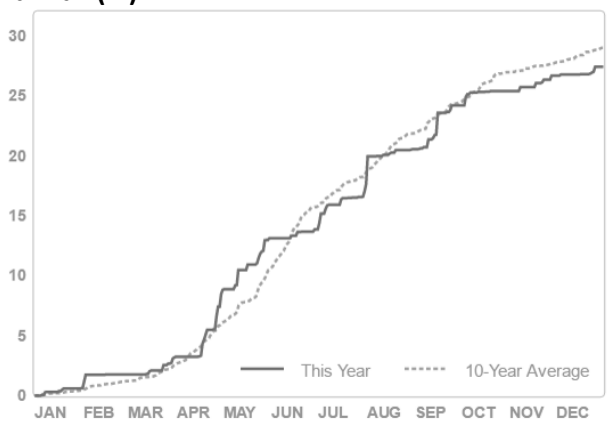
Project SENSE (Sensor-based In-season N Management)

Study ID: 021125201601
County: Nance
Soil Type: Loretto-Thurman complex 1-3% slope; Thurman loamy fine sand 2-6% slopes, eroded; Thurman loamy fine sand 2-6% slopes; Thurman loamy fine sand 1-3% slope
Planting Date: 5/10/16
Harvest Date: 10/31/16
Population: 28,600
Hybrid: P1197
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	6.0	6.8	0.16	NONE	0.9	25.8	62	38	12	2.64	128	749	72	4	6.2	24	5	61	10	0
2	5.8	6.8	0.21	NONE	1.1	33.9	81	25	11	3.48	155	666	77	3	6.0	27	7	55	11	0
3	5.6	6.7	0.21	NONE	1.6	29.8	71	40	12	2.74	255	839	87	5	8.9	37	7	47	8	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 grower applied 70 lb N/acre pre-plant. An additional 75 lb N/acre was applied in-season. The total N applied was 145 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 70 lb N/acre was applied at planting. Crop canopy sensing and application occurred on June 29, 2016 at V10 growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 72 lb N/acre. The total N rate was 142 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	145	186 A*	72 A	0.78 A	502.82 A
Project SENSE N Management	142	185 A	73 A	0.77 A	499.42 A
P-Value	N/A	0.520	0.712	0.815	0.670

†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:

-Wind damage was noted at this site.

-Project SENSE N application was 2 lb N/acre lower than the grower's N application.

-There was no yield difference between the two management strategies.

-There was no difference in N use efficiency between the two management strategies.

-There was no difference in marginal net return between the two management strategies.

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