Corn Tillage System Comparison

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Objective

To evaluate the effect of tillage systems on yield of corn.

Background

Cooperator:	NW Branch	Fertilizer:	See Methods
County:	Wood	Planting Date:	May 29, 2002
Nearest Town:	Deshler	Planting Rate:	30,000 seed/acre
Drainage:	Tile, well-drained	Row Width:	30-inch
Soil type:	Hoytville, clay	Herbicides:	Harness Extra 2.4 qt/A,
Tillage:	See Methods		Atrazine 1 pt/A,
Previous Crop:	Soybeans		Roundup 26 oz/ A
Soil test:	pH 5.9, P 42 ppm, K 189 ppm	Harvest Date:	October 23, 2002

Methods

The entries were replicated four times in a randomized complete block design. Plot size was 10 x 70 feet, each entry. After the 2001 soybean harvest, the following fertilizer was applied: 100 lbs/ A of 0-46-0 and 150 lbs/ A of 0-0-60. On 11-05-01, fall tillage was performed on the soybean residue: strip-tillage, Aer-Way and Harrow, Zone-builder, and disk and field cultivator (stale seedbed). The remaining entry was untouched for no-till.

No further tillage was done, and corn was directly planted into soil as is in the spring (no spring tillage). At corn planting, 20 lbs/ A of 46-0-0 was placed 2 x 2. Sidedress application of 43 gal/ A of 28-0-0 was coulter injected in June. Harvest data were collected from the center two rows.

Results

Table 1. Corn Yield by Tillage System.[1]

Tillage System	Yield (bu/A)
Zone builder	63.1 a
Aerway	66.3 a
No-till	68.6 ab
Strip till	71.4 ab
Disk,field cultivator	79.5 b
LSD (0.05)	12.5
F-test	1.5

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

Table 2. Temperature and Rainfall Averages for 2002 and 30-Year Average (Normal), Northwestern Branch, Ohio Agricultural and Research Development Center, Custar, Ohio.

Time Period	Temperature		Rainfall	
	Observed (°F)	Average (°F)	Observed (in.)	Average (in.)
January	32.8	24.2	1.9	1.82
February	33.2	27.2	2.61	1.61
March	35.6	36.7	2.82	2.51
April	50.9	48.9	3.76	3.25
May 1-15	53.7	56.9	3.15	1.47
May 16-31	57.4	62.6	1.5	1.97
June 1-15	68.3	67.8	1.98	1.91
June 16-30	75.2	71.2	0.15	1.63
July 1-15	75.3	72.6	0.03	1.75
July 16-31	76.7	73	3.25	2.04
August 1-15	70.4	71.1	0	1.51
August 16-31	67	70.1	2.92	1.65
September	67.7	64	3.68	2.71
October	50.2	52.5	1.18	2.05
Total	—	—	25.68	25.64

Summary

Yields were extremely low due to late planting (May 29) followed by a lack of rainfall during the summer growing season. For that reason, no meaningful conclusions should be derived comparing the tillage systems.

Zone builder tillage (subsoiler) may have allowed the soil to dry out more than the other systems due to its 12- to 18-inch deep shank penetration, thus resulting in lower yields. This was consistent with results from other research at the same site in 2002.

Disking and field cultivation in the fall was in the highest-yielding group of treatments, but it also had the least amount of surface residue for soil protection from erosion.

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