

No-Till vs. Chisel for Corn/Soybean Rotations

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Objective

To compare tillage effects on corn and soybean yields when using no-till and disk-chisel tillage systems in a three-year trial.

Background

Cooperator: Darke County Farm
County: Darke
Nearest Town: Greenville
Soil Type: Patton silty clay loam
Crosby silt loam
Drainage: Subsurface
Row Width: 30 inches

2000 Corn/ 1999 Soybean/ 1998 Corn Field

Soil Test: pH 6.5, P 38 ppm, K 175 ppm
Fertilizer: 18-46-0 135 lbs/A
0-0-60 100 lbs/A
150 lbs/A nitrogen as 28%
Herbicide: Leadoff (5 pt/A), Basis (1/3 oz/A), Banvel (3 oz/A)
Insecticide: Pounce (3 oz/A)
Variety: Pioneer 33R81
Planting Date: May 6, 2000
Planting Rate: 29,500 seeds/A
Harvest Date: October 25, 2000

2000 Soybean/ 1999 Corn/ 1998 Soybean Field

Soil Test: pH 6.1, P 70 ppm, K 210 ppm
Fertilizer: 0-46-0 100 lbs/A
0-0-60 125 lbs/A
Variety: Countrymark 3865
Planting Date: May 9, 2000
Planting Rate: 186,000 seeds/A
Harvest Date: October 11, 2000

Methods

There were six replications of two treatments in each field: Chisel vs. No-till. Experiment design was a complete randomized block design. Individual treatment plots were 12 rows (30 ft.) wide by lengths ranging progressively from 760 to 1,400 feet for this year's corn. Individual treatment plots were 12 rows (30 ft.) wide by 1,465 feet in length for the soybeans. The tilled plots were prepared using a soil commander disk ripper and once over with a field cultivator with cultipacker. Both crops were planted with a Buffalo slot planter into adequate soil moisture and adequate rainfall for good germination. As the crop developed, there were no obvious differences in the plots.

Results

Table 1. Corn and Soybean Yields.

Treatments	Corn Yield (bu/A)	Soybean Yield (bu/A)
No-Till	112.6	46.3
Chisel	125.1	47.3
Significance P = 0.05	NS F = 2.1, CV = 12.7%	NS F = 1.8, CV = 2.7%

Summary and Notes

There were no significant differences in yields between the two treatments. This experiment can best be summarized using the following chart showing corn and soybean rotation plots in two parts of the same field for the past three years.

Year	Field 1			Field 2		
	Crop	No-Till Yield (bu/A)	Chiseled Yield (bu/A)	Crop	No-Till Yield (bu/A)	Chiseled Yield (bu/A)
1998	Soybeans	47.1	47.7	Corn	106.1	138.2
1999	Corn	182.2	182.4	Soybeans	40.2	50.7
2000	Soybeans	46.3	47.3	Corn	112.6	125.1

For three years, there was virtually no difference in yields when comparing no-till to chiseled in Field N2 in a corn/soybean rotation. The field had been in no-till corn and soybean rotation from 1993 through 1997. The same experiment conducted in a contiguous part of the same field (Field N3) in 1998 and 1999 significantly favored the chisel-tillage system. It appears that there has been some factor in that particular part of the field that has limited yield when planting no-till corn or soybeans. It also appears that the limiting factor(s) may not have favored the chiseled system so much in 2000. The tillage comparison will be continued one more year with soybeans in Field N3 in 2001.

For additional information, contact:

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