

# Rye termination timing:

## Balancing weed suppression and no-till soybean yield impacts

Jim Stute, East Troy

### Collaborators

Tom Novak, Sullivan

Nick Kau, Helenville

Tyler Troiola, Palmyra

Tom Burlingham, Palmyra



SARE Partnership Project ONC23-135

Project Reports: <https://northcentral.sare.org/>

# SE Wisconsin trial sites

Mean trial latitude: 42.9°

30-year Normal\*

Precipitation (in)

Annual 37.42

Growing season (Apr. – Oct.) 26.99

Growing Degree Day (GDD<sub>50</sub>)

Annual 2,737

Growing season (Apr. – Oct.) 2,716

Median Frost Date

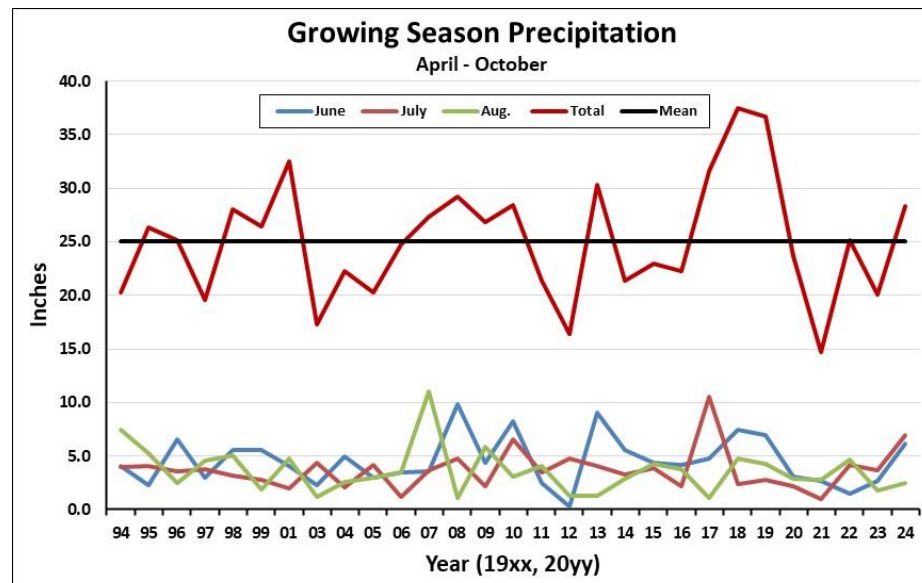
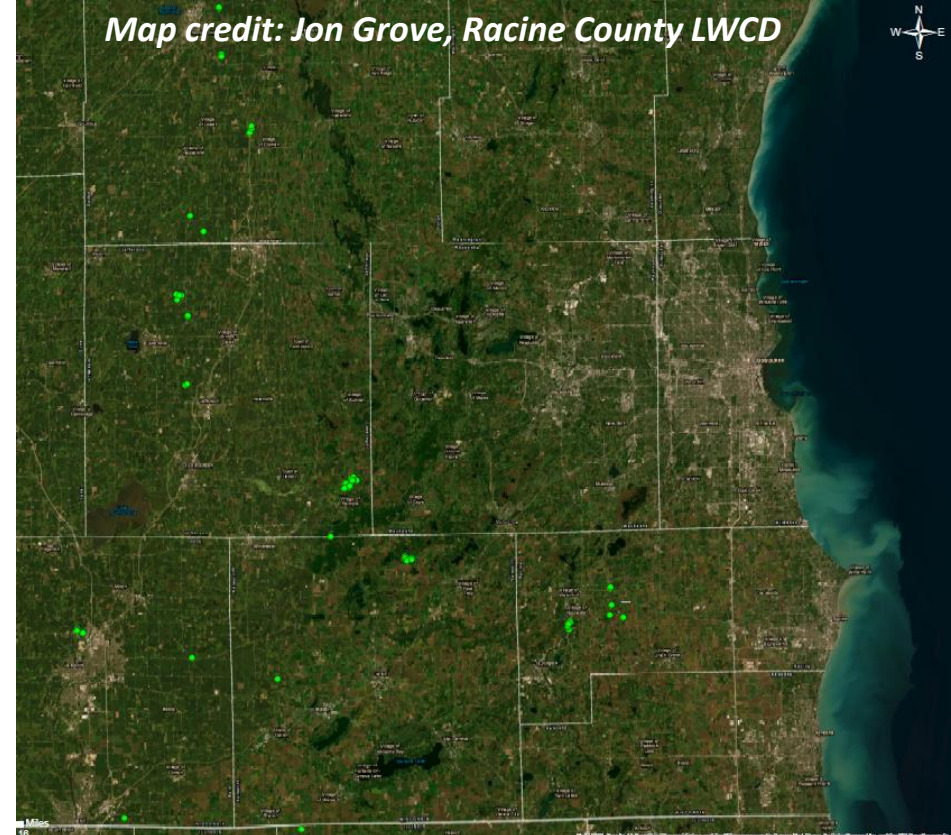
First Oct. 5

