Nitrogen Response in Corn Study

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Objective
To determine the effects of nitrogen rates on corn yields and provide data for nitrogen response curves.

Background
Crop Year: 2014
Location: Allen Township
County/Town: Darke/Bradford
Soil Type: Celina Silt Loam
Drainage: Systematic with 40 foot Laterals
Previous Crop: Soybeans
Tillage: No-Till
Soil Test: pH 6.7, P 37 ppm M III, K 203 ppm
Planting Date: May 7, 2014
Nitrogen: Varied
Seeding Rate: 33,000
Harvest Date: October 11, 2014

Methods
Six nitrogen rates were replicated three times in a randomized complete block design. Treatments were planted with a 12 row Kinze planter. All treatments received the same tillage, herbicide applications. Seed used was Dekalb 6116. Planting included a 2x2 application of 28% at a rate of 35 pounds of actual N except for the zero N treatment. The other treatments were side dressed with 28% to reach the treatment levels. Stand counts were taken at V6 by obtaining 2 counts per treatment and calculating the simple average. Plots were harvested with a commercial combine equipped with a 6 row corn head. Yields and moistures were obtained by using a calibrated yield monitor. Yields were verified using a grain cart. Yields were shrunk to 15.5% moisture. Precipitation data was obtained from cocorahs.org and recorded daily.

Treatments
1. 0 pounds of N
2. 50 lbs N
3. 100 lbs N
4. 150 lbs N
5. 200 lbs N
6. 250 lbs N
## Results

<table>
<thead>
<tr>
<th>Nitrogen Treatment # Actual</th>
<th>Acres</th>
<th>Wet Moisture</th>
<th>Treatment Average</th>
<th>Return over N $ of lower treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.35</td>
<td>18.5%</td>
<td>71.5</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>0.35</td>
<td>20%</td>
<td>114.8</td>
<td>$104.90</td>
</tr>
<tr>
<td>100</td>
<td>0.35</td>
<td>20.6%</td>
<td>160.3</td>
<td>$111.59</td>
</tr>
<tr>
<td>150</td>
<td>0.35</td>
<td>20.9%</td>
<td>195</td>
<td>$70.10</td>
</tr>
<tr>
<td>200</td>
<td>0.35</td>
<td>21.1%</td>
<td>206.5</td>
<td>$9.50</td>
</tr>
<tr>
<td>250</td>
<td>0.35</td>
<td>22.0%</td>
<td>214.8</td>
<td>-$0.10</td>
</tr>
</tbody>
</table>

Total rainfall April 15 thru October 15 was 20.44 inches.

LSD = 13.75 (p<0.00); CV 6.31; Significant Difference.

## Summary

Corn yield was influenced by nitrogen rates. There was significant difference in yield of the corn as affected by the rate of nitrogen. Moisture levels at harvest increased as rates of Nitrogen increased. An economic comparison between the nitrogen rates of 200 and 250 pounds revealed a $.10 loss over yield increase. Assumptions were nitrogen cost of $.50 per pound and corn at $3.00 per bushel.

## Acknowledgement

The author expresses appreciation to on-farm collaborators Overholser Farms for the land use, planting and harvesting of this plot.

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