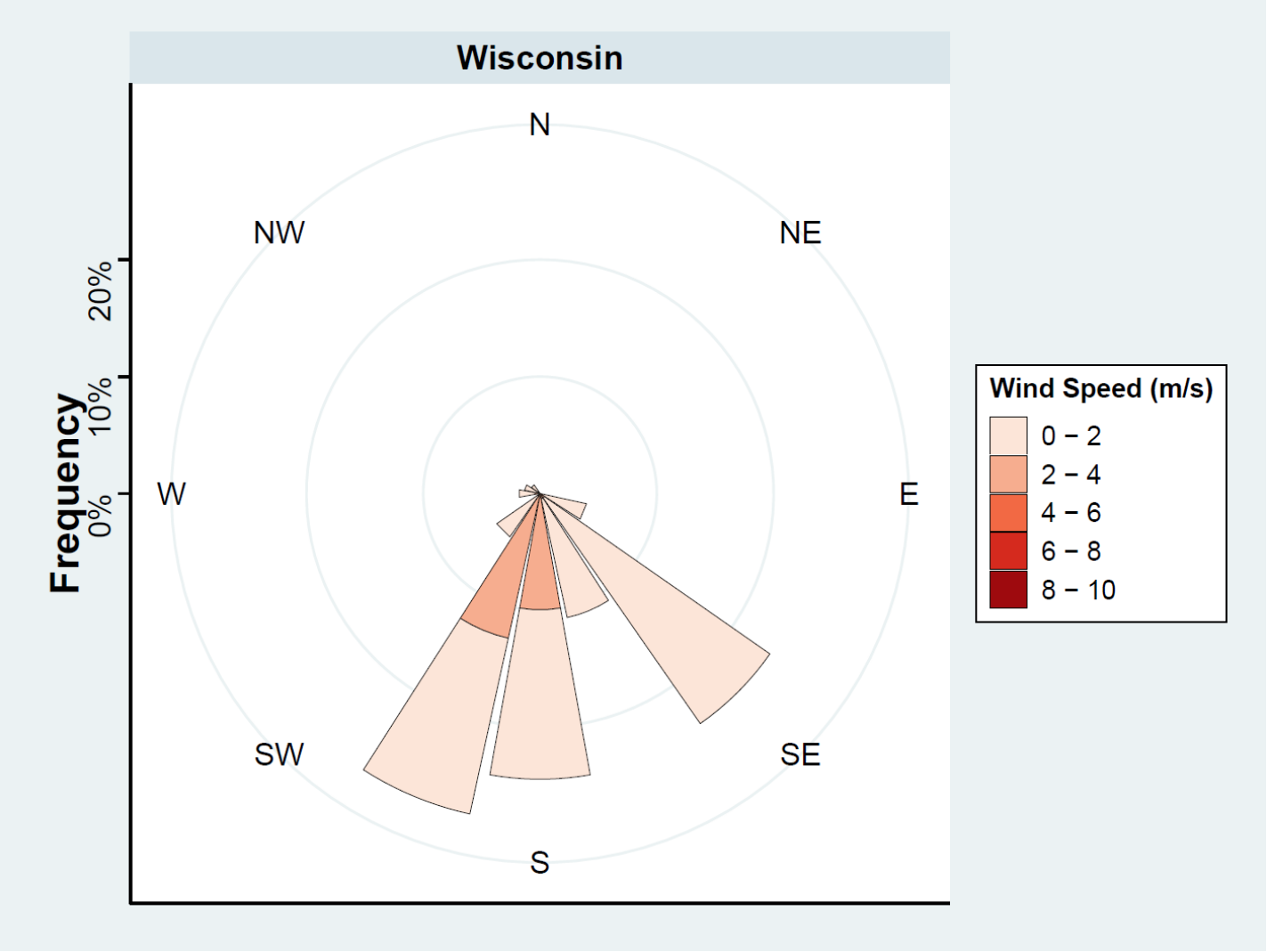
Visual Evaluation:

