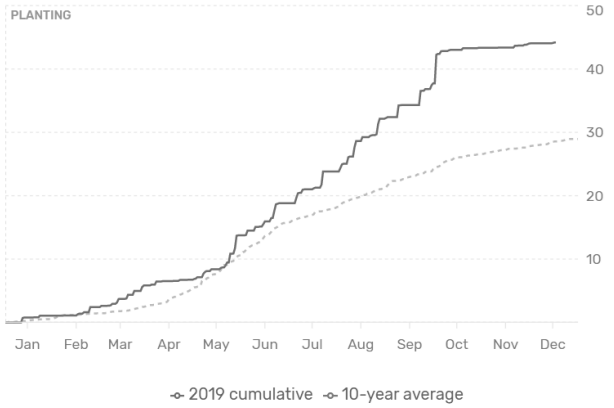
Soybean Benchmarking-Baseline vs Improved Soybean Practices

Study ID: 0917059201901
County: Fillmore
Soil Type: Crete silt loam 1-3% slope
Harvest Date: 10/23/19
Row Spacing (in): 30
Variety: Channel® 3519R2X
Reps: 4
Previous Crop: Corn
Tillage: No-Till
Herbicides: ***Pre:*** 4 oz/ac Fierce® XLT, 22 oz/ac XtendiMax®, 32 oz/ac glyphosate, and 12.9 oz/ac MOUNTAINEER® MAX on 5/14/19 ***Post:*** 22 oz/ac Roundup PowerMAX® and 6 oz/ac chlethodim with 17 lb dry AMS/100 gallon solution
Seed Treatment: Marauder® (inoculant) and Inovate® (fungicide and insecticide)

Fertilizer: None
Irrigation: None
Rainfall (in):



Soil Tests (Oct 2019 - average of each treatment):

	Soil pH	Soluble Salts 1:1	Excess Lime	Organic Matter	Nitrate – N	Nitrate lb N/A	Mehlich P-III	Ammonium Acetate (ppm)				M-2 Sulfate	DTPA (ppm)				CEC	% Base Saturation				
	1:1	mmho/cm	Rating	LOI %	ppm N	(0-8")	ppm P	K	Ca	Mg	Na	ppm S	Zn	Fe	Mn	Cu	me/100g	H	K	Ca	Mg	Na
Baseline	6.4	0.16	None	3.0	6.2	15	28	403	2457	351	31	15.6	1.32	62.5	17.1	1.09	21.5	24	5	56	14	1
Improved	6.3	0.15	None	3.3	6.2	15	21	397	2504	361	10	9.8	1.07	65.6	18.1	1.11	22.7	27	4	55	13	0

Introduction: Analysis of producer survey data revealed: (1) an average yield gap of 20-30% between current farmer yield and potential yield as determined by climate, soil, and genetics, and (2) a number of agronomic practices that, for a given soil-climate context, can be fine-tuned to close the gap and improve soybean producer profit.

In Nebraska, three practices were identified as being important for improving yield and producer profit. These practices relate to planting date, seeding rate, and the use of foliar fungicides and insecticides. This study collectively tested the "baseline" practices versus the "improved" practices.

In this study, the baseline treatment was soybeans planted on June 2 at a rate of 160,000 seeds/ac with no foliar fungicide or insecticide. The improved treatment was soybeans planted on May 3 at a rate of 130,000 seeds/ac with a foliar fungicide and insecticide application on July 31 with 10 oz/ac Affiance® and 4 oz/ac FanFare®.

Soybean cyst nematode tests for this field came back negative.

