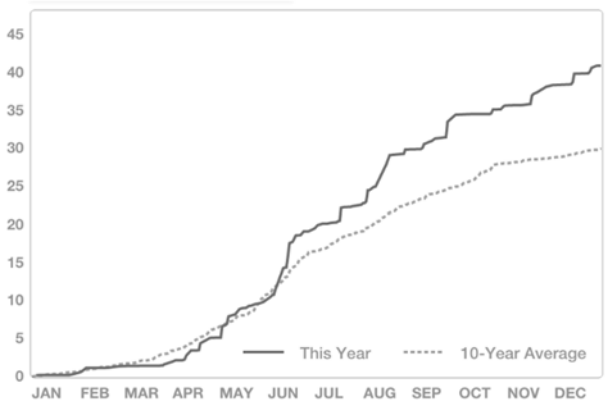
Nebraska On-Farm Research Network

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

Study ID: 201141201501
County: Platte
Soil Type: Valentine fine sand; Thurman loamy fine sand; Blendon fine sandy loam; Valentine-Thurman complex;
Planting Date: unknown
Harvest Date: 10/21/15
Population: unknown
Row Spacing (in.) 30”
Hybrid: unknown
Reps: 5
Previous Crop: Hailed out corn, planted soybeans late
Tillage: No-Till
Herbicides: ***Pre:*** unknown ***Post:*** unknown
Seed Treatment: unknown
Foliar Insecticides: unknown
Foliar Fungicides: unknown

Note: 0-36” soil nitrate sample after 2014 crop had 1.5 and 3 ppm (average was used for NRD N rec).
Irrigation water nitrate: 28.8 ppm
Irrigation: Pivot, Total: 10.3
Rainfall (in.):



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

Grower Nitrogen Treatment: The grower initial N rate was 50 lbs N/acre and was applied at planting. A side-dress rate of 100 lbs N/acre was applied. Total N applied was 150 lbs N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 30 lbs N/acre was applied at planting and another 46 lb/ac in two subsequent sidedress applications. Crop canopy sensing and application occurred on 7/13/15 at the VT growth stage. Across all project SENSE treatments, the average N rate applied in-season was 88 lbs N/acre with a minimum rate of 30 lbs N/acre, and maximum rate of 230 lbs 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/ac)†	Partial Factor Productivity of N (lb grain/lb N)	lbs N/ bu grain	Marginal Net Return‡
Grower N Management	150	179 A*	67 A	0.84 B	$555.85
Project SENSE N Management	164	171 B	59 B	0.96 A	$517.55
P-Value	N/A	0.0473	0.0203	0.0352	N/A

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

Summary: At this site, the Project SENSE N application was 14 lb/acre higher than the grower's N application. Yield was significantly lower for the Project SENSE treatment (9 bu/ac). Partial Factor Productivity of N was higher for the grower N treatment. Marginal net return looking at grain and N prices resulted in a loss in profit for the SENSE treatments due to lost yield. At this site, Project SENSE N application did not occur until near VT; this resulted in only 75 lb N/acre being available to the crop for much of the growing season.

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