

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

John H. Grove

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 25R49
Planting Date/Rate	Oct. 16, 2003; 35.2 seed/sq.ft
Harvest Date	June 24, 2004
Fertilizer	Nitrogen – 25% of all N rates as 34-0-0 on 3/23/04 75% of all N rates as 34-0-0 on 4/14/04
Herbicides	Harmony – 0.5 oz/ac on 3/23/04 Brominal ME4 – 0.75 pint/ac on 3/23/04
Fungicides	Folicur – 8 fl oz/ac on 5/11/04
Results	Average of 4 replications – see Table 1, next page.

CONCLUSIONS:

In this, the seventh year of this experiment, the tillage management did not have a significant effect on the average yield of wheat following soybean residues. Yields were similar, regardless of whether chisel tillage or no-tillage establishment was used. Second year no-tillage yields tended to be greater than first year no-tillage yields, but this was not statistically significant (at the 90% level of confidence). The yield response to tillage contrasts with that observed in some earlier years. There was a large average response (+43.0 bushels/acre) to fertilizer nitrogen (N), with yields increasing up to a total fertilizer N rate of 80 lb N/acre. There was no statistically significant interaction between tillage and fertilizer N rate. Unlike some previous years, there was no trend for no-till wheat to require more N to optimize yield than chisel plow wheat. Lodging and disease pressures were greater at the highest fertilizer N rate, regardless of tillage rotation treatment.

TABLE 1. EFFECT OF TILLAGE SEQUENCE AND FERTILIZER NITROGEN ON WHEAT YIELDS

Annual Tillage Sequence:					
	2002	*CH	NT	NT	N Rate Average:
Fertilizer	2003	NT	CH	NT	
N Rate	2004	NT	NT	CH	
Lb N/Acre	Grain Yield (Bu/Acre)				
0		50.3	44.5	49.9	48.2c
40		79.2	67.6	78.1	75.0b
80		90.0	83.8	90.4	88.1a
120		93.7	92.5	97.5	94.5a
Tillage Average:		78.3a	72.1a	79.0a	
*CH = chisel plow; NT = no-tillage					