

Beating Glyphosate Resistant Weeds by Planting Green



Jim Stute
2023 National No-Till Conference
St. Louis, MO



About me ...



Past Affiliations: UW-Extension, Michael Fields Institute

Member: Watershed Protection Committee of Racine County (PLWPG)

Wisconsin NRCS Soil Health Committee

Wisconsin Association of Professional Crop Consultants



Cover crop research/ outreach since 1989

Current topics

Yield effects/ economics

Weed suppression

Conservation crediting/ SnapPlus NM software

SARE Program Support

Farmer/ Rancher
Partnership
Research and Education
Professional Development
Graduate Student



My farm ...

Walworth County, SE Wisconsin

Home farm ~160 acre, former dairy

Fox silt loam, A-C slopes, HEL, gravel substratum

Continuous no-till since 2003

Rental ground treated the same as owned

Purpose driven cover crop use since 1994

Red clover interseeded in wheat- N

Cereal rye after corn- N scavenging

2022->rye on all acres for soil water management



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Glyphosate resistance in Wisconsin



Photos: Tom Novak, TCM LLC



Can planting green suppress GT/RW?

SARE Project ONC17-034

“Do cover crops pay?”

Oak Hill, 2019

Kidder sandy loam, 2% OM; rye, 40 lb./a, Oct 18

Planned Termination: May 6

Cover, 21.8%, AGB, 150 lb./a

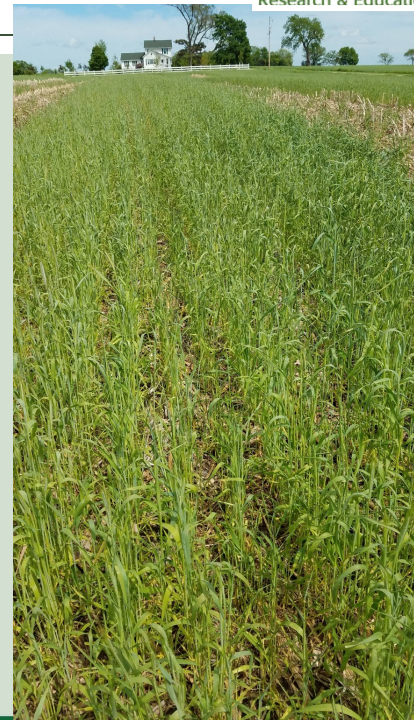
Actual Termination: May 30

Cover, 64.1%, AGB, 1,434 lb./a

Cover vs. no cover

+1.8 bu./a, 3.7%

In-season observation: no waterhemp in rye



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SARE Partnership Project ONC21-094

Hybrid “on-farm” Trial: 2-year, 4 location, 4 replicates per site

Control

no rye, total burndown + residual
(Sulfentrazone + Chloransulam-methyl)

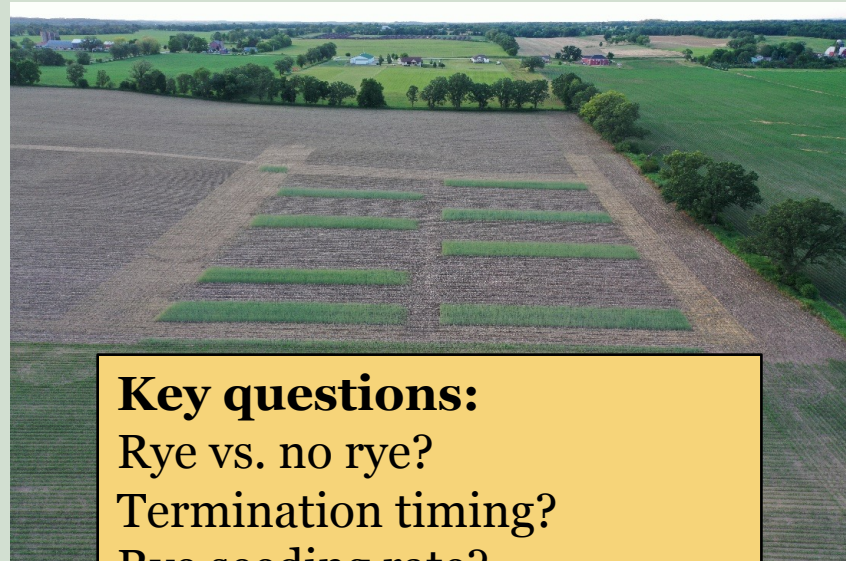
UW-Extension recommendations

“Burndown” (preemergence, PRE)

rye (40, 80 lb./a), same herbicide

“Plant Green” (post emergence, POST)

rye (40, 80 lb./a), bdlf. burndown + residual



Key questions:

