Do cover crops pay? Here's what the numbers say…

Jim Stute

Economics: A major barrier to adoption

Fear, belief, and perception

- Yield reduction
- Additional time and expense
- Complicates management, especially weed control
- Benefits are a long-term proposition

Lack of "credible" economic data

- On-farm vs. Research Station generated
- Collected vs. self reported

Can cover crops pay?

3-Year NCR SARE funded project

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Objectives:

- Measure crop yield response, financial return
- Identify and validate best practices
- Myth-bust where appropriate

Goal:

Economic argument for adoption

The Nature Conservancy
nature.org/Wisconsin

Can cover crops pay?

70 replicated on-farm trials, 2022-24
Cereal rye, corn-soybean rotation
100% no-till

Treatments

1. No rye (control)
2. Normal rye management
3. Alternative rye management

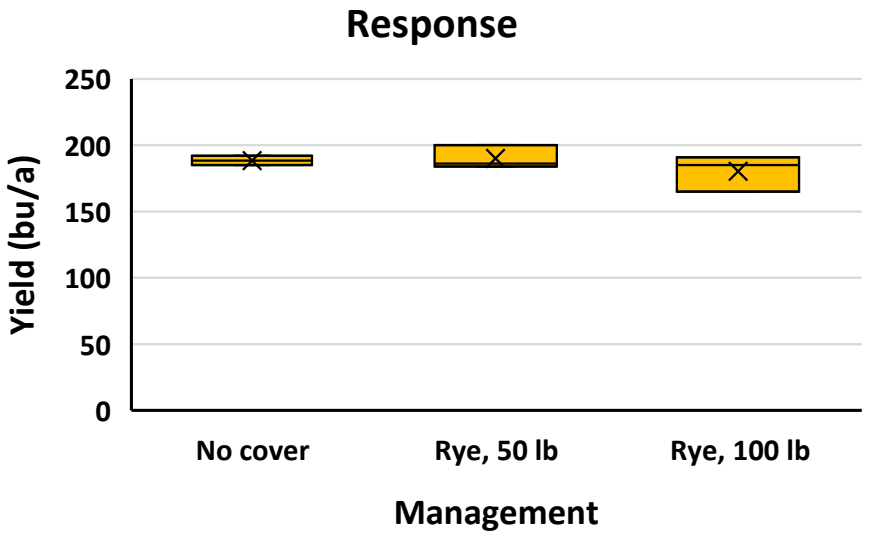
Data Reporting: average, range => focus on Top 25%

Can cover crops pay?

Individual, stand-alone trials
Goal: answer farm specific management questions

- Seeding rate
- Termination timing
- Row placement
- Supplemental N in corn

Data combined, analyzed in aggregate
BMP identification
Economic data



Can cover crops pay?

Agronomic: Response ratio (unitless)

Response ratio
Yield: cover/ no cover
=1, no difference
>1, yield increase
<1, yield decrease

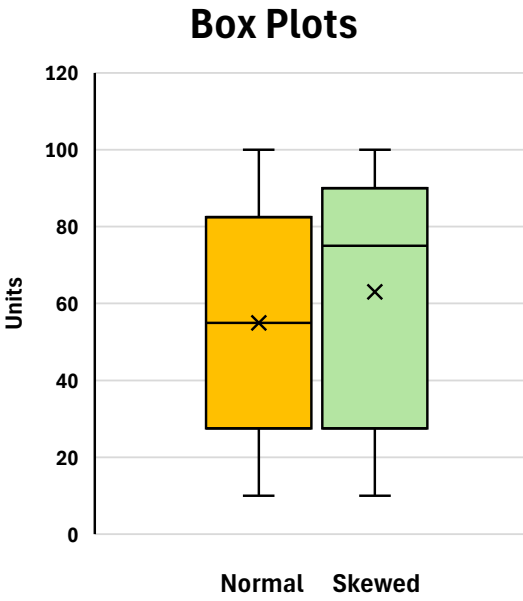
Economic: Net margin ($/acre)

= Gross margin (yield diff. x $) –

Yield dependent costs (haul, dry, shrink, P/K removal) -

Cover crop costs (seed, est., term., other mgt., interest)

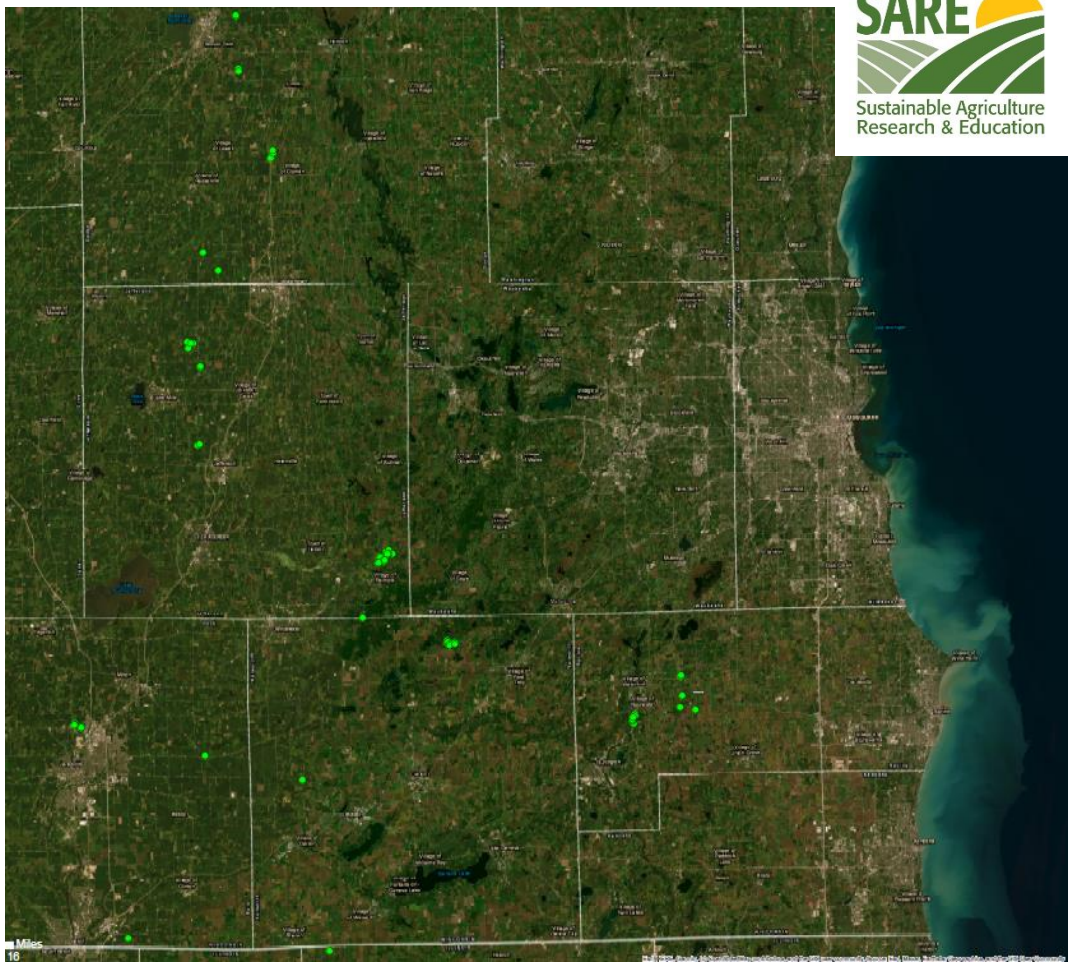
Partial budget analysis using average cooperator I/O prices



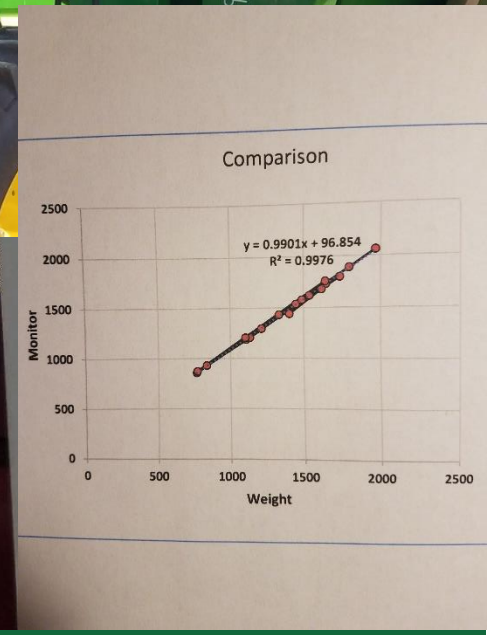
SE Wisconsin sites

Mean trial latitude:	42.9°
30-year Normal*	
Precipitation (in)	
Annual	37.42
Growing season (Apr. – Oct.)	26.99
Growing Degree Day (GDD_{50})	
Annual	2,737
Growing season (Apr. – Oct.)	2,716
Median Frost Date	
First	Oct. 5
Last	Apr. 26
Snowfall (in)	35.95

