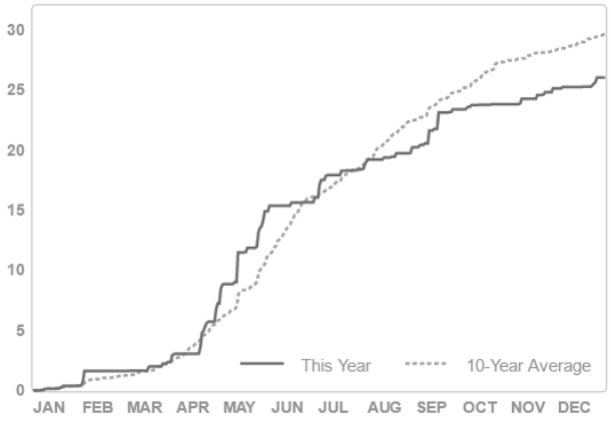
Project SENSE (Sensor-based In-season N Management)

Study ID: 207121201601
County: Merrick
Soil Type: Brocksburg loam 0-2% slope; Blendon fine sandy loam 0-2% slope
Planting Date: 5/4/16
Harvest Date: 10/23/16
Population: 32,500
Hybrid: CRM (days) 113
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)				CEC me/100g	% Base Saturation				
											K	Ca	Mg	Na		H	K	Ca	Mg	Na
1	6.4	6.9	0.17	NONE	1.2	10.2	24	17	11	2.3	168	963	102	7	7.1	14	6	68	12	0
2	6.4	6.9	0.16	NONE	1.5	10.2	24	11	16	1.7	127	1205	131	12	8.5	12	4	70	13	1
3	6.3	6.7	0.12	NONE	1.4	8.6	21	17	14	1.35	147	772	95	8	7.8	35	5	50	10	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 initial grower N rate was 50 lb N/acre at or prior to planting. An additional application of 90 lb N/acre was made in early June. Total N applied was 140 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 80 lb N/acre was applied at or prior to 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 91 lb N/acre. The total N rate was 171 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	140	212 A*	85 A	0.66 B	584.23 A
Project SENSE N Management	171	211 A	69 B	0.81 A	565.03 B
P-Value	N/A	0.183	<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 31 lb N/acre higher than the grower's N application.

-There was no yield difference between Project SENSE N management and the grower's N management.

-The grower's N management resulted in higher N use efficiency than Project SENSE N management.

-The grower's N management resulted in $19/acre higher marginal net return than the Project SENSE N management.

Sponsored by:

In Partnership with: