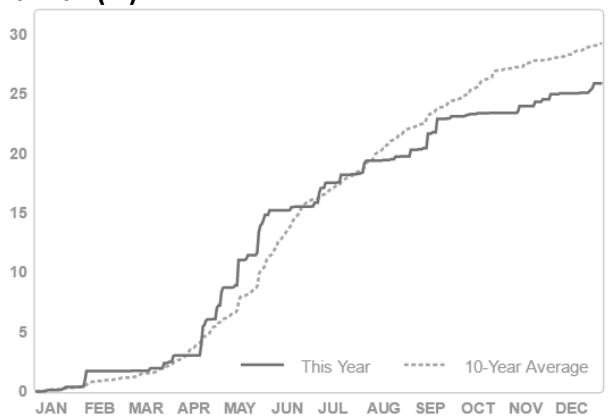
Project SENSE (Sensor-based In-season N Management)

Study ID: 208121201601
County: Merrick
Soil Type: Leshara silt loam occasionally flooded; Silver Creek complex saline-alkali, rarely flooded
Planting Date: 4/26/16
Harvest Date: 10/20/16
Population: 34,000
Hybrid: CRM (days) 116
Reps: 4
Previous Crop: Corn
Tillage: No-Till

Irrigation: SDI
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	7.3	7.2	0.32	NONE	2.2	22.1	53	48	9	1.78	365	1816	229	27	12.0	0	8	75	16	1
2	6.9	7.2	0.47	NONE	2.3	25.7	62	32	8	1.45	572	2253	393	30	16.1	0	9	70	20	1
3	6.5	7.0	0.21	NONE	2.3	18.9	45	30	8	1.61	428	1593	278	24	11.7	2	9	68	20	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. This is the second year this study was conducted on this field, with four treatment strips in the same location both years.

Grower Nitrogen Treatment: The grower N rate was split between 120 lb N/acre prior to planting and 160 lb N/acre applied during the season. Total N application was 280 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 120 lb N/acre was applied prior to planting. Crop canopy sensing and application occurred on July 1, 2016 at V11 growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 93 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	280	210 A*	42 B	1.33 A	514.23 A
Project SENSE N Management	213	198 B	52 A	1.08 B	507.47 A
P-Value	N/A	0.008	0.001	0.001	0.277

†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:
-Project SENSE N application was 67 lb N/acre lower than the grower's N application.
-Project SENSE N management had 12 bu/acre lower yield compared to the grower's N management.
-Project SENSE had higher N use efficiency than the grower's management.
-There was no significant difference in marginal net return between the two treatments.

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