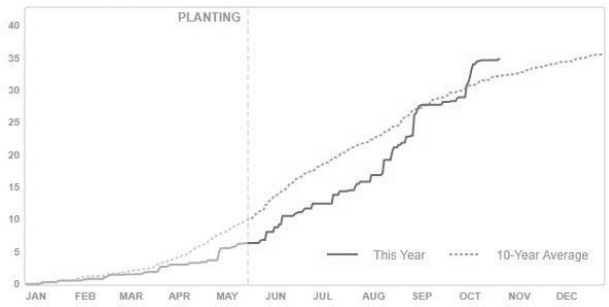
Evaluating Soybean Maturity for Improving Cover Crop Establishment

Study ID: 0701147201804
County: Richardson
Soil Type: Marshall silty clay loam 2-6% slopes
Planting Date: 5/21/18
Harvest Date: 9/24/18 and 11/16/18
Population: 180,000
Row Spacing (in): 15
Reps: 4
Previous Crop: Corn
Tillage: No-Till
Herbicides: ***Pre:*** 8 oz/ac dicamba and 6 oz/ac 6# 2,4-D. 1 qt/ac generic glyphosate, 1.25 pt/ac metolachlor, 9.3 oz/ac of 6# 2,4-D, 6 oz/ac Volunteer®, and 2 lb/ac AMS in April 2018 ***Post:*** 32 oz/ac Buccaneer® and 2 lb/ac AMS

Irrigation: None
Rainfall (in):



Soil Test (Dec. 2018):

Soil pH 1:1	Buffer pH	CEC	OM	Bray P1 Weak Bray	Bray P2 Strong Bray	K	Mg	Ca	S	Zn	K	Mg	Ca	H
		mg/100g	*%*	*ppm*	*ppm*	*----------(ppm)----------*					*--% Base Saturation---*			
5.2	6.1	15.2	2.4	11	13	115	214	1575	8	1.1	1.9	11.7	51.8	34.6
5.5	6.6	14.6	2.7	10	12	191	265	1620	7	1.5	3.4	15.1	55.5	26.0

Introduction: Cover crops have the potential to provide several ecosystem services; therefore, many corn and soybean producers are looking for ways to better integrate them into their cropping systems. One of the primary limitations to fall planted cover crops in Nebraska is the limited growing window following corn and soybean harvest. One way to increase the growing window for cover crops following corn and soybean harvest is to plant earlier maturing corn and soybean varieties. Recent small plot research at the University of Nebraska found that shorter season comparative relative maturity (CRM) corn hybrids had yields similar to longer season CRM hybrids. This research also showed the potential for greater cereal rye biomass accumulation following the shorter season hybrids. The objective of this study was to evaluate the same concept on soybeans. Four soybean maturity groups were evaluated. The group 1 and 2 soybeans were harvested on September 24 and the group 3 and 4 soybeans were harvested on November 16.

Group 1 (1.1 maturity) = Asgrow® 11X8
Group 2 (2.4 maturity) = Asgrow® 24X7
Group 3 (3.3 maturity) = Asgrow® 33X8
Group 4 (4.1 maturity) = Asgrow® 41X8

Figure 1. Images showing difference between group 3 and group 4 soybeans on September 26.

Results: Because of the variability in stand count, harvest stand count was included as a confounding variable (covariate) in the model so that test weight, moisture, yield, and net return can be evaluated for the soybean maturity groups without the complicating factor of stand count. The test weight, moisture, yield, and net return analysis was completed with the GLIMMIX procedure in SAS 9.4 (SAS Institute Inc., Cary, NC). Mean separation for test weight, moisture, yield, and net return was performed with Tukey's HSD.

	Harvest Stand Count (plants/ac)	Test Weight	Moisture (%)	Yield† (bu/ac)	Marginal Net Return‡ ($/ac)
Group 1 Soybean Maturity	190,503 A*	54 A	14.0 B	47 B	279.91 B
Group 2 Soybean Maturity	155,655 A	55 A	16.5 A	58 A	358.22 A
Group 3 Soybean Maturity	160,301 A	55 A	12.4 B	52 AB	309.34 AB
Group 4 Soybean Maturity	177,725 A	55 A	12.7 B	54 AB	326.02 AB
P-Value	0.110	0.116	0.001	0.067	0.057

*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 $7.40/bu soybean and seed costs of group 1 at $55/unit, group 2 at $53/unit, group 3 at $57/unit, and group 4 at $55/unit.

Summary:

- There were significant moisture differences with group 2 having a higher grain moisture at harvest.
- There was no difference in test weight between the four maturity groups.
- Yield and net return were higher for the group 2 soybeans when compared to the group 1 soybeans. Group 3 and group 4 soybeans were not different than group 1 or group 2. This study supports the idea that a group 2 maturity soybean could be planted without sacrificing yield, allowing for earlier crop harvest and subsequent earlier cover crop establishment.
- This study should be conducted in additional locations and years to determine if the conclusions from this study hold true in other growing conditions.

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