- 0% (no injury)
- 100% (death)

Behrens & Leuschens (1979)

Wind Speed and Direction

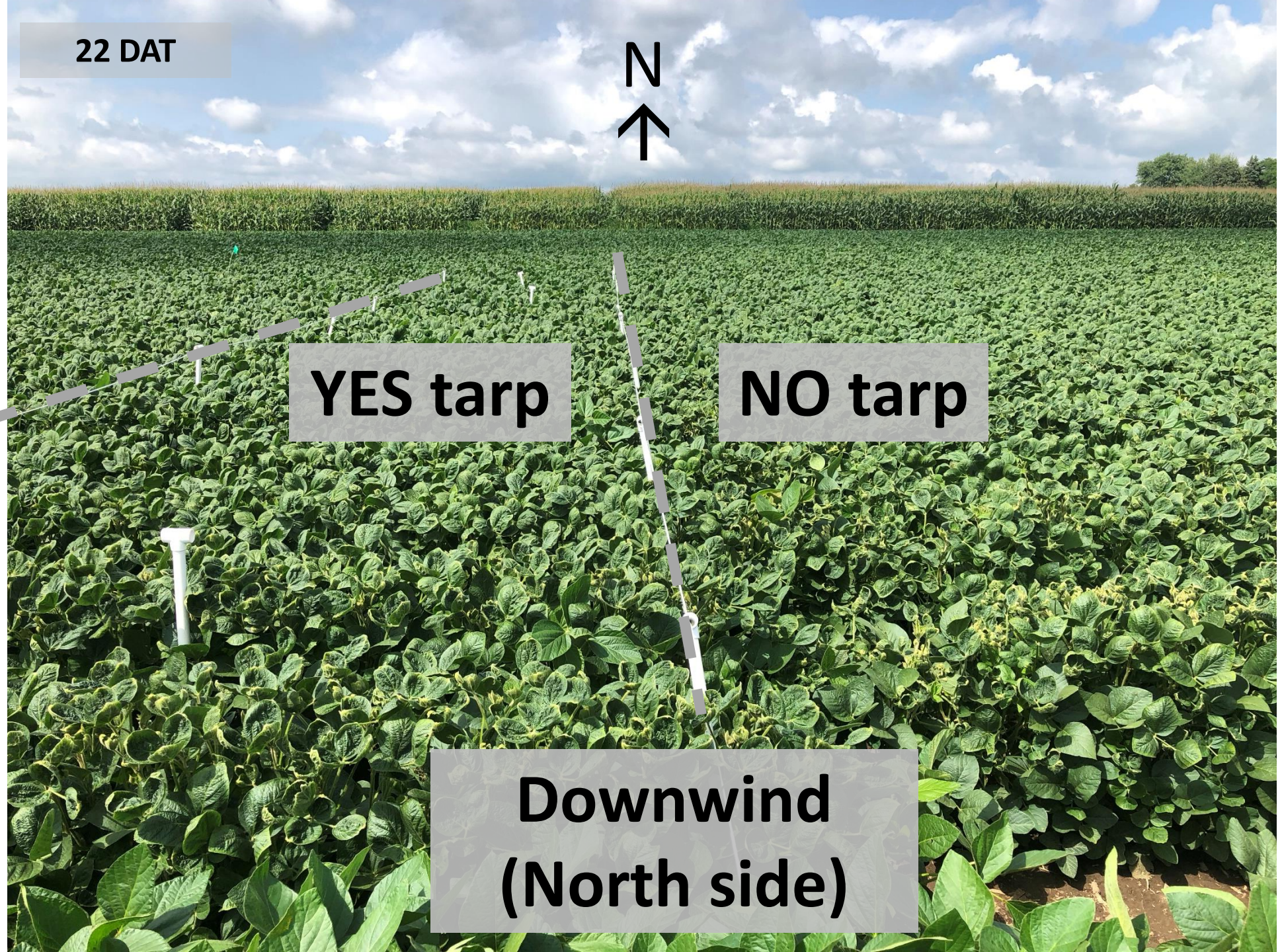
during → 72 hours after application



Oliveira et al. (2018)


