Evaluation of Tillage Systems Following Wheat for Field Corn

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Objectives

To compare population and yield of field corn under three different tillage systems following wheat.

Background

Cooperator:	Marsh Foundation/ Farm Focus
County:	Van Wert
Nearest Town:	Van Wert
Soil Type:	Hoytville silty clay loam
Drainage:	Tile
Previous Crop:	Wheat
Tillage:	See Methods
Soil Test (2002):	pH 6.4, P 48 ppm, K 135 ppm
Fertilizer:	250 lb/A 7-26-26 in row at planting 180 lb/A nitrogen sidedressed as 28% UAN on June 8, 2002
Herbicides:	
PRE (April 27)	3 qt/A Fultime 3 oz/A Hornet WDG 1 pt/A 2,4-D LVE
Insecticide:	6.7 oz per 1,000 row ft. Aztec 2.1G T-banded
Hybrid:	Walton Hybrids WX1800A
Row Width:	30 inch
Planting Rate:	29,120 seeds/A April 26, 2002
Harvest Date:	October 7, 2002

Methods

Three tillage systems were replicated four times in a randomized complete block design. The three tillage systems included no-till, fall strip-till, and fall deep-till followed by spring field cultivation. Strip-till was performed on November 15, 2001, using a sixrow 30-inch Trail Blazer strip-till machine 8 to 9 inches deep. The fall deep-till/ spring cultivate treatment consisted of using an M&W Earthmaster #1150 disk/ripper 16 inches deep on November 15, 2001, followed by a spring field cultivation three inches deep with one pass of a Wilrich C-shank field cultivator on April 26, 2002. The study was planted using a John Deere 7000 Maxemerge six-row planter. Each individual plot contained 12 rows and was 1,090 feet in length.

Percent residue data collection was completed post-plant on May 10 by using a USDANRCS Crop Residue Management Kit. Early season populations (May 29, corn stage V3-V4) and harvest populations (October 3) 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). Individual plot weight and moisture was determined using a calibrated PF3000 yield monitor in a John Deere 6620 combine. Yields reported in this study have been adjusted to 15% moisture standard.

Results

Table 1. Crop Residue, Population, Moisture, and Yield Means.[a]

Tillage Treatment	Residue (%)	Population at V3/V4 (plants/A)	Harvest Population (plants/A)	Grain Moisture (%)	Yield (bu/A)
No-till	57.8 a	23,700 b	23,700 a	18.3	103.8
Strip-till	46.0 b	24,600 a	22,200 b	18.2	103.1
Fall deep till/ spring cultivate	2.3 c	24,700 a	23,500 a	18	99.9
LSD (0.05)	8.5	600	1,100	NS	NS
F-test	141.7	8	7.3	<1	2.2

[a] Means followed by the same letter in the same column are not significantly different.
NS = Not Significant

Summary

This is the second consecutive year for conducting this tillage trial at Farm Focus. Data from this year indicates that there were no statistically significant yield differences among the three treatments although no-till and strip-till were 4 and 3 bu/ acre, respectively, above the deep-tilled plots. This agrees with the 2001 results and indicates that all tillage practices used in this study will provide similar yields following wheat. This held true for both years of the trial even though growing conditions were significantly different, resulting in much lower than normal yields in 2002. These yield results would also indicate that strip-till or no-till could be used following wheat to improve residue coverage without sacrificing corn yield.

Early populations under the no-till system were significantly lower than the strip-till or the conventional tillage populations. Corn emergence and growth were most likely slowed by cooler, wetter conditions under the no-till system. The slower, early season corn emergence did not have a negative effect on yield for the no-till management system. Again, this is consistent with results obtained from 2001. Significant differences in harvest populations among the three tillage systems are not expected and were most likely due to a series of environmental stresses experienced in 2002 such as frost, drought, and heat. These environmental stresses also most likely contributed to the overall stand reductions from the targeted seeding rates.

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