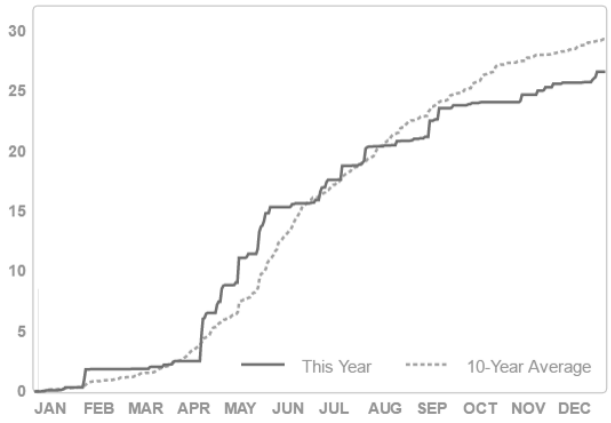
Project SENSE (Sensor-based In-season N Management)

Study ID: 209079201601
County: Hall
Soil Type: Jansen fine sandy loam overblown, leveled
Planting Date: 4/27/16
Harvest Date: 10/23/16
Population: 33,000
Hybrid: CRM (days) 115
Reps: 6
Previous Crop: Corn
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) K	Ca	Mg	Na	CEC me/100g	% Base Saturation H	K	Ca	Mg	Na
1	7.0	7.2	0.13	NONE	1.2	6.9	17	109	12	2.05	109	944	89	13	5.8	0	5	81	13	1
2	6.2	6.8	0.13	NONE	2.1	8.0	19	299	13	4.86	285	1145	102	9	9.1	20	8	63	9	0
3	6.7	7.2	0.14	NONE	2.3	6.7	16	274	11	6.69	201	1314	115	12	8.1	0	6	81	12	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: Total N applied was 225 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 75 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 119 lb N/acre. The total N rate was 194 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	225	150 B*	37 B	1.50 A	355.78 B
Project SENSE N Management	194	173 A	51 A	1.12 B	440.27 A
P-Value	N/A	0.001	0.003	0.002	0.0004

†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:
-Insect and wind damage was noted during the season.
-Project SENSE N application was 31 lb N/acre lower than the grower's N application.
-Project SENSE N management had a 23 bu/acre yield increase over 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 $84/acre higher marginal net return than the grower's N management due to reduced N application and increased yield.

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