Rye vs. no rye?

Termination timing?

Rye seeding rate?



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SARE Partnership Project ONC21-094

Cooperators:

Tom Novak, Pleasant Valley Acres/ Total Crop Management LLC

Nick Kau, Kau Farms

Tyler Troiola, Troiola Enterprises

Tom Burlingham, Langmanor Farms

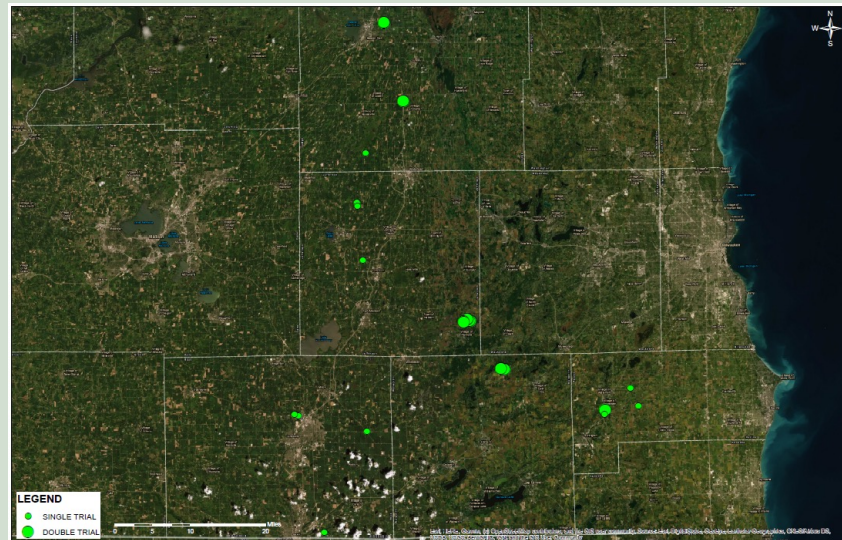
Southeast Wisconsin:

23" Growing season precipitation (39" annual)

2,560 GDD (April- September)

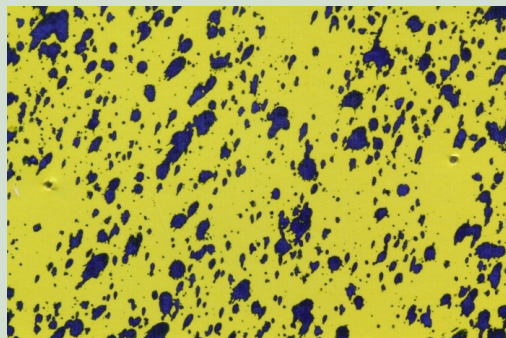
Corn, 102-105 RM

Soybean, 2.1-2.5

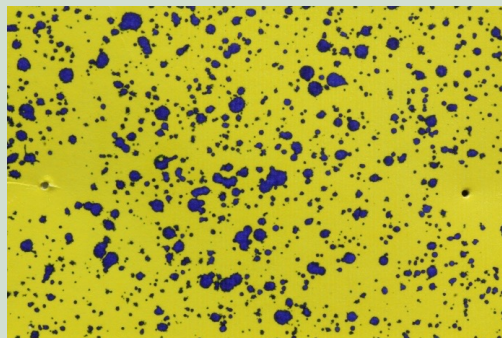


What about spray interception?

