

# Can Cover Cropping & No-till Work in Northwest Wisconsin?



The Horse Creek Area Farmer-Led Watershed Council Has Some Answers



## Project Summary

The Horse Creek Area Farmer-Led Watershed Council has operated a no-till and cover crop test plot for the past 10 growing seasons. Treatments were designed to study how conservation practices impact agronomic productivity. The study was implemented in 2015, and treatments have been repeated annually in a corn grain-soybean rotation.

Treatments include:

1. No-till + No Cover Crop (NT+NoCC)
2. No-till + Multi-species Cover Crop (NT+MSCC)
3. No-till + Cereal Rye Cover Crop (NT+RCC)
4. Conventional Till + Cereal Rye Cover Crop (CT+RCC)
5. Conventional Till + No Cover Crop (CT+NoCC)

Treatments 1-4 represent different levels of conservation management, while treatment 5 represents conventional management.

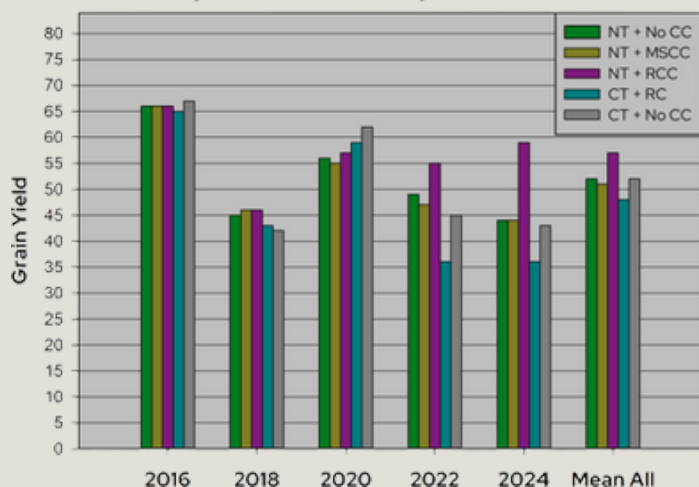
**Objective:** Does yield or economic return “drag” when implementing cover crops and/or no-till?



## Soybean Yield Results

Management had a significant effect on soybean yield in 3 out of 5 years and when averaged across all growing seasons. When averaged across all seasons, NT+RCC (purple) resulted in a statistically higher yield than all other treatments.

Soybean Grain Yields by Treatment



## Key Soybean Yield Takeaways

- Soybean yield was statistically the same over the first 2 rotations indicating management did not affect soybean yield.
- Yield was statistically different in 2020, 2022\*, and 2024\* indicating management affected yield.
- In 2018, no-till plots averaged 2-4 bu/ac greater yield than conventional till.
- In 2020, conventional till plots averaged 2-7 bu/ac greater yield than no-till.
- Over the first 3 rotations, average soybean yield between all treatments varied by 1.1 bu/ac or less.
- In 2022\*, 2024\*, and when averaged across all years:
  - No-till yielded the same or better than conventional till.
  - NT+RCC (purple) resulted in the highest yield.
  - NT+NoCC (green) yielded the same as CT+NoCC (grey).
  - CT+RCC (blue) resulted in the lowest yield.

**Study Notes\*:** In 2022 and 2024 a variety of factors led to poor soybean plant population across all treatments. Based on timing of planting, anticipated germination, and a pre-emergent herbicide application followed by a heavy rain event, it is hypothesized that herbicide injury was a contributing factor that caused plant injury and poor soybean stand establishment.

Data analysis was provided by the University of Wisconsin-Madison Division of Extension in collaboration with the Horse Creek Area Farmer-Led Watershed Council and Polk County Land and Water Resources Department.

