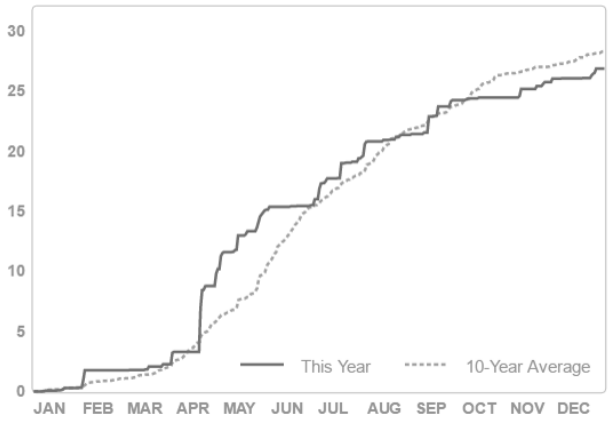
Project SENSE (Sensor-based In-season N Management)

Study ID: 205079201601
County: Hall
Soil Type: Hord silt loam 0-1% slope; Hord silt loam 1-3% slope
Planting Date: 5/5/16
Harvest Date: 10/15/16
Population: 32,000
Hybrid: P1197AMT
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) K	Ca	Mg	Na	CEC me/100g	% Base Saturation H	K	Ca	Mg	Na
1	6.9	7.2	0.25	NONE	2.8	22.5	54	36	10	3.10	295	1875	192	15	11.8	0	6	79	14	1
2	7.2	7.2	0.16	NONE	2.8	17.4	42	28	10	2.48	288	2363	243	21	14.7	0	5	80	14	1
3	6.7	7.2	0.17	NONE	2.5	19.3	46	19	12	3.59	227	2133	212	19	13.1	0	4	81	14	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 treatment strips in the same location both years.

Grower Nitrogen Treatment: The initial grower N rate was 30 lb N/acre prior to planting. An additional application of 130 lb N/acre on June 11, 2016 at V3-V4. Total N applied was 160 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 30 lb N/acre was applied prior to planting. An additional application of 60 lb N/acre was made on June 11, 2016 at V3-V4. 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 43 lb N/acre. The total N rate was 133 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	160	234 A*	82 B	0.69 A	640.98 B
Project SENSE N Management	133	235 A	99 A	0.57 B	655.53 A
P-Value	N/A	0.213	<0.0001	<0.0001	0.0002

†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 27 lb N/acre lower than the grower's N application.
-There was no yield difference between Project SENSE N management and the grower's N management.
-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 management due to reduced N application with no yield reduction.

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