Effect of Seeding Rate on Corn Yield

Eric Richer, Ohio State University Extension Educator, Fulton County

Objective
To determine effects of corn seeding rate on grain yield and profitability.

Background
Crop Year:       2015
Location:        Fayette, OH
County:          Fulton
Soil Type:       Colwood/Dixboro loam
Drainage:        Systematic tile
Previous Crop:   Soybeans
Tillage:         No-till
Planting Date:   May 10, 2015

Soil Test (2014): pH 6.7, P* 90 ppm, K 161 ppm
CEC 12.5, OM 2.9%

Nitrogen:        200 lbs at split at plant and sidedress

Harvest Date:    October 30, 2015
Rain (Apr-Sept): 22.1”

Mehlich III extractant

Methods
This trial was designed with four treatments replicated three times in a randomized complete block design. Treatment plots were field length (at least 1,000 feet) by 15 feet wide. A 12-row Kinze 3600 planter was used to plant the plot. The seed used was Pioneer 0210 AMX. All treatments received the same starter fertilizer, herbicide and sidedress nitrogen. Stand counts were taken prior to harvest by obtaining 8 counts per treatment and calculating the simple average. Plots were harvested with commercial combine. Yields and moistures were measured by using a calibrated Ag Leader yield monitor. Yields were shrunk to 15% moisture. Precipitation data was obtained from the nearest CoCoRaHS station (OH-WL-5).

Treatments:
1. 23,000 seeds per acre
2. 28,000 spa
3. 33,000 spa
4. 38,000 spa

Results
Table 1. Corn Yield (bu/ac) Response to Seeding Rate

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Harvest Stand</th>
<th>Moisture</th>
<th>Dry Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>23,000 seeds/ac</td>
<td>22,100 plants/acre</td>
<td>18.3%</td>
<td>152.1 b</td>
</tr>
<tr>
<td>28,000 spa</td>
<td>27,300 ppa</td>
<td>18.3%</td>
<td>159.8 ab</td>
</tr>
<tr>
<td>33,000 spa</td>
<td>32,600 ppa</td>
<td>18.6%</td>
<td>171.3 a</td>
</tr>
<tr>
<td>38,000 spa</td>
<td>38,500 ppa</td>
<td>18.8%</td>
<td>158.5 ab</td>
</tr>
</tbody>
</table>

LSD (p<.05) = 15.8 (cv 4.92)

agcrops.osu.edu

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: go.osu.edu/cfaesdiversity.
Summary

Table 2. Effect of Seeding Rate on Profitability

<table>
<thead>
<tr>
<th>Seeding rate (x1,000)</th>
<th>Yield Bu/acre</th>
<th>Gross Revenue per acre</th>
<th>Seed Cost per acre</th>
<th>Net Revenue per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>152.1</td>
<td>$532.35</td>
<td>$79.12</td>
<td>$453.23</td>
</tr>
<tr>
<td>28</td>
<td>159.8</td>
<td>$559.30</td>
<td>$96.32</td>
<td>$462.98</td>
</tr>
<tr>
<td>33</td>
<td>171.3</td>
<td>$599.55</td>
<td>$113.52</td>
<td>$486.03</td>
</tr>
<tr>
<td>38</td>
<td>158.5</td>
<td>$554.75</td>
<td>$130.72</td>
<td>$424.03</td>
</tr>
</tbody>
</table>

Economics: Gross income= yield x $3.50/bu; Seed cost= $3.44 per 1,000 seeds x seeding rate; Net revenue= Gross revenue – seed cost.

Discussion:
There was no statistical significance for yield among the seeding rates 28,000-38,000. However, there was a significant statistical difference between the 23,000 and 33,000 rates. Rates 23,000, 28,000 and 38,000 were considered statistically the same. Based on one year of data at this plot, a planted population of 33,000 seeds per acre resulted in the greatest returns per acre. It should be noted that this field location received higher than average seasonal rainfall, which could have affected “normal” yields. Further data in the form of multi-year replications will add to the validity of these results.

Acknowledgement
The author expresses appreciation to on-farm collaborator Les Seiler for his help in planting and harvesting this plot. Thanks to agronomy intern Troy Grime for helping with the data collection on this plot.