

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

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## **Research Objective:**

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

## **Methods:**

Location: Fayette County/Spindletop  
Soil Type and Drainage:  
Loradale silt loam – well drained  
Previous Crop: Corn  
Tillage: No-Tillage (Lilliston 9680)  
Aeration Tillage/No-Tillage  
Cultivar: Southern States 8302  
Planting Date & Rate: Oct. 26, 2004;  
41 seed/sq. ft.  
Harvest Date: July 1, 2005  
Fertilizer: Nitrogen–0, 35, 75, 105 lb  
N/acre as 34-0-0 on 3/21/05  
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.

## **Discussion/Conclusions:**

No-till wheat yields were excellent, especially with the residues of the previous 180+ bu/acre corn crop. These residues were redistributed better, with a hay tedder, prior to the aeration treatments and fall wheat planting. A Genesis Tillage II unit equipped with helical atines and a Phoenix harrow was used to make the aeration treatments. The helical aeration was not angled, giving a very passive pass over the corn residues, but clearly pushed a portion of the residue into the soil. There was one treatment with the Phoenix harrow engaged and another with the harrow disengaged. There was a large average response (+51 bushels/acre) to fertilizer nitrogen (N), with yields increasing significantly, up to a total fertilizer N rate of 105 lb N/acre. There was a statistically significant interaction between the aeration treatments and fertilizer N rate. Aeration tended to result in greater yields, but only at the highest N rate. The simple effect of aeration treatment was not statistically significant (at the 90% level of confidence), though there was a trend for improved yield with aeration. 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**

<b>Aeration/Phoenix Tillage?</b>					
<b>Fertilizer</b>	<b>Aeration?</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>N Rate</b>
<b>N Rate</b>	<b>Phoenix?</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>Average:</b>
<b>Lb N/Acre</b>	<b>Grain Yield (bu/acre)</b>				
<b>0</b>		<b>44.1</b>	<b>43.8</b>	<b>40.9</b>	<b>42.9d</b>
<b>35</b>		<b>66.9</b>	<b>68.6</b>	<b>65.8</b>	<b>67.1c</b>
<b>70</b>		<b>80.6</b>	<b>85.9</b>	<b>83.3</b>	<b>83.3b</b>
<b>105</b>		<b>85.8</b>	<b>102.5</b>	<b>94.2</b>	<b>94.2a</b>
<b>Aeration/Phoenix Average</b>		<b>69.4a</b>	<b>75.2a</b>	<b>71.1a</b>	