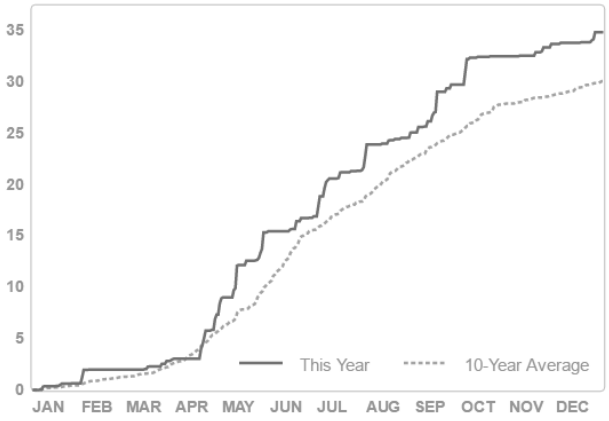
Project SENSE (Sensor-based In-season N Management)

Study ID: 201125201601
County: Nance
Soil Type: Thurman loamy fine sand 2-6% slopes; Valentine-Thurman complex 3-9% slopes; Thurman loamy fine sand 1-3% slope
Planting Date: 5/26/16
Harvest Date: 11/15/16
Population: 30,000
Hybrid: CRM (days) 110
Reps: 6
Previous Crop: Potato
Tillage: Disk

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
1	5.7	6.6	0.08	NONE	1.5	2.9	7	32	18	3.3	131	737	77	7	8.4	4.3	4	45	8	0
2	6.3	6.6	0.10	NONE	1.9	5.3	13	50	20	3.7	241	981	81	7	10.3	40	6	47	7	0
3	5.5	6.6	0.06	NONE	1.2	2.3	5	37	18	2.5	117	585	55	6	7.5	51	4	39	6	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 total N applied was 213 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 77 lb N/acre as a base rate at planting. Crop canopy sensing and application occurred on July 18, 2016 at VT growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 55 lb N/acre. The total N rate was 132 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	213	203 A	53 B	1.05 A	523.88 B
Project SENSE N Management	132	196 B	84 A	0.67 B	538.48 A
P-Value	N/A	0.1197	0.0001	<0.0001	0.282

†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:
-Rye cover crop was present prior to planting corn.
-Project SENSE N application was 81 lb N/acre lower than the grower's N application.
-There was slight visible N stress in the Project SENSE treatments at the time of application.
-There was no yield difference between the two management strategies.
-Project SENSE N management resulted in higher N use efficiency than the grower's N application.
-Project SENSE N management resulted in higher marginal net return than the grower's N application.

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