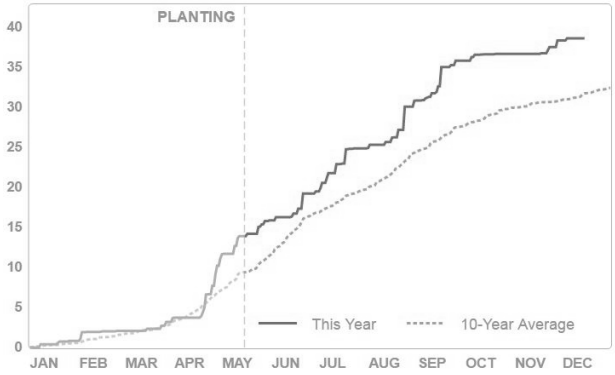
EXTENSION
On-Farm Research

Rainfed Soybean Population Study

Study ID: 610177201601
County: Washington
Soil Type: Belfore silty clay loam 0-2% slope; Moody silty clay loam 2-6% slopes
Planting Date: 5/15/16
Harvest Date: 10/25/16
Row Spacing (in): 15
Hybrid: Asgrow 3334
Reps: 4
Previous Crop: Corn
Tillage: No-Till
Herbicides: ***Pre:*** 4 oz/ac Sonic®, 1 oz/ac Sharpen®, and 24 oz/ac Roundup PowerMAX® on 4/15/16
Post: 6 oz/ac Select®, 16 oz/ac Flexstar®, 3 qt/ac Warrant®, and 28 oz/ac Roundup PowerMAX® on 6/10/16
Seed Treatment: Acceleron® (Metalaxyl, Pyraclostrobin, Fluxapryoxad, and Imidacloprid)

Foliar Insecticides: None
Foliar Fungicides: None
Fertilizer: Dry manure applied in fall 2015 (rate of nutrients unknown)
Irrigation: None
Rainfall (in):



Soil Samples:

ID	Soil pH 1:1	Modified WDRF BpH	OM L.O.I.	P weak Bray ppm	P strong Bray ppm	----Ammonium Acetate---- ppm			Sum of Cations me/100g	% Base Saturation			
						K	Ca	Mg		H	K	Ca	Mg
Rep 1	5.6	6.5	4.1	47	62	289	2699	352	22.5	23.7	3.3	60.0	13.0
Rep 2	5.8	6.6	3.9	52	73	357	2726	372	21.7	18.7	4.2	62.8	14.3
Rep 3	5.8	6.5	3.8	38	56	347	2894	405	23.1	18.9	3.9	62.6	14.6
Rep 4	5.8	6.6	4.2	49	62	313	2632	351	20.9	19.2	3.8	63.0	14.0

Introduction: Previous on-farm research has demonstrated that planting rates of 80,000 to 120,000 seeds/acre resulted in the highest profitability. Most of this research was conducted in irrigated conditions with 30" row spacing. The purpose of this study was to determine the optimal planting rate in non-irrigated conditions with 15" row spacing. Stand count locations were marked with flags so that the same area was counted for the early stand counts (June 20, 2016) and harvest stands counts (Oct. 10, 2016). These stand counts were compared to planting rate to determine the percent of planted seeds which emerged and the percent of planted seeds which were present at harvest *(Figure 1).* There were visible differences between the aerial imagery from August 31, 2016 (*Figure 3*) for the lowest seeding rate, likely attributed to minor differences in lodging.

Results:

	Early Season Stand Count (plants/ac)	% of Planted Seeds Emerged	Harvest Stand Count (plants/ac)	% of Planted Seeds Present at Harvest	Yield (bu/acre)†	Marginal Net Return‡ ($/ac)
90,000 seeds/acre	85,333 D*	95 A	83,167 D	92 A	76 A	$664.43
120,000 seeds/acre	115,000 C	96 A	111,500 C	93 A	77 A	$660.82
150,000 seeds/acre	143,167 B	95 A	136,500 B	91 A	77 A	$647.96
180,000 seeds/acre	173,583 A	96 A	165,000 A	92 A	76 A	$625.86
P-Value	<0.0001	0.5375	<0.0001	0.506	0.2757	N/A

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $9.25/bu soybean and $60/unit soybean seed (140,000 seeds/unit).

Figure 1. Early and harvest stand counts compared to planting rate.