Caution urged by several midwestern Universities
Documented in later terminated rye, AGB ~ 4,000 lb./a



No rye ~ 22% coverage

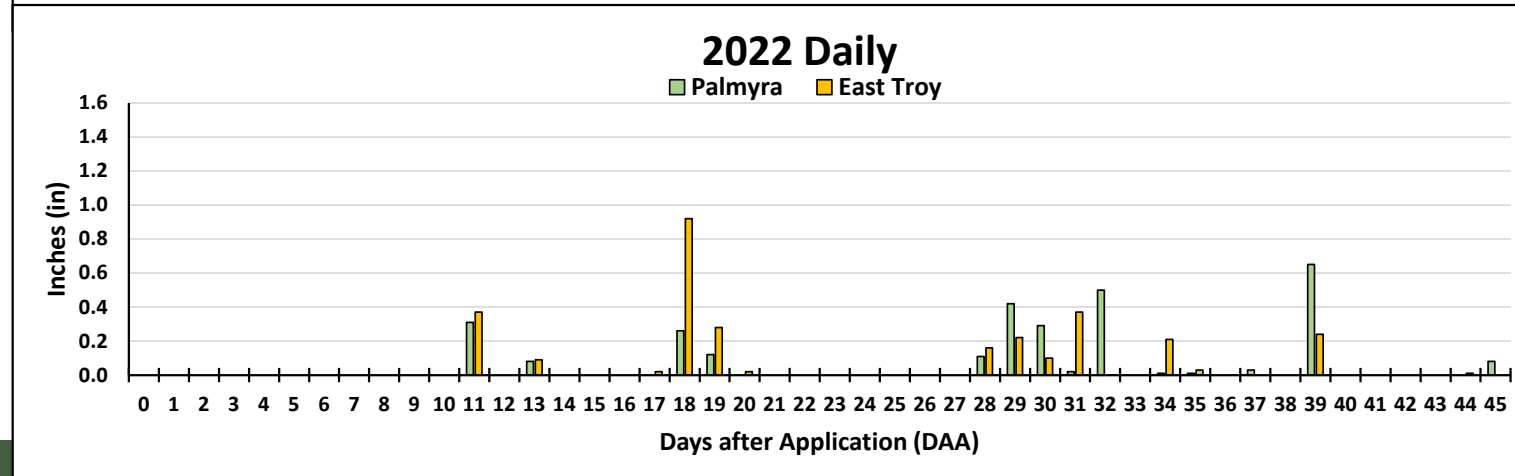
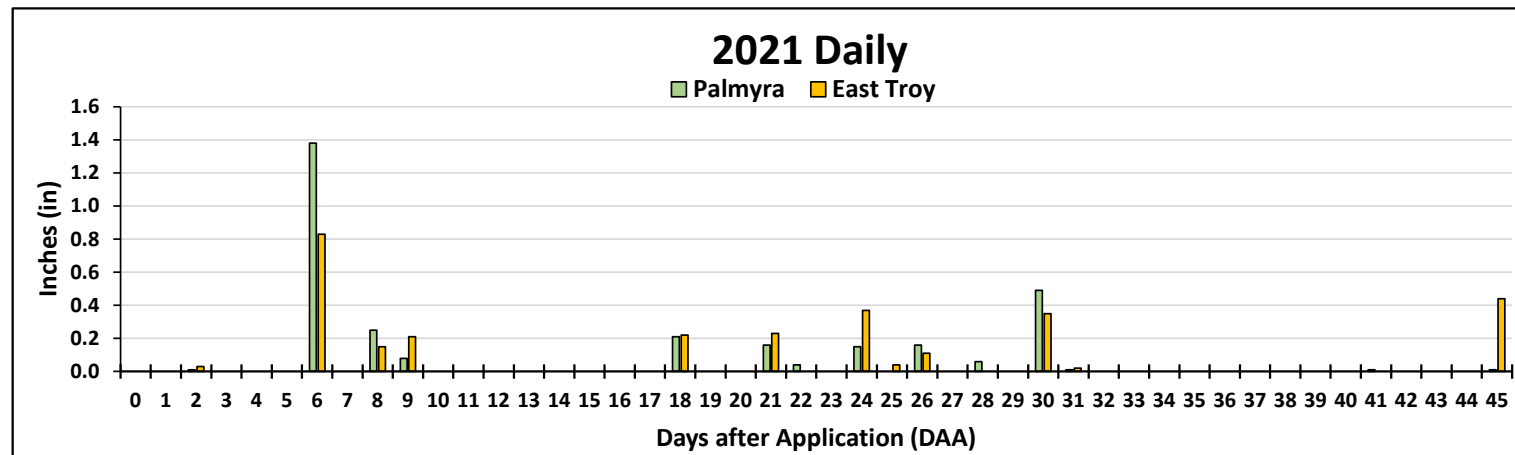


