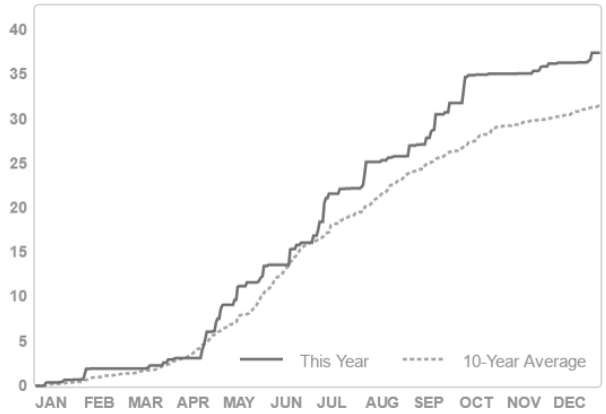
Project SENSE (Sensor-based In-season N Management)

Study ID: 621023201601
County: Butler
Soil Type: Brocksburg sandy loam 0-2% slope
Planting Date: 4/24/16
Harvest Date: 10/22/16
Population: 32,000
Row Spacing (in) 30
Hybrid: P33D53AM
Reps: 6
Previous Crop: Soybean
Tillage: No-Till
Herbicides: ***Pre:*** 1 pt/ac 2-4,D and 1 qt/ac Atrazine
Post: 3 qt/ac Halex® GT and 1 qt/ac Atrazine
Seed Treatment: Poncho® 1250 + VOTiVO®
Foliar Insecticides: None
Foliar Fungicides: Headline AMP® 10 oz/ac at VT

Note: Greensnap, 25-30%
Irrigation: Pivot, Total: 12
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
6	6.4	6.9	0.10	NONE	0.9	6.8	16	340	7	21.8	73	697	55	6	5.2	19	4	68	9	0
14	5.6	6.9	0.09	NONE	0.9	6.8	16	16	11	3.2	96	488	48	4	4.4	30	6	55	9	0
22	5.6	6.9	0.09	NONE	0.7	5.1	12	32	9	2.9	69	406	44	4	4.0	35	4	51	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.

Grower Nitrogen Treatment: The grower N rate was 168 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 73 lb N/acre was applied on May 4, 2016, after planting, but before emergence. Crop canopy sensing and application occurred on June 24, 2016 at V10 growth stage. Across all Project SENSE treatments, the average N rate applied in-season was 98 lb N/acre. Total N applied 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	168	184 B*	61 B	0.92 A	552.88 B
Project SENSE N Management	171	208 A	68 A	0.82 B	627.92 A
P-Value	N/A	<0.0001	0.0006	0.0007	<0.0001

†Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $3.05/bu corn and $0.45/lb nitrogen fertilizer.

Summary:
-Project SENSE N application was 3 lb N/acre higher than the grower's N application.
-Yield for Project SENSE N management was 24 bu/acre greater than for the grower's management.
-Project SENSE had higher N use efficiency than the grower's management.
-Project SENSE had a $75/acre higher marginal net return due to increased yield with only a small increase in N fertilizer.

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