

Corn Yield Response to Starter Phosphorus-Delta

Eric A. Richer, Ohio State University Extension Educator, Fulton County

Objective

To evaluate corn yield response to starter phosphorus.

Background

Crop Year: 2017	Population: 33,000 seeds per acre	Soil Type: Hoytville Clay Loam
County: Fulton	Planting Date: May 17	Soil Test (grid avg):
Location: Delta, OH	Harvest Date: November 4	pH 6.3
Drainage: Systematic	Rainfall (May-August): 18.7"	P 21 ppm (Bray-P1)
Previous Crop: Soybeans	Tillage: Conventional	K 176 ppm
Varieties: DeKalb 57-50, Pioneer 0506	Herbicide: Cinch ATZ, Abundant Edge	O.M. 3.7%
		CEC 17.6 meq/100g

Methods

Two varieties of corn (A and B) were used in independent randomized complete block designs. Within each randomized block, two corn phosphorus starter rates were replicated six times. Plots were 8 rows wide (20 feet) by 2500 feet long. Seed variety in trial A was DeKalb 57-50 and seed variety used in trial B was Pioneer 0506. The trial was planted, sprayed, sidedressed and harvested with commercial farm equipment. In order to ensure nitrogen rates and timing was consistent, the starter mixtures were nitrogen-balanced at planting so that all treatments began with 24 lbs N/ac. All treatments received 180 lbs N/acre at sidedress (V3-V4), for a total nitrogen rate of 204 lbs/acre. Yields and moistures were measured using a calibrated yield monitor and shrunk to 15% moisture. Rainfall data was sourced from the Wauseon Water Treatment Plant.

Treatments

- 1) 0% Starter Rate – 0 gal/ac (Net: 24-0-0-5S per acre)
 - a. Recipe: 6.5 gal 28-0-0 plus 5 gal 8-0-0-9S and 6.5 gal water
- 2) 50% Starter Rate – 10 gals/ac (Net: 24-28-0-5S per acre)
 - a. Recipe: 7 gal 10-34-0 and 4 gal 28-0-0 plus 5 gal 8-0-0-9S and 2 gal water



Results

Table 1. Corn Yield Response to Starter Phosphorus - Delta

A. Starter P Rate (lbs/ac)	Starter P Rate (gal/ac of 10-34-0)	Yield (bu/ac)	Return Minus P Cost* (\$/ac)
0	-	142.9 a	\$500
28	7	142.9 a	\$488
LSD (P<.05, CV 7.1)		15.06	
B. Starter P Rate (lbs/ac)	Starter P Rate (gal/ac of 10-34-0)	Yield (bu/ac)	Return Minus P Cost* (\$/ac)
0	-	158.2 a	\$554
28	7	148.4 a	\$507
LSD (P<.05, CV 10.03)		22.83	

*Based on \$3.50/bu corn and \$.43/lb P (Source: OSUE 2017 Corn Budget)

Discussion

There was no statistically significant difference in grain yield between either rate in either Trial A or B in 2017. Standard economic calculations show that reduced rates of starter phosphorus can produce maximum economic returns. Further research in the form of multi-year replications would add to the validity of these results.

Acknowledgement

The author expresses appreciation to L & L Farms as the cooperating farmer, Davis Farm Services for assistance in blending the starter solutions and to Ross Andre and Kaitlin Ruetz for helping with data collection on these trials. Thanks to the Culman Lab at OARDC in Wooster and Ohio Corn Checkoff Board for supporting this research.

<p>For more information, contact: Eric Richer OSU Extension – Fulton County 8770 State Route 108 Wauseon, OH 43567 Richer.5@osu.edu</p>
--