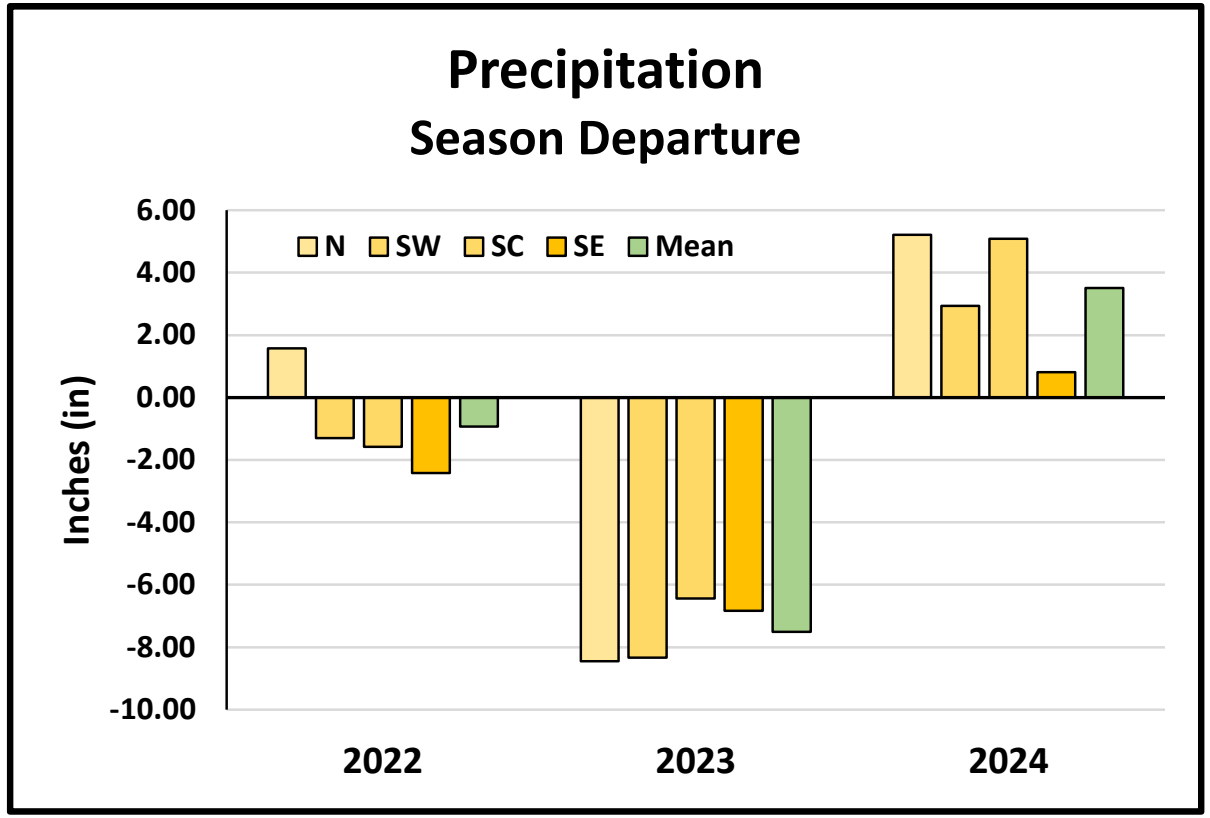
NOAA Sullivan, 42.96799, -88.54924, 1994- 2024



Credit: Jon Grove, Racine County LWCD



Growing season summary, 2022-24



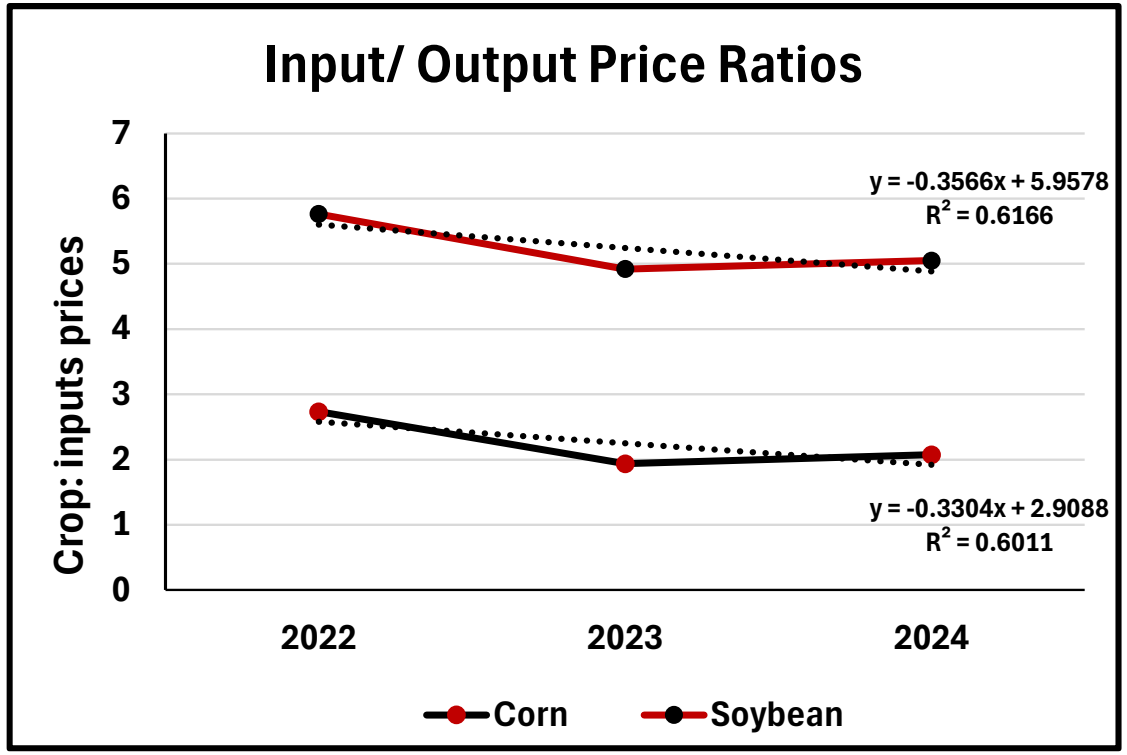
Seasonal notes:
Late April wet period- All years

Flash droughts:
2023: May
2024: Mid August

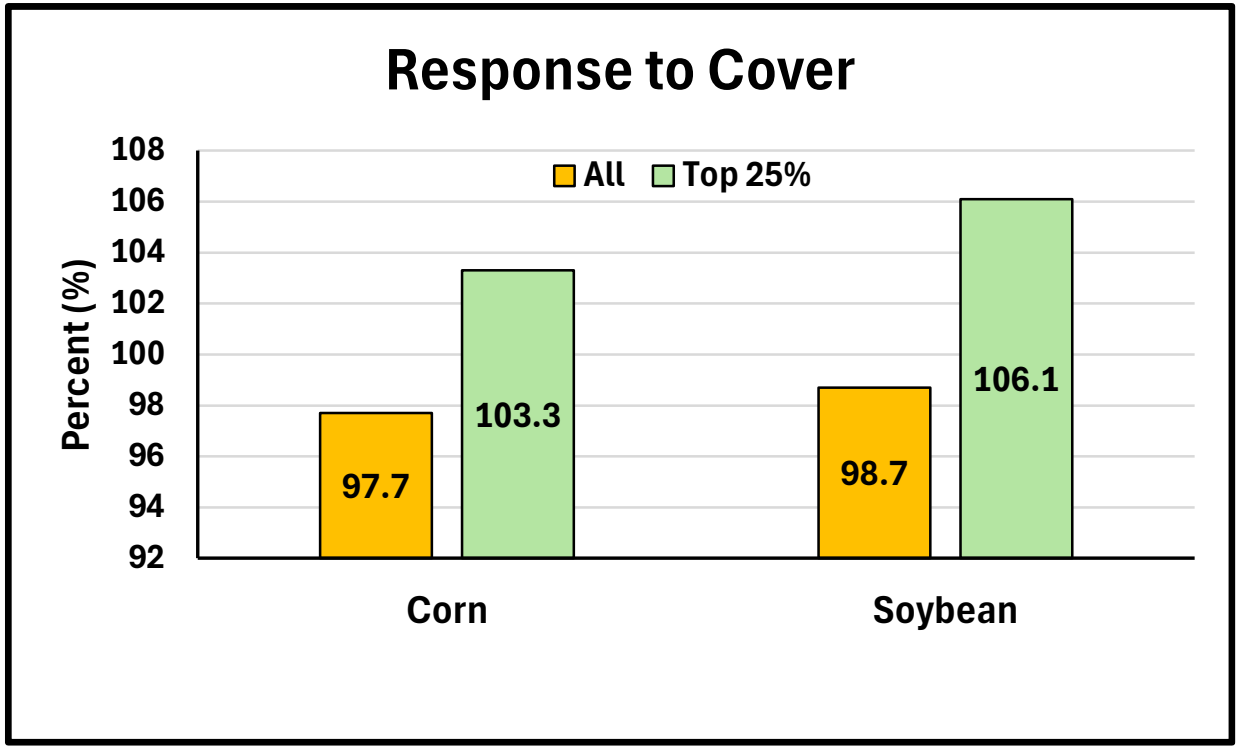
GDD Accumulation, % LTM*
2022: 97.7
2023: 99.5
2024: 104.3