22 DAT
Non-Xtend block
Xtend block
Upwind
(South side)
→ N


22 DAT
Xtend block
Non-Xtend block
Downwind
(North side)
→ N


22 DAT
N
YES tarp
NO tarp
Downwind
(North side)

Dicamba Visual Injury

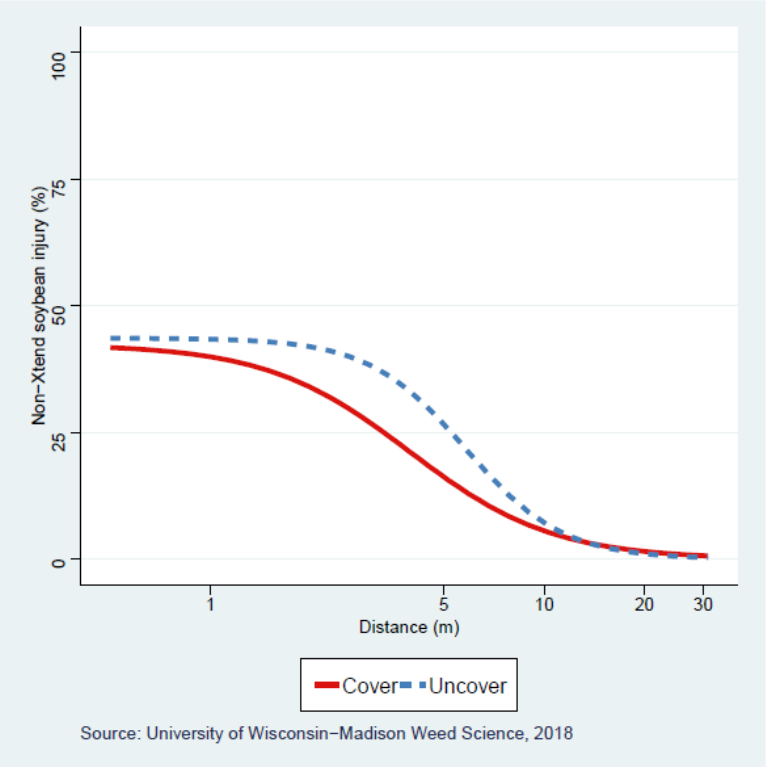


Figure 49: Non-Xtend soybean injury (%) with distance (%) from the dicamba treated area 2 (cover and uncover) in Wisconsin at 28 DAT.

