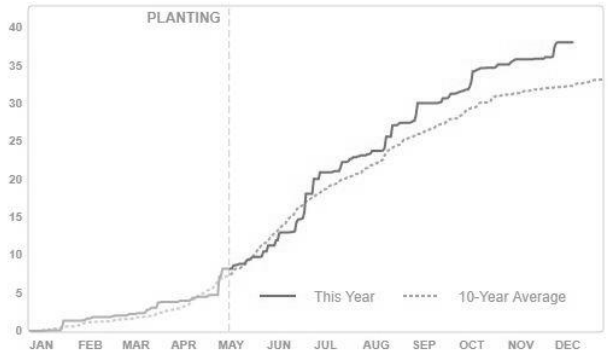
Project SENSE (Sensor-based In-season N Management)

Study ID: 0621023201801
County: Butler
Soil Type: Brocksburg sandy loam
Planting Date: 5/8/18
Harvest Date: 10/18/18
Population: 31,000
Row Spacing (in): 30
Hybrid: Pioneer® P1479AM
Reps: 6
Previous Crop: Soybean
Tillage: No-Till

Irrigation: Pivot, Total: 8.5", 16.9 ppm N in irrigation water results in 32 lb N/ac
Rainfall (in):



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 with the grower's standard N management.

Grower Nitrogen Treatment: The initial grower N rate was 75 lb N/ac applied at planting. An additional 127 lb N/acre was applied at V6 growth stage, and 20 lb N/acre was applied at V8 growth stage. Total N applied was 222 lb N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 75 lb N/acre was applied at planting and 20 lb N/acre was applied at V8 growth stage. Crop canopy sensing and application occurred on July 3, 2018 at V12 growth stage. Across all project SENSE treatments, the average N rate applied in-season, based on the sensor, was 88 lb N/acre. The total N rate averaged 183 lb N/acre.

Results:

	Total N rate (lb/ac)	Yield† (bu/ac)	Partial Factor Productivity of N (lb grain/lb N)	lb N/ bu grain	Marginal Net Return‡ ($/ac)
Grower N Management	222	208 A*	52 B	1.07 A	593.21 A
Project SENSE N Management	183	206 A	63 A	0.89 B	601.21 A
P-Value	N/A	0.591	0.004	0.001	0.482

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $3.23/bu corn and $0.35/lb N.

Summary:

- The Project SENSE N management was 39 lb N/ac lower than the grower's N management.
- There was no yield difference between the Project SENSE N management and the grower's N management.
- Project SENSE had a higher partial factor productivity of N and used fewer pounds of N to produce a bushel of grain.
- There was no difference in marginal net return between the Project SENSE N management and the grower's N management.

Sponsored by: University of Nebraska Lincoln

In Partnership with: Nebraska Corn Board; Nebraska Soybean Checkoff; Nebraska Corn Growers Association; Nebraska Dry Bean Commission