Rye ~ 12% coverage

Spray card data and photo credit: WiscWeeds, Dr. Rodrigo Werle

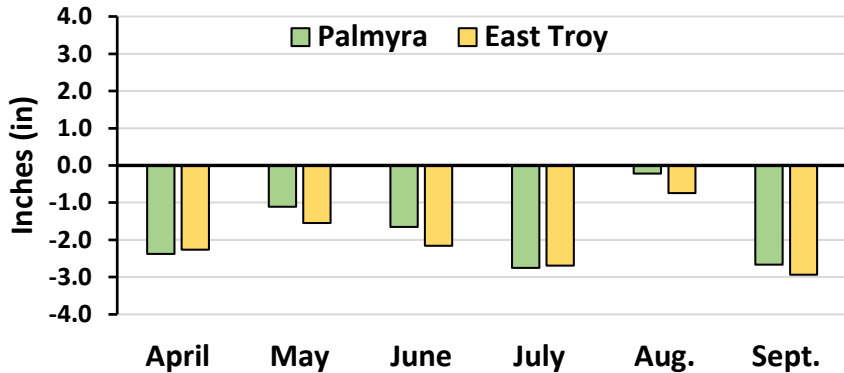


Critical precipitation: residual herbicide activation

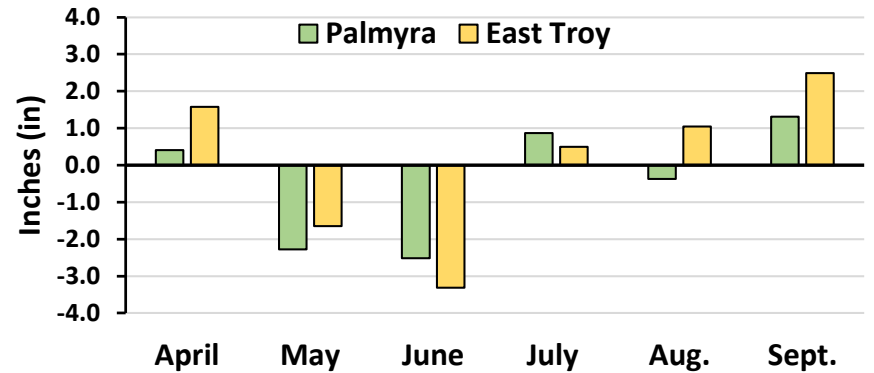


Monthly precipitation: departure from long-term mean

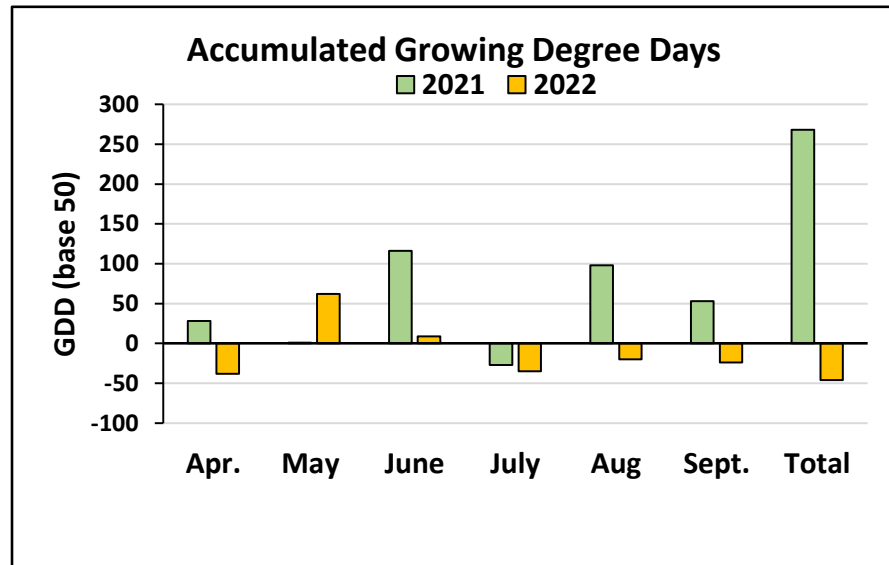
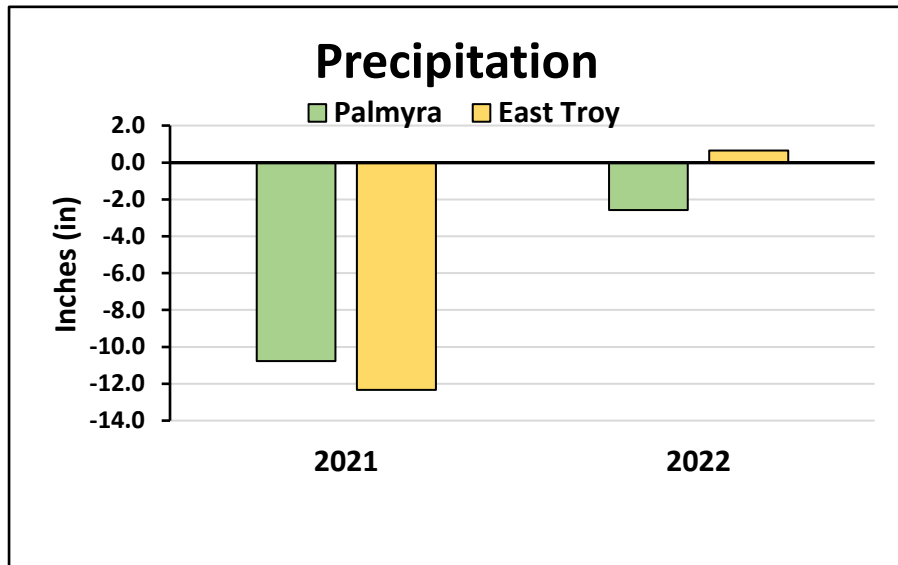
2021



