

## Nitrogen Rate and Timing on Corn

**Study ID:** 004053201701

**County:** Dodge

**Soil Type:** Moody silty clay loam 0-2% slope;  
Fillmore silt loam occasionally ponded

**Planting Date:** 4/24/17

**Harvest Date:** 10/25/17

**Population:** 34,000

**Row Spacing (in):** 30

**Hybrid:** Hoegemeyer 8471

**Reps:** 4

**Previous Crop:** Corn

**Tillage:** Mulch finish

**Herbicides: Pre:** 2.4 qt/ac Keystone® LA on 4/24/17

**Post:** 0.75 oz/ac Armazon™, 0.5 lb/ac Atrazine, and  
22 oz/ac Roundup® on 5/24/17

**Seed Treatment:**

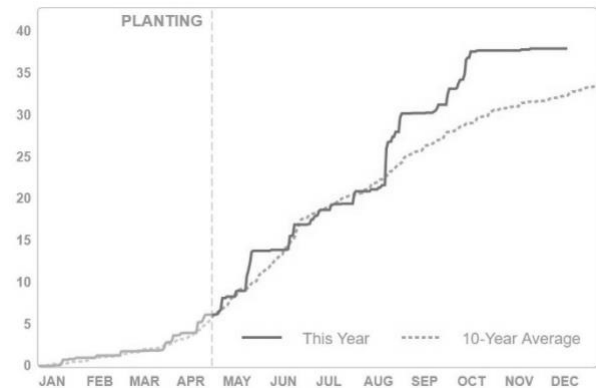
**Foliar Insecticides:** 6 oz/ac Capture® LFR® on  
4/24/17

**Foliar Fungicides:** 10 oz/ac Headline AMP® on  
7/12/17

**Fertilizer:** 11-52-0 in fall 2016 and 58 lb/ac 10-24-0  
on 4/24/17 in addition to N rates tested and listed  
in treatments

**Irrigation:** Pivot, Total: 4"

**Rainfall (in):**



### Soil Tests (May 2017):

OM	P1	P2	K	Mg	S	Zn	Mn	Fe	Cu	B	Ca	CO <sub>2</sub> C Burst
%	-----ppm-----											
3.1	59	85	356	430	20	2.4	7	85	1.1	0.4	2889	176

**Introduction:** The objective of this study was to evaluate sidedress N rates. The producer's normal N management is to apply 70 lb N/ac pre-plant and 140 lb N/ac sidedress. To test the rate and timing, the producer compared his normal N sidedress rate with sidedress rates of 110 lb N/ac and 170 lb N/ac (normal sidedress rate minus 30 lb N/ac and normal sidedress rate plus 30 lb N/ac). All sidedress application treatments were made on June 5, 2017, with 32 percent UAN. The producer's normal N management was compared with a pre-plant only treatment. In this treatment the same total N was applied (210 lb N/ac); however, all the N was applied as pre-plant. Ear leaf N concentrations were taken at R2. Aerial imagery was collected in July and August to observe differences in plant vegetation. Aerial imagery was used to calculate the normalized difference vegetative index (NDVI). This index is indicative of overall plant biomass and greenness. True color imagery and NDVI are presented in *Figure 1*.

### Results:

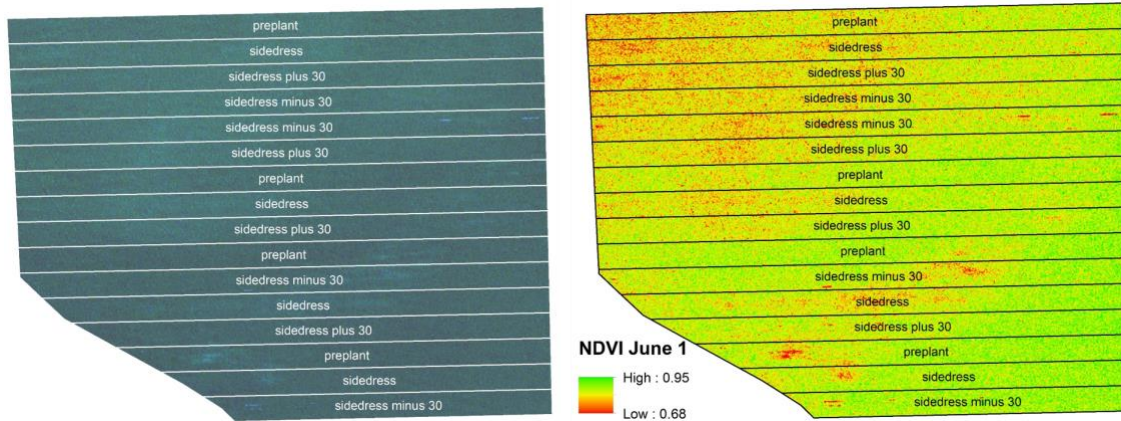
	Harvest Stand Count	Foliar Nitrogen (%)	Moisture (%)	Yield (bu/ac)†	Marginal Net Return‡ (\$/ac)
210 lb N/ac Pre-plant	32,250 A*	3.04 B	15.5 B	216 B	610.98 B
70 lb N/ac Pre-plant + 110 lb N/ac Sidedress	32,833 A	3.27 AB	15.9 A	239 A	684.90 A
70 lb N/ac Pre-plant + 140 lb N/ac Sidedress	31,667 A	3.44 A	16.2 A	243 A	689.43 A
70 lb N/ac Pre-plant + 170 lb N/ac Sidedress	31,833 A	3.29 AB	16.2 A	251 A	704.07 A
P-Value	0.113	0.054	0.001	0.0007	0.0009

