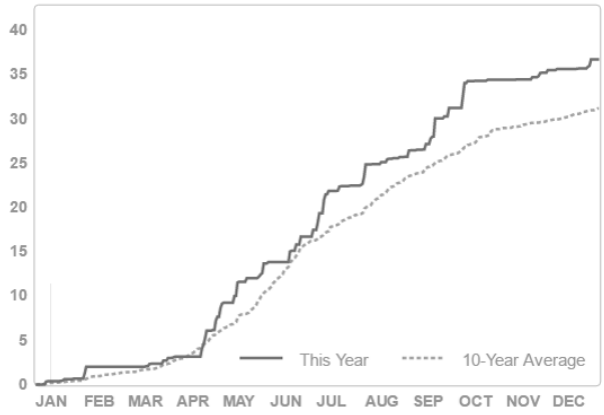
Project SENSE (Sensor-based In-season N Management)

Study ID: 212023201601
County: Butler
Soil Type: Gibbon silty clay loam occasionally flooded; Thurman loamy fine sand 2-6% slopes
Planting Date: 5/4/16
Harvest Date: 10/20/16
Population: 34,000
Hybrid: Mycogen 2C799
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)				CEC me/100g	% Base Saturation				
											K	Ca	Mg	Na		H	K	Ca	Mg	Na
1	7.4	7.2	0.26	NONE	2.0	8.3	20	6	11	0.92	165	2715	146	11	15.3	0	3	89	8	0
2	8.2	7.2	0.34	HIGH	5.2	15.8	38	23	8	1.94	159	5710	363	14	32.0	0	1	89	9	0
3	8.3	7.2	0.39	HIGH	5.6	10.2	24	20	15	1.54	142	6097	352	30	33.9	0	1	90	9	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 67 lb N/acre at or prior to planting. A sidedress application of 143 lb N/acre was applied on June 8, 2016 at V5. Total N applied was 210 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 67 lb N/acre was applied at or prior to planting. Crop canopy sensing and application occurred on June 24, 2016 at V9 growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 109 lb N/acre. The total N rate was 176 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	210	183 A*	49 A	0.87 A	462.96 A
Project SENSE N Management	176	168 B	54 A	0.96 A	432.03 B
P-Value	N/A	0.005	0.121	0.121	0.040

†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 34 lb N/acre lower than the grower's N application.
-At the time of crop canopy sensing, all the Project SENSE treatment strips were visibly yellow.
-Yield for Project SENSE N management was 15 bu/acre less than for the grower's management.
-There was no difference in N use efficiency.
-The grower's N management had a $31/acre higher marginal net return.

Sponsored by:

In Partnership with: