

YIELD OF NO-TILLAGE WINTER WHEAT AFTER SURFACE AERATION TILLAGE OF THE PREVIOUS CORN CROP'S RESIDUES

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Research Objective:

Determine the impact of surface aeration tillage on the yield response of otherwise no-tillage wheat to fertilizer nitrogen.

Methods:

Location: Fayette County/Spindletop

Soil Type and Drainage:

Mauzy silt loam – well drained

Previous Crop: Corn

Tillage: No-Tillage (Lilliston 9680)
Aeration Tillage/No-Tillage

Cultivar: Southern States 560

Planting Date & Rate:

Oct. 26, 2004; 39 seed/sq. ft.

Harvest Date: June 30, 2005

Fertilizer:

Nitrogen–30% of all N rates as
34-0-0 on 3/21/05

70% of all N rates as 34-0-0 on
4/11/05

Herbicides:

Harmony – 0.5 oz/ac on 4/04/05

Brominal ME4 – 0.75 pint/ac on
4/04/05

Fungicides:

Folicur – 8 fl oz/ac on 5/19/05

Results:

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

Conclusions:

Wheat yields were excellent, especially with the residues of the previous 200+ bu/acre corn crop. These residues were redistributed better, with a hay tedder, prior to the aeration treatments and fall wheat planting. Aeration tillage was done with a Genesis Tillage II unit equipped with helical tines and a Phoenix harrow. The aerator was not angled, giving a very passive pass over the corn residues, but clearly pushing a portion of the residue into the soil. There was a large average response (+64 bushels/acre) to fertilizer nitrogen (N), with yields increasing significantly, up to a total fertilizer N rate of 80 lb N/acre. There was no statistically significant interaction between the aeration treatments and fertilizer N rate. No-tillage without aeration tended to result in greater yields, but this was not statistically significant (at the 90% level of confidence). We continue to examine whether alternate methods of residue management will improve no-till wheat establishment and yield.

Table 1. No-Till Wheat Yield Response to Surface Aeration and Nitrogen

Fertilizer	Surface Aeration?		N Rate
N Rate	no	yes	Average:
lb N/acre	Grain yield (bu/acre)		
0	25.2	26.6	25.9c
40	60.9	54.4	57.7b
80	83.9	82.7	83.3a
120	95.7	83.5	89.6a
Aeration Average:	66.4a	61.8a	