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Effect of Starter Phosphorus Fertilizer on Corn Yield

Objective

To evaluate the agronomic and economic impacts of phosphorus fertilizer applications.

Background

Crop Year: 2023 corn
Location: Fayette
County: Fulton
Soil Type: Blount loam
Drainage: Pattern
Tillage: No-till
Previous crop: soybeans
Herbicides: Resicore, Glyphosate, 2,4-D
Planting Date: 5-21-23
Variety: Pioneer P0035AM
Seeding Rate: 34,000
Fertilizers: see below
Harvest Date: November 15, 2023
Soil test : pH 5.9, P 18 ppm M3, K 116 ppm, CEC 12.7 , O.M. 2.7 % preplant

Methods

Phosphorus starter fertilizer was compared to no phosphorus applied. Treatments were replicated four times in a random block design. Treatments are 20 feet wide by 2140 feet long. All treatments received the same inputs except for starter phosphorus fertilizer. On September 15, 2022, cereal rye cover crop was flown on at a rate of 60 lbs./acre before soybean harvest. Yields and moistures were obtained by using a weigh wagon. Yields were adjusted to 15.5% moisture.

Fertilizers

28% UAN ; 81# at planting 2 x 2
12-0-0-26 thiosul ; 3 gal/acre at planting
10-34-0 ; 5 gallon/acre (58.2#) for treated area only at planting 2x2

28% UAN ; 96# at sidedress on June 12, 2023
12-0-0-26 thiosul ; 3 gal/acre on June 12, 2023

Treatments

1. 28% UAN & thiosul
2. Phosphorus starter fertilizer (10-34-0 and 28%) & thiosul

Results

Table 1. Impact of Phosphorus (P) Fertilizer

Starter P Rate (gal/ac of 10-34-0)	Corn Yield (bu/ac)	Value of Corn ($/ac)	Cost of Phosphorus ($/ac)	Return Minus P Cost ($/ac)
0	154.5	$695.25	0	$695.25
5	164.8	$741.60	$23.25	$718.35

No Significant Difference in yield. CV 4.39; P<.05.
Based on $4.50/Bu corn and $800/ton 10-34-0 P ($4.65/gal.)

Table 2 Weather Data

	2023 Local Rainfall Weather Link (Seiler Farms)	Archbold Historic Rainfall www.weather-us.com
May	0.82 in.	2.28 in.
June	0.60 in.	2.6 in.
July	0.13 in.	2.17 in.
August	2.01 in.	2.13 in.
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Total	3.55 in.	9.18 in.

Summary

Corn yield was not influenced by the addition of starter fertilizer phosphorus 10-34-0. A gain of $23.10 per acre was incurred when phosphorus fertilizer was applied (table 1).

Acknowledgement

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