

# Evaluation of Tillage Systems Following Soybeans for Field Corn

## Objectives

To compare population and yield of field corn under four different tillage systems following soybeans.

## Background

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Soil Type:	Hoytville clay	Herbicides:	
Drainage:	Systematic tile	PRE (April 20):	4 qt./A Fieldmaster + 0.55 lb./A Atrazine 90DF + 22 oz./A Roundup WeatherMax + 17 lb./100 gal. AMS
Previous Crop:	Soybeans	Insecticide:	None applied
Tillage:	Variable (see Methods)	Hybrid:	Beck's Hybrids 5322 CB
Soil Test (2002):	pH 6.1, P 43 ppm K 124 ppm	Row Width:	30 inch
Fertilizer:	235 lb./A 6-26-30 2X2 banded at planting 190 lb./A nitrogen sidedressed as 28% UAN (May 28, 2004)	Planting Rate:	29,680 seeds/A
		Planting Date:	April 19, 2004
		Harvest Date:	October 12, 2004

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## Methods

Four tillage systems were replicated four times in a randomized complete block design. The four tillage systems included no-till, fall strip-till, fall deep till followed by spring field cultivate, and a shallow fall disking. Strip-till was performed on October 24, 2003, by using a six row 30 inch Trail Blazer strip till machine 9-10 inches deep. The fall deep till/spring cultivate treatment consisted of using an M&W Earthmaster disk/ripper 12 inches deep on October 24, 2003; followed by a spring field cultivation three inches deep with two passes of a Wilrich C-shank field cultivator on April 19, 2004. A three inch deep shallow disking was performed on October 24, 2003 with an International #37 disk. The study was planted using a John Deere 7000 Maxemerge six row planter. Each individual plot contained 12 rows 1,025 feet in length.

Percent residue was determined post-plant on April 28 by using a USDA-NRCS Crop Residue Management Kit. Early emergence populations (May 11, corn stage V1) and harvest populations (September 30) were estimated by counting the number of plants on each side of a 17.5 feet tape at three different locations in each individual plot. The average of the number of plants counted per 17.5 feet was converted to plants per acre. Yields were collected from one combine round (12 rows) in each plot. Individual plot weight and moisture was determined using a calibrated AgLeader PF3000 yield monitor in a John Deere 6620 combine. Yields reported in this study have been adjusted to a 15% moisture standard.

## Results

Table 1. Crop residue, population, moisture and yield means<sup>1</sup>

Tillage Treatment	Crop Residue (%)	Emergence Population (plants/A)	Harvest Population (plants/A)	Moisture (%)	Yield (bu/A)
Strip-till	23.6 b	29,900	29,000	15.9	196.7 a
No-till	32.1 a	29,700	28,800	16.0	192.5 a
Fall disk	17.9 c	29,600	28,700	15.9	192.8 a
Fall deep till/spring cultivate	3.4 d	30,000	28,700	15.9	185.9 b
LSD (0.05)	4.5	NS	NS	NS	5.3
F-test	72.4	<1	<1	<1	7.5
CV(%)	14.8	1.7	2.7	<1	1.7

<sup>1</sup>Means followed by the same letter in same column are not significantly different  
NS = not significant

Table 2. Yield means<sup>1</sup> by year.

Tillage Treatment	2001	2002	2003	2004
Strip-till	188.5 ab	101.7 b	167.1 a	196.7 a
No-till	192.6 a	97.8 c		192.5 a
Fall disk	185.2 bc	100.0 bc		192.8 a
Fall deep till/spring cultivate	183.2 c	114.2 a	171.9 a	185.9 b

<sup>1</sup>Means followed by the same letter in same column are not significantly different

## Summary

This is the third year for conducting this tillage trial at Farm Focus. Data from this year suggests that there were statistically significant yield differences among the tillage systems compared. In each of the years this trial has been conducted there have been statistical yield differences between some of the treatments. As Table 2 indicates, the treatment with the highest yield differs from year to year. Observations during the 2002 trial indicated significant dandelion pressure in the strip-till, no-till, and fall disked treatments that received no spring tillage prior to planting as a possible reason for yields that were lower than the fall deep tillage/spring field cultivated plots.

The results from these 3 years of four tillage comparisons, plus the comparison of conventional deep tillage to strip-tillage in 2003, would indicate that none of the tillage methods tested provided a consistent yield advantage over the others. Individual results for each year can be accessed on the Farm Focus website (<http://farmfocus.osu.edu>). The tillage cost savings that may be realized in the no-till and reduced tillage methods (strip-till and fall disking only) as compared to conventional tillage must be weighed against the cost of any additional herbicides needed to control weeds in these tillage systems. This will vary based upon individual farm's weed pressures.

## Acknowledgement

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