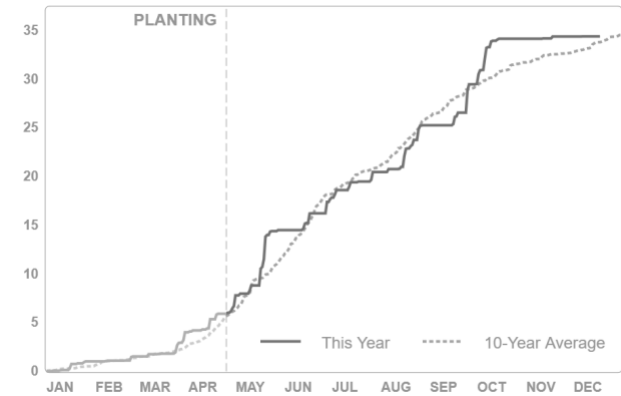


Project SENSE (Sensor-based In-season N Management)

Study ID: 108155201701
County: Saunders
Soil Type: Yutan silty clay loam 2-6% slopes, eroded; Filbert silt loam 0-1% slope; Tomek silt loam 0-2% slope
Planting Date: 4/25/17
Harvest Date: 10/11/17
Population: 32,300
Hybrid: DKC 62-98
Reps: 6
Previous Crop: Soybean
Tillage: No-Till

Irrigation: Pivot; 15 lb N/ac from irrigation
Rainfall (in):



Soil Sample Results: Soil samples were taken in three locations within the research study area and do not correspond to specific treatments or replications.

ID	Soil pH 1:1	WDRF Buffer pH	Soluble Salts 1:1 mmho/cm	Excess Lime Rating	Organic Matter LOI %	Nitrate - N ppm N	Nitrate lb N/A	Mehlich P-III ppm P	Sulfate-S ppm S	Zn (ppm)	Ammonium Acetate (ppm)				CEC me/100g	% Base Saturation				
											K	Ca	Mg	Na		H	K	Ca	Mg	Na
3	6	6.3	0.12	NONE	3.7	14.7	35	9	8	1.14	425	2120	282	32	21.1	33	5	50	11	1
14	6.9	7.2	0.17	NONE	2.4	7.1	17	4	7	0.37	334	2945	653	49	21.2	0	4	69	26	1
22	6.1	6.4	0.09	NONE	3.5	5.1	12	12	5	0.95	480	2223	309	7	21.2	30	6	52	12	0

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 initial grower N rate was 180 lb N/acre applied prior to planting on March 24, 2017. No additional applications were made during the growing season.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 75 lb N/acre was applied at or prior to planting. Crop canopy sensing and application occurred on June 23, 2017, at the V10 growth stage. The normalized difference red edge (NDRE) index values captured using the crop canopy sensors are shown in *Figure 1*. Across all Project SENSE treatments, the average N rate applied in-season was 157 lb N/acre. Nitrogen application for the Project SENSE treatment strips is shown in *Figure 2*. The total N rate was 232 lb N/acre.

Results: Data were analyzed using the GLIMMIX procedure in SAS 9.4 (SAS Institute Inc., Cary, NC). Mean separation was performed with Fisher's LSD.

	Total N rate (lb/ac)	Yield (bu/acre)†	Partial Factor Productivity of N (lb grain/lb N)	lb N/bu grain	Marginal Net Return‡ (\$/ac)
Grower N Management	180	261 B*	81 A	0.69 B	748.92 A
Project SENSE N Management	232	265 A	64 B	0.88 A	738.08 B
P-Value	N/A	0.011	<0.0001	<0.0001	0.015

*Values with the same letter are not significantly different at a 95% confidence level.

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

‡Marginal net return based on \$3.15/bu corn and \$0.41/lb nitrogen fertilizer.