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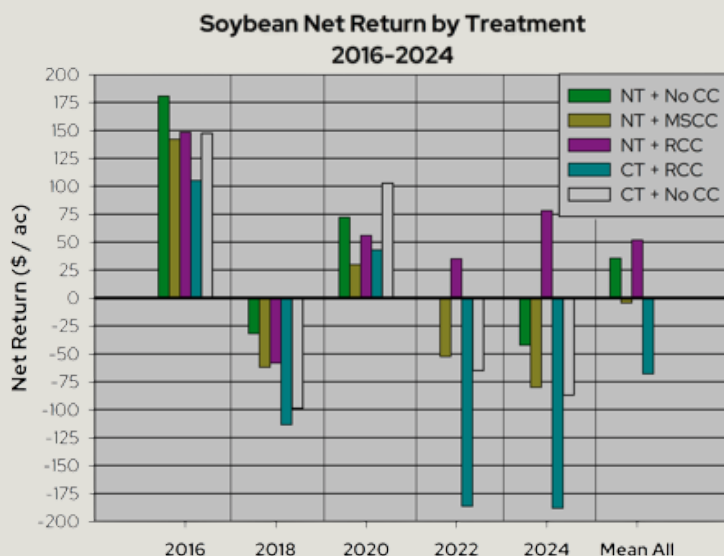


<https://farmerledwatershed.org/horse-creek-watershed/>



## Soybean Economics Results

Yield is great, but economic return is what pays the bills on the farm. The graph below displays the average net return (\$/acre) for each of the five treatments for each soybean year (i.e. 2016, 2018, etc.) and when averaged across all five soybean years (i.e. Mean All).



**Note:** Given assumed prices and production costs in this analysis (listed below), there were 3 soybean years (2018, 2022, 2024) where net return was negative for most or all treatments. These results are still relative to the analysis and treatments can be compared to determine which treatment resulted in “less loss”.



## Soybean Economic Assumption

- Soybean Value: \$10.00/bu (10-year USDA average)
- Tillage Cost: Chisel \$18.61/ac + Field Cultivation \$14.94/ac = \$33.55/ac
- Cover Crop Planting: \$15/ac
- Cover Crop Seed Cost:
  - Cereal Rye Cost: Seed Cost: \$10.25/bu @ Seed Rate 1.5 bu/ac = \$15.38/ac
  - Multi-species Cost: Seed Cost: \$1.40/lb @ Seed Rate 15 lb/ac = \$21.00/ac
- All other Soybean Production & Land Costs: \$484/ac



## Key Soybean Economic Takeaways

- In the first soybean year, NT+NoCC (green) resulted in a return of ~\$33/ac more than CT+NoCC (grey) and was more profitable in 4 out of 5 soybean years.
- In the first soybean year, NT+RCC (purple) was slightly more profitable (~\$1/ac) than the CT+NoCC (grey), and was more profitable in 4 out of 5 soybean years.
- In all years, CT+RCC (teal) resulted in significantly lower return than CT+NoCC (grey).
- In 2018 all treatments resulted in an economic loss. However, the three no-till treatments resulted in “less loss” than both conventional till treatments.
- In 2022\* and 2024\* NT+NoCC (green) and NT+MSCC (yellow) resulted in “less loss” than both conventional treatments while NT+RCC (purple) was the only treatment to produce a positive economic return.
- Averaged over all years, NT+NoCC (green), NT+RCC (purple), and CT+NoCC (grey) were the only treatments to result in a positive net return (~\$36, \$52, and \$1/acre respectively).
- YES, NT+NoCC and NT+RCC can pay the bills in NW Wisconsin, even without incentive programs!



## Analyzing the Corn-Soybean Rotation Together

When evaluating the economic outcomes of these different cropping systems on a 2-year rotation basis, average return over the rotation was highest in NT+NoCC (green) and NT+RCC (purple) with each providing \$138/ac return. NT+MSCC (yellow) and CT+NoCC (grey) netted nearly the same return (\$63 and \$64/ac respectively), while CT+RCC (teal) provided the lowest return at -\$1/ac.

