Soybean Date of Planting and Maturity in Northeast Iowa

RFR-A1962

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Introduction

Every year soybean planting can get delayed due to wet soil conditions. Soybean typically responds favorably to earlier season planting dates, although these also tend to compensate well if planting is delayed. The chance of having to replant due to late spring frost is offset by the chance of planting all crops in a timely manner. As spring planting progresses and planting is delayed, a question that always arises is when to switch to shorter maturity group soybean. This annually conducted trial at the research farm is designed to help demonstrate how well three different maturities are suited across four planting dates ranging from mid-April to late May.

Materials and Methods

This study was conducted at the ISU Northeast Research Farm in 2017, 2018, and 2019. Three maturity group (MG) varieties were planted at four target planting dates of April 10, April 25, May 10, and May 25. The plots were setup in a split plot statistical design with four replications. Target planting date was the whole plot and hybrid was the split plot. Data collection included growth stage, grain yield, and grain moisture.

Results and Discussion

Planting dates. In general, highest grain yields were obtained with planting dates of early-May, followed by late spring and mid-May, with late May planting dates trending to lowest yields (Table 1). However, in all three years and across all planting dates and maturity groups yield differences were small.

Maturity groups. In general, the highest grain yields were achieved with the 2.1-2.3 maturity group (MG) regardless of planting dates (Table 1). Only in 2018, was there a trend for later plantings favored by early MG varieties, which was a year plagued with heavy rainfall events.

The dates of emergence (V1), flowering stage (R1), and maturity stage (R8) are presented in Table 2. It took 21, 13, and 26 days for the earliest planting dates to emerge in 2017, 2018, and 2019, respectively. The latest planting dates took 5 to 7 days to emerge. Once emerged, the rate of plant development was relatively similar across planting dates with mid- and late-MG reaching R1 stage 1.6 and 4.2 days later than the early MG, and reaching R8 stage 3.1 and 4.2 days later than the early MG, respectively.

Early planting in colder soils slows emergence compared with later plantings, but in most cases does not negatively influence yield, unless a severe frost occurs. Results from ISU Research Farm planting date studies continue to support recommendations for optimal soybean planting dates of late April for the southern two-thirds of Iowa, and early May for the northern one-third of Iowa. This assumes soil conditions are suitable and the forecast is favorable. Planting when soil conditions are not optimal ultimately will lead to reduced plant emergence, lower plant populations, and possibly yield reductions.

Acknowledgements

Table 1. Soybean grain yield of three varieties of an early, mid, and late maturity group (MG) for the region, and four planting dates at the ISU Northeast Research Farm, Nashua, IA, in 2017, 2018, and 2019.

Actual date of planting	Early variety 1.8-2.0 MG	Mid-variety 2.1-2.3 MG	Late variety 2.4-2.6 MG	Average yield across three MG
	------------------------------------- bu/ac -------------------------------------			
4/18/2017	61.5 abc	64.0 a	61.4 abc	62.3 a
5/4/2017	61.4 abc	62.7 ab	60.5 abc	61.5 ab
5/15/2017	57.8 cd	61.3 abc	57.6 cd	58.9 bc
5/30/2017	58.3 cd	59.1 bcd	56.4 d	58.0 c
Average yield (bu/ac)	59.8	61.8	59.0	$LSD_{0.05} = 2.9$
		$LSD_{0.05} = 4.0$		
4/27/2018	57.8 d	66.1 ab	61.4 bcd	61.8 a
5/7/2018	63.4 abcd	68.7 a	65.4 ab	65.8 a
5/21/2018	64.1 abcd	61.9 abcd	63.1 abcd	63.0 a
6/1/2018	65.4 abc	65.0 abc	59.2 cd	63.2 a
Average yield (bu/ac)	62.7	65.4	62.3	$LSD_{0.05} = 5.4$
		$LSD_{0.05} = 6.9$		
4/21/2019	58.7 c	65.1 ab	59.6 bc	61.1 a
5/4/2019	59.3 c	64.7 ab	62.5 abc	62.1 a
5/16/2019	57.6 cd	60.3 abc	60.7 abc	59.5 a
6/1/2019	53.5 d	60.1 abc	61.0 abc	58.2 a
Average yield (bu/ac)	57.3	62.5	60.9	$LSD_{0.05} = 4.2$
		$LSD_{0.05} = 5.2$		

$LSD_{0.05}$ = least significant difference. Entries that differ by one LSD or more are considered to be in different classes with 95 percent certainty. Entries by year with the same letter are not considered to be significantly different.

Table 2. Soybean dates of emergence (VE), flowering (R1), and maturity (R8) for three varieties of an early, mid, and late maturity group (MG) for the region, and four planting dates at the ISU Northeast Research Farm, Nashua, IA, in 2017, 2018, and 2019.

Actual date of planting	Emergence (VE)			Flowering (R1)			Maturity (R8)		
	1.8-2.0 MG	2.1-2.3 MG	2.4-2.6 MG	1.8-2.0 MG	2.1-2.3 MG	2.4-2.6 MG	1.8-2.0 MG	2.1-2.3 MG	2.4-2.6 MG
4/18/2017	5/9	5/9	5/9	6/19	6/24	6/30	9/20	9/22	9/24
5/4/2017	5/13	5/13	5/13	6/29	7/1	7/1	9/21	9/23	9/25
5/15/2017	5/30	5/30	5/30	7/2	7/4	7/8	9/25	9/27	9/29
5/30/2017	6/5	6/5	6/5	7/8	7/12	7/12	9/28	9/30	10/2
4/27/2018	5/10	5/10	5/10	6/19	6/19	6/22	9/14	9/15	9/14
5/7/2018	5/20	5/20	5/20	6/19	6/20	6/24	9/15	9/18	9/16
5/21/2018	5/29	5/29	5/29	6/30	7/2	7/3	9/20	9/22	9/24
6/1/2018	6/6	6/6	6/6	7/8	7/9	7/13	9/30	10/1	10/1
4/21/2019	5/17	5/17	5/17	6/25	6/25	6/28	9/17	9/21	9/22
5/4/2019	5/22	5/22	5/22	6/27	6/29	7/1	9/17	9/21	9/23
5/16/2019	5/30	5/30	5/30	7/4	7/3	7/6	9/19	9/26	9/28
6/1/2019	6/6	6/6	6/6	7/8	7/8	7/10	9/23	9/30	10/1