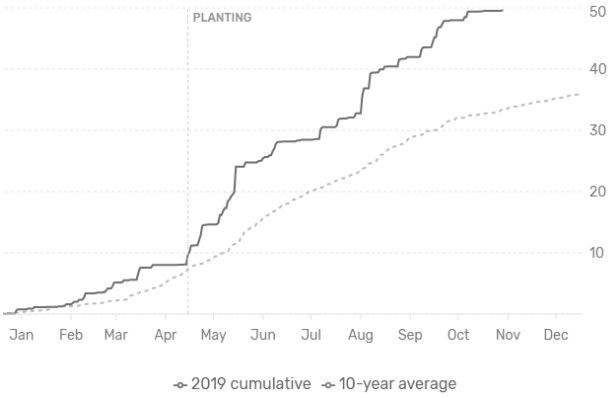
Soybean Benchmarking-Baseline vs Improved Soybean Practices

Study ID: 0821147201901
County: Richardson
Soil Type: Wabash silty clay loam, occasionally flooded
Harvest Date: 10/25/19
Row Spacing (in): 15
Variety: Pioneer® P40A47X
Reps: 4
Previous Crop: Corn
Tillage: No-Till, Strip-Till
Herbicides: ***Pre:*** 32 oz/ac Buccaneer® 5, 8 oz/ac dicamba, and 6 oz/ac Zidua® PRO on 4/16/19 ***Post:*** 32 oz/ac Buccaneer® 5, 10 oz/ac Outlook®, and 6 oz/ac Volunteer® on 6/12/19
Seed Treatment: None

Fertilizer: None
Irrigation: None
Rainfall (in):



Soil Tests (July 2019 - average of study area)

pH	BpH	CEC	1:1 S Salts	OM	Nitrate-N	K	S	Zn	Fe	Mn	Cu	Ca	Mg	Na	H	K	Ca	Mg	Na	Mehlich P-III
		meq/100g	mmho/cm	%	ppm	ppm									%					ppm
6	6.8	14.9	0.09	3	4.4	136	3.8	1.12	68.8	17.3	0.93	2156	258	7	11	2	72	14	0	40

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 5 at a rate of 160,000 seeds/ac with no foliar fungicide or insecticide. The improved treatment was soybeans planted on April 26 at a rate of 130,000 seeds/ac with a fungicide (4 oz/ac Priaxor®) and insecticide (4 oz/ac Hero®) application in mid-July.

Soybean cyst nematode tests for this field came back negative.

Results:

	Early Season 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	133,817 A*	55 A	12.3 B	65 B	473.02 B
Improved: Early Planted, Lower Seeding Rate, Fungicide & Insecticide	98,984 B	56 A	12.7 A	74 A	531.35 A
P-Value	0.038	0.245	0.002	0.001	0.002

*Values with the same letter are not significantly different at a 90% confidence level.
†Yield values are from yield monitor data. Bushels per acre corrected 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), $452/gal Priaxor®, and $138/gal Hero® ($18.44/ac for fungicide and insecticide for improved treatment), and $6.94/ac for application of fungicide and insecticide on improved treatment.

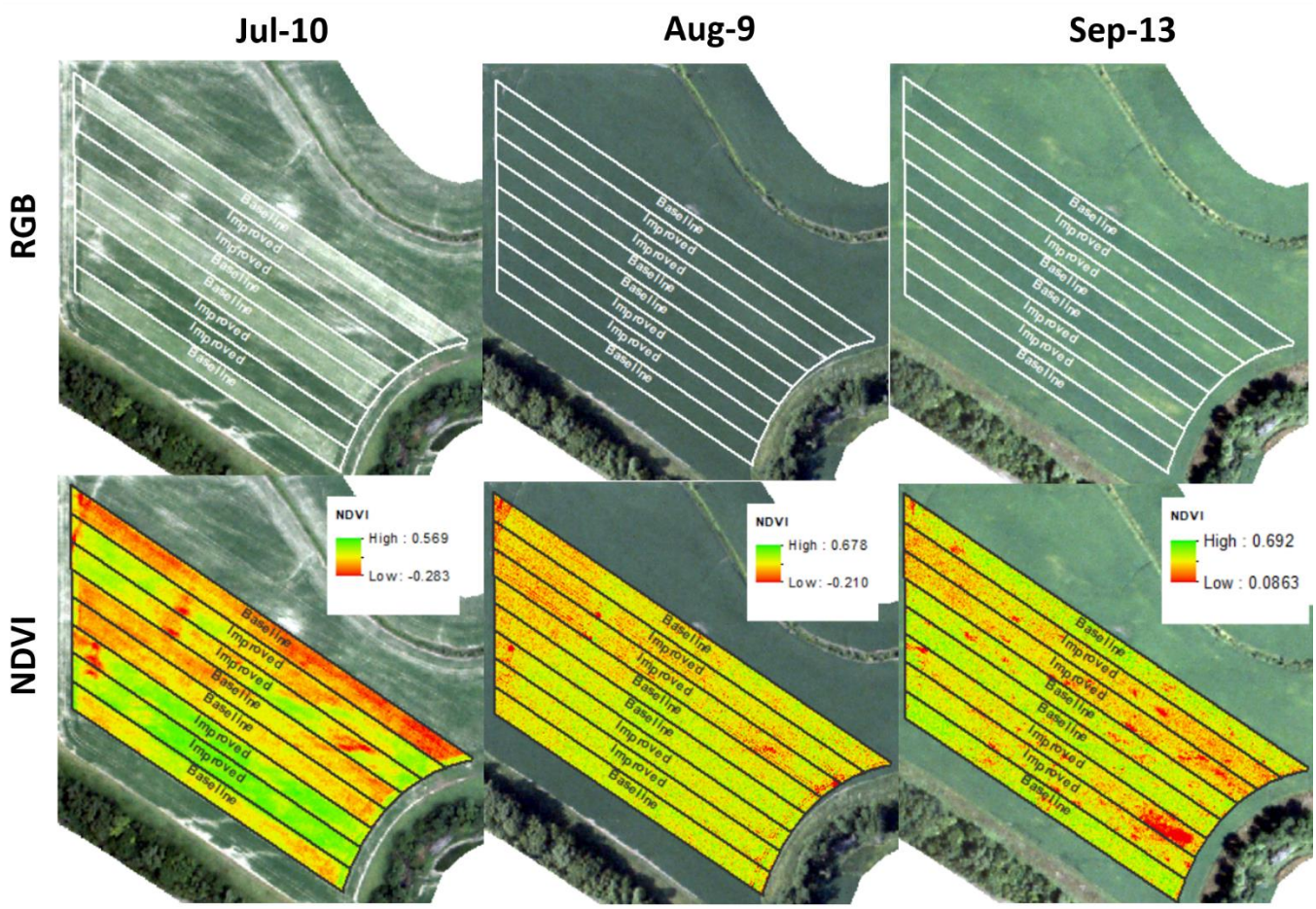


Figure 1. Aerial imagery from July 10, August 9, and September 13 displayed as true color (top) and normalized difference vegetation index (NDVI) (bottom).

Summary:

- The improved treatment (lower seeding rate with early planting and fungicide and insecticide application) resulted in a 9 bu/ac yield increase and a $58.32/ac increase in profit.
- Aerial imagery from July 10 showed the improved treatment was greener and had higher NDVI values compared to the baseline treatment. September 13 imagery showed the improved treatment was less green and had lower NDVI values compared to the baseline treatment, corresponding to earlier senescence for the early planted treatment.

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