

# YIELD OF NO-TILLAGE WINTER WHEAT AFTER SURFACE AERATION TILLAGE OF THE PREVIOUS CORN CROP'S RESIDUES – MAURY SILT LOAM

John H. Grove, Plant and Soil Sciences Department  
Department of Plant and Soil Sciences  
University of Kentucky, Lexington, KY 40546  
PH: (859) 257-5852: Email: [jgrove@uky.edu](mailto:jgrove@uky.edu)

## **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: Maury silt loam-well drained  
Previous Crop: Corn  
Tillage: No-Tillage (Lilliston 9680)  
Aeration Tillage/No-Tillage  
Cultivar: Southern States 8302  
Planting Date & Rate:  
Oct. 25, 2006; 30 seed/sq. ft.  
Harvest Date: June 26, 2007  
Fertilizer: Nitrogen – 40% of all N rates  
as 34-0-0 on 3/21/07  
60% of all N rates as 34-0-0 on  
4/09/07  
Herbicides: Gramoxone – 1 quart/ac on  
10/30/06  
Harmony – 0.5 oz/ac on  
4/19/07  
Brominal ME4 – 0.75 pint/ac  
on 4/19/07  
Fungicides: Folicur – 8 fl oz/ac on 5/13/07  
Results: Average of 4 replications – see  
Table 1, next page.

## **Conclusions:**

Wheat yields were below average, due in part to freeze injury. These residues were redistributed with a hay tedder prior to the aeration treatments. Aeration tillage was done with a Genesis Tillage II unit equipped

with helical tines and a Phoenix harrow. The aerator was gently angled, giving a passive pass over the corn residues, but clearly pushing a portion of the residue into the soil. There was a large average response (+28 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, though there was a trend for aeration to give lower yields than no-tillage at the two lower N rates, but greater yields than no-tillage at the two higher N rates. On average, aeration did not result in significantly (at the 90% level of confidence) greater yields. After three years of work, without positive yield response, we conclude that aeration offers little improvement to no-till wheat establishment and yield.

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

Fertilizer N Rate	Surface Aeration?		N Rate Average:
	No	Yes	
Lb N/acre	Grain Yield (bu/acre)		
0	28.2	27.2	27.7c
40	51.0	50.6	50.8b
80	53.3	57.6	55.5a
120	53.0	54.4	53.7ab
Aeration Average:	46.4a	47.5a	