

Nitrogen Rate on Corn following Wheat

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Objective

To evaluate the effect of nitrogen rate on corn yield and profit when planted after a failed wheat crop.

Background

Crop Year: 2022	Tillage: No-Till
Location: Seiler Farms	Planting Date: 5/18/2022
County/Town: Fulton/ Fayette, Ohio	Seeding Rate: 34,000 seeds/ac
Soil Type: Tedrow Loamy Fine Sand	Harvest Date: 11/24/2022
Drainage: none	
Previous Crop: Soybeans	

Methods

A randomized complete block design with four treatments and four replications was used. This nitrogen rate trial was in a corn crop following a failed wheat crop. Each treatment received 80 lbs N/ac of nitrogen (UAN) at planting and the additional nitrogen was added at sidedress in the form of 28% UAN. Nitrogen was applied at four rates: 80 lbs N/ac, 120 lbs N/ac, 180 lbs N/ac, and 240 lbs N/ac. Corn Stalk Nitrate Tests (CSNT) were conducted approximately 10 days prior to harvest to determine the levels of nitrate-nitrogen left in the corn stalk. Samples were collected in field from each treatment and an average was calculated. Yield and moisture data was collected from an Ag Leader monitor which was calibrated before harvest. Harvest was completed in a pass down the entire length of the field in the treatment's center row.

Results

The results of this trial are listed in Table 1 below. The 240 lbs of applied nitrogen was the most successful in this trial. This application rate yielded significantly higher than the other three rates. There was a significant profit increase with the 240 lbs of applied nitrogen showing that this was the most successful N rate following a wheat crop.



Table 1. Corn Yield Response to Nitrogen Rate (pounds per acre)

Rate	CSNT (ppm)	Yield(bushels/acre)	Return over N (\$/ac)
80 lbs.	93	140 d	762
120 lbs.	83	177 c	943
180 lbs.	230	196 b	995
240 lbs.	225	208 a	1,008
		LSD (0.1) 7.0	

Summary

The results of this study indicated a clear statistical yield difference between each nitrogen rate. Based on the university recommendations (<250 ppm nitrate N) and the Corn Stalk Nitrate Test results, we can see that each nitrogen level is yield-limiting based on the available nitrogen left in the stalk. Based on a price of \$0.85 per unit N and corn price of \$6.00/bushel, the 240 lbs N/ac rate proved to have the greatest return over nitrogen cost.

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