Last Apr. 26

Snowfall (in) 35.95

\*NOAA Sullivan, 42.96799, -88.54924, 1994- 2024

Map credit: Jon Grove, Racine County LWCD









# Based on SARE project ONC21-094

## Can planting green suppress GTRWs?

2021-22, 7 site-years replicated data

### Treatments:

No rye

Preplant and Anthesis termination

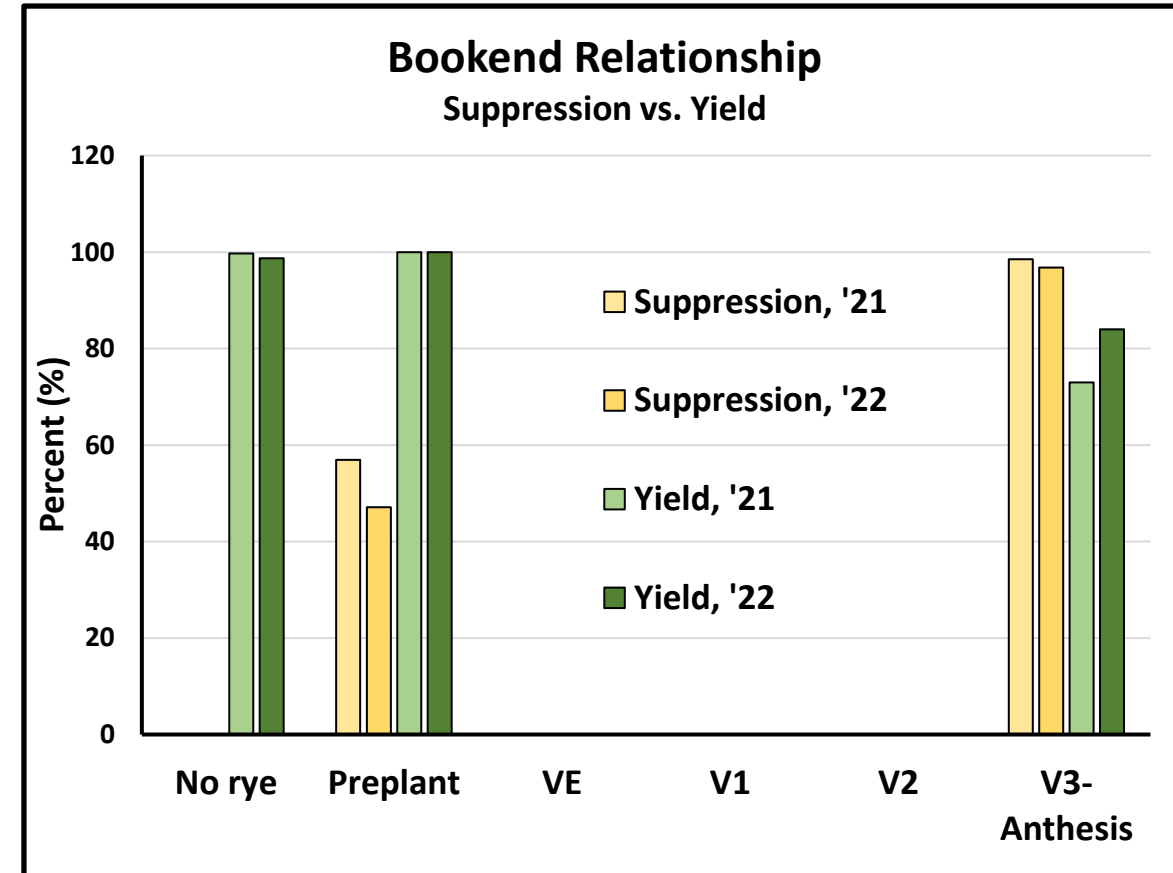
-min. and max. AGB production

-residual herbicide + BDLF burndown

### Measurements:

AGB, GTRW density, yield

**Analysis:** Suppression (% reduction from no rye), yield





# Current project:

## Where's the sweet-spot?

2023-24, 7 site-years replicated data

Rye: 55 lb/a NRCS EQIP rate

No rye control

Preplant termination

Staged termination: VE – anthesis

V1, V2, V3 ~ weekly both years

Residual: Sulfentrazone + cloransulam

POST: Glyphosate + 2,4-D choline

Measures: AGB, GTRW density, yield

Suppression: Reduction from control, %









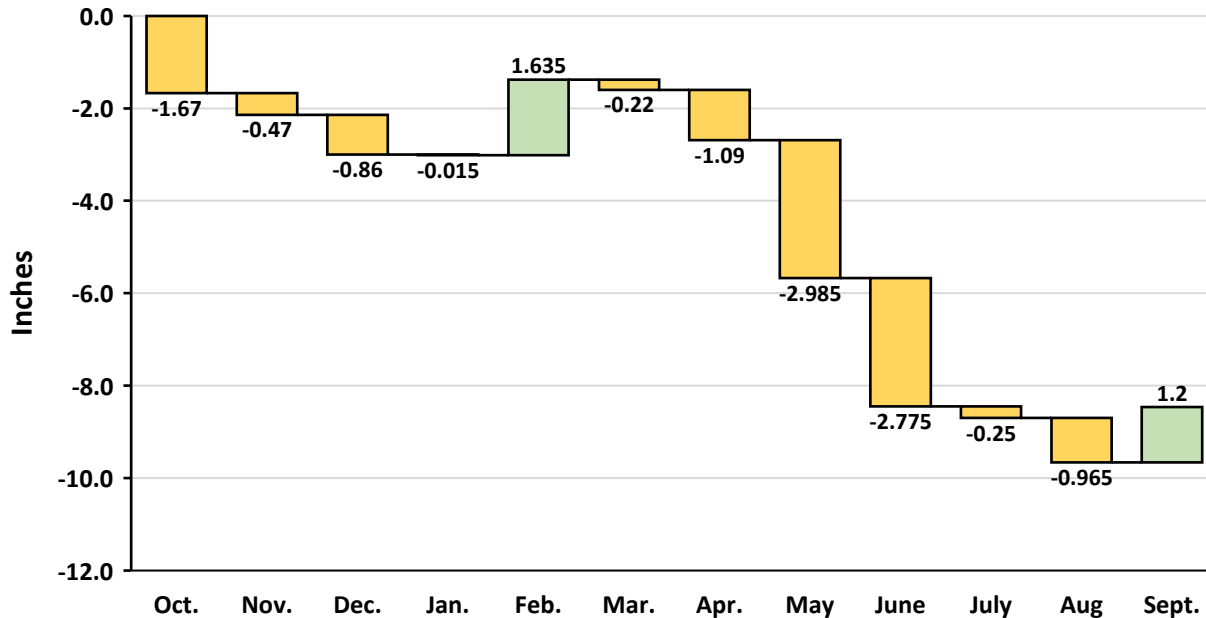




# Precipitation: cumulative departure

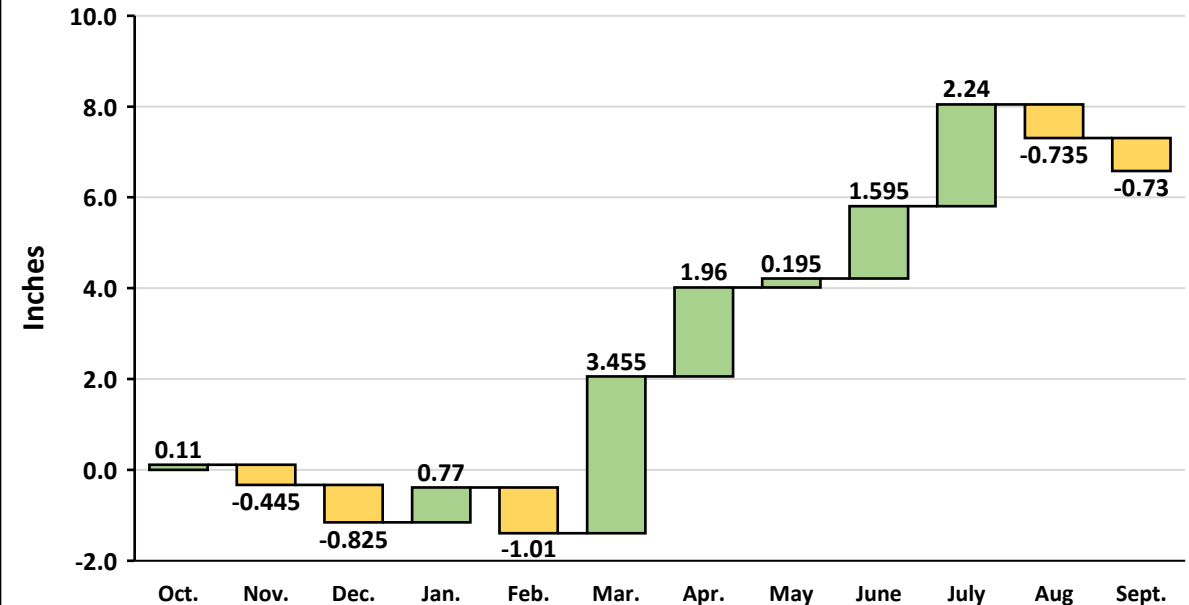
2023 Precipitation  
Cumulative departure from normal