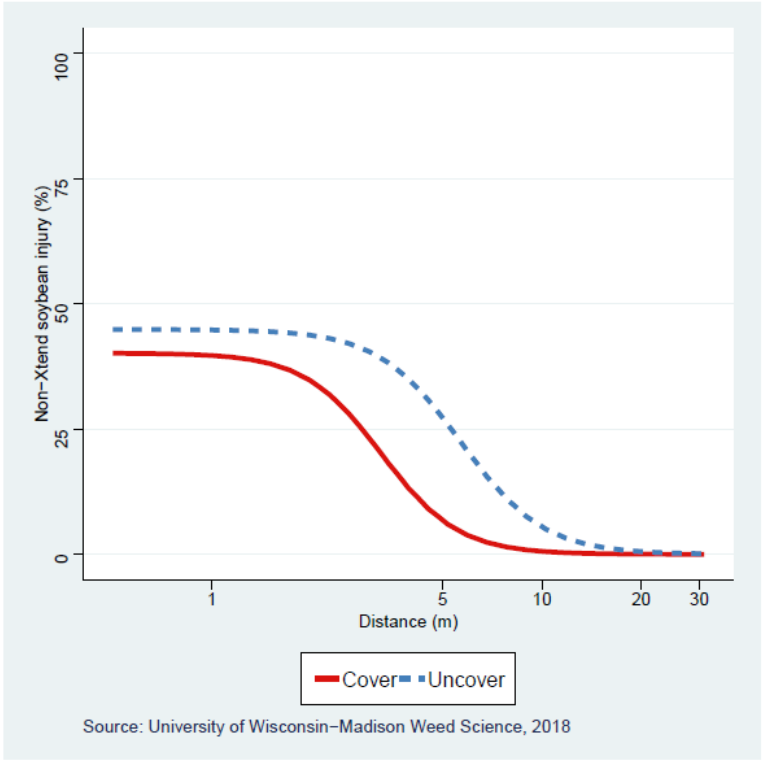


Figure 50: Non-Xtend soybean injury (%) with distance (%) from the dicamba treated area at