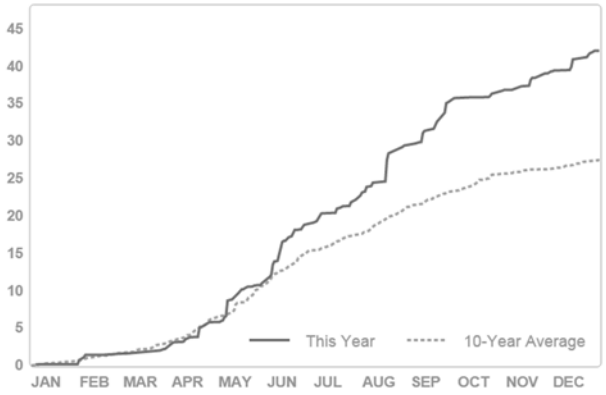
Nebraska On-Farm Research Network

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

Study ID: 204159201501
County: Seward
Soil Type: Hastings silt loam; Hastings silty clay loam;
Planting Date: 4/28/15
Harvest Date: 10/27/15
Population: 34,000
Row Spacing (in.) 30
Hybrid: Pioneer 1690
Reps: 6
Previous Crop: Soybean
Tillage: No-Till
Herbicides: ***Pre:*** Corvus ***Post:*** Roundup PowerMax
Seed Treatment: Pioneer Standard Rate with Poncho PPST 250
Foliar Insecticides: None
Foliar Fungicides: Aproach Prima
Irrigation: Pivot, Total: 4.80"
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 25 lbs N/acre applied at planting. A side dress rate of 175lbs N/acre was applied on 7/5/15. Total grower N application was 200 lbs N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips, 25 lbs N/acre were applied at planting with an additional 50 lbs N/acre added on 6/10/15. Crop canopy sensing and application occurred on 7/8/15 at the V12 growth stage. Across all project SENSE treatments, the average N rate applied in-season was 61 lbs N/acre with a minimum rate of 30 lbs N/acre, and maximum rate of 194 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	200	243 A*	68 B	0.81 A	$756.95
Project SENSE N Management	136	232 B	95 A	0.58 B	$758.40
P-Value	N/A	0.0008	<.0001	<.0001	N/A

†Yield data from cleaned yield monitor data. Bushels per acre corrected to 15.5% moisture.
*Values with the same letter are not significantly different at a 95% confidence level.
‡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.

Summary: At this site, the Project SENSE N application was 64 lb/acre lower than the grower's N application. This resulted in a statistically significant yield loss (11 bu/ac). 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 due to greater monetary return for saved N than monetary loss for reduced yield.

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