■ Increase ■ Decrease ■ Total



2024 Precipitation  
Cumulative departure from normal

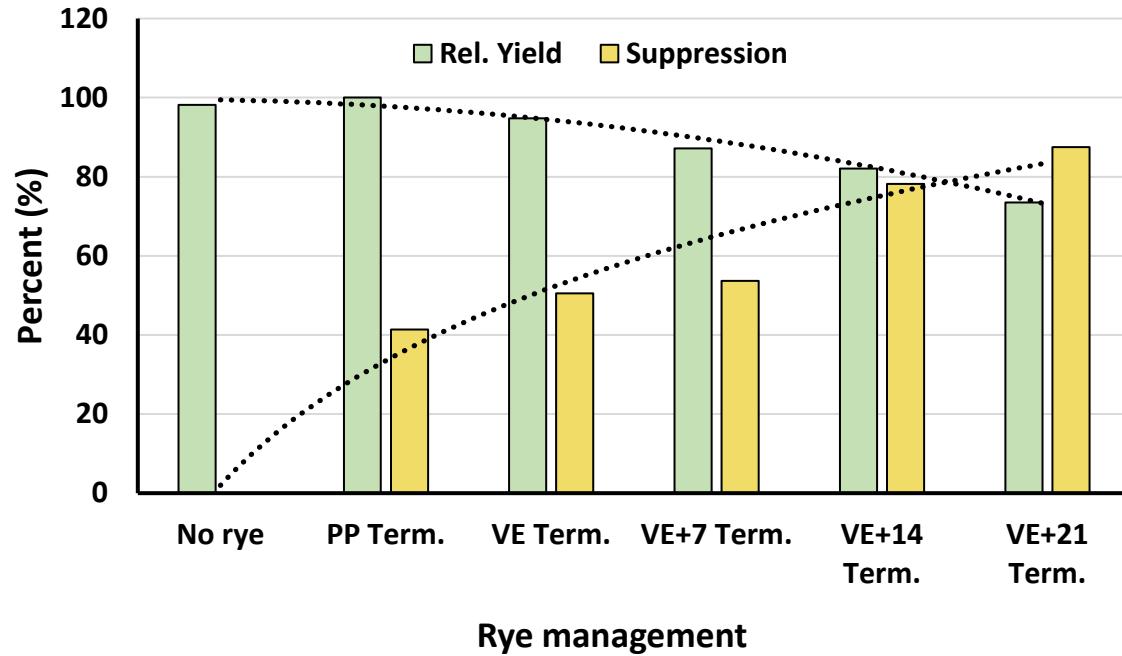
■ Increase ■ Decrease ■ Total



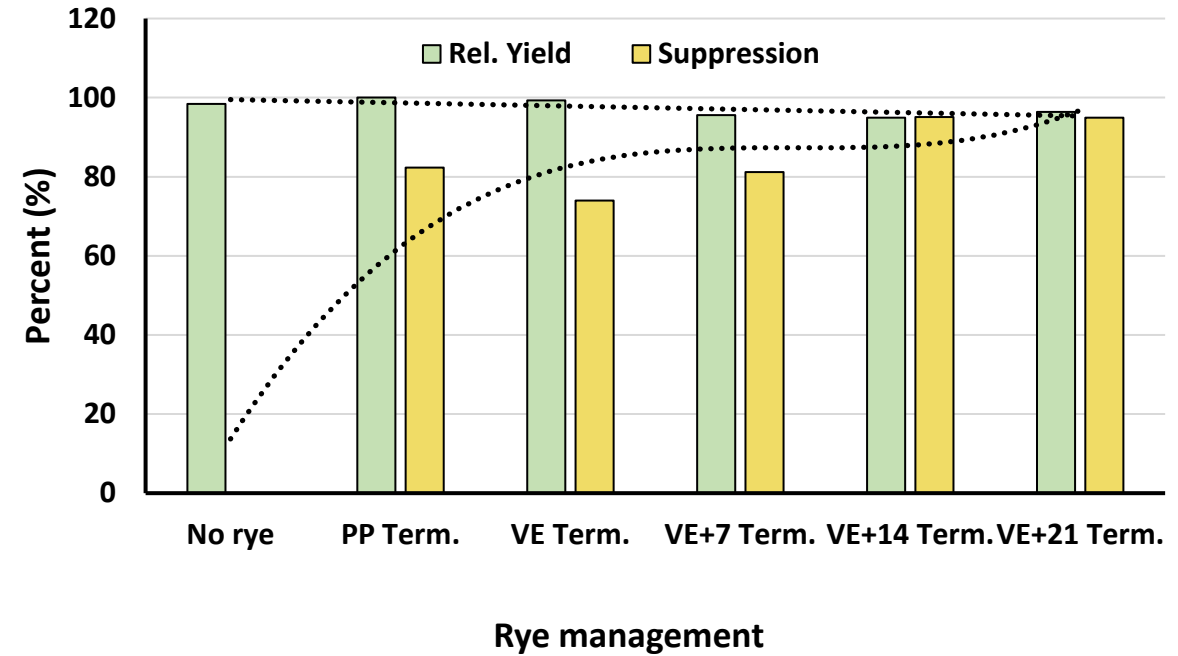


# Relationship: weed suppression and yield

**Yield and Weed Suppression**  
No rye vs. staged termination, 2023



**Yield and Weed Suppression**  
No rye vs. staged termination, 2024

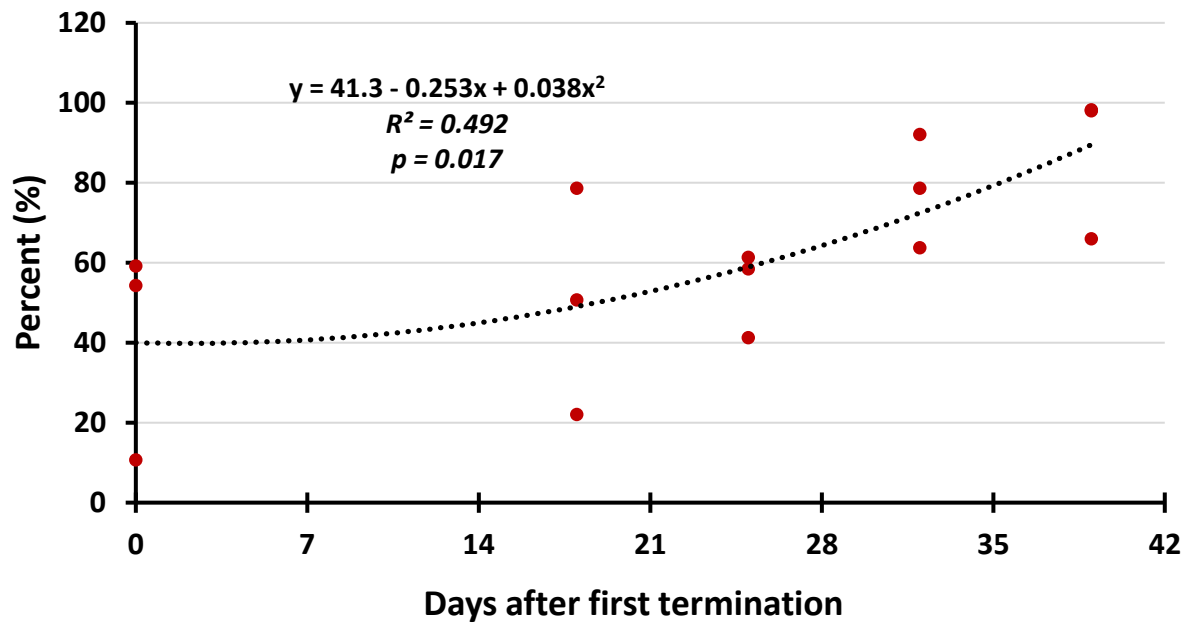






