

# Cereal Rye as a Cover Crop in Soybean - Indiana

## Trial Objective

- Planting cereal rye as a cover crop can provide numerous short- and long-term agronomic and environmental benefits such as improved soil quality, decreased soil erosion and nutrient loss, and weed suppression.
- Cereal rye is a popular cover crop choice in Indiana due to its winter hardiness and ease of termination with herbicides or a roller/crimper.
- The objective of this study was to evaluate the difference in soybean stand, weed control, and crop yield between soybean planted into a cereal rye cover crop and no-till soybean without a cover crop.

## Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
West Lafayette, IN	Silt loam	Corn	Fall tillage; no spring tillage	05/24/2018	10/18/2018	55	140K

- The trial was planted with a 3.0 maturity group Roundup Ready 2 Xtend® soybean product.
- This trial was a split-block design with two replications. Each block (cereal rye and no-till) was one acre. Soybeans were planted in 30-inch rows with eight rows per treatment. Eight total rows were harvested for crop yield and averaged per treatment.
- Cereal rye was drilled at a 50 lb/acre seeding rate on November 10, 2017 after corn harvest and fall tillage.
- Crimping of cereal rye was conducted after planting when rye was in the flowering stage.
- Percent weed control ratings were taken 21 days after the POST treatment.
- The entire trial area was tilled in the fall of 2017. No spring tillage occurred in the trial area in 2018, and the trial was planted into a stale seedbed (i.e. “no-till” block) and the established cereal rye block on May 24.

**Table 1. Treatments and application timing.**

Treatment	Application Timing	Treatment Applied
1	At Planting	Crimp (Cereal Rye) with Roundup PowerMAX® herbicide (No-Till)
	POST	Roundup PowerMAX® + XtendiMax® herbicide with VaporGrip® Technology + DRA*
2	Burndown 14 DPP**	Roundup PowerMAX® + XtendiMax® herbicide with VaporGrip® Technology + DRA*
3	Burndown At Planting	Roundup PowerMAX® + XtendiMax® herbicide with VaporGrip® Technology + DRA*
4	Burndown 14 DPP**	Roundup PowerMAX® + XtendiMax® herbicide with VaporGrip® Technology + Valor® SX + DRA*
5	Burndown 14 DPP**	Roundup PowerMAX® + XtendiMax® herbicide with VaporGrip® Technology + Valor® SX + DRA*
	POST	Roundup PowerMAX® + XtendiMax® herbicide with VaporGrip® Technology + Warrant® Herbicide + DRA*

\*DRA – Drift Reduction Agent \*\*DPP – Days Prior to Planting

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## Understanding the Results

Table 2. Percent weed control 21 days after postemergence application timing.

Block	Treatment	Grass*	Small Seeded Broadleaf Weeds**	Large Seeded Broadleaf Weeds***
No-till	1	99	99	99
Rye	1	99	99	99
No-till	2	35	40	50
Rye	2	30	88	65
No-till	3	45	88	83
Rye	3	58	97	90
No-till	4	50	85	83
Rye	4	68	93	93
No-till	5	99	99	99
Rye	5	99	99	99

\*Grass – barnyardgrass, giant foxtail  
 \*\*Small-Seeded Broadleaf weeds – common lambsquarters, pigweed species  
 \*\*\*Large-seeded Broadleaf weeds – velvetleaf, giant ragweed

