Strip Tillage and No-Tillage Effect on Corn Production

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Objective

To evaluate corn response to fall strip-tillage soil preparation vs. spring no-tillage.

Background

Cooperator:	Jerry & Leon Klopfenstein	Fertilizer:	9-18-9 starter (4.3 gal/A)
County:	Paulding	Herbicide:	Acquire (1.5 pt/A)
Soil Type	Latty silty clay		Guardsman (4.6 pt/A)
Tillage:	See Methods	Hybrid:	Pioneer 37B23
Previous Crop:	Soybeans	Planting Date:	May 15, 2000
Soil Test:	pH 6.9, P 83.5 ppm,	Planting Rate:	29,900 seeds/A
	K 187 ppm, OM 4%	Row Width:	30 inches
		Harvest Date:	November 19, 2000

Methods

The experimental design was a randomized complete block design of field length (2,530 ft.) by eight-row-wide plots (0.87 acre) with five replications. The design for the temperature measurements was completely randomized. Fall strip-tillage was done on October 29, 1999, in a field that was no-tilled the previous five years. The first 100 feet of the field alongside the test area was strip-tilled to provide a buffer for the first treatment plot that was strip-tillage. A buffer of no-till was used on the opposite side of the field next to the last treatment plot that was no-till. Starter fertilizer was applied at planting in a 2" by 4" placement.

Results

Table 1. Soil Temperature on April 27, 2000 (8:45am, air temp. 51°F, avg. of 7 readings).

Location	Soil Temperature (°F)
Within tilled strips	49.1 a
Between tilled strips	46.3 b
No-till	47.6 ab
LSD (0.05) F = 3.0, CV = 4.5%	2.4

Means followed by the same letter are not significantly different.

Table 2. Corn Harvest Population and Yield.

Treatment	Harvest Population (plants/A)	Yield (bu/A)
Strip Till	28,227	141.0 a
No-Till	28,401	129.6 b
LSD (0.05)	NS	9
F<1	CV=2.4% F=12.2	CV=3.8%

Means followed by the same letter are not significantly different.

NS = Not Significant

Summary

There was not a large difference in soil temperature between the tilled strip and the no-till areas as some temperature experiments have shown. However, the soil temperatures within the strip-till strips were significantly warmer than temperatures outside those strips. The soil temperatures for the no-till areas were not significantly different from either strip-till area. This may have been due to the presence of an abundant night-crawler population and the lowered amounts of the previous year's soybean residue. The night crawlers had most of the residue in middens, exposing large areas of the soil surface.

The harvest plant populations were not significantly different between the tillage treatments.

On average, the strip-till yield was significantly higher than the no-till yield. The strip-till yields were consistent across all repetitions. The no-till yields, however, decreased across replications as the soil became more poorly drained. Therefore, one may conclude that strip-tillage may provide a greater yield advantage in more poorly drained soils.

For additional information, contact:

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