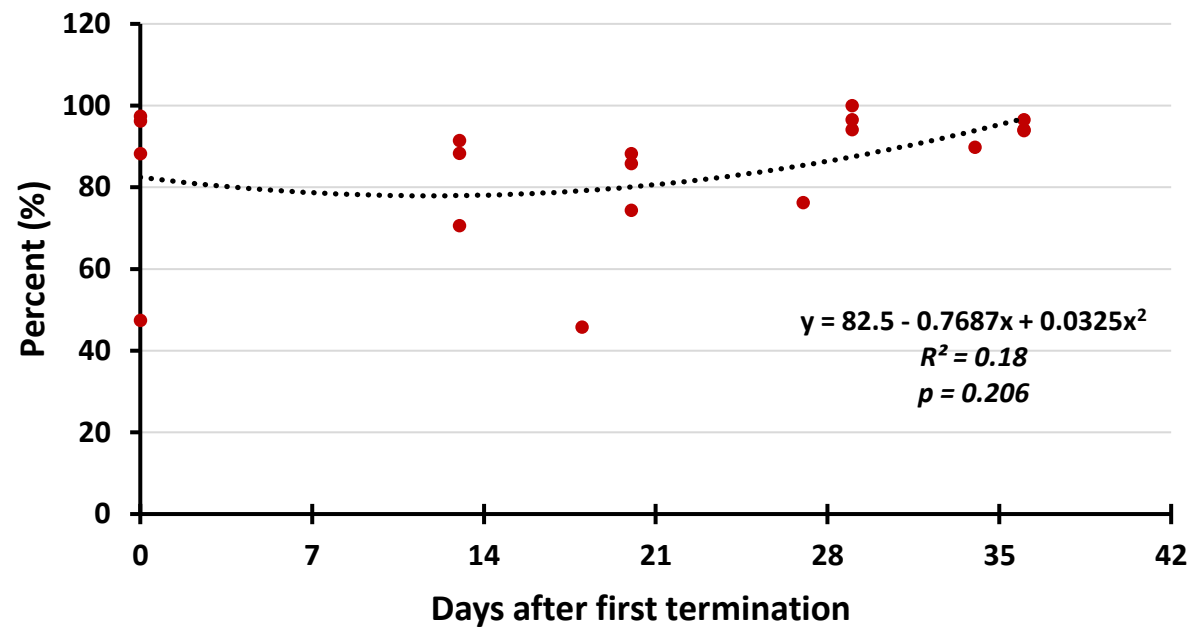
## Weed Suppression

Population reduction relative to no rye, 2023



## Weed Suppression

Population reduction relative to no rye, 2024

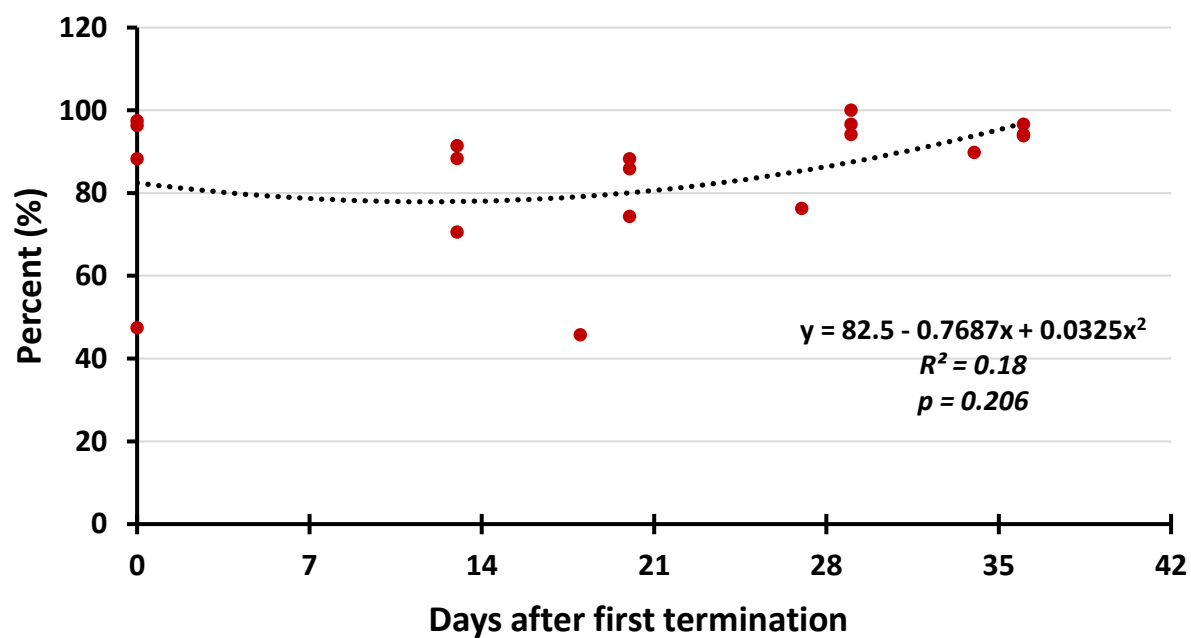






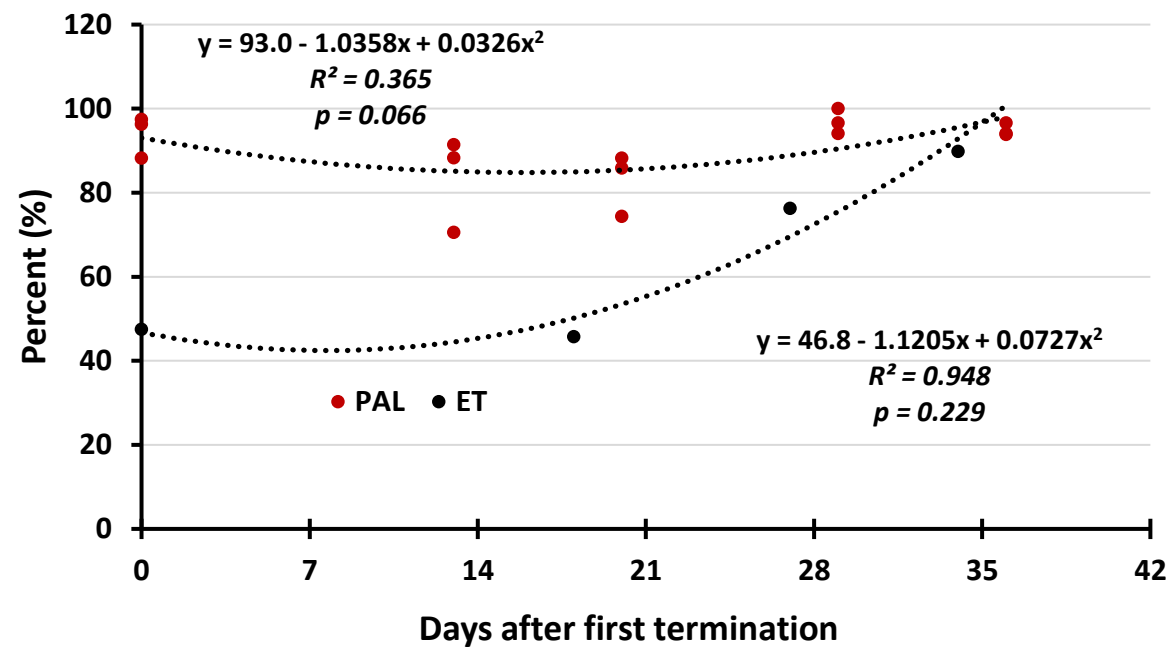
## Weed Suppression

Population reduction relative to no rye, 2024



## Weed Suppression

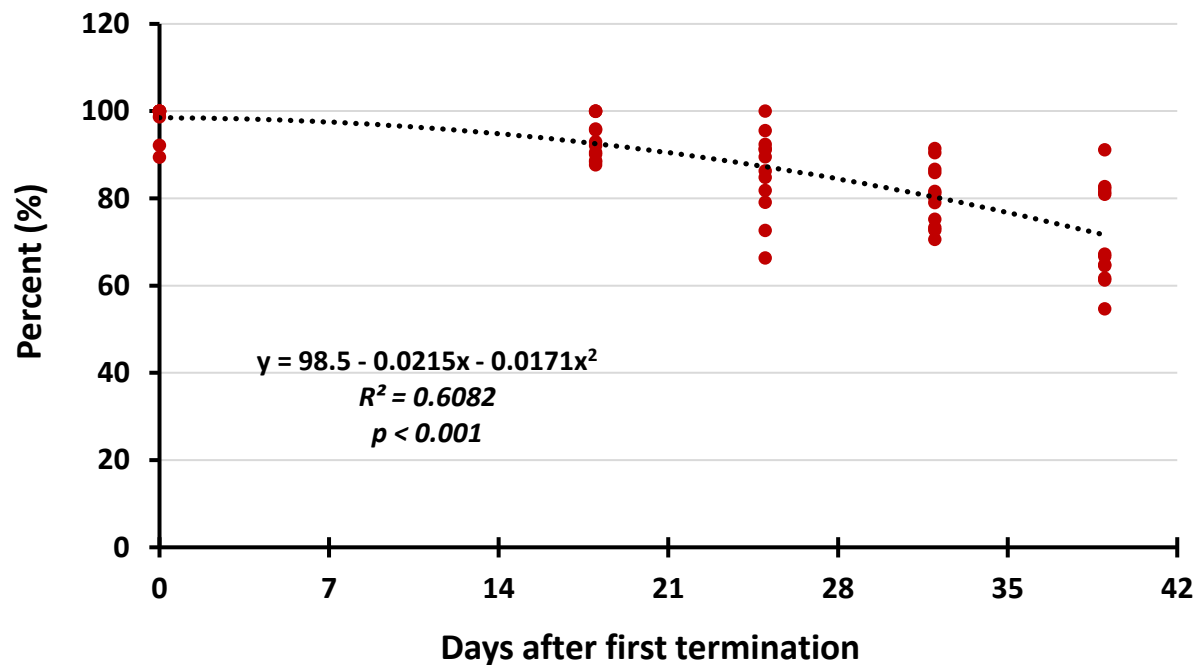
Population reduction relative to no rye, 2024