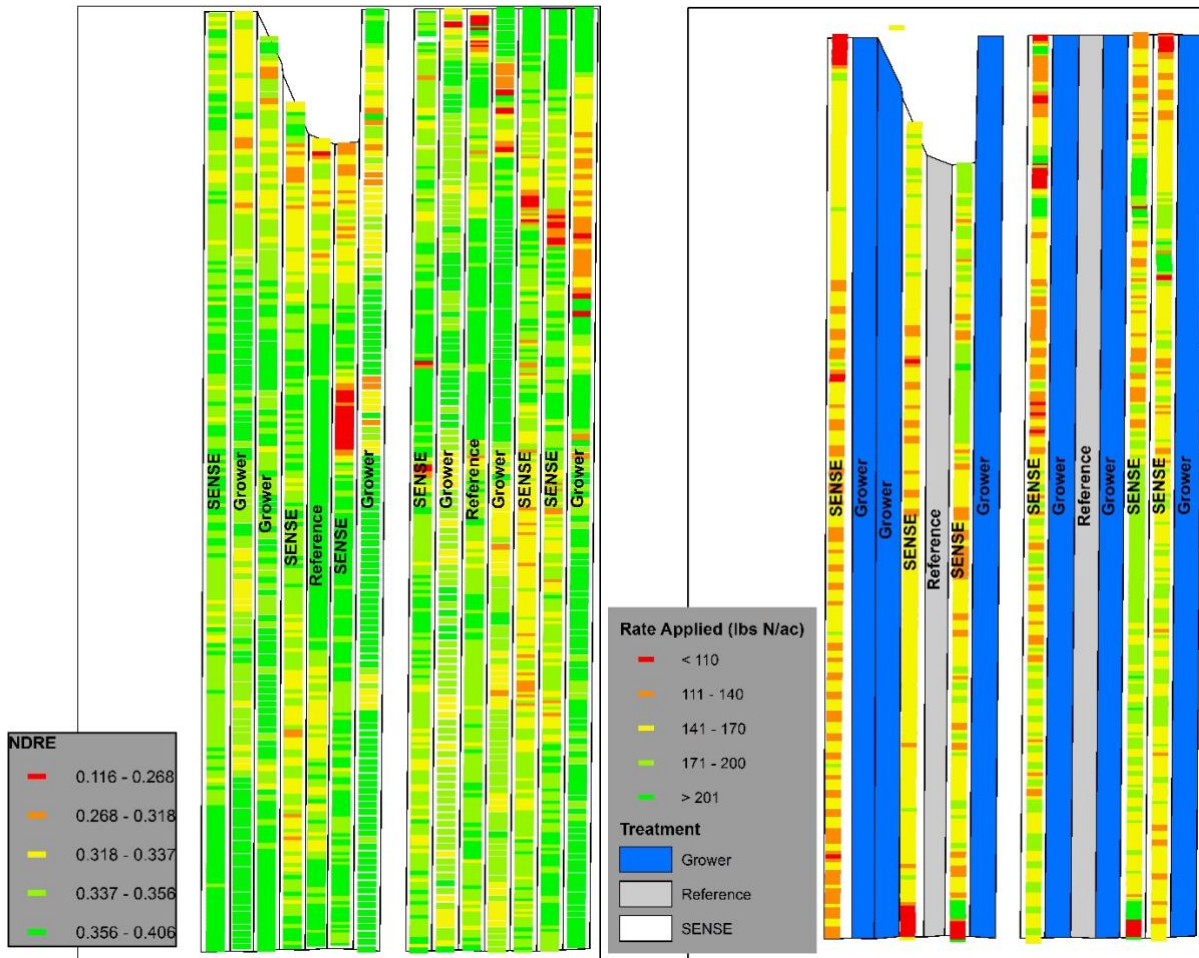


Figure 1. NDRE (normalized difference red edge) index obtained using crop canopy sensors mounted on a high clearance applicator for the plot area on June 23, 2017.

Figure 2. Nitrogen rate applied to Project SENSE N Management treatments based on NDRE captured with the crop canopy sensors and displayed in *Figure 1*.

Summary:

- Project SENSE N application was 52 lb N/acre higher than the grower's N application.
- The Project SENSE N management resulted in a 3 bu/acre yield increase compared with the grower's N management.
- The grower's N management resulted in higher N use efficiency than the Project SENSE N management.
- The grower's N management resulted in an \$11/acre higher marginal net return.

Sponsored by:



In Partnership with:

