

TILLAGE, PREVIOUS TILLAGE, AND THE NITROGEN REQUIREMENT OF WHEAT FOLLOWING FULL-SEASON SOYBEANS

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RESEARCH OBJECTIVE:

Determine whether the past and present soil management system (no-tillage vs. chisel plowing) will influence the fertilizer nitrogen requirement of wheat following full-season soybean.

METHODS:

Location	Fayette County/Spindletop
Soil Type and Drainage	Maury silt loam – well drained
Previous Crop	Soybean
Tillage	No-Tillage (Lilliston 9680) Chisel Plow + Secondary Discing
Cultivar	Pioneer 25R26
Planting Date/Rate	Oct., 26, 1999; 32.8 seed/sq.ft
Harvest Date	June 23, 2000
Fertilizer: Nitrogen	– 25% of all N rates on 3/2/99 75% of all N rates on 3/22/99
Herbicides: Harmony Extra	– 0.65 oz/ac on 11/23/99 Harmony Extra – 0.5 oz/ac on 3/7/00
Fungicides: Tilt 3.2EC	– 4 fl oz/ac on 5/3/00

Results: Average of 4 replications – see Table 1, next page.

CONCLUSIONS:

In this, the third year of this experiment, the tillage management had only a small effect on the average yield of wheat following soybean residues. There was a tendency for wheat to yield more with greater duration of no-tillage. There was a good average response (+13.7 bushels/acre) to fertilizer nitrogen (N), with yields increasing up to a total fertilizer N rate of 80 lb N/acre. There was an interaction between tillage and fertilizer N rate. The no-till wheat required more N (total of 80 lb N/acre) to optimize yield than did the chisel plow wheat (total of 40 lb N/acre). The more modest N response of tilled wheat was likely due to greater mineralization of N from organic matter. Lodging was observed in the chisel plow wheat at the two highest fertilizer N rates.

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Table 1. Effect of Tillage Sequence and Fertilizer Nitrogen On Wheat Yields

Fertilizer N Rate <u>Lb N/acre</u>	<u>Annual Tillage Sequence:</u>			N Rate <u>Avg.</u>
	1998	*CH	NT	
	1999	NT	CH	NT
	2000	NT	NT	CH
	----- Grain Yield (bu/acre) -----			
0	66.0c	66.0c	70.5c	67.5 c
40	81.1b	76.5b	80.0b	79.2ab
80	88.0a	81.3b	74.3bc	81.2a
120	80.3b	74.3bc	70.5c	74.8b
<u>Tillage Average</u>	78.8a	74.4a	73.9a	

*CH = chisel plow; NT= no-tillage