2022



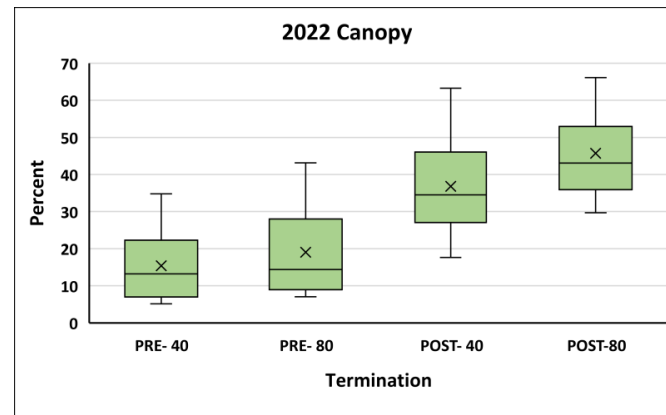
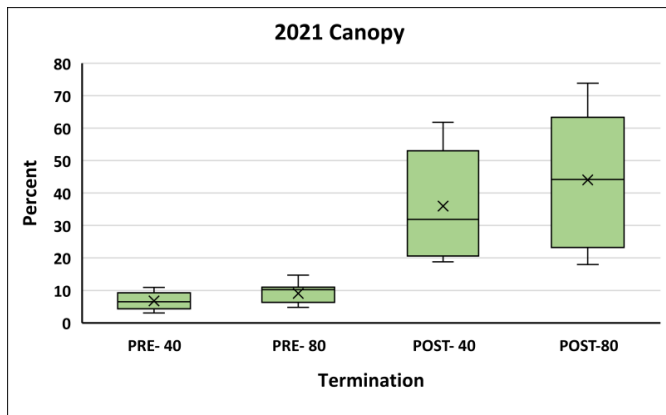
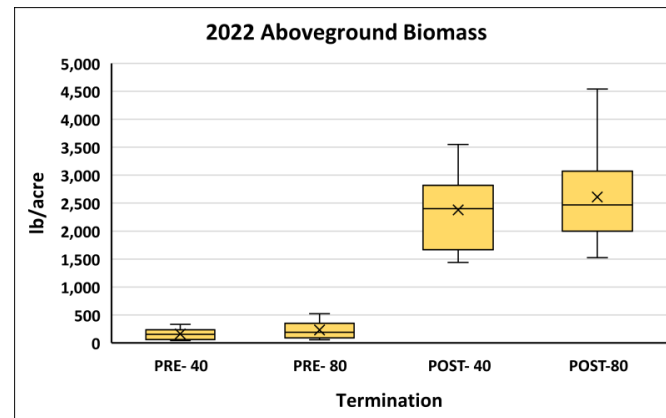
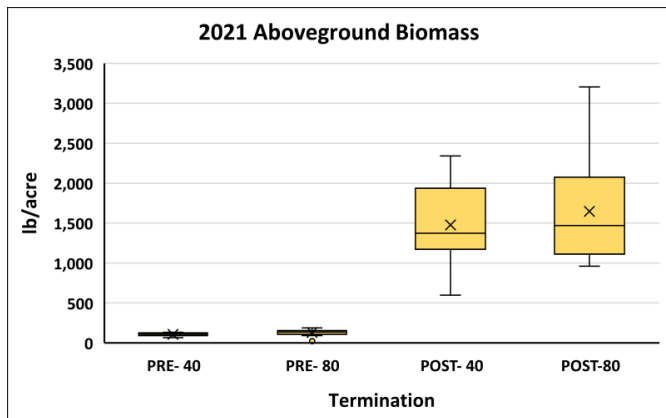