Area 3 (cover and uncover) in Wisconsin at 28 DAT.

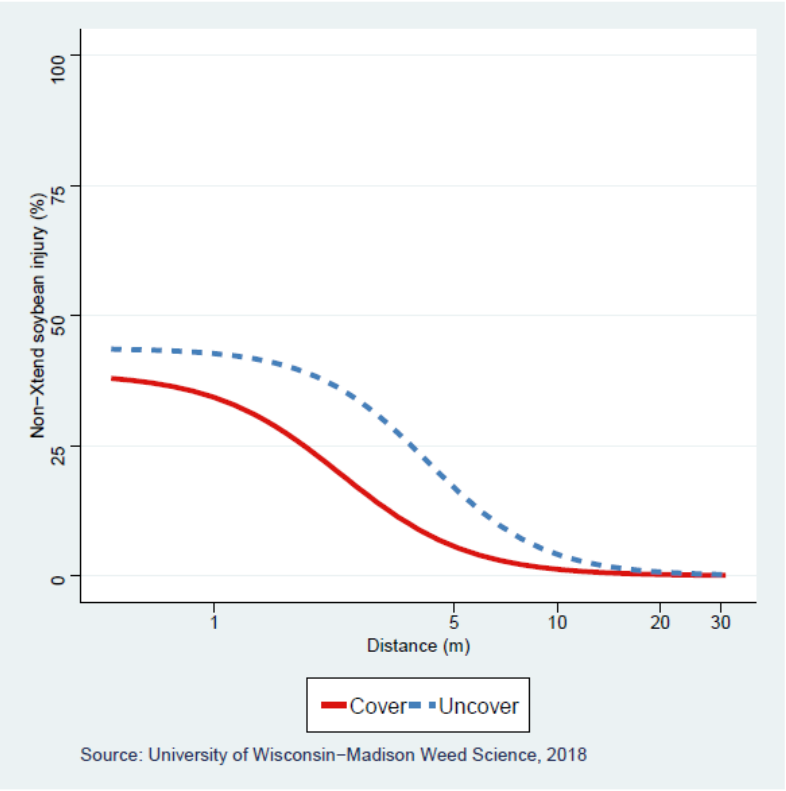
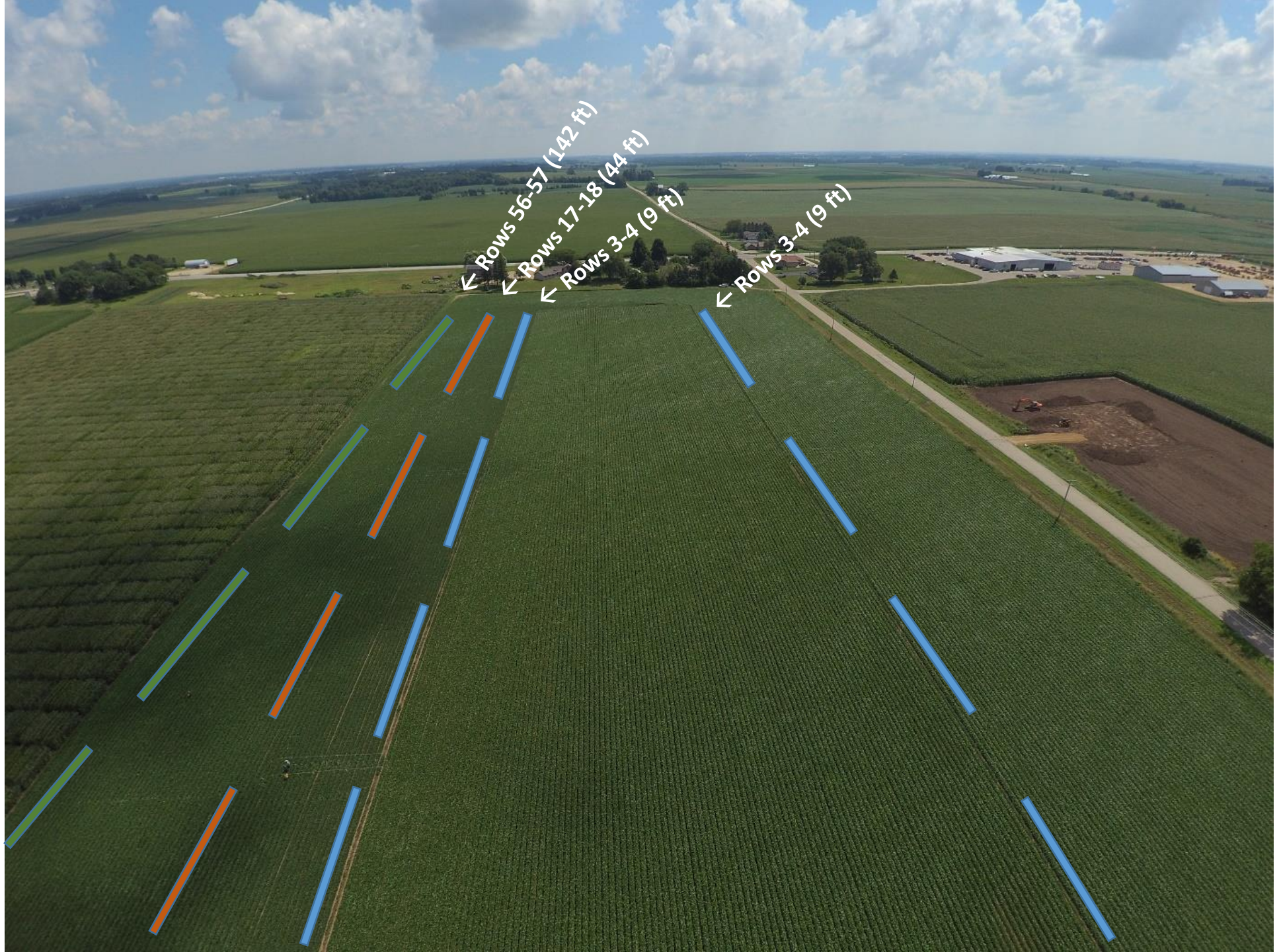


