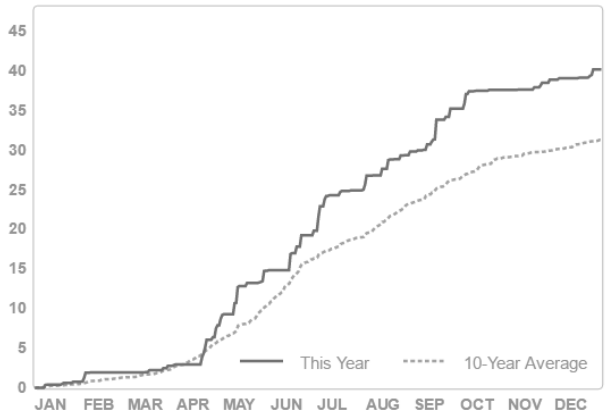
Project SENSE (Sensor-based In-season N Management)

Study ID: 210037201601
County: Colfax
Soil Type: Lawet silt loam rarely flooded
Planting Date: 5/10/16
Harvest Date: 10/29/16
Population: 32,500
Hybrid: G07B39
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	8.3	7.2	0.33	HIGH	6.3	6.6	16	68	7	1.76	313	5032	1062	16	34.9	0	2	72	25	0
2	8.3	7.2	0.31	HIGH	5.4	6.7	16	102	8	2.06	385	5306	908	14	35.1	0	3	75	22	0
3	8.3	7.2	0.38	HIGH	5.7	6.8	16	82	5	1.92	371	5158	1140	19	36.3	0	3	71	26	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. 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 75 lb N/acre. A sidedress application of 100 lb N/acre was applied around V5-V6. Total N application was 175 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips 75 lb N/acre was applied at planting. Crop canopy sensing and application occurred on July 12, 2016 at V14 growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 30 lb N/acre. Total N rate was 105 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	175	176 A*	56 B	0.99 A	458.81 A
Project SENSE N Management	105	157 B	84 A	0.67 B	431.80 B
P-Value	N/A	<0.0001	<0.0001	<0.0001	0.001

†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 70 lb N/acre lower than the grower's N application.
-Greensnap and lodging occurred on July 5.
-Project SENSE N management had 19 bu/acre lower yield compared to the grower's N management.
-Project SENSE had higher N use efficiency than the grower's management.
-The grower's N management resulted in $27/acre higher marginal net return than the Project SENSE N management.

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