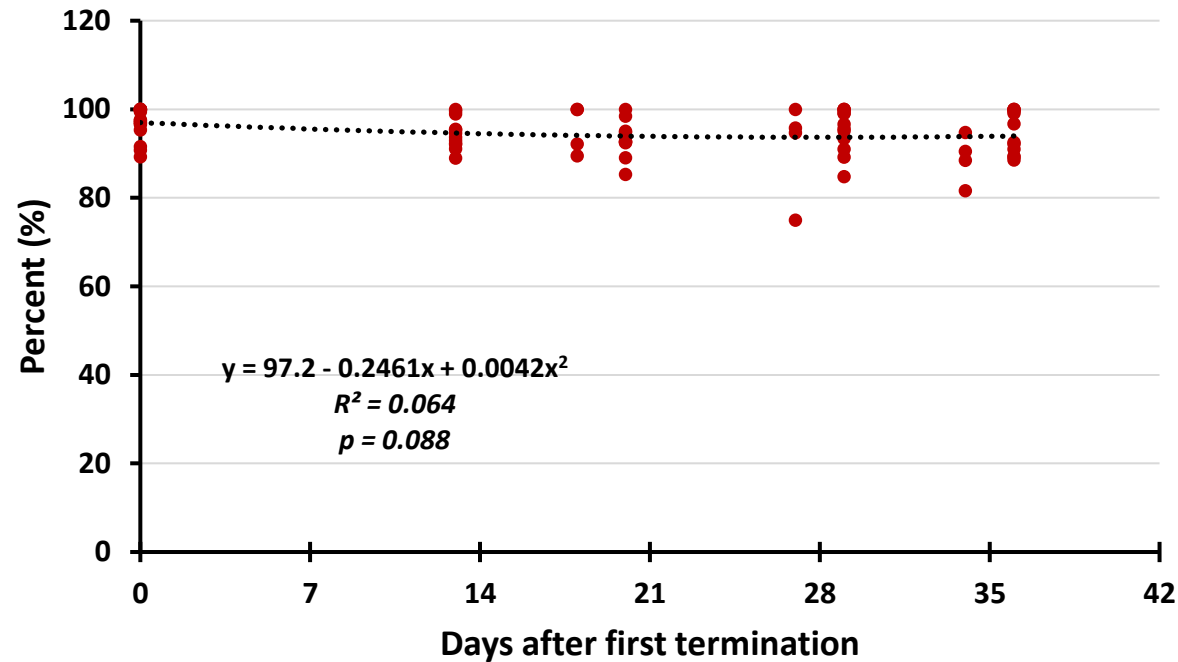




**Relative Yield**  
Response to termination timing, 2023



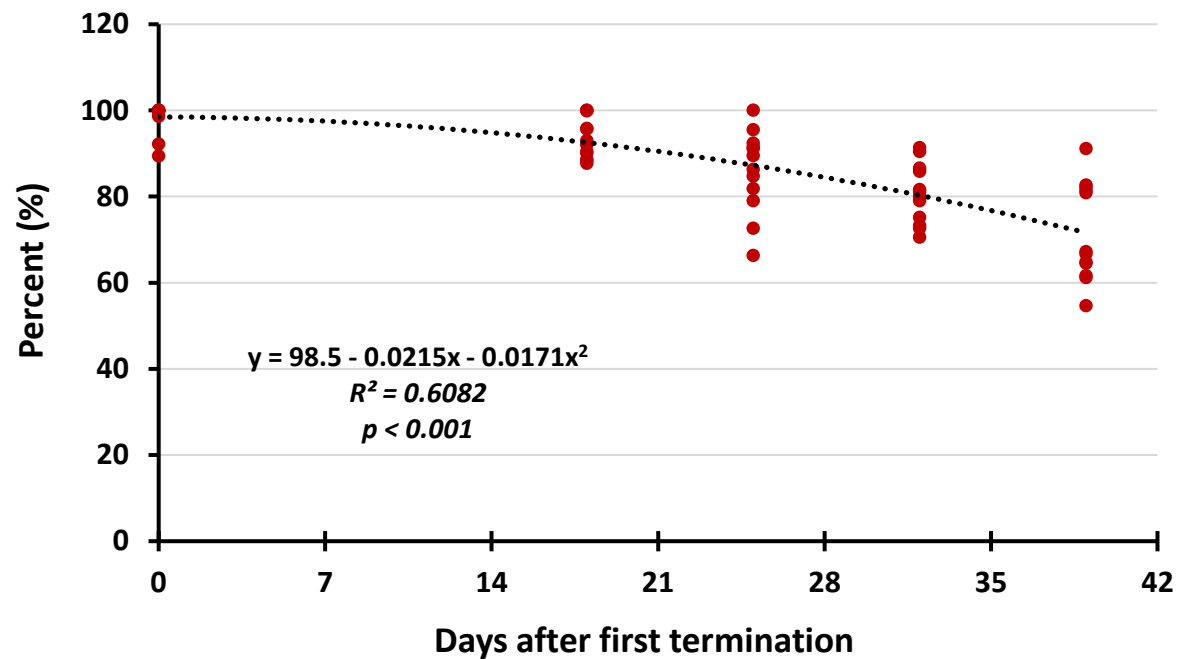
**Relative Yield**  
Response to termination timing, 2024



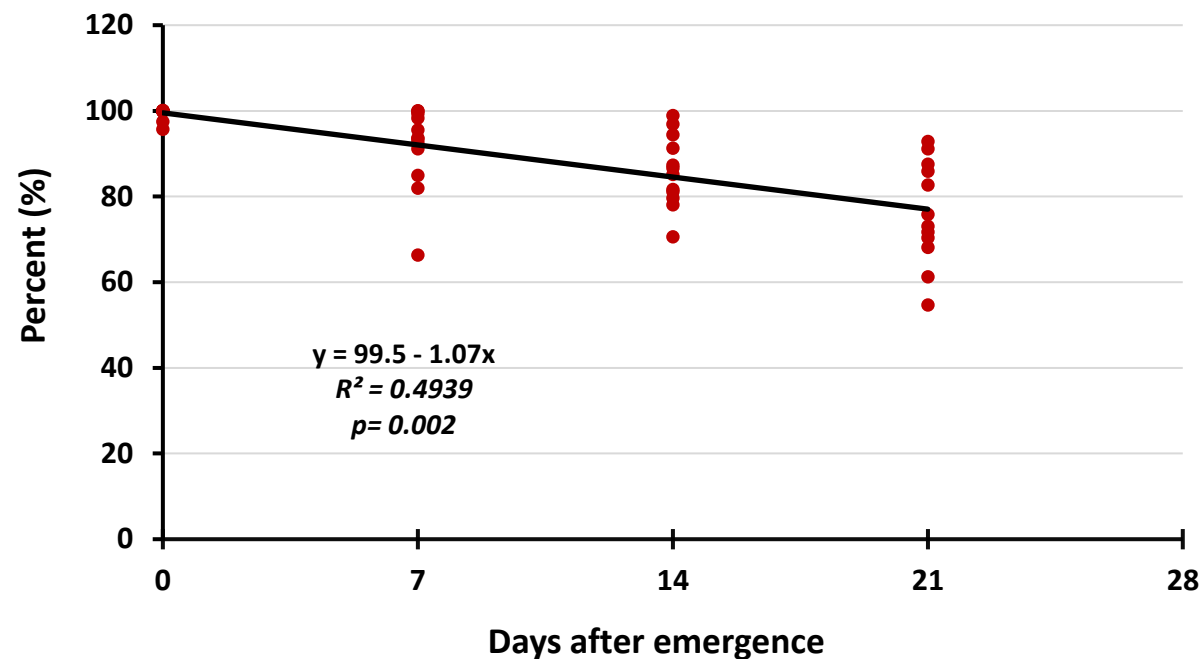




**Relative Yield**  
Response to termination timing, 2023



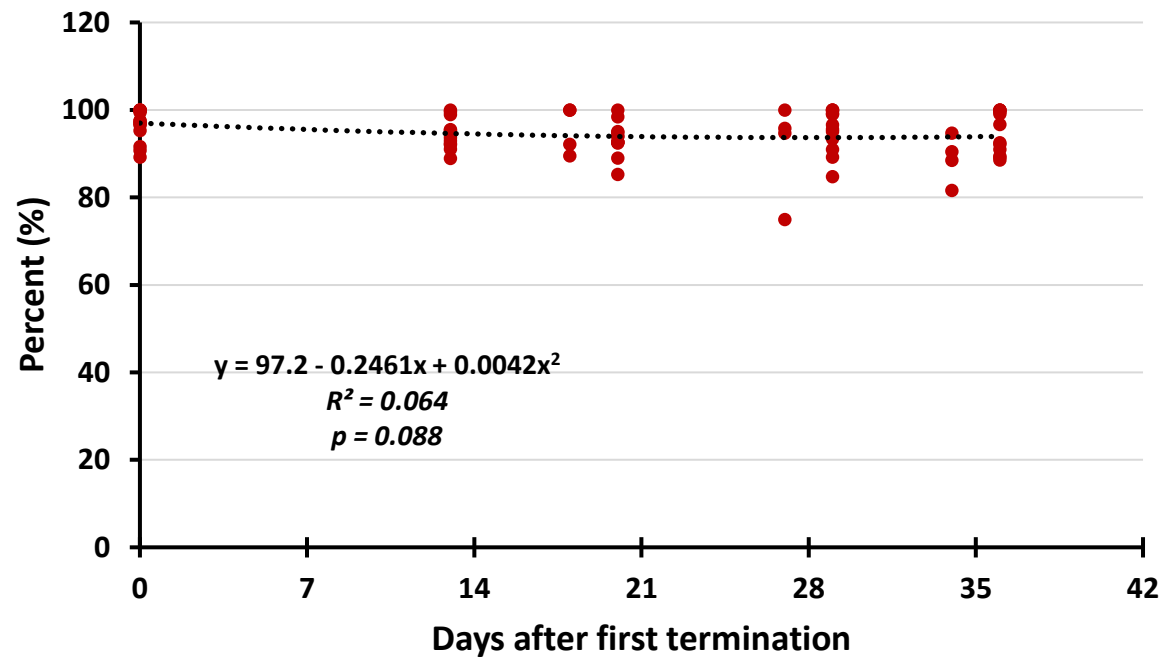
**Relative Yield**  
Response to termination timing, 2023



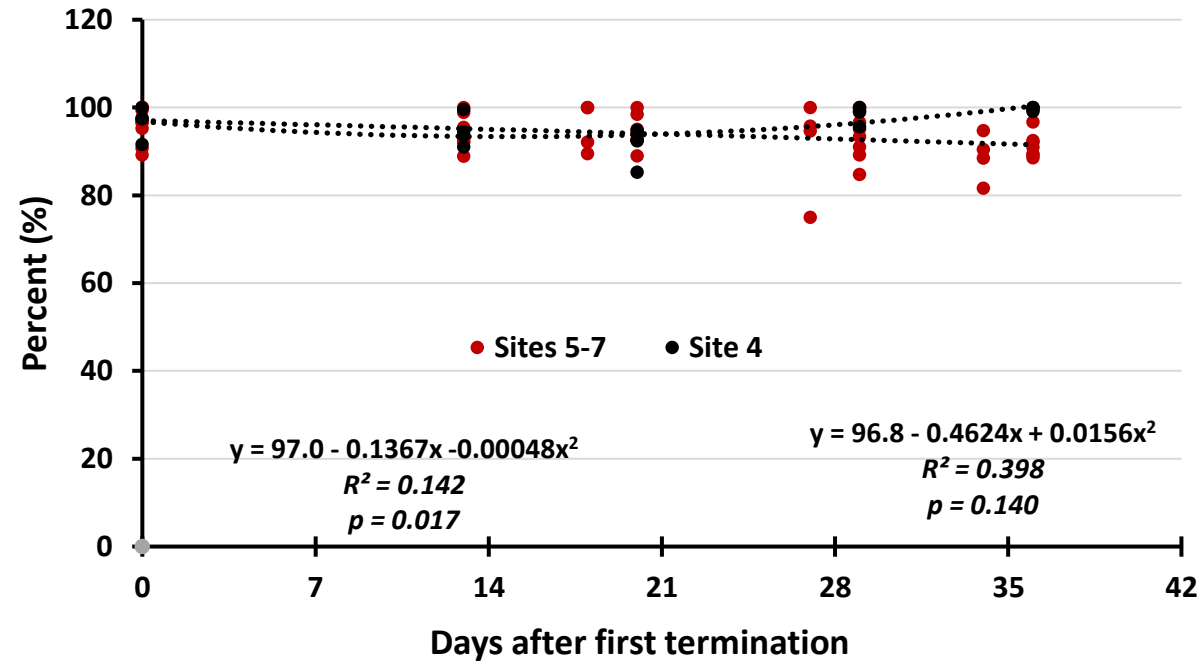




**Relative Yield**  
Response to termination timing, 2024



**Relative Yield**  
2024, differential sites





# Lessons from 2023

“Flash Drought”, Moderate to severe: June > October

## Preplant termination was the “Sweet Spot”

Relative to no-rye

- 41% suppression

- ~2% yield increase

Relative suppression gains began 7-14 DAE (5.3%/day)

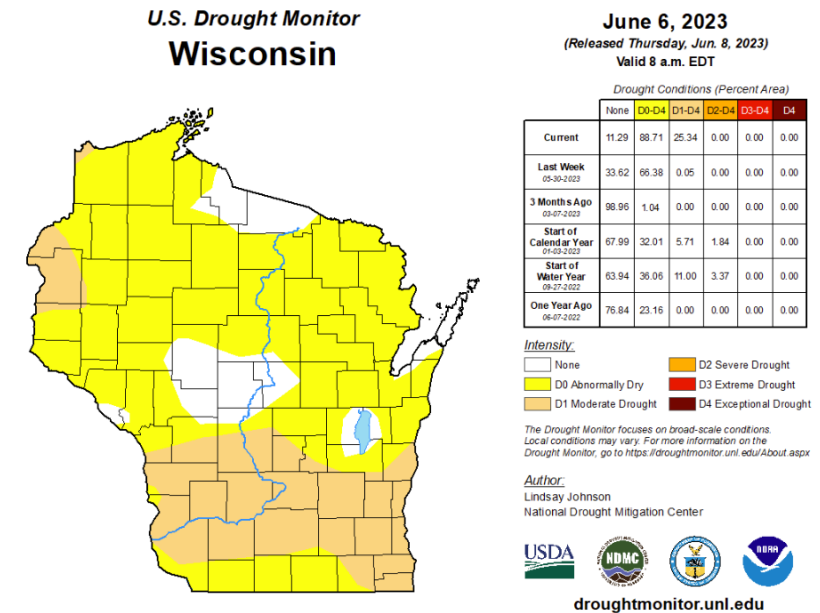
Yield decline accelerated with delayed termination

- 1.7% within 3 DAP (estimated)

- 5.3% at Emergence

- 1.1% per day after VE

**Stay to course with rye, practice Adaptive Management**





# Lessons from 2024

Wet spring and summer, “Flash Drought” late

**“Sweet Spot” variable, depends on objectives**

Preplant termination relative to no-rye

- 82% suppression

- 1.6% yield increase

Modest 12.6% gain in suppression, <1% per day after initial reduction

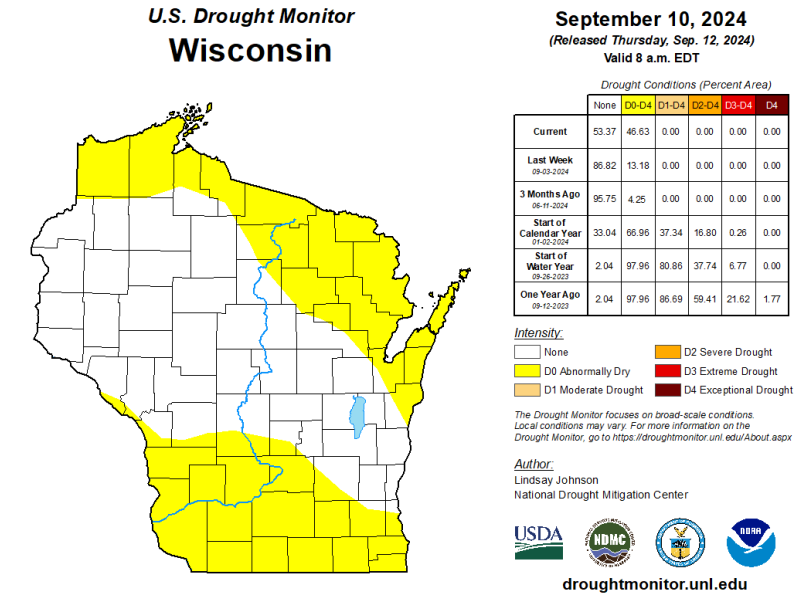
Gradual yield decline with delayed termination

- No loss within 3 DAP (estimated), no penalty for combining applications

- 0.7% at Emergence

- 3.6% at anthesis (mean all sites, up to 9%)

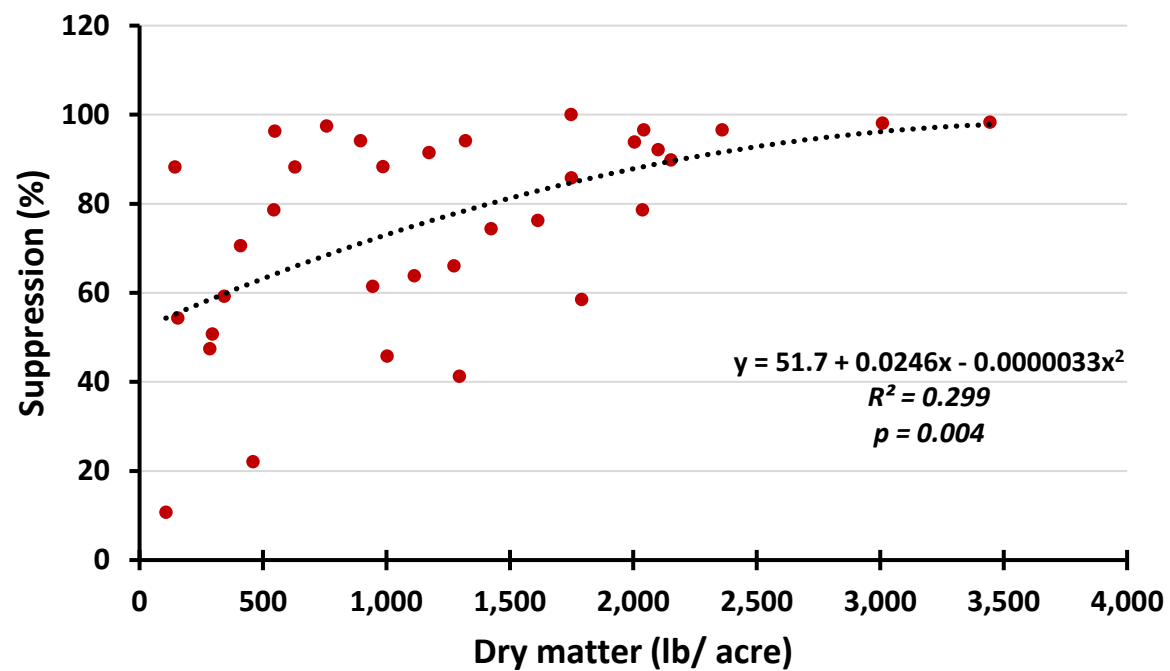
**Termination decision: practice risk management**



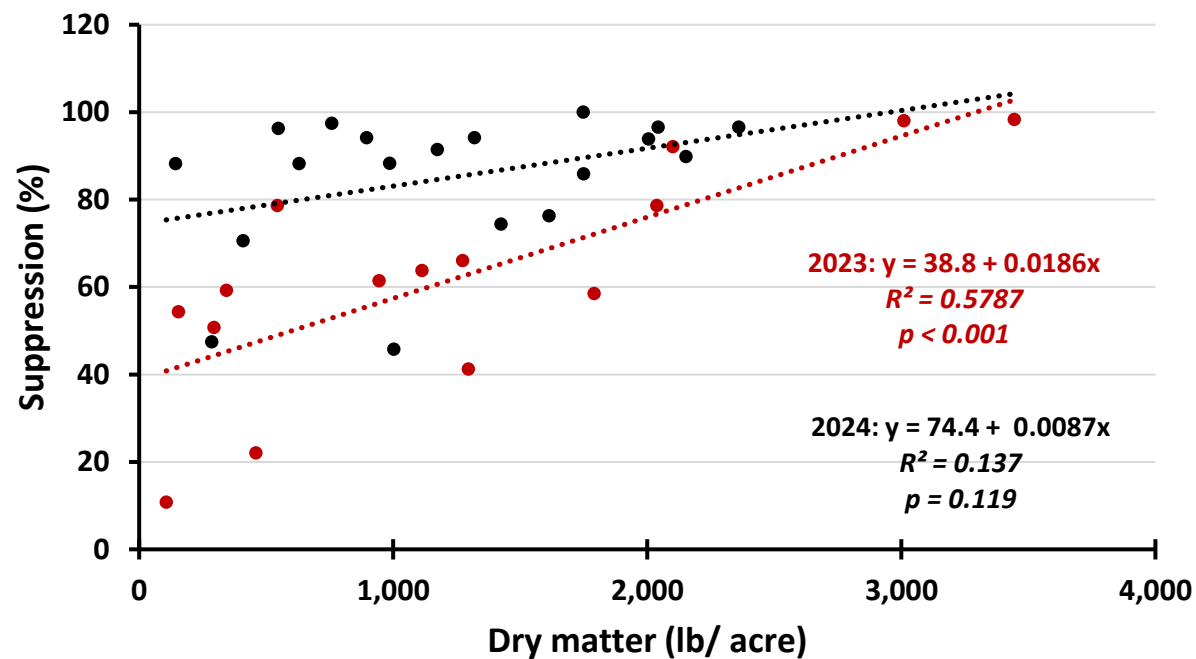




**AGB vs Suppression**



**AGB vs Suppression**







## **Weed suppression: residue**

Physical barrier

Light interception

Buffer soil temperature fluctuations

Allelopathy (?)