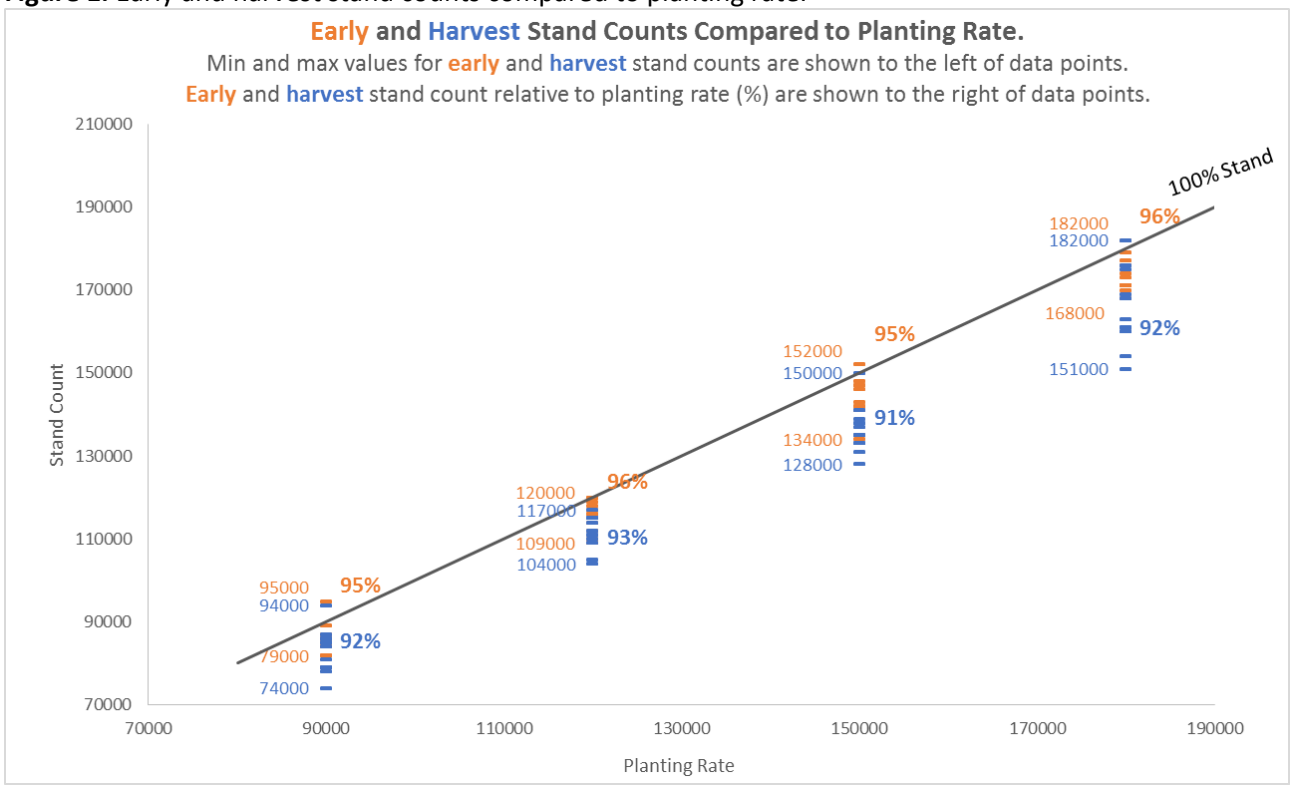


Figure 2. Aerial image with yield values overlaid.