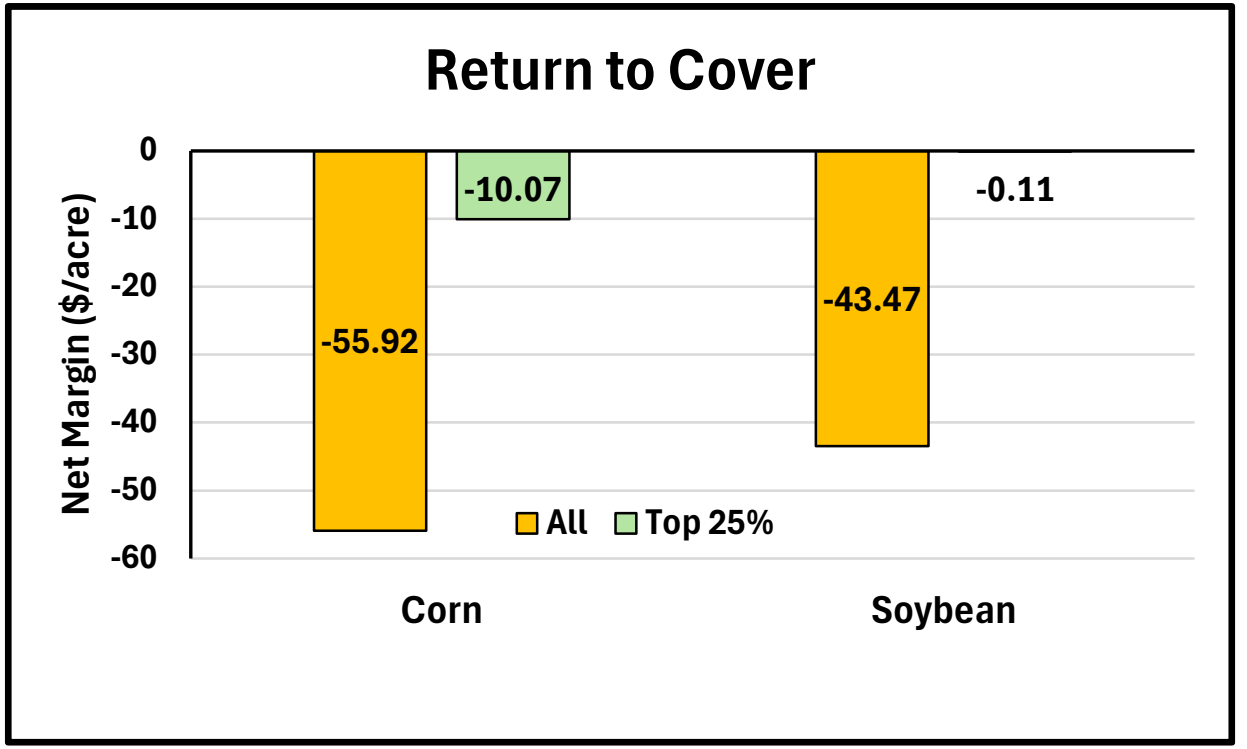
****NOAA NWS, Sullivan WI***

Input/ Output price relationship 2022-24

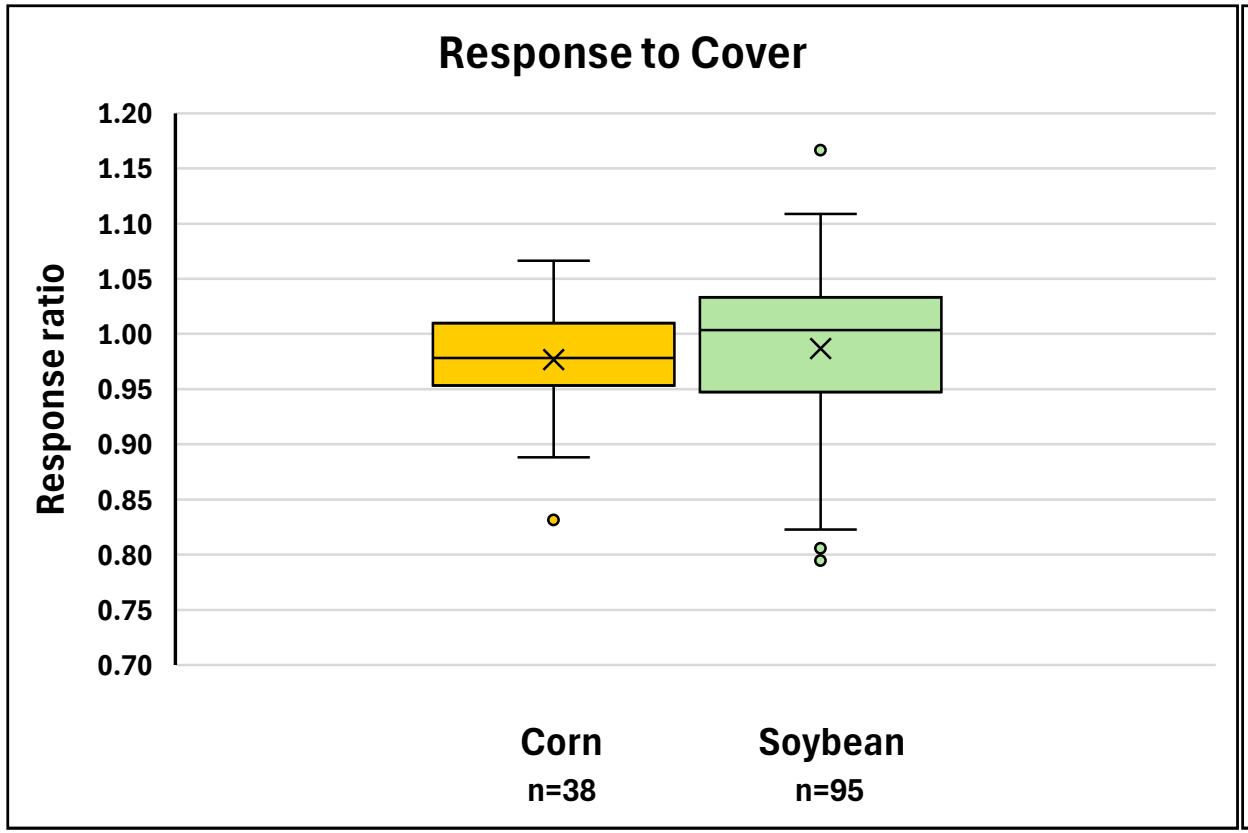


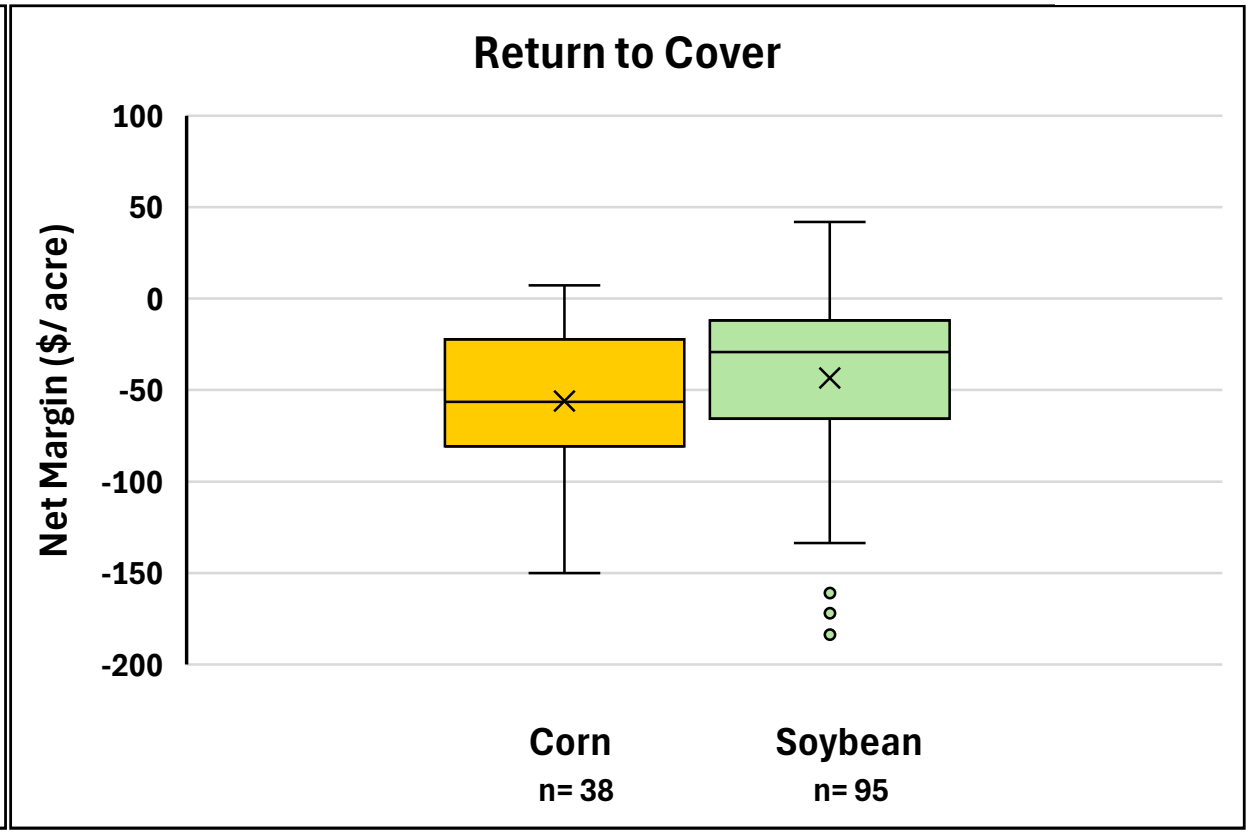
Response and return: All vs. Top 25%



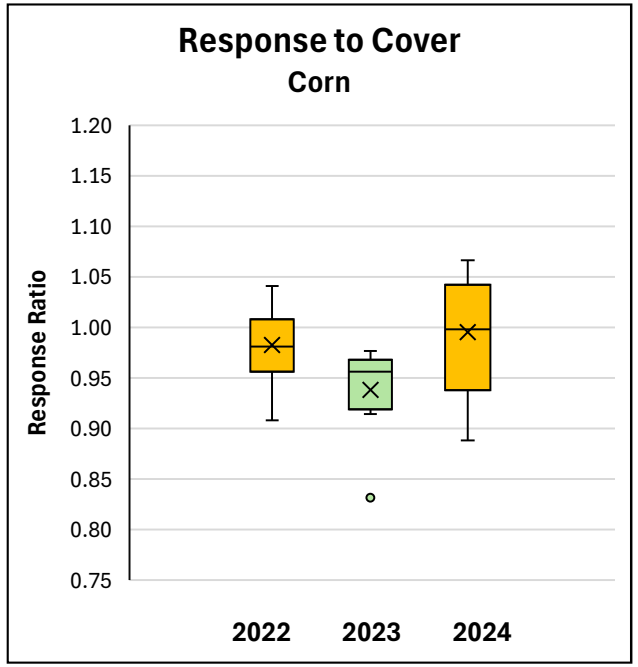


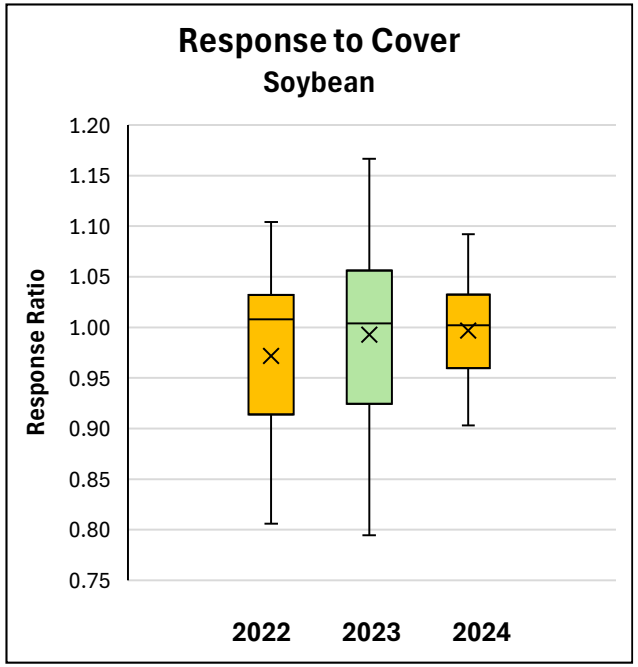
Response and return, all data

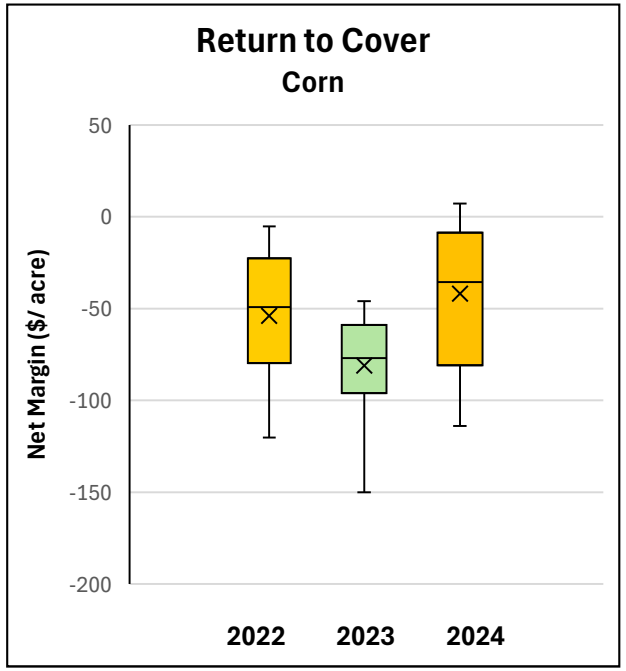


