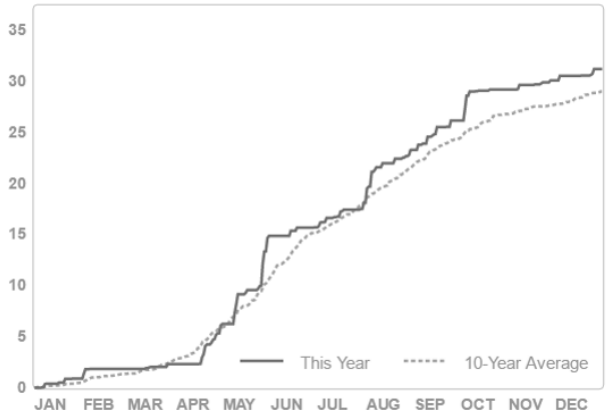
Project SENSE (Sensor-based In-season N Management)

Study ID: 620059201601
County: Fillmore
Soil Type: Crete silt loam 0-1% slope; Butler silt loam 0-1% slope; Fillmore silt loam 0-1% slope
Planting Date: 4/24/16
Harvest Date: 9/26/16
Population: 32,000
Hybrid: Mycogen 2V717
Reps: 6
Previous Crop: Soybean
Tillage: Reduced Tillage

Irrigation: Pivot, Total: 6.7
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	5.8	6.7	0.47	NONE	3.5	36.2	87	28	19	0.85	355	3804	742	48	29.7	11	3	64	21	1
2	5.7	6.6	0.32	NONE	3.1	29	70	17	14	0.97	242	2316	308	32	19.0	22	3	61	13	1
3	5.8	6.7	0.56	NONE	3.8	50.9	122	51	21	2.46	278	3040	397	26	22.2	13	3	68	15	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.

Grower Nitrogen Treatment: The initial grower N rate was 75 lb N/acre prior to or at planting. An additional application of 73 lb N/acre mid-June around V5-V6. Total N applied was 148 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 75 lb N/acre was applied prior to or at planting. Crop canopy sensing and application occurred on June 30, 2016 at V11 growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 35 lb N/acre. The total N rate was 110 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	148	237 A*	90 B	0.62 A	656.84 A
Project SENSE N Management	110	233 B	118 A	0.47 B	659.56 A
P-Value	N/A	0.014	<0.0001	<0.0001	0.474

†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 38 lb N/acre lower than the grower's N application.
-The grower's N management resulted in a 4 bu/acre yield increase compared to the Project SENSE N management.
-Project SENSE N management resulted in higher N use efficiency than the grower's N application.
-There was no significant difference in marginal net return between the two N management strategies.

Sponsored by:

In Partnership with: