

Starter Fertilizer Response in Corn Study, Darke County

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Objective

To determine the effects of starter fertilizer, sulfur and zinc on corn yields and provide data for nitrogen and phosphorous response curves.

Background

Crop Year: 2018

Location: Allen Township

County/Town: Darke/Bradford

Soil Type: Celina Silt Loam

Drainage: Not patterned

Previous Crop: Soybeans

Tillage: No-Till

Soil Test: pH 6.6, P 15 ppm M3, K 155 ppm

Planting Date: April 30, 2018

Nitrogen: 200 units per acre

Seeding Rate: 33,000 seeds per acre

Harvest Date: September 18, 2018

Rainfall: 24.82 - 4/15-9/15

Methods

Five starter fertilizer treatments were replicated three times in a randomized complete block design. Treatments were planted with a 12 row Kinze planter. All treatments received the same tillage and herbicide applications. Seed used was Becks 5140. Treatments were made at planting as a 2x2 fertilizer application. Nitrogen levels were balanced at sidedress with appropriate rates of 28% to equal 200 units per acre total N applied. Stand counts were taken at V6 by obtaining two counts per treatment and calculating the simple average. Plots were harvested with a commercial combine equipped with a six row corn head. Yields and moistures were obtained by using a calibrated yield monitor. Yields were verified using a grain cart. Yields were adjusted to 15.5% moisture. Precipitation data was obtained from cocorahs.org and recorded daily.

Treatments:

1. 28% only – 43lb Actual N/acre
2. Starter fertilizer (10-34-0 and 28%) with 43lb N and 23lbP₂O₅/acre
3. Starter fertilizer (10-34-0 and 28%) with 2 gallons sulfur per acre
4. Starter fertilizer (10-34-0 and 28%) with 2 gallons sulfur and 1 quart zinc per acre
5. No starter fertilizer



Results

Treatments	Moisture (%)	Yield (bu/acre)	Return over No Starter/Acre
No starter	20.1 d	242 a	
28 only	19.6 ac	245 abc	\$10.12
28 & P	19.4 a	248 c	\$16.28
28, P and Sulfur	19.8 c	242 ab	-\$7.61
28, P, Sulfur and Zinc	19.5 a	246 ab	\$0.62
Treatment Means with the same letter are not significantly different according to Fisher's Protected Least Significant Differences (LSD) test at alpha = 0.1.	LSD:0.29 CV: 0.97%	LSD: 4.01 CV: 1.09%	

Summary

Corn moisture and yield showed some statistical difference by the addition of starter fertilizer but there was no statistical difference between 28 only and 28 & P. The highest yield and most economical return on investment was the Starter fertilizer (10-34-0 and 28%) with 43lb N and 23lb P₂O₅/acre.

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