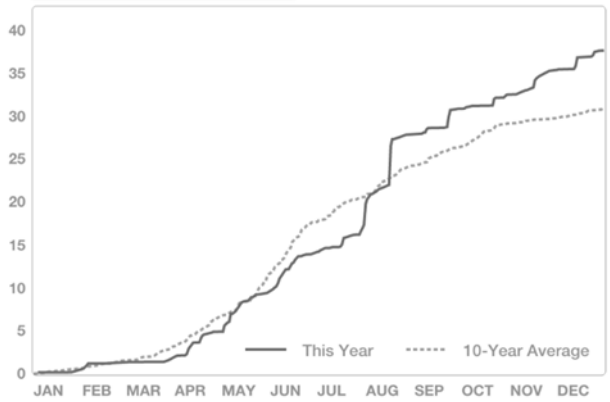
Nebraska On-Farm Research Network

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

Study ID: 202125201501
County: Nance
Soil Type: Hord very fine sandy loam; Detroit silt loam; Loretto-Thurman complex; Nora-Crofton complex;
Planting Date: 4/28/15
Harvest Date: 10/30/15
Population: 34,000
Row Spacing (in.) 30
Hybrid: Unknown
Reps: 6
Previous Crop: Soybean
Tillage: Strip-till

Note: 0-36" soil nitrate sample after 2014 crop had 6.2 ppm.
Irrigation water nitrate: N/A – river water
Irrigation: Pivot, Total: 9.3
Rainfall (in.):



Introduction: This study compares crop canopy sensor based in-season N application to the grower's standard N management.

Grower Nitrogen Treatment: In a strip-till operation prior to planting 45 lb N/ac was applied (13 gal 32% + 2 gal/ac Thiosulfate). The grower initial N rate was 45 lbs N/ac and was applied at planting. A side dress rate of 185 lbs N/acre was applied (52 gal/ac 32%). These application brought the total to 230 lbs N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 49 lb N/ac was applied in a strip-till operation prior to planting and an additional 53 lb N/ac (15 gal 32%) was applied at sidedress. This brought the base rate to 98 lb N/ac prior to crop sensing. Crop canopy sensing and application occurred on 7/1/15 at the V11 growth stage. Across all project SENSE treatments, the average N rate applied in-season was 69 lbs N/acre with a minimum of 30 lbs N/acre and maximum of 294 lbs N/ac.

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/ac)†	Partial Factor Productivity of N (lb grain/lb N)	lbs N/ bu grain	Marginal Net Return ($/ac)‡
Grower N	230	243 A*	59 B	0.95 A	737.45
Project SENSE N	167	237 A	81 A	0.71 B	756.50
P-Value	N/A	0.3460	0.0067	0.0031	N/A

†Wet bushels per acre. Moisture data not available to correct to standard moisture. Yield data is from yield monitor and was not cleaned.
*Values with the same letter are not significantly different at a 95% confidence level.
‡Marginal net return based on $3.65 corn and $0.65/lb N fertilizer. Cost of applicator and equipment is not included in this calculation.

Summary: At this site, the Project SENSE N application was 55 lb/acre lower than the grower's N application. There was no statistical difference in yield between the two treatments. Partial Factor Productivity of N was higher for the SENSE N treatment. Marginal net return looking at grain and N prices was favorable for the SENSE treatment this year.

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