

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

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OBJECTIVE:

Determine whether the 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. 24, 1998; 40.3 seed/sq ft

Harvest Date: June 23, 1999

Fertilizer: Nitrogen - 20% of all N rates on 12/16/98

20% of all N rates on 3/2/99

60% of all N rates on 4/5/99

Herbicides: Gramoxone Extra - 1 qt/ac on 10/23/98

Harmony Extra - 0.7oz/ac on 4/7/99

Brominal ME4 - 0.75 pt/ac on 4/7/99

Fungicides: Bayleton 50WP - 4 oz/ac on 5/8/99

Tilt 3.2EC - 4 fl oz/ac on 5/15/99

Results: Average of 4 replications - see Table 1, below.

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

Fertilizer N Rate (lb N/ac)			Grain Yield (bu/ac)	
Fall	Spring	Total	Chisel	No-Tillage
0	0	0	66.5c	67.9c
10	40	50	80.6a	82.8a
20	80	100	79.8a	79.1a
30	120	150	81.3a	73.0b

CONCLUSIONS:

In this, the second year of this experiment, wheat following chisel plowed soybean residues averaged 77.1 bu/ac, while no-till wheat was not significantly different, averaging 75.7 bu/ac. There was a good response (+13.5 bu/ac) to fertilizer nitrogen, with yields increasing with greater fertilizer N rate, up to a total N rate of 50 lb N/ac (40 lb N/ac in the spring). Tillage had little influence on the observed pattern in wheat yield response to fertilizer N. There was some decline in no-tillage wheat yields at the highest N rate, for which no cause was observed.