

Soybean Residue: Tillage System Impact on Planting Time Soil Conditions and Corn Yield

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Objective

Determine differences in planting time soil conditions in three tillage systems for corn planted into soybean residue and their impact on corn yield.

Background

Cooperator:	OARDC Hoytville Farm	Previous Crop:	Soybeans
County	Wood	Planting Date:	May 19, 1998
Soil Type:	Hoytville clay	Planting Rate:	28,000 seeds/A

Methods

In November 1997 plowing and strip tillage were completed. Hourly soil temperature (2-inch depth in seed zone) was recorded on all plots from April 25, 1998, until May 17, 1998. Growing Degree Days (GDD) from 4/25/98 to 5/17/98 were calculated and totaled. On May 18, secondary tillage was performed on the plowed plots while strip tillage and no-till were undisturbed as planting occurred. Soil moisture was determined from two-inch deep soil samples collected one week and again at one day before planting. The wet vs. dry weight was converted to percent water. Soil temperature was recorded on May 26, 1998, under full sun at 3 p.m. at two-inch depth or the seed zone with an air temperature of 80 degrees F and corn at one-inch height. All data represent a minimum of three replications.

Results

	Growing Degree Days (April 25-May 17)	Soil Moisture (May 13, % water)	Soil Moisture (May 18, % water)	Soil Temperature (May 26, °F)	Emerged Population (plants/A)	Corn Yield (bu/A)
Fall Plow	294.3 A	18.3 A	16.7 A	80.0 A	28,250 A	210.1 A
Fall Strip Till	289.5 A	17.6 A	16.0 A	78.6 A	29,000 A	212.9 A
No-Till	267.0 A	23.1 B	20.7 B	76.1 B	28,250 A	215.3 A
LSD (0.05)	42.8	3.38	3.16	1.52	1,605	9.84

Treatment averages followed by the same letter are not significantly different from each other.

Summary and Notes

No-till soil temperature on May 26 was significantly cooler compared to plowing and strip tillage soil temperatures. However, total Growing Degree Days (GDD) were not significantly different for all three tillage systems. One may conclude that tillage had a significant effect on soil temperature.

Soil moisture was significantly higher under no-till. Tillage allowed the soil to dry better.

Corn population and yields were not effected by type of tillage. . From this one-year study, one may conclude that when planting corn into soybean residue, planting-time soil temperature did not influence corn yield. However, due to rain on May 3, planting was delayed until May 18. Soil temperatures were already high (more than 80 degrees), and the benefit of soil warming from various tillage systems may have not been expressed. This experiment will be repeated next year in order to achieve earlier planting into cool soil.

For additional information, contact:

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