Seasonal precipitation and temperature: departure from long-term mean



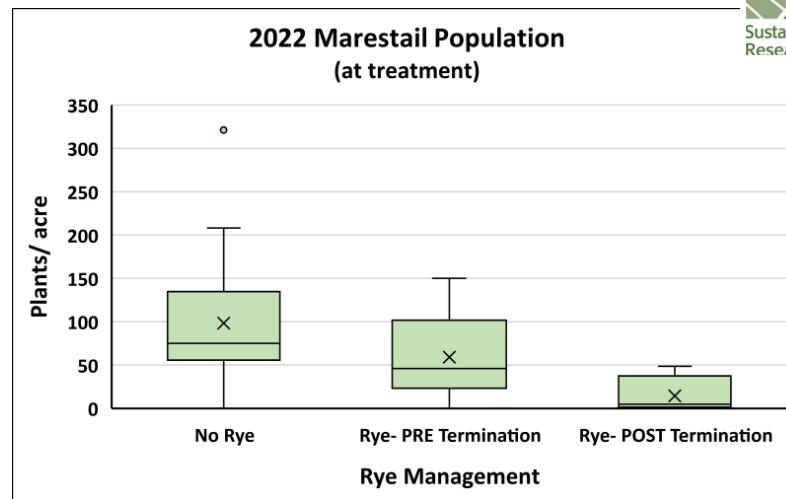
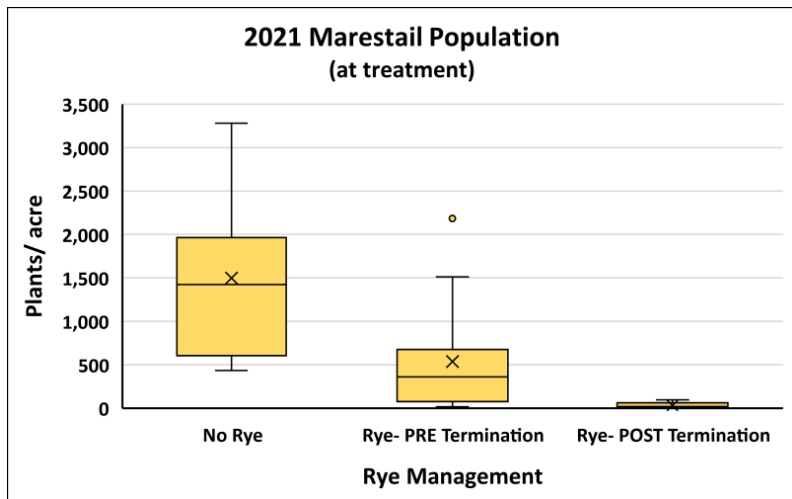