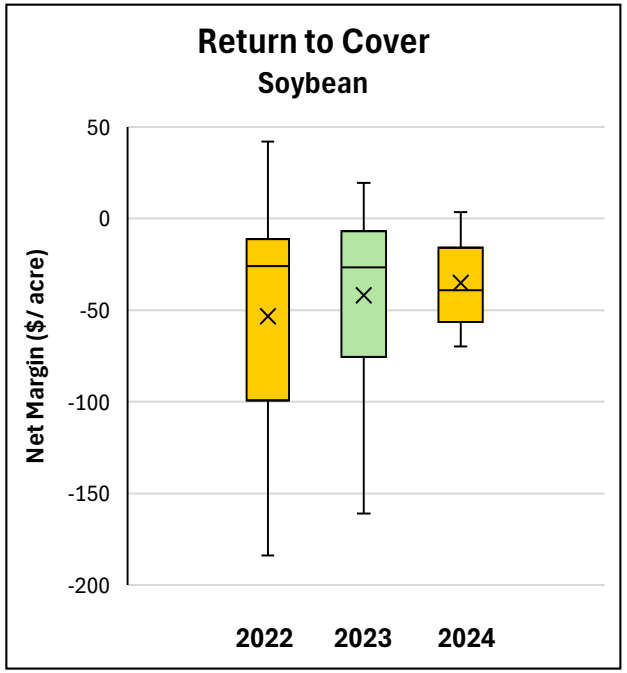


Response and return, annual

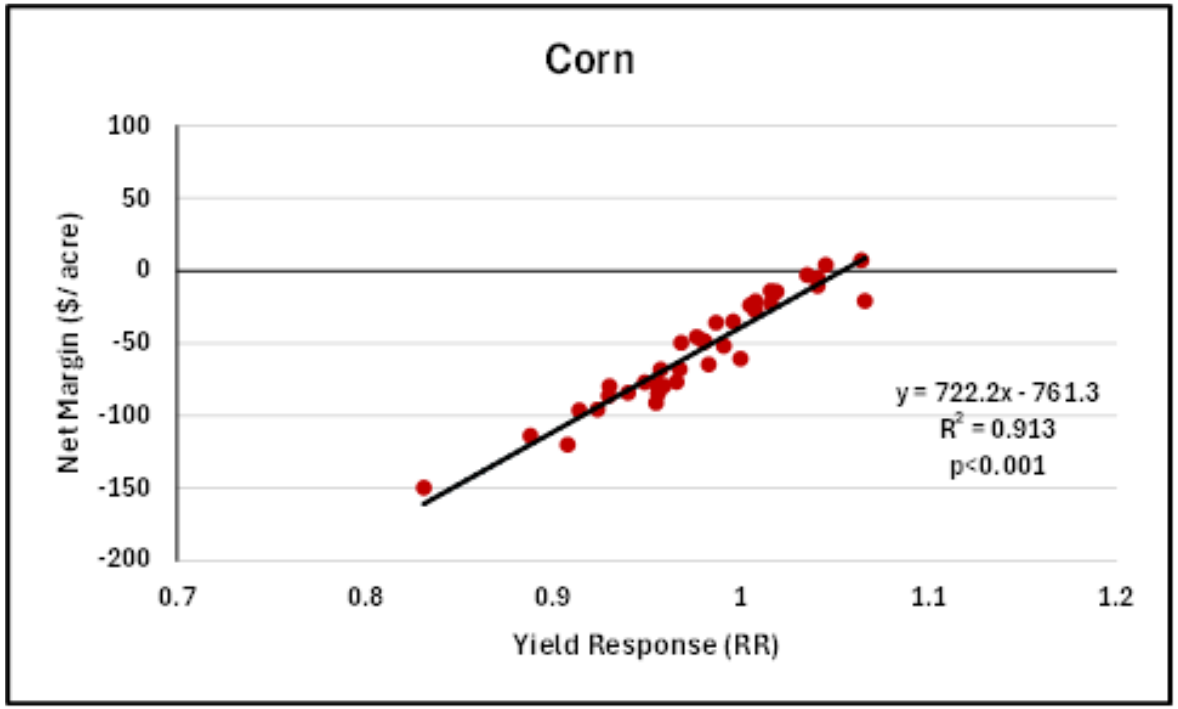


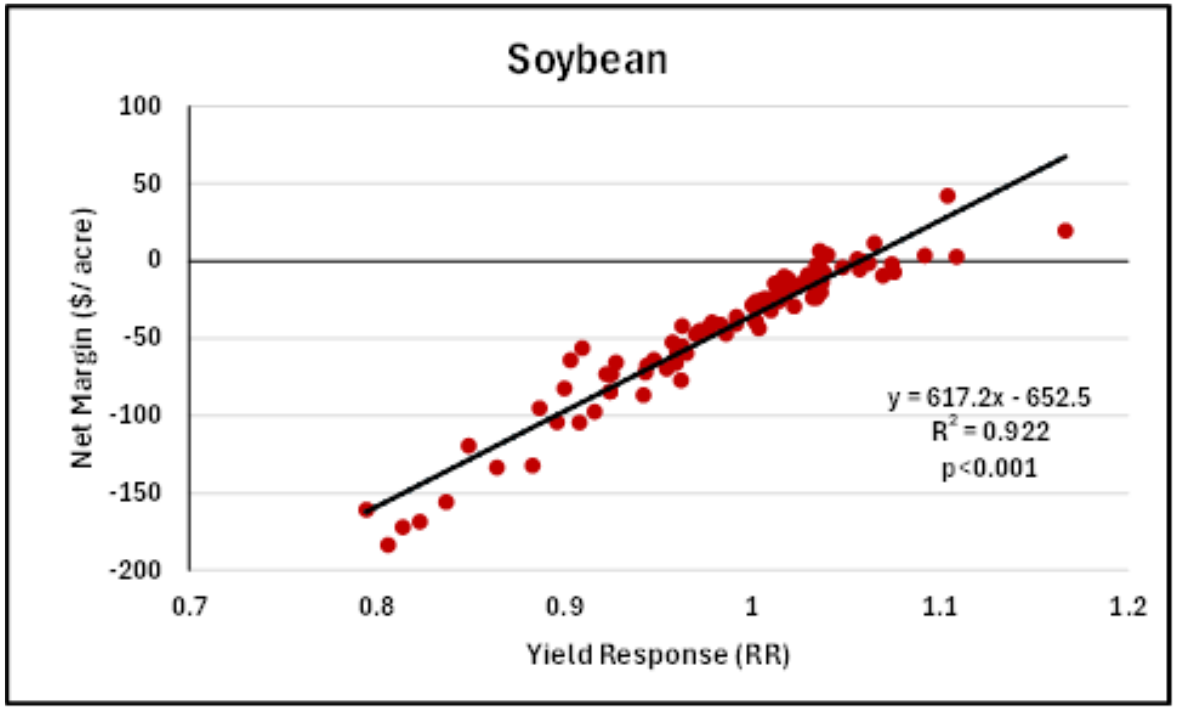






Relationship: Yield response and return





Response to management: Planting

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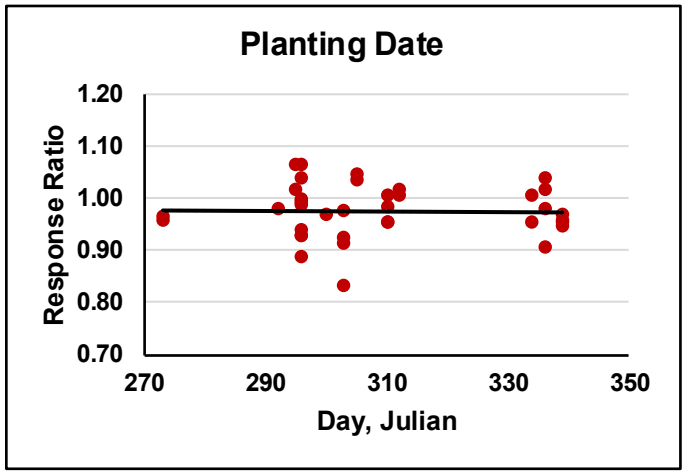
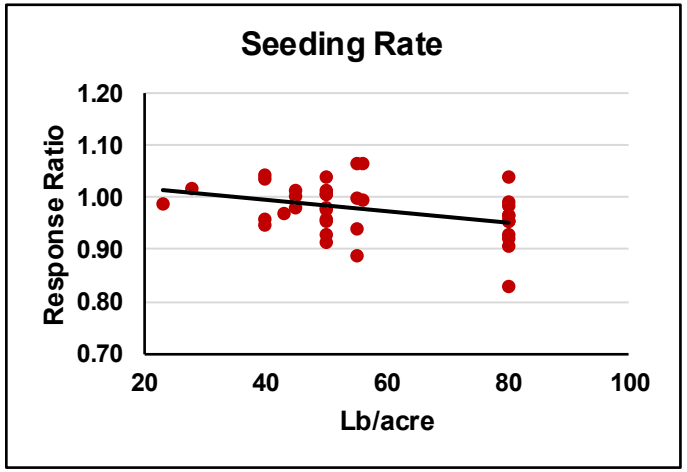
