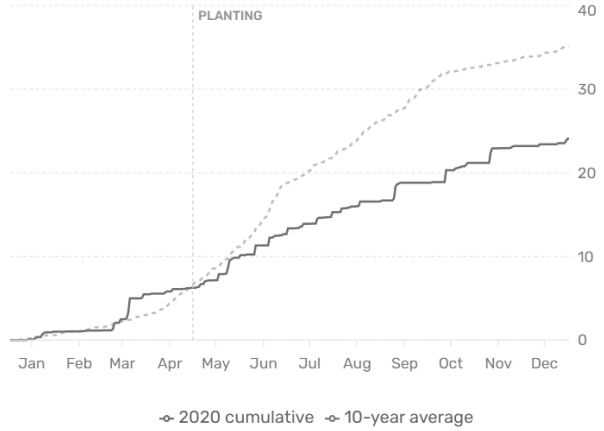
Project SENSE (Sensor-based In-season N Management) on Non-irrigated Corn

Study ID: 0103053202001
County: Dodge
Soil Type: Moody silty clay loam; Alcester silty clay loam; Coleridge silty clay loam
Planting Date: 4/30/20
Harvest Date: 10/9/20
Seeding Rate: 31,000
Row Spacing (in): 30
Hybrid: Fontanelle Hybrids® 13D843
Reps: 6
Previous Crop: Soybean
Tillage: No-Till

Irrigation: None
Rainfall (in):



Soil Samples (June 2020, minimum, maximum, and average values from zone sample):

	Soil pH			Nitrate –	Mehlich P-	Sulfate-S	Ammonium Acetate (ppm)				CEC	% Base Saturation				
	1:1	BpH	OM LOI %	N ppm N	III ppm P	ppm S	K	Ca	Mg	Na	me/100g	H	K	Ca	Mg	Na
Min	5.6	6.4	3.4	2.3*	21	4.2	183	2078	418	6	19.3	0	2	50	17	0
Max	7.1	7.2	4.3	12.2*	103	7.6	378	2952	597	10	23.1	29	5	76	23	0
Avg	6.2	6.6	3.7	7.3*	44	5.5	265	2529	493	8	21.1	17	4	60	20	0

*All samples are 0-8" depth except nitrate-N ppm N sampled at 0-24" depth

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 grower rate was 124 lb N/ac, applied as 10 gal/ac UAN with the planter on April 30, 2020 (contributing 35 lb/ac N), and 25 gal/ac UAN at V6 with a coulter applicator on June 17, 2020 (contributing 87 lb/ac N).

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, the base rate (prior to in-season sensing) was established with 10 gal/ac UAN with the planter on April 30, 2020 (contributing 35 lb/ac N), for a total base rate of 35 lb/ac N. Crop canopy sensing and application occurred on June 29, 2020, at the V11 growth stage. Across all Project SENSE treatments, the average N rate applied based on the in-season sensing was 88 lb N/ac, applied as 28% UAN with Nitrain Bullet™ pronitridine stabilizer. Following the application, the field received 0.71" of rain on June 30, 2020. The average total N rate was 123 lb N/ac.

This field had a cereal rye cover crop seeded at 50 lb/ac on October 20, 2019. The cover crop was terminated by herbicide on April 28, 2020, at a height of 10".

Results:

	Total N rate (lb/ac)	Yield (bu/ac)†	Partial Factor Productivity of N (lb grain/lb N)	lbs N/bu grain	Marginal Net Return‡ ($/ac)
Grower	124 A*	177 A	80 A	0.70 A	569.71 A
Project SENSE	123 A	177 A	80 A	0.70 A	570.17 A
P-Value	0.771	0.99	0.889	0.995	0.983

*Values with the same letter are not significantly different at a 90% confidence level.
†Yield values are from cleaned yield monitor data. Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $3.51/bu corn and $0.41/lb N.

Summary:

- At this site, the grower N management and Project SENSE N management resulted in very similar total N rates.
- There were no differences in yield, partial factor productivity of N, lbs of N per bushel of grain, or profit.

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