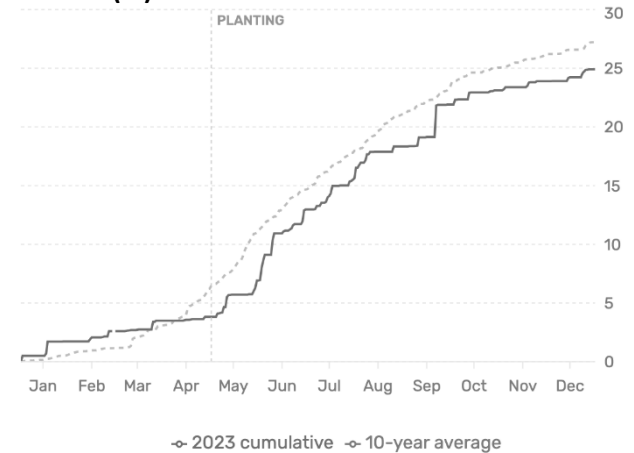


## Imagery-Based Nitrogen Fertilization with Sentinel Fertigation N-Time®

**Study ID:** 0195019202301  
**County:** Buffalo  
**Soil Type:** Wood River silt loam  
**Planting Date:** 5/1/23-5/2/23  
**Harvest Date:** 10/18/23-10/20/23  
**Seeding Rate:** 35,000  
**Row Spacing (in):** 30  
**Hybrid:** Channel® 214-78 DGVT2P  
**Reps:** 4  
**Previous Crop:** Soybean  
**Tillage:** Strip-till  
**Herbicides:** *Pre:* 2 qt/ac Degree Xtra®, 3 oz/ac mesotrione, and 1% COC *Post:* 1.25 qt/ac Harness® Max, 1 pt/ac Atrazine, 8 oz/ac Tough®, 20 oz/ac Roundup PowerMAX® 3, and 8.5 lb AMS/100 gal  
**Seed Treatment:** Standard Channel® seed treatments  
**Foliar Insecticides:** None

**Foliar Fungicides:** 10.5 oz/ac azoxystrobin and propiconazole package mix applied at R1  
**Irrigation:** Pivot  
**Rainfall (in):**

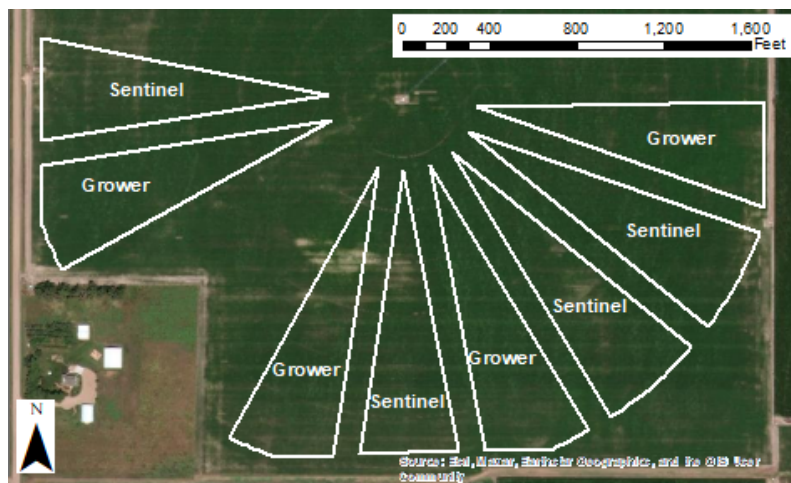


### Baseline Soil Samples 0-6" (May 2023):

pH	OM LOI %	Nitrate-N ppm N	M3-P ppm P	Sulfate-S ppm S	K ppm	Ca ppm	Mg ppm	Na ppm	CEC me/100g
7.9	3.2	38.1	51	36.8	507	1687	281	154	12.8
7.6	3.6	60.9	145	19.6	650	2493	451	172	18.6

**Introduction:** Corn nitrogen (N) management may be improved by using sensors or imagery to detect and respond to corn N needs during the growing season. Sentinel Fertigation's N-Time® application analyzes multispectral images to deliver fertigation scheduling recommendations. Indicator blocks (small blocks established during the base N applications) with higher (+60 lb N/ac) and lower (-30 lb N/ac) rates were applied in the field on June 7, 2023 to monitor and determine when fertigation was needed.

If an N application was recommended by N-Time® the N applied via fertigation (typically 30 or 60 lb N/ac) is noted in the application table below. Note that different Sentinel sectors of the pivot may receive different recommendations throughout the growing season. This study compared the grower's standard N management to the Sentinel Fertigation N-Time® N management, with four paired sectors of each treatment (each sector was about 7 acres, buffered 60 feet internally to reduce sprinkler package overlap between sectors); the field trial layout is shown below.



**Application Table:** Nitrogen applied throughout the 2023 growing season (or in fall of 2022, as noted) is included in the table below. N applications (in lb N/ac) are noted by date, along with products applied at those instances. Sentinel N-Time<sup>®</sup> began monitoring and directing N fertigation applications following the June 7, 2023 N application. Nitrogen applications directed by N-Time<sup>®</sup> are shaded in gray to the right of the double vertical lines in the table below.

	Nov. 2022	5/1	6/7	7/10	Total N Rate (lb/ac)
<b>Treatment</b>	-----lb N/ac applied-----				
<b>Grower N Management</b>	8.7 <sup>a</sup>	51 <sup>b</sup>	35 <sup>c</sup>	21 <sup>c</sup>	<b>115.7</b>
<b>Sentinel Fertigation N-Time<sup>®</sup></b>	8.7 <sup>a</sup>	51 <sup>b</sup>	35 <sup>c</sup>	-	<b>94.7</b>

<sup>a</sup> Product used was 10-34-0 applied with strip till

<sup>b</sup> Product used was 32-0-0 applied with planter

<sup>c</sup> Product used was 32-0-0

**Results:**

	Total N rate (lb/ac)	Moisture (%)	Yield (bu/ac) <sup>†</sup>	Partial Factor Productivity of N (lb grain/lb N)	lbs N/bu grain	Marginal Net Return <sup>‡</sup> (\$/ac)
Grower N Management	115.7	16.3 A*	274 A	133 B	0.42 A	1,297 B
Sentinel Fertigation N-Time <sup>®</sup>	94.7	16.2 A	273 B	162 A	0.35 B	1,306 A
P-Value	N/A	0.541	0.092	<0.0001	<0.0001	0.026

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

<sup>†</sup>Yield values are from cleaned yield monitor data. Bushels per acre corrected to 15.5% moisture.

<sup>‡</sup>Marginal net return based on \$5/bu corn \$0.63/lb N.

**Summary:** The Sentinel Fertigation N-Time<sup>®</sup> management did not recommend any additional N applications beyond the grower base rate, which resulted in a 21 lb N/ac reduction in N fertilizer with a 1 bu/ac yield reduction. This resulted in a 22% increase in nitrogen use efficiency. Marginal net return was \$9/ac greater for the Sentinel Fertigation N-Time<sup>®</sup> management.

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