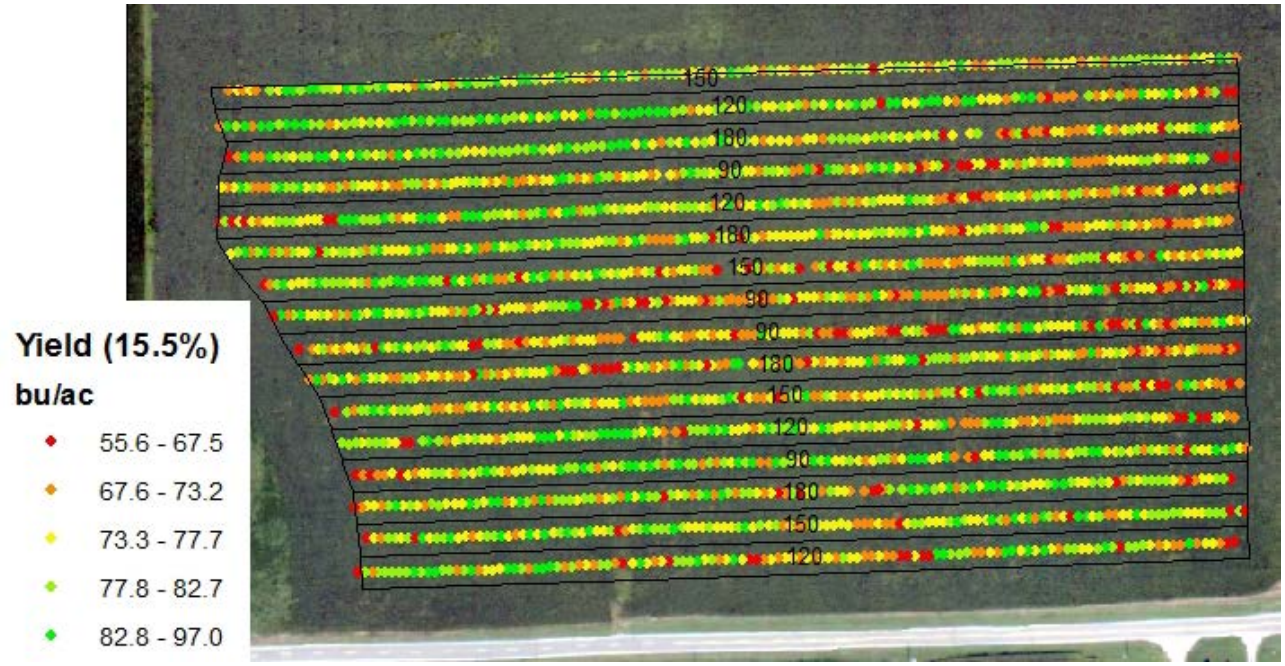
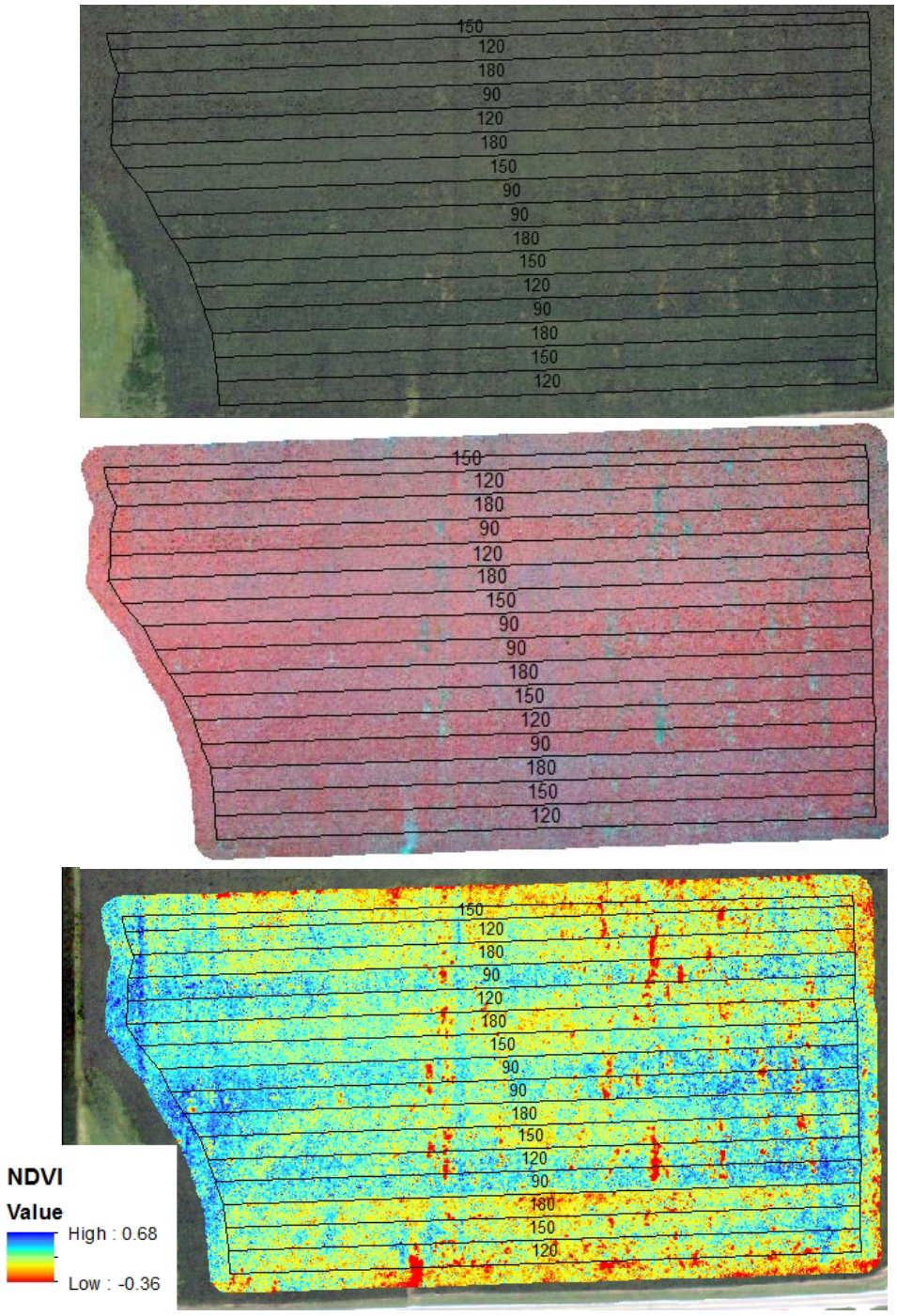


Figure 3. False color image (top) and NDVI (bottom) on August 31, 2016.



Summary: There was no yield difference for the planting populations tested. There was no difference in percent of plants which emerged or were present at harvest for the four seeding rates tested. The 90,000 seeds/acre rate, with a final stand of 83,167 plants/acre, resulted in the highest profitability due to lower seed costs. This is consistent with previous research findings.

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