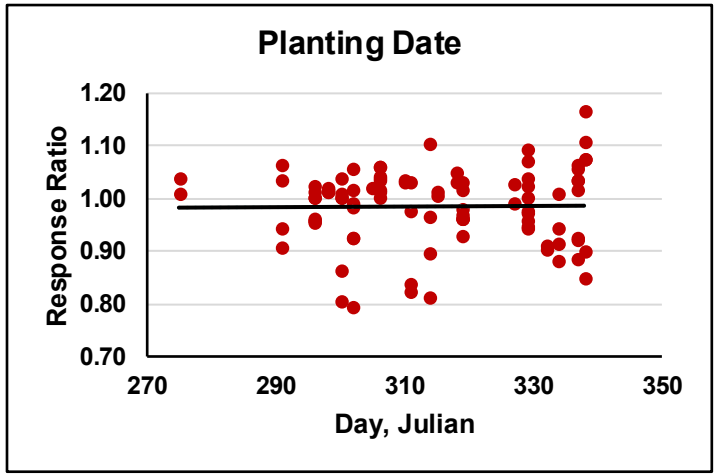
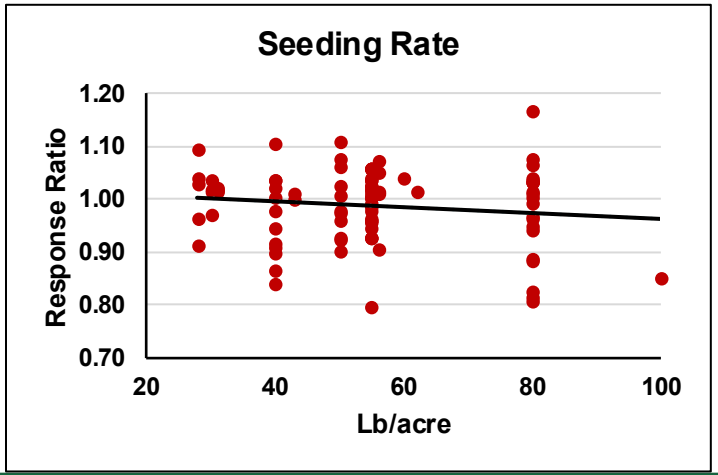
Corn





Soybean





Response to management: Termination

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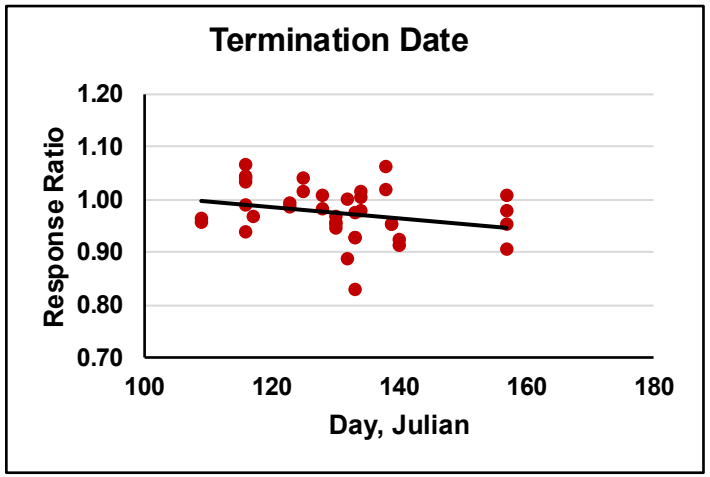
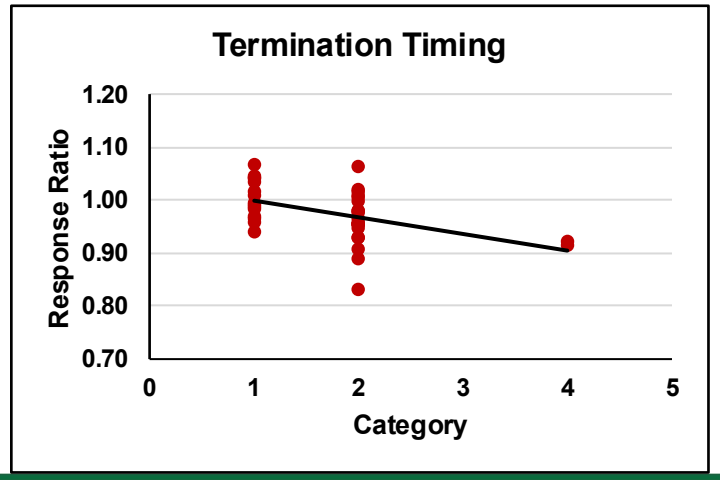
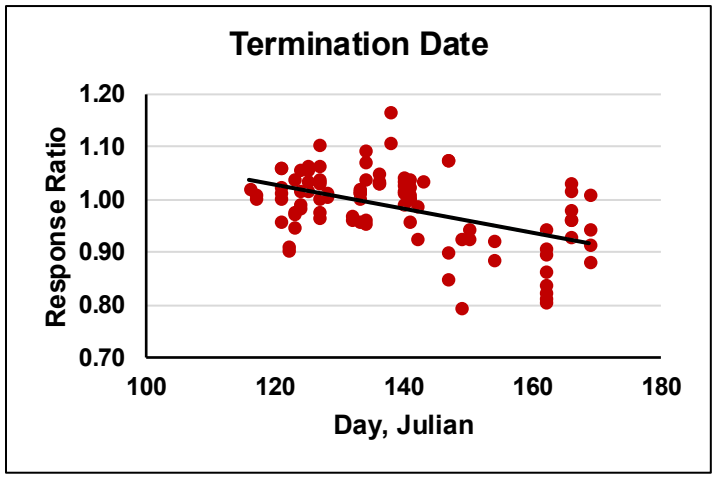
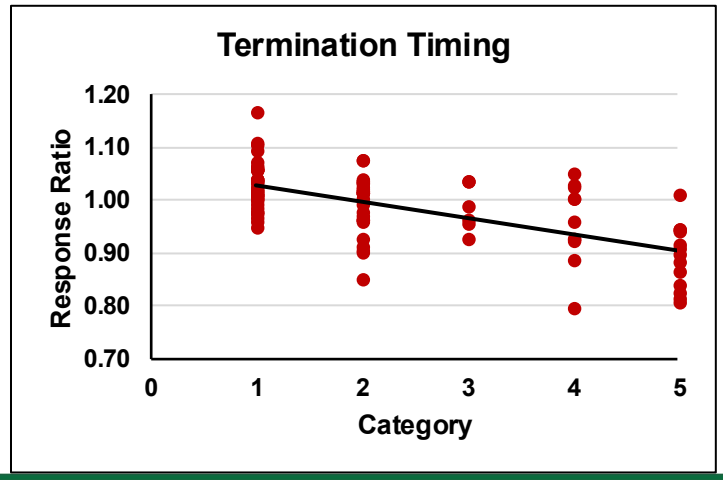
Corn





