Corn Population Study, Darke County

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Objective
To determine the effects of corn seeding rate on corn yields to determine best management practices for corn seeding rates and provide data points for determining variable rates for corn seeding.

Background
Crop Year: 2018  
Location: Harrison Township  
County/Town: Darke/New Madison  
Soil Type: Crosby Silt Loam  
Celina Silty Loam  
Drainage: non-systematic  
Previous Crop: Soybeans  
Tillage: Minimum Tillage  
Planting Date: May 8, 2018  
Nitrogen: 200 units/acre  
Seeding Rate: Varied  
Harvest Date: October 29, 2018  
Rainfall: 18.17 inches, April - August

Methods
Six corn populations, including the farmer’s typical variable rate, were replicated three times in a randomized complete block design. Treatments were planted with a 16 row Kinze planter, field length and .93 acres each. The farmer’s variable rate ranged from 26,000 to 38,000 in 4,000 unit increments and were prescribed based on soil type. All treatments received the same tillage and herbicide applications. Variety used was Pioneer P0483AM and PO977AM in a split planter. Stand counts were taken at V4 by obtaining two counts using 1/1,000th of an acre per treatment and calculating the simple average. Plots were harvested with a commercial combine equipped with a 12 row header. Yields and moistures were obtained using a calibrated yield monitor. Yields were adjusted to 15.5% moisture. Precipitation data were obtained from cocorahs.org and recorded daily.

Results

<table>
<thead>
<tr>
<th>No.</th>
<th>Target Planting Population</th>
<th>V4 Stand Count</th>
<th>Grain Moisture %</th>
<th>Treatment Average (bu./acre)</th>
<th>Return Above Seed ($/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22,000</td>
<td>21,125</td>
<td>16.1</td>
<td>227 c</td>
<td>718</td>
</tr>
<tr>
<td>2</td>
<td>26,000</td>
<td>20,250</td>
<td>15.9</td>
<td>235 b</td>
<td>732</td>
</tr>
<tr>
<td>3</td>
<td>30,000</td>
<td>24,938</td>
<td>16.3</td>
<td>246 a</td>
<td>756</td>
</tr>
<tr>
<td>4</td>
<td>34,000</td>
<td>30,000</td>
<td>16.4</td>
<td>246 a</td>
<td>742</td>
</tr>
<tr>
<td>5</td>
<td>38,000</td>
<td>31,813</td>
<td>16.3</td>
<td>253 a</td>
<td>753</td>
</tr>
<tr>
<td>6</td>
<td>farmer variable</td>
<td>28,625</td>
<td>16.2</td>
<td>252 a</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Grain Moisture CV %: 1.52 not significant - Yield LSD (0.10): 7.72, CV%: 2.57
Summary
In this plot, there was not a significant difference in the grain moisture at harvest. There was a significant difference in yield between the two lower seeding rates and the three higher seeding rates. The optimal return above seed cost per acre was the 30,000 rate.

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