Effect of Seeding Rate on Corn Yield

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Objective

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

Background

Crop Year:	2015	Soil Test (2014):	pH 6.7, P* 90 ppm, K 161 ppm CEC 12.5, OM 2.9%
Location:	Fayette, OH		
County:	Fulton	Nitrogen:	200 lbs at split at plant and sidedress
Soil Type:	Colwood/Dixboro loam		
Drainage:	Systematic tile	Harvest Date:	October 30, 2015
Previous Crop:	Soybeans	Rain (Apr-Sept):	22.1”
Tillage:	No-till		
Planting Date:	May 10, 2015	*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

Treatment	Harvest Stand	Moisture	Dry Yield
23,000 seeds/ac	22,100 plants/acre	18.3%	152.1 b
28,000 spa	27,300 ppa	18.3%	159.8 ab
33,000 spa	32,600 ppa	18.6%	171.3 a
38,000 spa	38,500 ppa	18.8%	158.5 ab
		LSD (p<.05) =	15.8 (cv 4.92)

Summary

Table 2. Effect of Seeding Rate on Profitability

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

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.

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