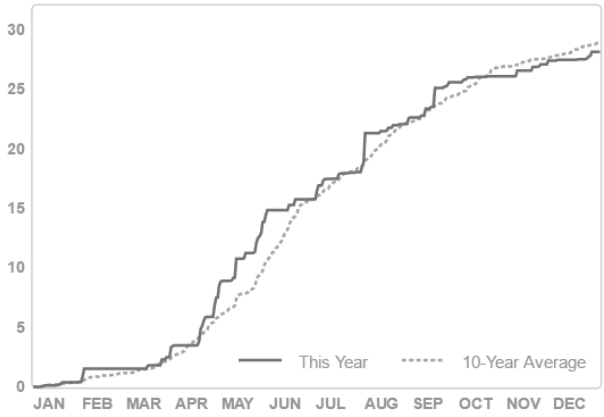
Project SENSE (Sensor-based In-season N Management)

Study ID: 202125201601
County: Nance
Soil Type: Detroit silt loam 0-1% slope; Hord very fine sandy loam 1-3% slope; Hord fine sandy loam 0-1% slope
Planting Date: 5/1/16
Harvest Date: 11/4/16
Population: 34,000
Hybrid: CRM (days) 116
Reps: 6
Previous Crop: Soybean
Tillage: Reduced Tillage

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	6.5	6.9	0.19	NONE	2.6	15.1	36	30	8	2.51	451	1436	157	16	10.9	11	11	65	12	1
2	6.4	7	0.21	NONE	2.2	27.3	65	51	10	2.76	412	1272	122	15	8.9	4	12	72	11	1
3	6.3	6.9	0.16	NONE	1.8	21	50	32	8	0.95	287	1266	195	53	9.7	8	8	65	17	2

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 203 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 78 lb N/acre was applied at planting. Crop canopy sensing and application occurred on June 28, 2016 at V13 growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 53 lb N/acre. The total N rate was 131 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	203	179 A*	49 B	1.14 A	453.48 B
Project SENSE N Management	131	179 A	77 A	0.73 B	486.25 A
P-Value	N/A	0.961	<0.0001	<0.0001	0.003

†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 72 lb N/acre lower than the grower's N 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 $33/acre higher marginal net return than the grower's N management due to reduced N application with no yield reduction.

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