

Project SENSE (Sensor-based In-season N Management) on Non-irrigated Corn

Study ID: 0546155201901

County: Saunders

Soil Type: Yutan, eroded-Judson complex, 6-11% slopes; Yutan, eroded-Aksarben silty clay loam, 2-6% slopes; Nodaway silt loam, occasionally flooded; Judson silt loam, 2-6% slopes

Planting Date: 4/20/19

Harvest Date: 10/22/19

Seeding Rate: 29,000

Row Spacing (in): 30

Variety: DEKALB® DKC63-57

Reps: 5

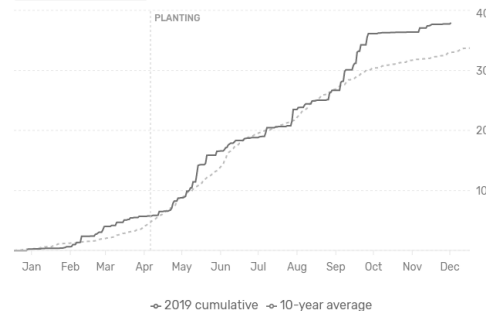
Previous Crop: Soybean

Soil Samples (June 2019):

Tillage: No-Till

Irrigation: None

Rainfall (in):



Soil pH	WDRF Buffer	Soluble Salts 1:1	Excess Lime Rating	Organic Matter LOI %	Nitrate - N ppm N	Nitrate lb N/ac (0-8")	Mehlich P-III ppm P	Sulfate-S ppm S	Ammonium Acetate (ppm)				CEC me/100g	% Base Saturation				
									K	Ca	Mg	Na		H	K	Ca	Mg	Na
6.2	6.8	0.35	NONE	3.3	20.1	48	29	14.1	301	2822	396	56	20.5	10	4	69	16	1
4.8	5.9	0.28	NONE	4.5	11.4	27	11	25.4	238	2429	295	63	26.1	41	2	47	9	1
5.0	6.4	0.35	NONE	3.6	29.6	71	25	18.0	326	2179	288	33	20.2	29	4	54	12	1
5.4	6.0	0.17	NONE	4.8	9.9	24	18	25.5	222	2772	322	101	27.6	37	2	49	10	2
4.9	5.9	0.25	NONE	3.7	33.6	81	30	27.5	194	1745	185	98	22.4	50	2	39	7	2

Introduction: A high clearance applicator was equipped with Ag Leader® OptRx® sensors. UAN fertilizer was applied with drop nozzles as the crop canopy was sensed. This study compares crop canopy sensor-based in-season N application with the grower's standard N management.

Grower Nitrogen Treatment: The grower rate was 120 lb N/ac applied as anhydrous ammonia on April 17, 2019.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 35 lb N/ac was applied as anhydrous ammonia on April 17, 2019. Crop canopy sensing and application occurred on July 8, 2019 at the V12 growth stage. Across all Project SENSE treatments, the average N rate applied based on the in-season sensing was 76 lb N/ac. The average total N rate was 111 lb N/ac.

Results:

N Management Strategy	Total N rate (lb/ac)	Moisture (%)	Yield (bu/ac)†	Partial Factor Productivity of N (lb grain/lb N)	lbs N/bu grain	Marginal Net Return‡ (\$/ac)
Grower	120 A*	16.8 A	232 A	108 B	0.52 A	848.11 A
Project SENSE	111 B	16.9 A	225 B	113 A	0.50 B	823.00 B
P-Value	0.002	0.169	0.054	0.049	0.044	0.054

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

†Yield values are from cleaned yield monitor data. Bushels per acre adjusted to 15.5% moisture.

‡Marginal net return based on \$3.83/bu corn, \$0.36/lb N as UAN, and \$0.32/lb N as anhydrous ammonia.

Summary:

- The Project SENSE N management was only 9 lb N/ac lower than the grower's N management and utilized split-N application while the grower's management utilized only one preplant N application.
- Yield was 6.5 bu/ac lower for the Project SENSE N management compared to the grower's N management. Poorer performance for the Project SENSE N management at this site may be due to a later in-season N application (July 8) with only 35 lbs of N applied prior to this application.
- Project SENSE had a slightly higher partial factor productivity of N and used slightly fewer pounds of N to produce a bushel of grain.
- The grower's N management resulted in a \$25/ac increase in profitability. Marginal net return only took into account the varying price of N fertilizer sources and rates; the cost of an additional in-season application for the Project SENSE N management compared to the grower's N management was not included.

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