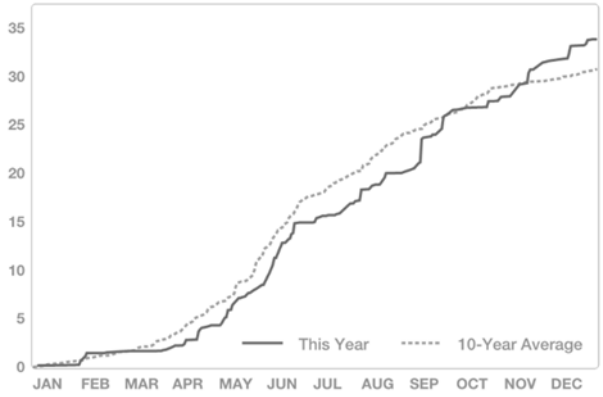
Nebraska On-Farm Research Network

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

Study ID: 208121201501
County: Merrick
Soil Type: Gibbon loam; Leshara silt loam;
Planting Date: 5/1/15
Harvest Date: 10/30/15
Population: 32,000
Row Spacing (in.) 30
Hybrid: Pioneer 1690 CHR
Reps: 6
Previous Crop: Soybean
Tillage: No-Till
Herbicides: ***Pre:*** 1 qt/ac Glyphosate and 2 qt/ac Volley ATZ on 5/3/15 (Burndown) ***Post:*** 1.5 qt/ac Glyphosate on 6/21/15
Seed Treatment: Unknown
Foliar Insecticides: None
Foliar Fungicides: None
Irrigation: SDI, Total: 6.81"
Rainfall (in.):



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

Grower Nitrogen Treatment: The grower initial N rate was 75 lbs N/acre applied at planting. A side dress rate of 205 lbs N/acre was applied. Total grower N application was 280 lbs N/acre.

Project SENSE Nitrogen Treatment: For the SENSE treatment strips 75 lbs N/acre were applied at planting and early in the season. The 75 lb N/acre was on by 6/10/15. Crop canopy sensing and application occurred on 6/22/15 at the V8 growth stage. Across all project SENSE treatments, the average N rate applied in-season was 74 lbs N/acre with a minimum rate of 30 lbs N/acre, and maximum rate of 209 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	280	238 A*	48 B	1.16 A	$686.70
Project SENSE N Management	149	226 B	86 A	0.66 B	$728.05
P-Value	N/A	0.0244	0.0002	<.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 131 lb/acre lower than the grower's N application. Yield was significantly lower for the Project SENSE treatment (12 bu/ac). Partial Factor Productivity of N was higher for the Project SENSE N treatment. Marginal net return looking at grain and N prices was favorable for the SENSE treatment this year because N savings outweighed the loss in yield. Since this is a sub-surface drip irrigation site, N applied on 6/22/15 likely was not incorporated until a July 2 rainfall event of ~0.60".

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