

Corn Yield Response to Starter Phosphorus - Pettisville

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Objective

To evaluate the yield response to starter phosphorus.

Background

Crop Year: 2016	Herbicide: Bicep II Magnum
County: Fulton	Soil Type: Latty, Fulton clay
Location: Pettisville, OH	Tillage: Conventional
Drainage: Systematic, 25' laterals	Soil Test (5/2016): pH 6.3
Previous Crop: Soybeans	P 33 ppm (Bray-P1)
Variety: Rupp A03-91	K 263 ppm
Population: 32,480 seeds per acre	CEC 15.1 meq/100g
Planting Date: May 18, 2016	O.M. 3.7%
Harvest Date: October 24, 2016	Rainfall (May-August): 10.9"

Methods

Three corn phosphorus starter rates were replicated four times in a randomized complete block design. Plots were 6 rows wide (15 feet) by 1200 feet long. The trial was planted, sprayed, sidedressed and harvested with commercial farm equipment. The yield goal on this farm was 170 bushels per acre. In order to ensure nitrogen rates and timing was consistent, the starter mixtures were nitrogen-balanced at planting so that all treatments began with 42 lbs N/ac. The base for starter was 10-34-0 liquid and additional N was added to dilute treatment 2. Only 28% UAN was used in treatment 1. All treatments received 150 lbs N/acre at sidedress (V3-V4), for a total nitrogen rate of 192 lbs/acre. Yields were measured using a weigh wagon and moistures calculated with a commercial moisture tester and shrunk to 15% moisture. Rainfall data was sourced from CoCoRaHS station OH-FL-11 in Wauseon, Ohio.

Treatments

1. 0% Starter Rate – 0 gal/ac (Net: 42-0-0 per acre)
 - a. Recipe: 14 gal 28-0-0 plus 6 gal water
2. 50% Starter Rate – 10 gals/ac (Net: 42-20-0 per acre)
 - a. Recipe: 5 gal 10-34-0 plus 12 gal 28-0-0 plus 3 gal water
3. 100% Starter Rate – 20 gals/ac (Net: 42-40-0 per acre)
 - a. Recipe: 10 gal 10-34-0 plus 10 gal 28-0-0



Results

Table 1. Corn Yield Response to Starter Phosphorus - Pettisville

Starter P Rate (lbs/ac)	Starter P Rate (gal/ac of 10-34-0)	Yield (bu/ac)	Return Minus P Cost* (\$/ac)
0	-	143.9 a	\$504
20	5.0	140.5 a	\$479
40	10.1	140.5 a	\$465

LSD (P<.05, CV 2.73)

26.68

*Based on \$3.50/bu corn and \$.66/lb P (Source: OSUE 2016 Corn Budget)

Discussion

There was no statistically significant difference in grain yield among all rates of starter P in 2016. This site received lower than average rainfall through July and the month of May was generally cooler and wetter than average. As such, these weather conditions had an impact emergence and yield results.

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

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