



# 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



# Cereal Rye as a Cover Crop in Soybean - Indiana

## 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

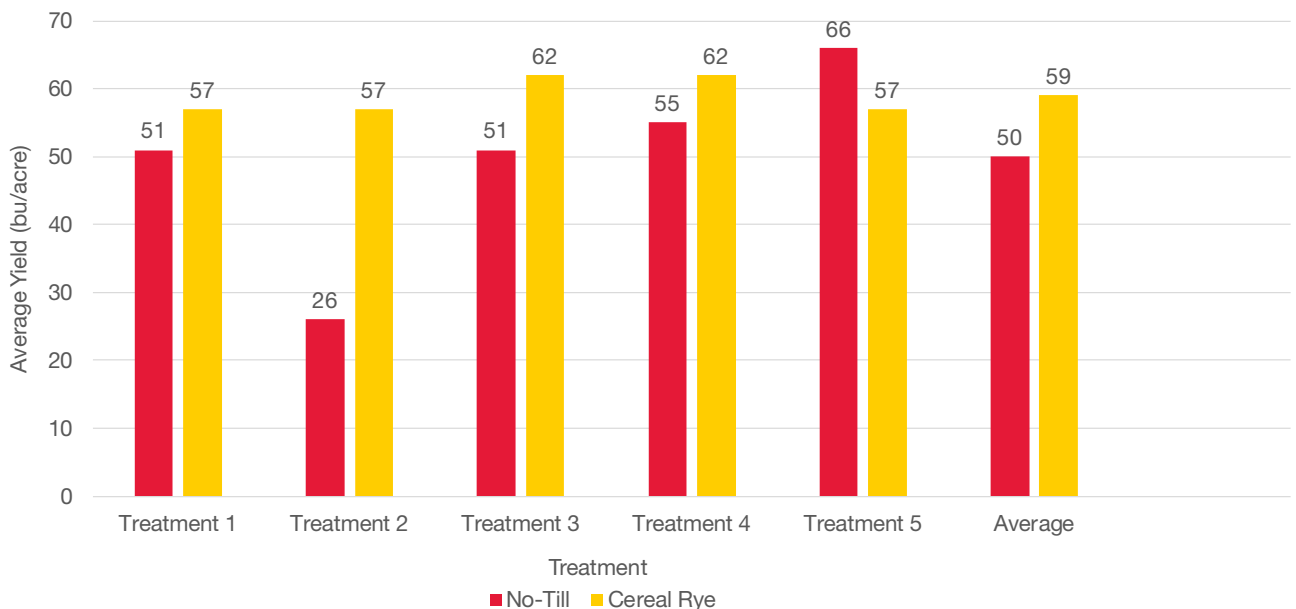


Figure 1. Average no-till soybean yield with and without a cereal rye cover crop in 2018.

# Cereal Rye as a Cover Crop in Soybean - Indiana



**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.

# Cereal Rye as a Cover Crop in Soybean - Indiana

## 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://weeds.cscience.missouri.edu>.

## Legal Statements

**XtendiMax® herbicide with VaporGrip® Technology is part of the Roundup Ready® Xtend Crop System and is a restricted use pesticide.** ALWAYS READ AND FOLLOW DIRECTIONS FOR USE ON PESTICIDE LABELING. It is a violation of federal and state law to use any pesticide product other than in accordance with its labeling. XtendiMax® herbicide with VaporGrip® Technology and products with XtendFlex® Technology may not be approved in all states and may be subject to use restrictions in some states. Check with your local product dealer or representative or U.S. EPA and your state pesticide regulatory agency for the product registration status and additional restrictions in your state. For approved tank-mix products and nozzles visit [XtendiMaxApplicationRequirements.com](http://XtendiMaxApplicationRequirements.com)

**Monsanto Company is a member of Excellence Through Stewardship® (ETS).** Monsanto products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Monsanto's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. This product has been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Excellence Through Stewardship® is a registered trademark of Excellence Through Stewardship.

**ALWAYS READ AND FOLLOW DIRECTIONS FOR USE ON PESTICIDE LABELING.** IT IS A VIOLATION OF FEDERAL AND STATE LAW to use any pesticide product other than in accordance with its labeling. NOT ALL formulations of dicamba or glyphosate are approved for in-crop use with Roundup Ready 2 Xtend® soybeans. ONLY USE FORMULATIONS THAT ARE SPECIFICALLY LABELED FOR SUCH USES AND APPROVED FOR SUCH USE IN THE STATE OF APPLICATION. Contact the U.S. EPA and your state pesticide regulatory agency with any questions about the approval status of dicamba herbicide products for in-crop use with Roundup Ready 2 Xtend® soybeans.

**Roundup Ready 2 Xtend® soybeans contains genes that confer tolerance to glyphosate and dicamba.**

**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.

**Performance may vary**, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

**ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Warrant® Herbicide is not registered in all states and may be subject to use restrictions. The distribution, sale, or use of an unregistered pesticide is a violation of federal and/or state law and is strictly prohibited. Check with your local dealer or representative for the product registration status in your state. Hubner Seed & Design™ and Hubner Seed™ are trademarks of Bayer Group. Roundup PowerMAX®, Roundup Ready 2 Xtend®, Roundup Technology®, VaporGrip®, Warrant® and XtendiMax® are registered trademarks of Bayer Group. Valor® is a registered trademark of Valent U.S.A. Corporation. All other trademarks are the property of their respective owners. ©2018 Bayer Group. All rights reserved. 181025164718 11142018