Results:

	Harvest Stand Count (plants/ac)	Test Weight (lb/bu)	Moisture (%)	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
Baseline: Late Planted, Higher Seeding Rate, No Fungicide & Insecticide	107,500 A*	57 A	10.7 B	75 B	551.19 B
Improved: Early Planted, Lower Seeding Rate, Fungicide and Insecticide	104,500 A	57 A	10.8 A	79 A	568.60 A
P-Value	0.734	0.591	0.058	0.016	0.057

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre adjusted to 13% moisture.
‡Marginal net return based on $8.10/bu soybean, $49.45/unit seed ($56.51/ac for baseline and $45.92/ac for improved), $15/ac for fungicide and insecticide for improved treatment, and $6.94/ac for application of fungicide and insecticide on improved treatment.

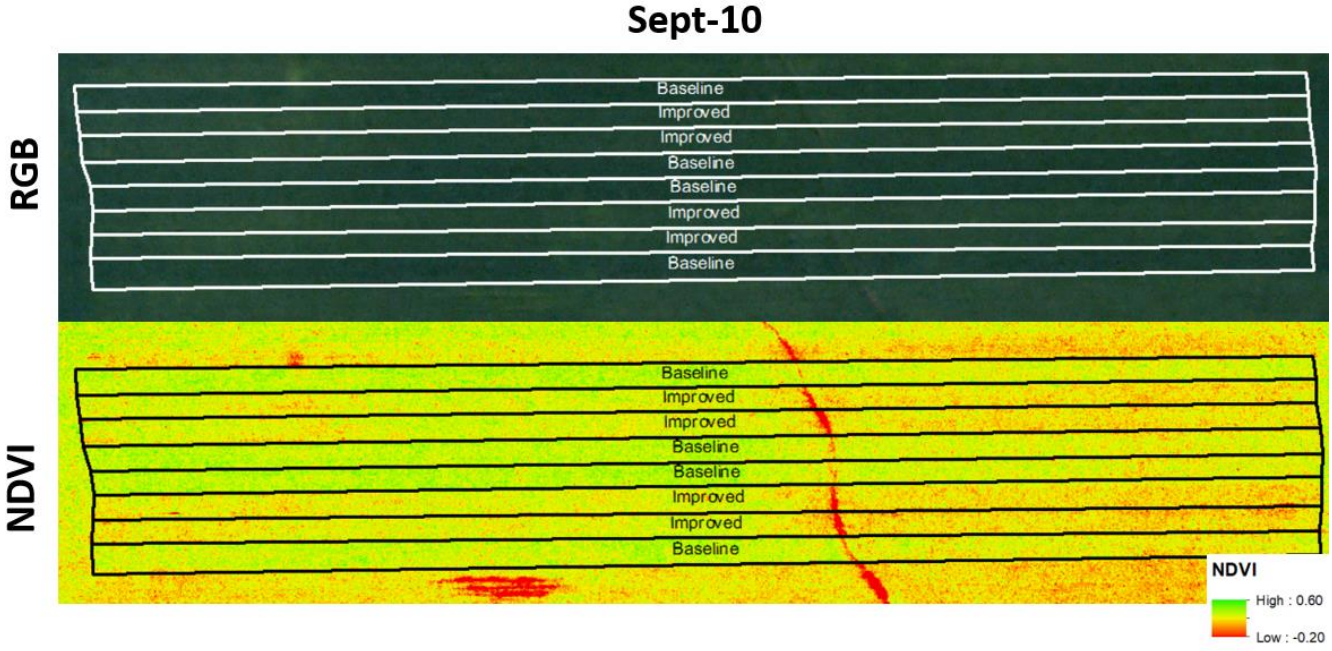


Figure 1. Aerial imagery from September 10 displayed as true color (top) and normalized difference vegetation index (NDVI) (bottom).

Summary:

- Despite different seeding rates for the two treatments, stand counts at harvest were not significantly different.
- The improved treatment (lower seeding rate with early planting and fungicide and insecticide application) resulted in a 3.6 bu/ac yield increase and $17.41/ac increase in profit.
- Aerial imagery from September 10 showed the improved treatment was less green and had lower NDVI values indicating these plots were senescing earlier.

This study was conducted in cooperation with a regional study funded by the North Central Region Soybean Research Program.