Rye biomass: seeding rate and termination timing



Weed suppression:



Rye management, $p < 0.001$

Reduction

PRE, 64.1%

POST, 97.9%

Seeding rate, p

Combined 0.116

PRE 0.105

POST 0.795

Rye management, $p < 0.034$

Reduction

PRE, 40.0%

POST, 93.6%

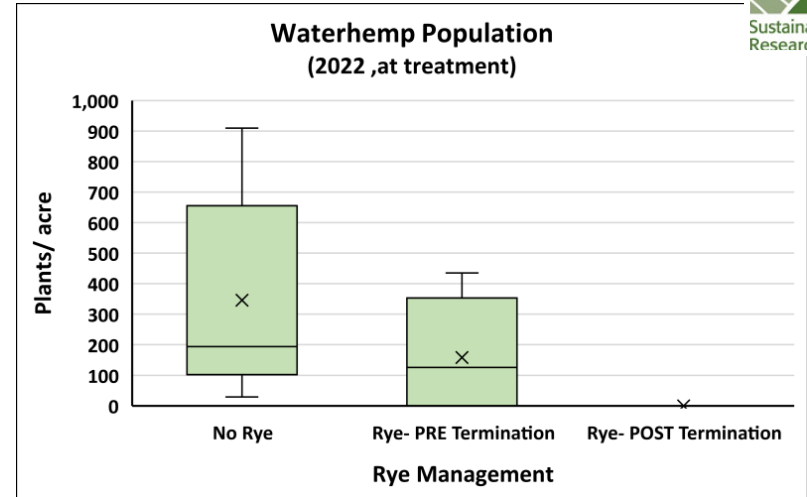
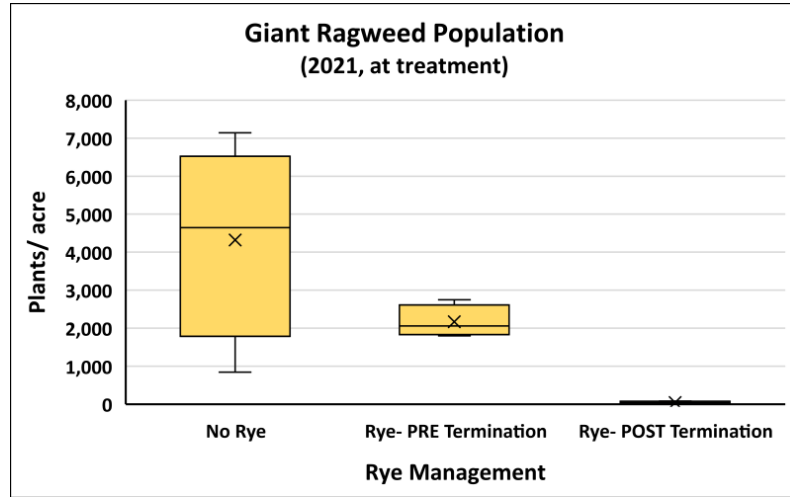
Seeding rate, p

Combined 0.335

PRE 0.328

POST 0.236

Weed suppression:



