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

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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 2552
Planting Date/Rate	Oct 31, 2001: 32.7 seeds/sq ft
Harvest Date	July 1, 2002
Fertilizer:	Nitrogen – 25% of all N rates As 34-0-0 on 3/7/02 and 75% of all N rates as 34-0-0 on 4/5/02
Herbicides:	Harmony – 0.5 oz/ac on 4/16/02 Brominal ME4 – 0.75 pint/ac on 4/16/02
Fungicides:	Tilt 3.2EC – 6 fl oz/ac on 5/11/02
Results:	Average of 4 replications – See Table below

CONCLUSIONS:

In this, the fifth year of this experiment, the tillage management had a significant effect on the average yield of wheat following soybean residues. Yields were reduced with wheat established in a second year of no-tillage. This response contrasts with that observed in some earlier years. There was a large average response (+33.9 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.

Effect of Tillage Sequence and Fertilizer Nitrogen on Wheat Yields

	Annual Tillage Sequence:				
	2000	***CH**	**NT**	**NT**	
Fertilizer	**2001**	**NT**	**CH**	**NT**	**N Rate**
N Rate	**2002**	**NT**	**NT**	**CH**	**Average:**
Lb N/Ac	**Grain Yield (Bu/Ac)**				
0		31.7	38.0	43.3	37.7d
40		48.4	55.9	58.7	54.3c
80		68.3	72.2	74.3	71.6a
120		62.1	71.6	63.0	65.5b
Tillage Avg:		52.6b	59.4a	59.8a	

*CH = chisel plow; NT = no-tillage