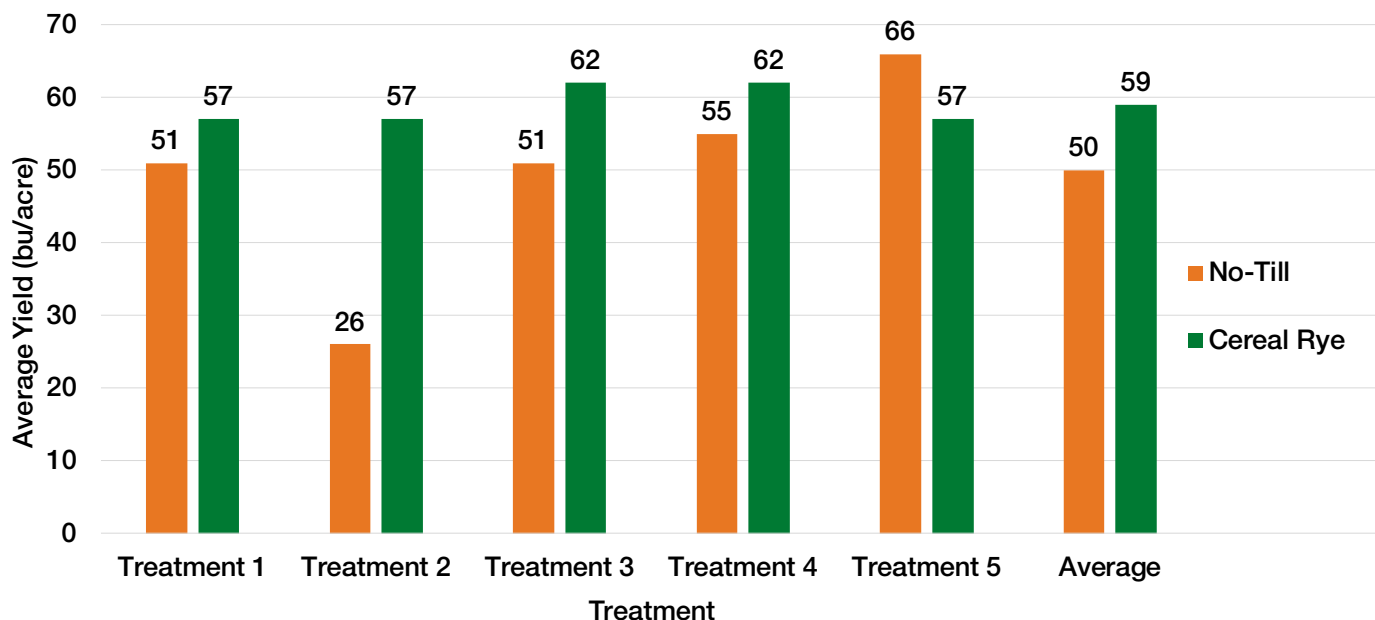


Figure 1. Average no-till soybean yield with and without a cereal rye cover crop in 2018.

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**Figure 2. Cereal rye cover crop treatments: rye ready to be crimped (A), herbicide application 14 days prior to planting (B), herbicide application at planting (C), soybean planted into rye prior to crimping (D), crimping of cereal rye following soybean planting (E).**

- Soybean emergence in the cereal rye block was a couple days later than in the no-till block regardless of treatment. Final stand counts were similar for each block.
- Soybean crop response from Valor® SX herbicide (i.e. leaf crinkling) was evident in the no-till block but absent in the cereal rye block.
- Cereal rye suppressed the emergence and growth of small- and large-seeded broadleaf weeds compared to the no-till block (Table 2). Grass control was similar between the two blocks.
- When averaged over all five treatments, utilizing a cereal rye cover crop resulted in an average 9 bu/acre yield advantage over no-till.

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## What Does This Mean For Your Farm?

- Cereal rye is one of the best cool-season cover crops for outcompeting weeds and has allelopathic suppression on some winter annuals, marestail, and some small-seeded summer annuals like pigweed species.<sup>1</sup>
- In this demonstration, utilizing cereal rye as a cover crop helped to suppress the emergence and growth of small- and large-seeded broadleaf weeds and showed a 9 bu/acre yield advantage over no-till (see \* in research site details).

## Sources:

<sup>1</sup> Bradley, K. 2017. A review of the effects of various cover crop species on winter and summer annual weed emergence. University of Missouri. <http://weedscience.missouri.edu>.

## Legal Statements

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**Glyphosate** will kill crops that are not tolerant to glyphosate. **Dicamba** will kill crops that are not tolerant to dicamba. **Glufosinate** will kill crops that are not tolerant to glufosinate. Contact your seed brand dealer or refer to the Technology Use Guide for recommended weed control programs.

**Roundup Technology®** includes glyphosate-based herbicide technologies.

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