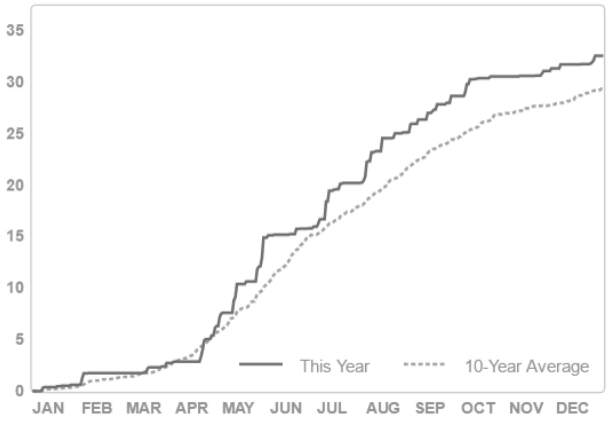
Project SENSE (Sensor-based In-season N Management)

Study ID: 619159201601
County: Seward
Soil Type: Deroin silty clay loam 6-11% slopes, eroded; Hastings silty clay loam 3-7% slopes, eroded; Deroin silty clay loam 11-30% slopes, severely eroded
Planting Date: 5/19/16
Harvest Date: 10/20/16
Population: 30,000
Hybrid: G07B39-3111A
Reps: 6
Previous Crop: Corn
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)				CEC me/100g	% Base Saturation				
											K	Ca	Mg	Na		H	K	Ca	Mg	Na
6	5.8	6.8	0.19	NONE	2.5	2.6	6	14	11	0.73	218	2096	527	25	17.7	12	3	59	25	1
14	5.9	6.7	0.24	NONE	3.6	5.0	12	9	12	0.98	433	2232	520	16	19.5	14	6	57	22	0
16	6.7	7.2	0.37	NONE	3.3	5.3	13	23	11	0.61	405	3458	834	26	25.4	0	4	68	27	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 to the grower's standard N management.

Grower Nitrogen Treatment: The initial grower N rate was 75 lb N/acre June 6, 2016 around V1-V2. An additional 74 lb N/acre was applied on June 30, 2016 at V7. On July 19, 2016, a final application of 70 lb N/acre was made at VT growth stage. Total N applied was 219 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips 75 lb N/acre was applied on June 6, 2016 around V1-V2. Crop canopy sensing and application occurred on July 19, 2016 at VT growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 68 lb N/acre. The total N rate was 143 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	219	171 A*	44 B	1.28 A	422.95 A
Project SENSE N Management	143	161 B	64 A	0.89 B	425.31 A
P-Value	N/A	0.005	0.001	0.001	0.691

†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:
-Poor emergence was noted.
-Project SENSE N application was 76 lb N/acre lower than the grower's N application.
-The grower's N management resulted in a 10 bu/acre yield increase compared to the Project SENSE N management.
-Project SENSE N management resulted in higher N use efficiency than the grower's N application.
-There was no significant difference in marginal net return between the two management strategies.

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