

Corn Nitrogen Rate Yield Effects on Two Corn Varieties

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Objective

To determine the effects of nitrogen rates on two corn varieties and their grain yield.

Background

Crop Year: 2014

Location: Fayette, OH

County: Fulton

Soil Type: Blount/Glynwood loam

Drainage: Systematic

Previous Crop: Soybeans

Tillage: No-till

Soil Test: pH 6.0, P 22 ppm*, K 115 ppm

Planting Date: May 6, 2014

Seeding rate: 33,000 seeds per acre

Harvest Date: October 10, 2014

Rainfall April-Sept: 10.94"

*Reported as Bray P1

Methods

Four corn nitrogen rates were replicated three times in a randomized complete block design. Field length treatments were planted with a 12 row Kinze 3600 planter. Six rows were planted to Pioneer 0604 and 6 rows were planted to Pioneer 0636. Starter rates of nitrogen were fixed and starter nitrogen credit was subtracted from the total nitrogen rate. The remainder of the total was applied at V4 stage corn as anhydrous ammonia. Total nitrogen treatment rates were 100, 150, 200 and 250 lbs of N per acre. All treatments received the same tillage and herbicide applications. All treatments were harvested with a commercial, 6 row combine. Yields and moistures were obtained by using a calibrated Ag Leader monitor. Dry yields were shrunk to 15% moisture. Precipitation data was obtained from Weather.com.

Results

Total Nitrogen Rate, lbs/ac	Variety	Harvest Moisture %	Dry Yield Bu/acre	
100	P 0604	20.3%	152.7	A
150	P 0604	20.4%	154.5	A
200	P 0604	20.7%	158.0	A
250	P 0604	20.5%	158.0	A
100	P 0636	22.1%	160.2	B
150	P 0636	21.7%	165.2	AB
200	P 0636	22.4%	174.5	A
250	P 0636	22.2%	171.7	AB

LSD 7.8 (p<..05)
CV 2.50

LSD 14. (p<..05)
CV 4.32



Summary

Total Nitrogen Rate, lbs/ac	Variety	Yield	Gross Revenue per acre	Nitrogen Cost per Acre	Net Return per acre
100	P 0604	152.7	\$611	\$46	\$565
150	P 0604	154.5	\$618	\$69	\$549
200	P 0604	158.0	\$632	\$92	\$540
250	P 0604	158.0	\$632	\$115	\$517
100	P 0636	160.2	\$641	\$46	\$595
150	P 0636	165.2	\$661	\$69	\$592
200	P 0636	174.5	\$698	\$92	\$606
250	P 0636	171.7	\$687	\$115	\$572

Economics: Gross income= yield x \$4.00/bu;

Nitrogen cost= \$0.46 per lb (source: 2014 Ohio State University AEDE Corn Budget).

Discussion:

There was no significant difference in yield in the trial with variety P0604. However, there was a significant difference in yield in the trial with variety P0636. For variety P0636 there was no significant difference in the 150-250 nitrogen rates using absolute yields. Based on one year of data, the P 0604 variety achieved greatest returns per acre when only 100 total units of nitrogen were applied and the P 0636 variety achieved greatest returns per acre when 200 total units of nitrogen were applied during the growing season. It should be noted that rainfall in this plot was significantly below normal and could have impacted results. Further data in the form of multi-year replications will add to the validity of these results.

Acknowledgement

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