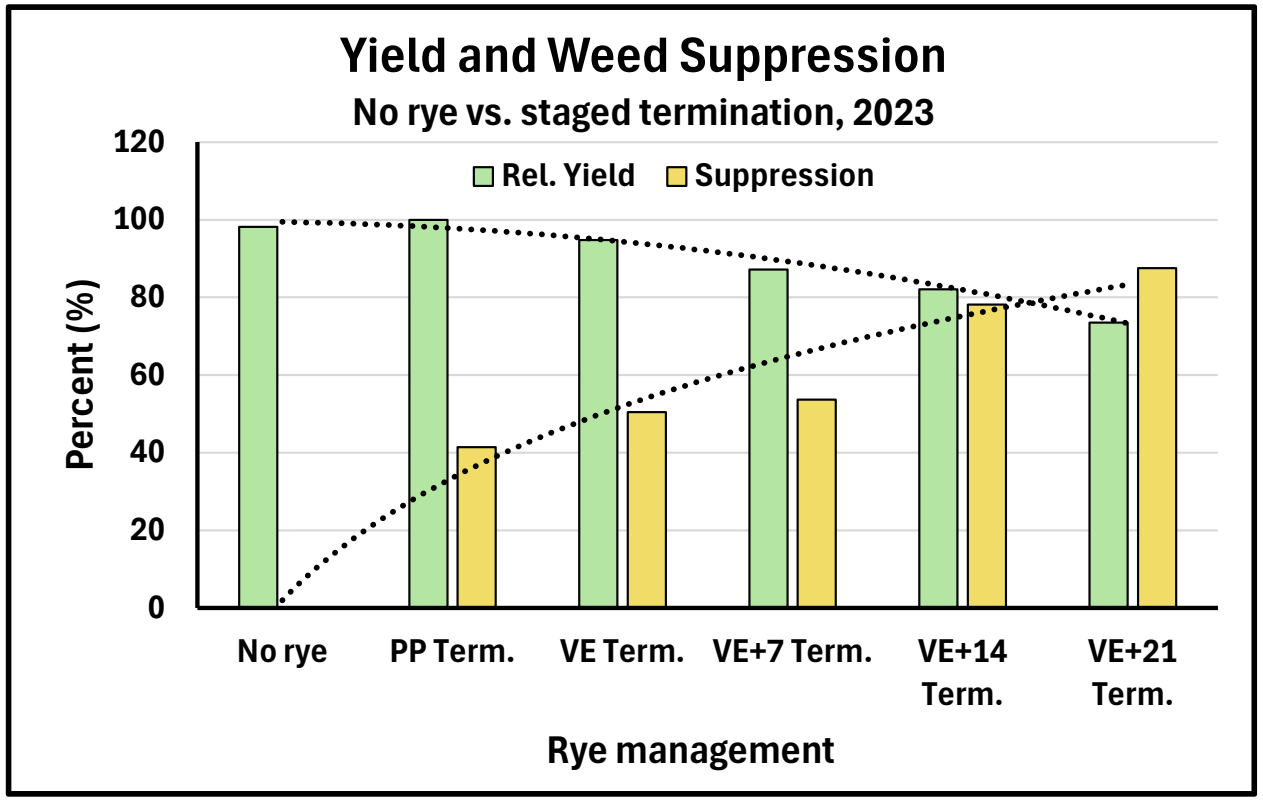
Soybean

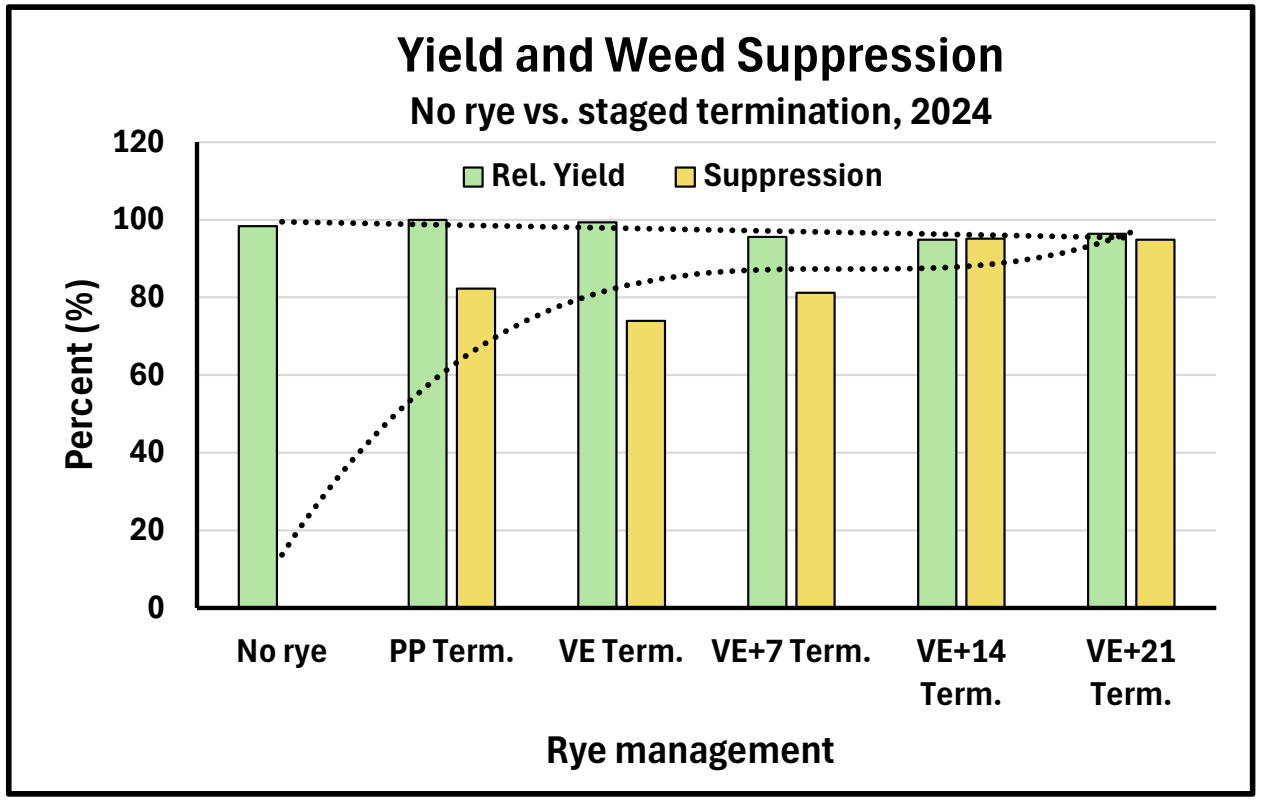




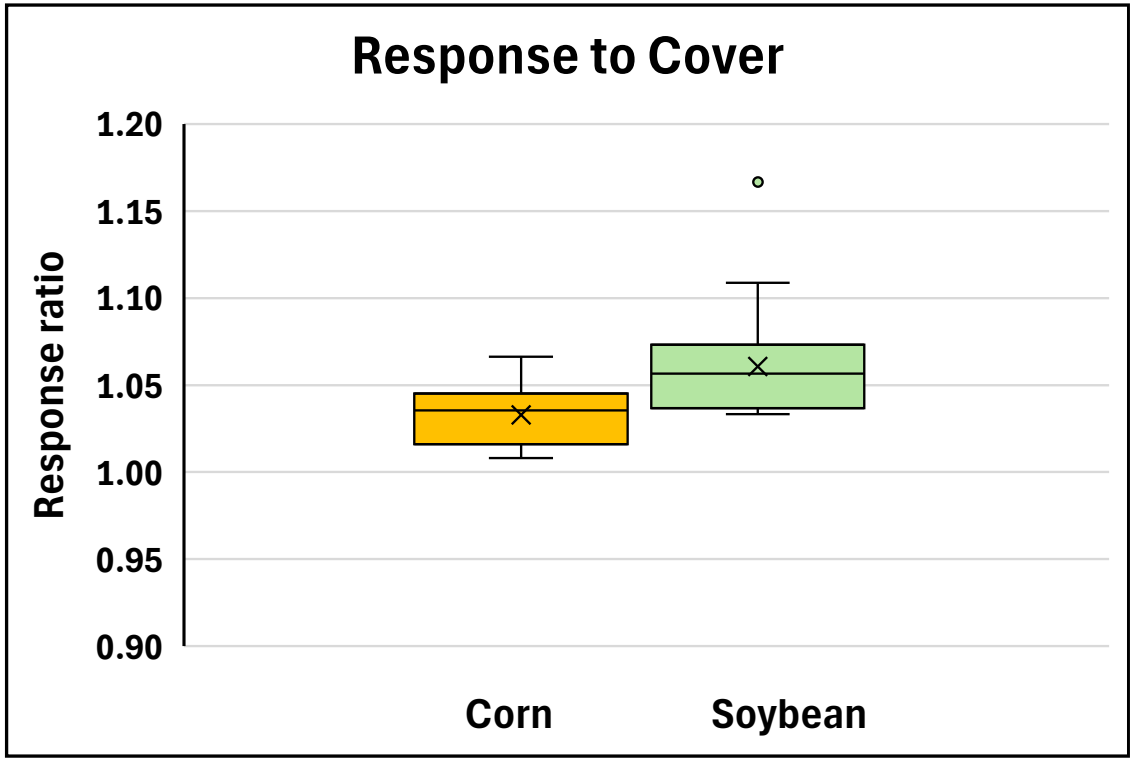
Termination: Finding the sweet spot

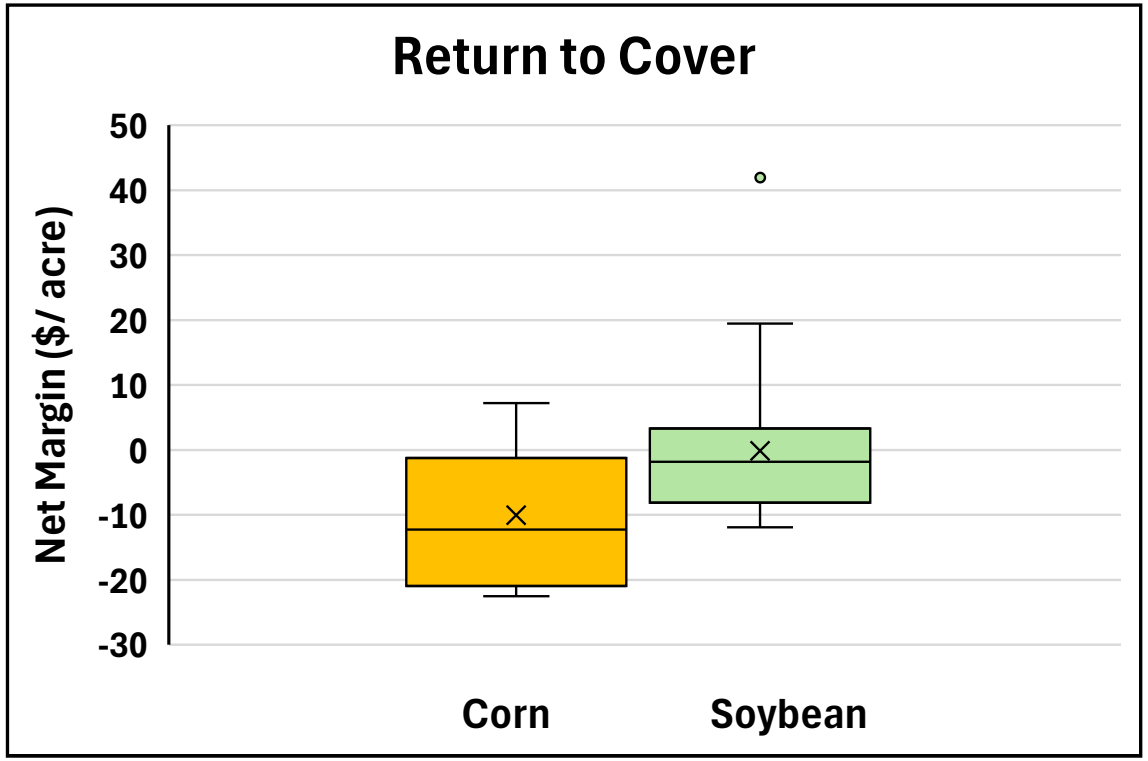
SARE Project ONC23-135



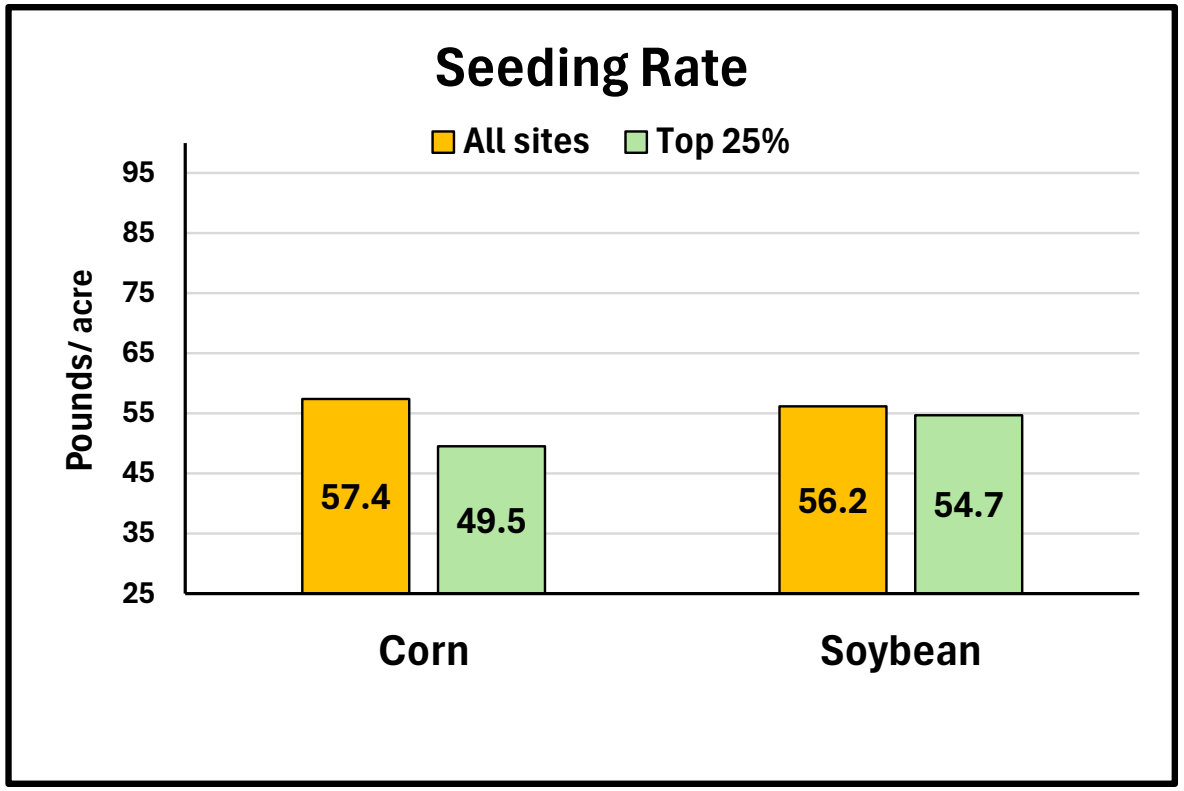


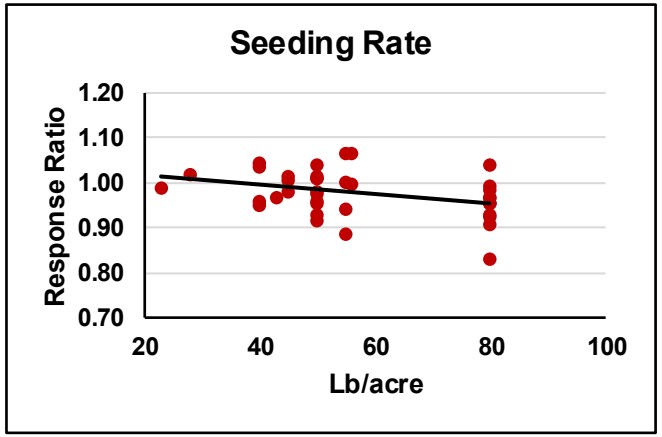
Top 25%: Response and return

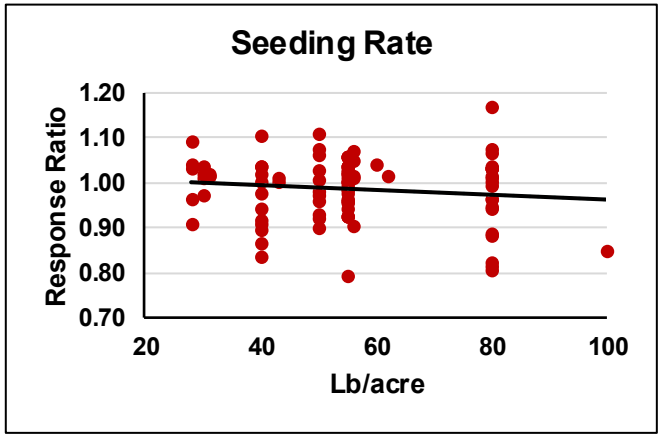




Practice validation: Seeding rate



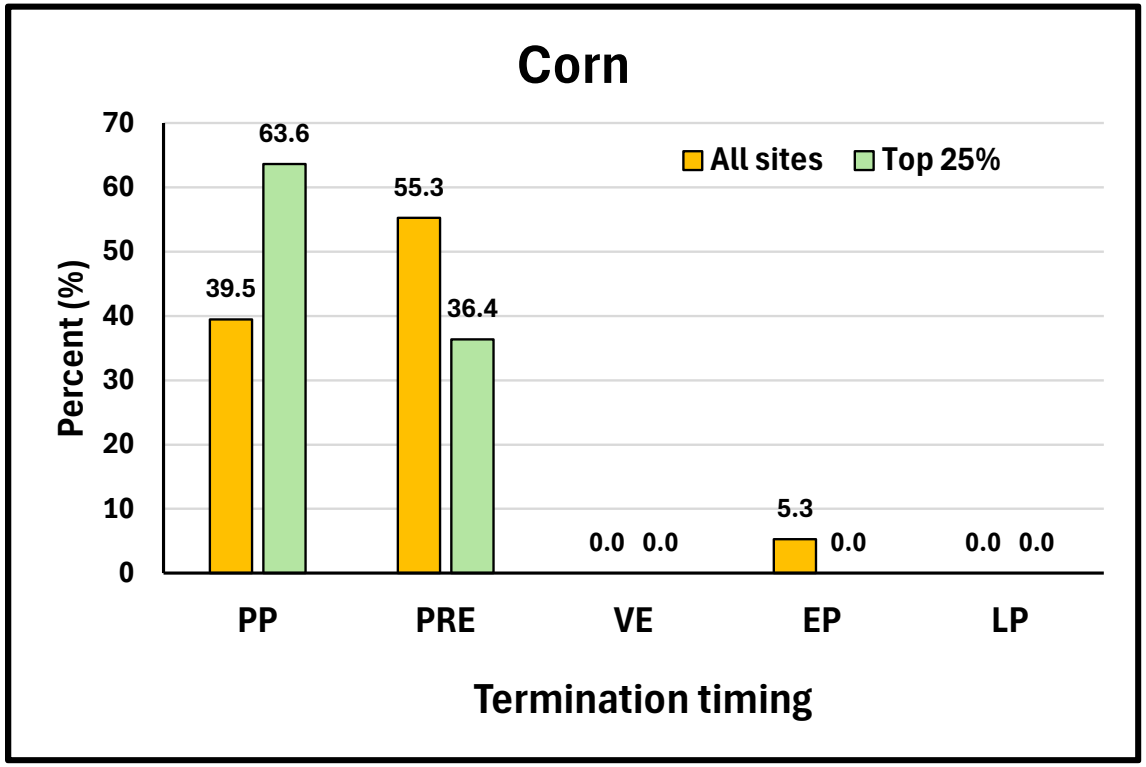


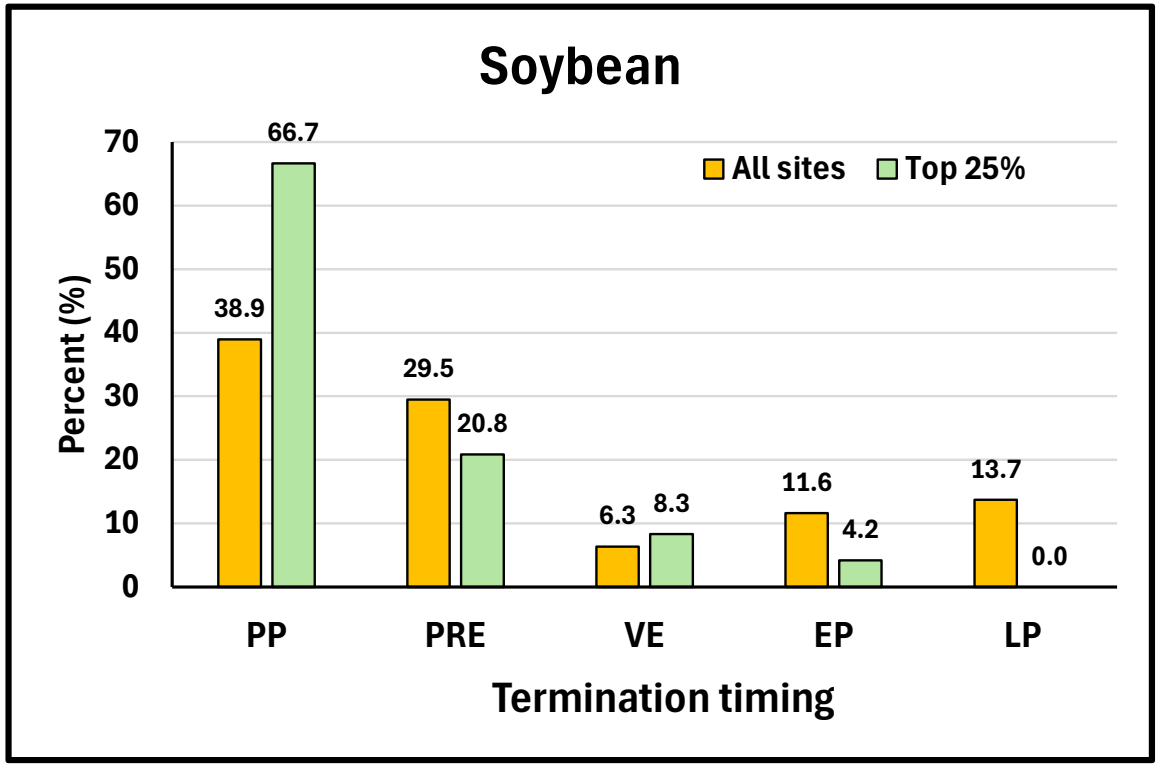


Corn
- 7.9 lb
-13.8 %

Soybean
-1.5 lb
-2.7 %

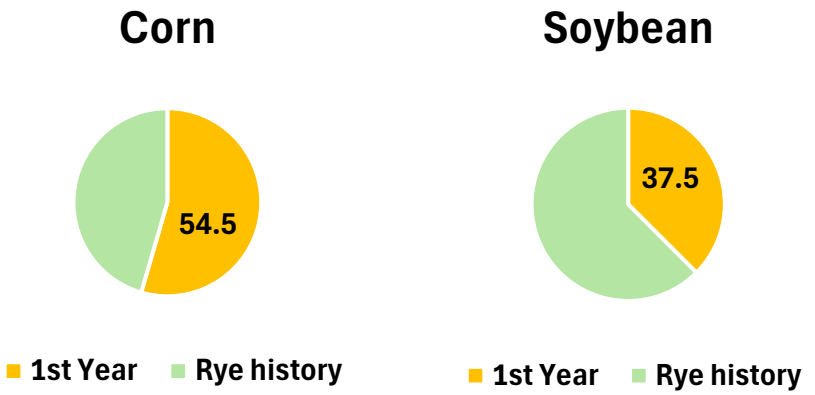
Practice validation: Termination timing





Top 25%: Insights

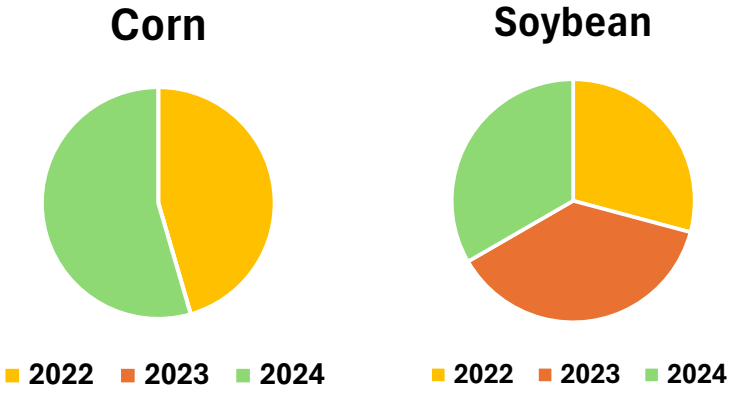
High percentage were “first-year” sites
- Less sensitive to seeding rate
- Rye appropriate for rental ground



Cost containment: Co-application of termination and residual herbicides

