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: Monroe Township
County/Town: Darke/Gordon
Soil Type: Crosby Silt Loam
Brookston Silty Loam
Drainage: non-systematic
Previous Crop: Soybeans
Tillage: No Till
Planting Date: May 7, 2018
Nitrogen: 200 units/acre
Seeding Rate: Varied
Harvest Date: October 12, 2018
Rainfall: 18.17, 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 1.36 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 organic matter. All treatments received the same tillage and herbicide applications. Variety used was Channel 210-26VT2PRIB. 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 an eight 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>14.6 a</td>
<td>206 d</td>
<td>644</td>
</tr>
<tr>
<td>2</td>
<td>26,000</td>
<td>25,750</td>
<td>15.7 b</td>
<td>214 c</td>
<td>658</td>
</tr>
<tr>
<td>3</td>
<td>30,000</td>
<td>28,688</td>
<td>16.0 b</td>
<td>220 bc</td>
<td>665</td>
</tr>
<tr>
<td>4</td>
<td>34,000</td>
<td>32,625</td>
<td>16.1 b</td>
<td>222 b</td>
<td>658</td>
</tr>
<tr>
<td>5</td>
<td>38,000</td>
<td>36,688</td>
<td>16.1 b</td>
<td>229 a</td>
<td>669</td>
</tr>
<tr>
<td>6</td>
<td>Variable Rate</td>
<td>30,563</td>
<td>15.8 b</td>
<td>223 ab</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Grain Moisture LSD (0.10): 0.49 CV %: 2.50

Yield LSD (0.10): 6.49, CV %: 2.39
Summary
In this plot, there was a significant difference in the grain moisture at harvest between the 22,000 population and the other populations. There was a significant difference in yield 38,000 seeding rate yielding significantly better than the other rates. The 38,000 return above seed cost per acre was the best.

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