

# Corn Yield Response to Starter Fertilizer

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## Objective

To evaluate the yield response and economics to starter fertilizer.

## Background

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Crop Year: 2015	Soil Test (11/2014):	pH 5.9
Location: Delta, OH		P 70 ppm*
County: Fulton County		K 448 ppm
Soil Type: Hoytville clay loam		CEC 19.4
Drainage: 25' Systematic, perpendicular		O.M. 3.6%
Previous Crop: Soybeans	Fertilizer: Net 8-39-105/ac broadcast pre-plant	
Tillage: Minimum	Herbicide: Cinch ATZ, glyphosate post	
Planting Date: May 9, 2015	Harvest Date: October 21, 2015	
Plant Rate/Harvest Population: 33,100/32,500	Rainfall (Apr-Sept): 25.6"	

## Methods

This study was designed to evaluate the impact that reducing phosphorus fertilizer would have on corn yield. The treatments were 1) farmer's normal starter rate, 2) 50% of farmer's normal rate and 3) a zero rate. The three treatments were arranged in a randomized complete block design with four replications. Treatment plots were planted 40 feet wide (16 rows) by 2,500 feet long (field length). Treatments were planted with a 1770 JD planter after one-pass, light spring tillage. Seed used was Pioneer 1197AM in all treatments.

The starter fertilizer used was a blended, liquid 11-25-0 analysis and was applied 2"x2" beside the row at planting. Nitrogen was balanced at sidedress 4 weeks after planting so that all treatments received a season total of 200 units. Harvest (yield) measurements were made by harvesting the center 8 rows within each treatment using a JD 9660 commercial combine. Yield measurements were taken with a 2630 JD monitor and shrunk to 15% moisture. Weather data was collected from a National Weather Service station in Wauseon, Ohio.

### Treatments

- 1) 100% Starter Rate – 20 gals/ac (Net: 23-53-0 per acre)
- 2) 50% Starter Rate – 10 gals/ac (Net: 12-27-0 per acre)
- 3) 0% Starter Rate – 0 gal/ac



## Results

Table 1. Corn Yield Response to Starter

Treatment	Yield (bu/ac)	*Gross Revenue/Ac	**Cost per acre	Net Revenue/Ac
100% Starter Rate – 20 gal/ac	189.4 b	\$663	\$40.80	\$622
50% Starter Rate – 10 gal/ac	204.9 a	\$717	\$20.40	\$697
0% Starter Rate – 0 gal/ac	186.0 b	\$651	\$---	\$651
	LSD (p<.05)	10.7		

**Coefficient of Variation = 2.44**

\* Based on \$3.50/bu marketing price

\*\*Starter Cost = \$2.04 (based on \$.46/lb N and \$.57/lb P)

## Summary

The research found a statistically significant difference in grain yield of the 50% starter rate treatment and the other treatments. The 50% starter rate treatment was +15.5 bu/ac better than the 100% starter rate treatment and +18.9 bu/ac better than the 0% starter rate treatment. Based on one year of data, the 50% starter rate showed an economic advantage to that of the other rates.

Some of the yield difference in this plot could be attributed to the timing of the nitrogen balancing as the 50% treatment and 0% treatment had 12 units and 24 units more, respectively, of nitrogen applied at sidedress. More than average rainfall accumulated in Northwest Ohio in 2015 in the early part of the growing season. Nitrogen applied later in the season was likely used in a more efficient manner by the corn plant. An improvement to these research methods would be to conduct the nitrogen balancing at planting as to remove the nitrogen timing variable in the research.

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