Soybean responsive under drought conditions

Losses represent a significant reduction in CC cost



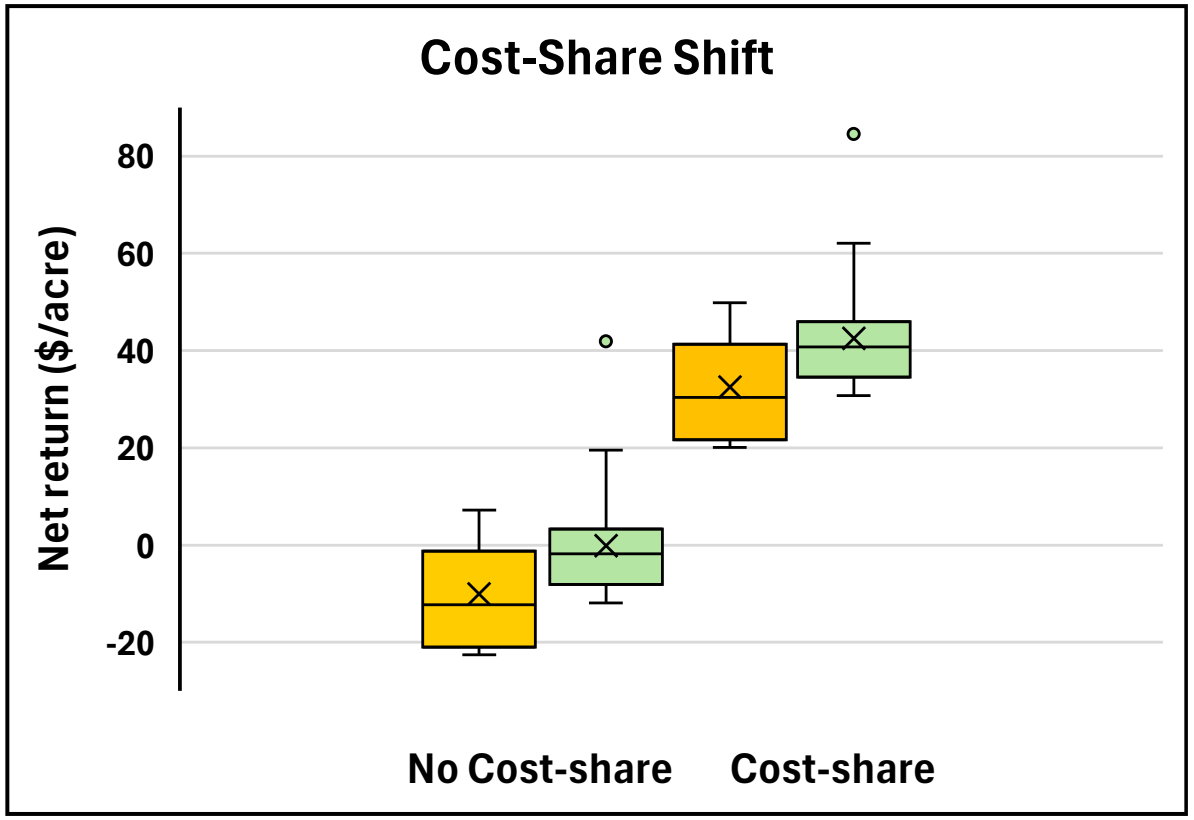
Corn responsive to supplemental N
- Data limited in current study, active area of study in Wisconsın

Best practices + cost-share

Guarantee for rental ground?
EQIP Example: WI (2022 rate)
$56.81, 75% payment

Example confounded
Noncompliance with 340 standard?

Minimum CS level: $22.54



Can cover crops pay? Takeaways

Return related to yield response, cost containment

Lower seeding rates
Earlier termination
Co-application, termination + residual

Soybean, greater probability of return

Less susceptible to drought conditions
Seeding rate < 55 lb/ a
Terminate before emergence

Corn, less forgiving

Greater sensitivity to dry conditions
Seeding rate < 50 lb/a
Terminate before emergence

First year response possible

Prevalent in the “Top 25%”
Appear more forgiving of management practices
Appropriate for rental ground

BMPs + Cost Share

Shift response distribution upward
Establish a floor to improve probability of a positive response

BMPs +/- Cost Share

Losses minimized, represent reduced CC cost

Can cover crops pay?

The Nature Conservancy
nature.org/Wisconsin

North Central SARE
Sustainable Agriculture Research & Education

SARE Project LNC21-456

Project Report:
https://northcentral.sare.org/project-reports/

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Dean Weichmann, Lake Mills
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Crop Consultants

Total Crop Management LLC
Soil Solutions Consulting LLC

Wisconsin Producer-led Groups

Dodge County Farmers HWHS
Jefferson County Soil Builders
Watershed Protection Racine