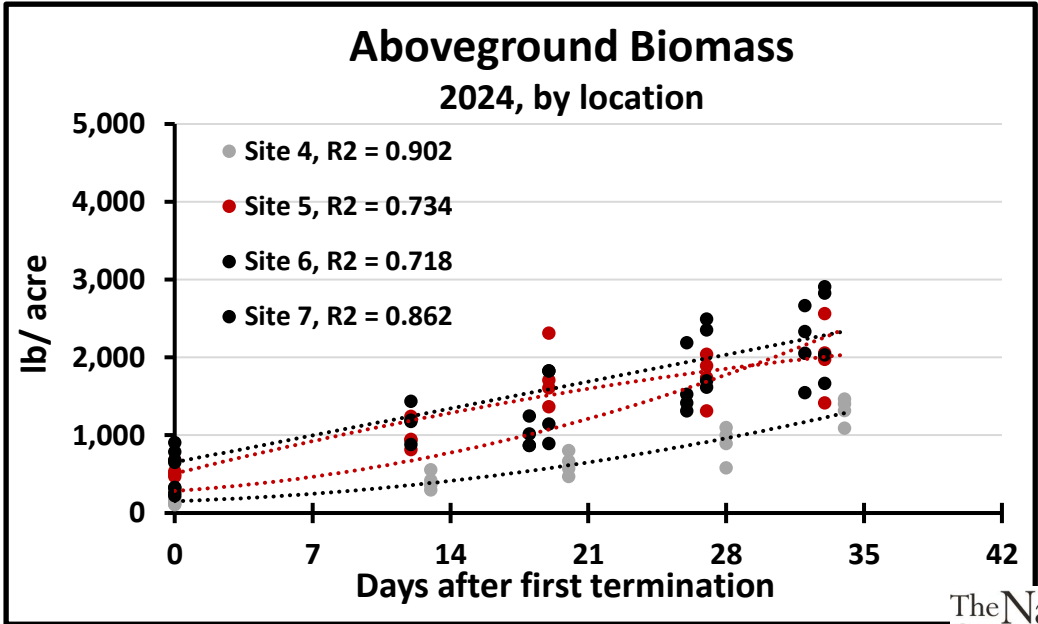
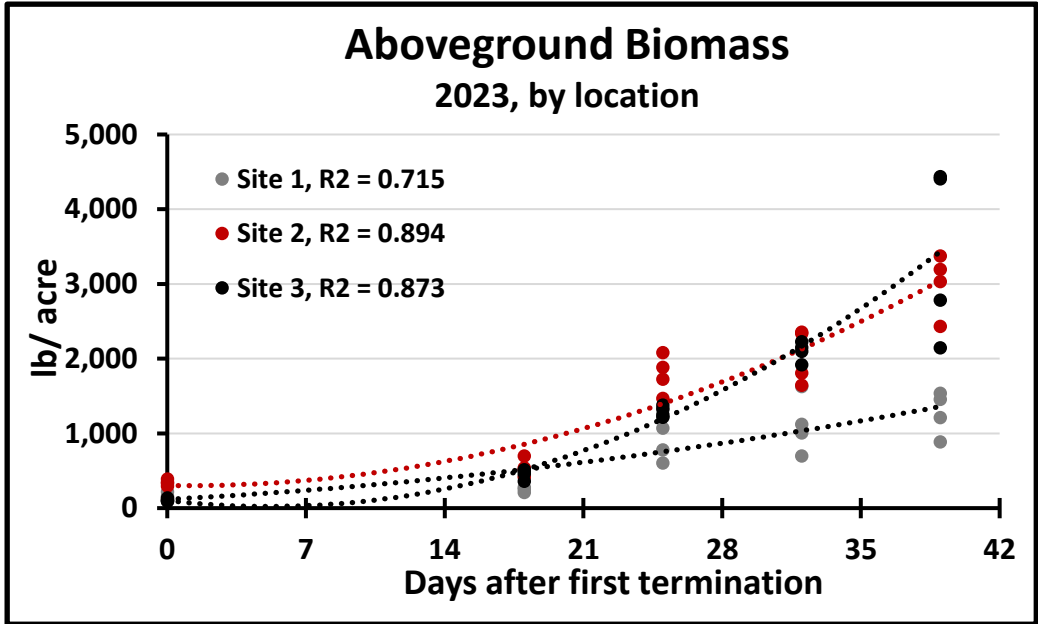
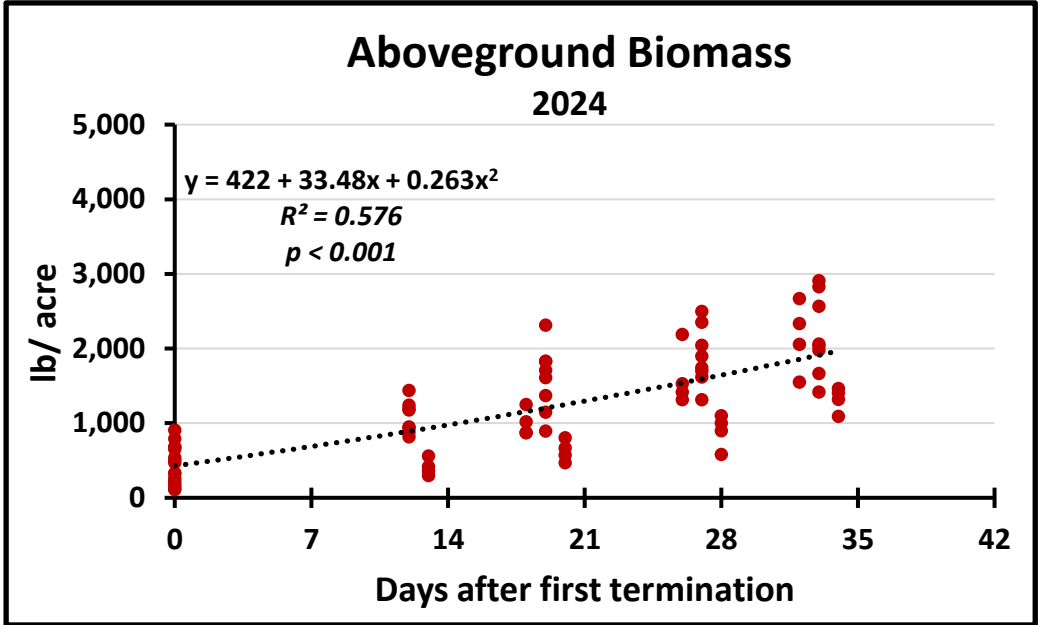
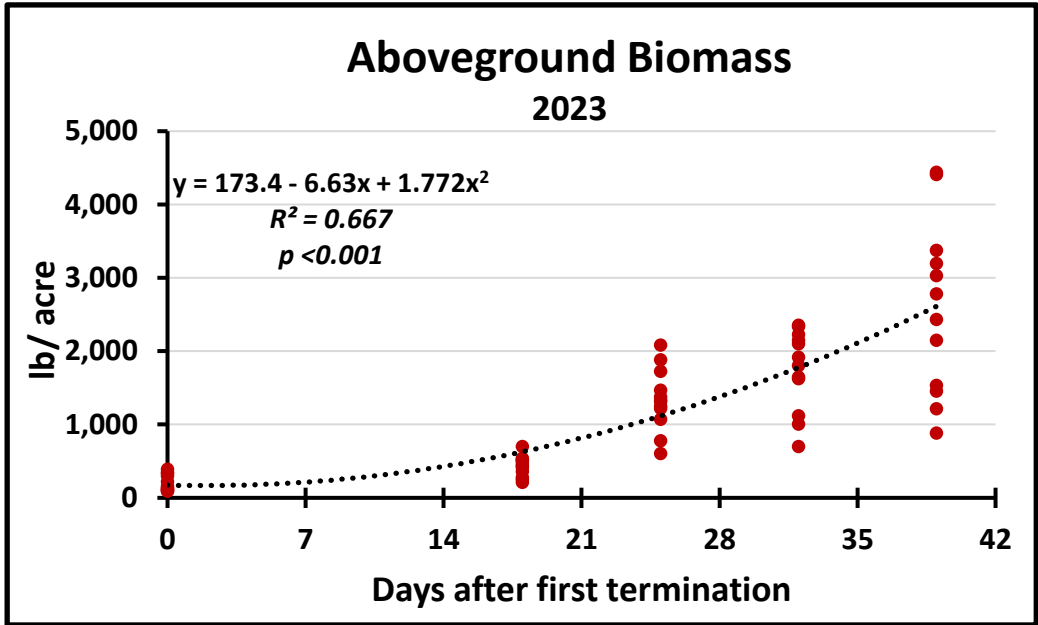


# Manage for early season biomass?

Preplant termination		
	AGB (lb/a)	Supp. (%)
2021	118	56.9
2022	196	47.1
2023	202	41.4
2024	433	82.3









# Optimizing the termination decision

## Balancing weed suppression and yield loss

### Dry spring

Terminate early to protect yield

Accept “accrued” weed suppression (our work: 41-57%)

Separate termination and residual applications or  
co-apply preplant (check product label)

### Wet spring

Plant green

Manage soil moisture for better planting

Option for co-application after planting

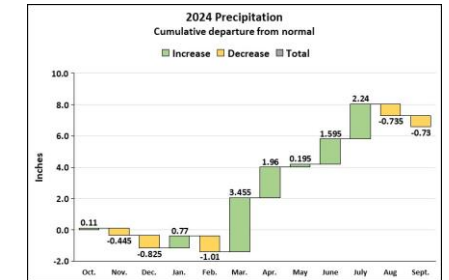
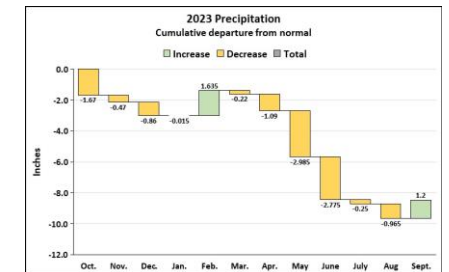
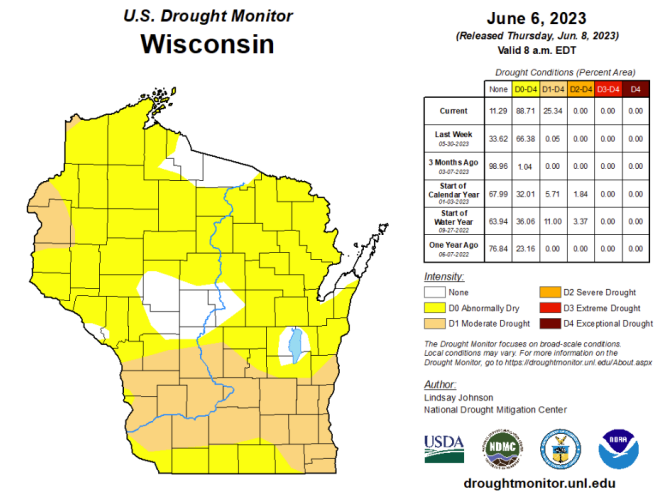
Factor level of AGB at planting- indicator of baseline suppression

Keep eye on 10-day, long-range forecast

### Manage rye for maximum AGB at planting

Early planting

Supplemental early spring N (?)





# For more information

Jim Stute

[jkstute@gmail.com](mailto:jkstute@gmail.com)

**SARE Project Reports:** <https://northcentral.sare.org/>

Can planting green suppress glyphosate tolerant/ resistant weeds in no-till soybean?

Project: ONC21-094

Finding the sweet spot: rye termination timing to balance weed suppression and yield reduction in no-till soybean

Project: ONC23-135