Figure 51: Non-Xtend soybean injury (%) with distance (%) from the dicamba treated area at Area 4 (cover and uncover) in Wisconsin at 28 DAT.

<1% injury observed after 65 ft from the last treated row

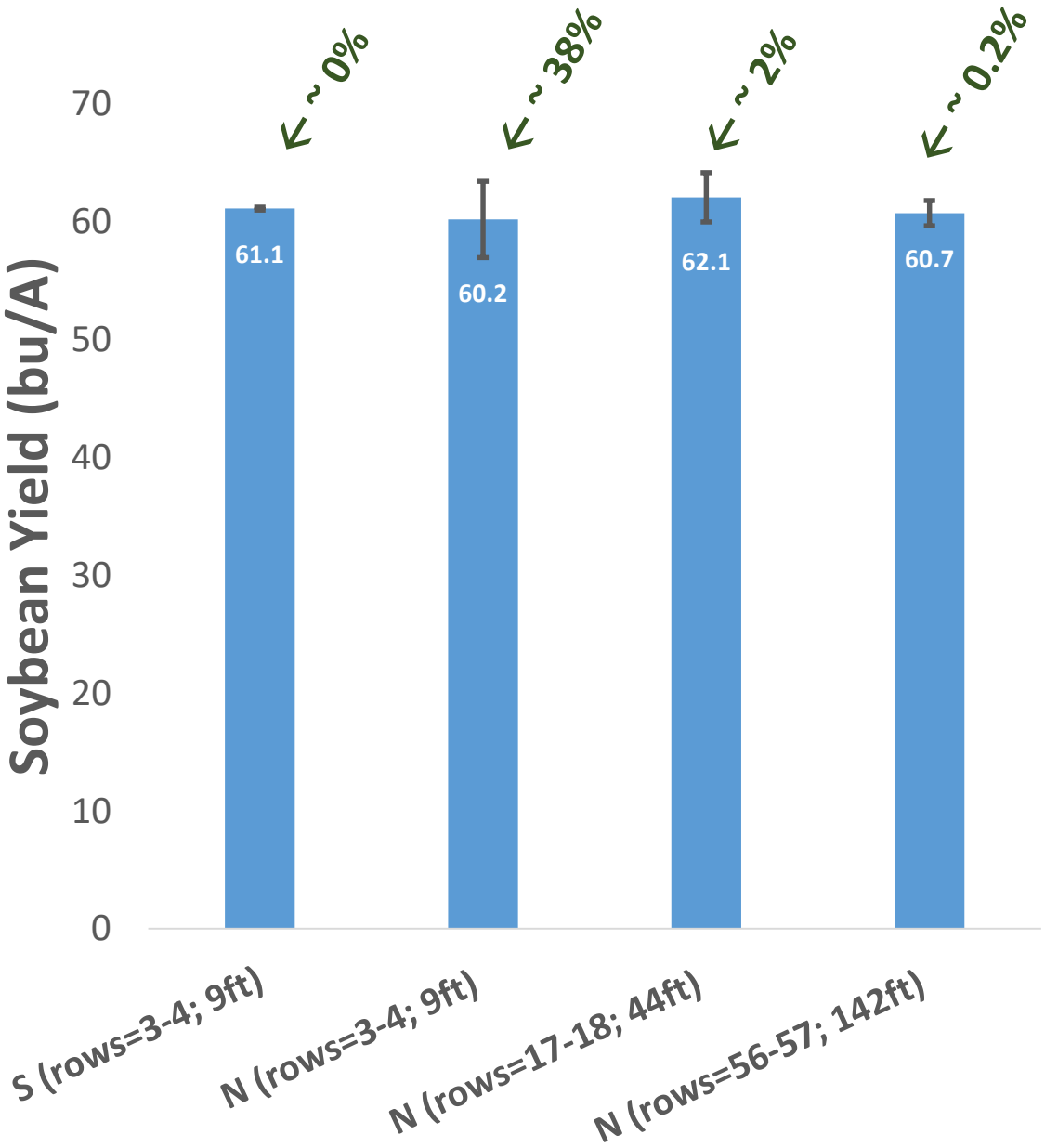
Oliveira et al. (2018)

N ←



NO YIELD DIFFERENCE

P=0.937; Avg=61.0 bu/A



← Dicamba Injury 28 DAT

Extension &/or Departments of Ag (SD, ND, MN, WI): Recommendations for Adoption of the Xtend Technology

- **Communicate** with neighbors (e.g., understand their herbicide programs and traits) to minimize the "headaches of dealing with drift complaints"
- Adopt an effective **PRE-emergence** herbicide program
- Use dicamba **early-POST** in combination with other **effective herbicide(s)**; not as "rescue" strategy for waterhemp
- Adoption of **cutoff dates** (June 20-July 1; cutoffs wouldn't allow for late-POST applications)
- *"If you can't **follow all the rules** in the label you should not be using the technology. And above this if it does not seem right **don't push** it wait"*

Thanks!

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Questions?