Effect of Nitrogen Rate on Corn Yield

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Objective
To compare corn yields over 3 nitrogen rates.

Background

Crop Year: 2008
Test Location: OSU Unger Farm
County: Crawford
Nearest Town: Bucyrus
Drainage: systematic subsurface
Soil type: Blount
Tillage: field cultivator
Previous Crop: soybeans
Variety: Pioneer 34K77
Herbicide: Laudus 3 oz/ac+ atrazine 1 pt/ac

Soil test: pH 6.8, P 26 ppm

Planting Date: April 25, 2008
Row Width: 30 inches
Fertilizer: starter, 10 gallons 9-18-9
Fertilizer: side-dress -3 rates
Rainfall: May 1 - Oct. 1, 18.1 inches
Harvest Date: October 16, 2008

Methods

This study used a randomized complete block design to compare corn yields over 3 nitrogen rates. The three treatments were replicated four times. Corn was planted with a 12 row cyclone planter on April 24, 2008. Starter fertilizer at the rate of 9-18-9/acre was applied at planting. Treatments were applied on July 2 with a John Blue 28% nitrogen applicator. Plots were from 609 to 625 feet long and 30 feet wide and were harvested with a 6 row combine on October 16, 2008.

Treatments
30 gallon 28% (90 lbs/a) nitrogen
40 gallon 28% (120 lbs/a) nitrogen
50 gallon 28% (150 lbs/a) nitrogen

Results

<table>
<thead>
<tr>
<th>Treatment (N/ac)</th>
<th>Moisture %</th>
<th>Test Weight lb/bu</th>
<th>Corn Yield bu/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>90lbs/a</td>
<td>18.0</td>
<td>58.4</td>
<td>182.0 a</td>
</tr>
<tr>
<td>120 lbs/a</td>
<td>18.0</td>
<td>58.0</td>
<td>178.5 a</td>
</tr>
<tr>
<td>150 lbs/a</td>
<td>18.0</td>
<td>58.0</td>
<td>185.2 a</td>
</tr>
</tbody>
</table>

LSD (P=0.025)
Summary

Yield differences between the side dress nitrogen treatments were not statistically significant in 2008. In 2007, there was not a statistical difference between the 2 higher side dress nitrogen rates. Only the low rate of side dress nitrogen was statically different. These studies do support current OSU recommendations published in the Tri-State Fertility Guide as well as new economic based recommendations available at agcrops.osu.edu.