\*Values with the same letter are not significantly different at a 90% confidence level.

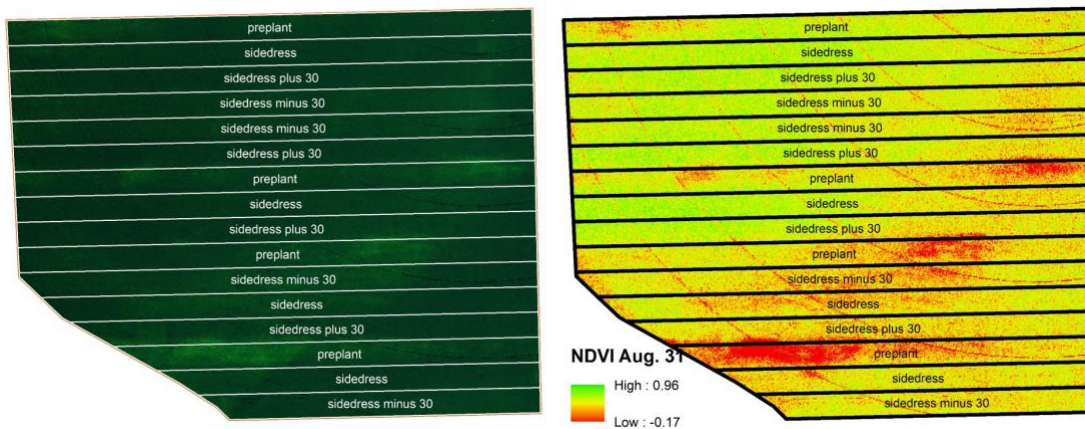
†Bushels per acre corrected to 15.5% moisture.

‡Marginal net return based on \$3.15/bu corn, \$0.33/lb N, and \$6.82/ac application cost for in-season application with Hagie.

	NDVI 7/1/17	NDVI 8/31/17
210 lb N/ac Pre-plant	0.891 A	0.899 B
70 lb N/ac Pre-plant + 110 lb N/ac Sidedress	0.889 A	0.905 AB
70 lb N/ac Pre-plant + 140 lb N/ac Sidedress	0.889 A	0.906 A
70 lb N/ac Pre-plant + 170 lb N/ac Sidedress	0.889 A	0.907 A
P-Value	0.215	0.050



**Figure 1.** True color (red-green-blue) imagery (left) and NDVI (right) from June 1, 2017.



**Figure 2.** True color (red-green-blue) imagery (left) and NDVI (right) from August 31, 2017.

## Summary:

- Moisture was significantly drier for the pre-plant only treatment.
- Harvest stand counts were not different between the N timing and rates.
- The leaf pre-plant rates were significantly different – the pre-plant rate had a significantly lower leaf N concentration than the producer's normal sidedress rate of 140 lb N/ac.
- There were no NDVI differences on July 1. There were differences in NDVI on August 31. The pre-plant N treatment had lower NDVI than the 140 lb N/ac and 170 lb N/ac sidedress treatments.
- Yield was significantly lower for the pre-plant treatment compared with the treatments with sidedress applications. There were no yield differences between the three sidedress N rates.
- Marginal net return was significantly lower for the pre-plant treatment compared with the treatments with sidedress applications. There were no marginal net return differences between the three sidedress N rates.

---

### Sponsored by:



### In Partnership with:



Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln cooperating with the Counties and the United States Department of Agriculture. University of Nebraska–Lincoln Extension educational programs abide with the nondiscrimination policies of the University of Nebraska–Lincoln and the United States Department of Agriculture.