

# Tillage System Plus Soybean Cover Crop Effect on Corn Production Following Wheat

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## Objective

To compare different wheat residue management systems for the following corn crop.

## Background

Cooperator:	OARDC NW Branch	Herbicide:	Aatrex, HarnessXtra,
County:	Wood		Roundup Ultra
Soil Type:	Hoytville clay	Corn Variety:	Beck's 5322
Previous Crop:	Wheat	Row Width:	30 inches
Fertilizer:	94-46-0 actual	Planting Date:	May 4, 2001
	N-P <sub>2</sub> O <sub>5</sub> -K <sub>2</sub> O	Harvest Date:	October 31, 2001

## Methods

The experimental design was a randomized complete block of four replications. A harvest yield of 65-bu/A wheat was harvested on July 10, 2000. After the wheat harvest, the stubble was mowed. Eight treatments were used. Treatments were four tillage systems: no-till, July chisel plus roterra, October chisel plus roterra, and October strip tillage with or without July planted soybeans. Plot size is 10 x 80 feet.

Cover crop soybeans were planted on July 21, 2000, with 90 lb/A Asgrow 3003 Roundup Ready soybeans. Soybean biomass was measured on September 26 before October tillage. Biomass samples consisted of removing cover crop above ground growth in one square foot and drying at 180F for 48 hours.

Corn was planted into the winter-killed soybean growth with no additional tillage in the spring for all eight treatments. Corn stalk population counts were done before harvest. Besides differences in tillage and the absence or presence of a soybean cover crop, all other inputs remained constant across all treatments. Nitrogen applied was purposefully kept low (94 lb/A total N) to allow the cover crop to express any nitrogen benefit.

Corn stalk population counts were taken from 1/1,000 of an acre, randomly, three times in each plot. The center of each plot was harvested, and yields were adjusted to 15.5% moisture.

## Results

**Table 1. Soybean Cover Crop Biomass.**

Area Planted	Dry Weight 9/26/00 (grams/ft <sup>2</sup> )
July chiseled area	14.7
Non-July chiseled	4.5
LSD (0.05)	NS
F	0.49
CV (%)	75.2

**Table 2. Corn Harvest Population and Yield.<sup>1</sup>**

Tillage Treatment	Cover	Population (stalks/A)	Yield (bu/A)
No-till	None	28,000 ab	141.7 bc
No-till	Soybeans	25,750 cd	136.3 c
July Chisel	None	24,750 d	152.1 abc
July Chisel	Soybeans	27,000 abc	162.1 a
October Chisel	None	27,000 abc	161.9 a
October Chisel	Soybeans	28,500 a	156.1 ab
October Strip Till	None	26,000 bcd	149.3 abc
October Strip Till	Soybeans	26,250 bcd	143.5 abc
	LSD (0.05)	2,209	18.8
	F	1.2	18.3
	CV (%)	5.6	8.5

<sup>1</sup> Means followed by the same letter are not significantly different at P = 0.05.

## Summary and Notes

Biomass results showed significantly more cover crop growth when planted after July chisel vs. no chiseling. For any of the four tillage systems, corn yield following soybean cover crop was not significantly different from having no cover crop.

July chisel followed by soybean cover crop and October chisel with no cover crop yielded significantly better than either no-till treatment.

This study did not take into account the soil quality benefits of planting a cover crop.

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