Rye management, $p < 0.006$

Reduction

PRE, 49.8%

POST, 99.0%

Seeding rate, p

Combined 0.181

PRE 0.289

POST 0.142

Rye management, $p < 0.008$

Reduction

PRE, 54.2%

POST, 99.9%

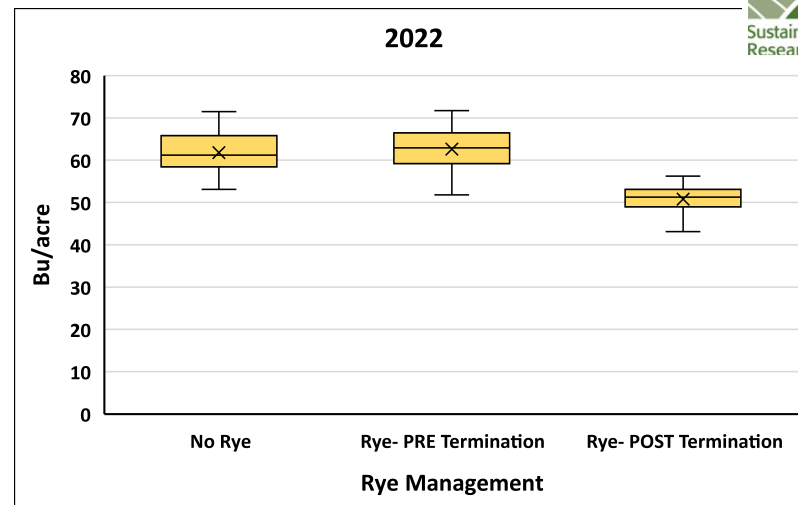
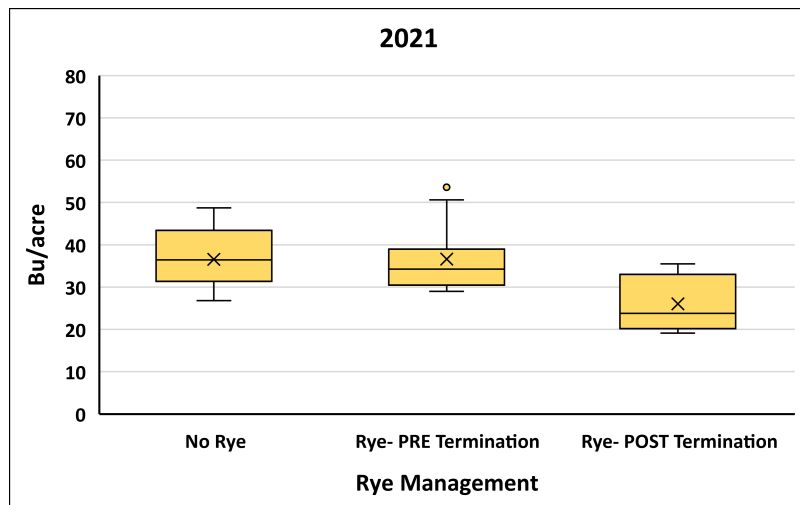
Seeding rate, p

Combined 0.088

PRE 0.076

POST n/a

Soybean yield:



Rye management, $p < 0.001$

Comparison, no rye

PRE, 103.1%

POST, 71.2%

Seeding rate, p

Combined 0.155

PRE 0.047

POST 0.552

Rye management, $p < 0.001$

Comparison, no rye

PRE, 102.3%

POST, 86.6%

Seeding rate, p

Combined 0.350

PRE 0.860

POST 0.121

What the data doesn't show:

Planting green delayed in-season flush

Implication: 1 in-season application possible?

Fewer individuals + fewer applications =
lower cost and resistance management



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What the data doesn't show:

Both rye managements
reduced late-season grass

Implication: potential to reduce late-season
applications, systemic or residual
products



What the data doesn't show:

Late termination can:
delay maturity, increase
moisture and lodging

2022

~ 7 days

+ 2%



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The Upshot:

Weed suppression potential is substantial

maximized with late termination, >90%

PRE provides ~50% with yield bump

Key component of resistance management

fewer individuals + fewer applications

Yield loss with late termination UNACCEPTABLE

need to find the “sweet spot”

termination based on growth stage/ conditions



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Questions?



Jim Stute

jkstute@gmail.com

SARE PROJECT NUMBER ONC21-094

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



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