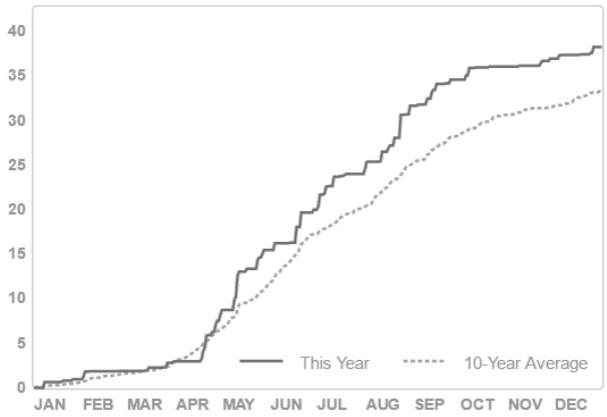
Project SENSE (Sensor-based In-season N Management)

Study ID: 108155201601
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: 5/5/16
Harvest Date: 10/31/16
Population: 31,000
Hybrid: P1197AM
Reps: 6
Previous Crop: Soybean
Tillage: No-Till

Irrigation: Pivot
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 lbs N/A	Mehlich P-III ppm P	Sulfate-S ppm S	Zn (ppm)	Ammonium Acetate (ppm) K	Ca	Mg	Na	CEC me/100g	% Base Saturation H	K	Ca	Mg	Na
1	6.2	6.8	0.29	NONE	3.8	10.7	26	29	9	1.2	394	2990	608	27	23.1	9	4	64	22	1
2	6.0	6.7	0.31	NONE	4.0	12.4	30	53	10	2.1	462	2474	480	25	20.6	14	6	60	19	1
4	6.0	6.6	0.25	NONE	4.1	16.6	40	111	9	3.3	517	1568	221	19	14.8	25	9	53	12	1

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 to the grower's standard N management.

Grower Nitrogen Treatment: The grower N rate was 75 lb N/acre applied prior to planting on March 17, 2016 as anhydrous ammonia. A sidedress rate of 99 lb N/acre was applied on June 27, 2016 at V10 growth stage. Total N applied was 174 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strip, 75 lb N/acre was applied prior to planting on March 17, 2016 as anhydrous ammonia. Crop canopy sensing and application occurred on June 27, 2016 at V10 growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 68.5 lb N/acre. The total N applied was 144 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	174	239 A*	77 B	0.73 A	650.45 A
Project SENSE N Management	144	234 A	92 A	0.61 B	650.38 A
P-Value	N/A	0.058	<0.0001	<0.0001	0.991

†Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $3.05/bu corn and $0.45/lb nitrogen fertilizer.
*Values with the same letter are not significantly different at a 95% confidence level.

Summary:
-The Project SENSE N application was 30 lb N/acre lower than the grower's N application. Fertilizer injury was seen on all treatments after application.
-Yield was not different between the two treatments.
-Nitrogen use efficiency was higher for the Project SENSE N management.
-There was no difference in marginal net return.

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