

Corn Date of Planting and Maturity in Northeast Iowa

RFR-A1961

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Introduction

Historically, planting dates can get delayed due to weather and wet soil conditions during the early growing season. Replanting is sometimes necessary due to soil compaction from heavy rain events. There always is the question of what maturities of corn should be selected at various planting dates during the planting season for optimal grain moisture and yield. This trial was set up to determine what maturities are well suited for northeast Iowa, but also how maturity selection should be adjusted as planting dates get pushed into late spring.

Materials and Methods

This study was conducted at the ISU Northeast Research Farm in 2017, 2018, and 2019. In 2017 and 2018, the same three hybrids (P0157AM, P0589AM, and P1197AM) were planted on four target planting dates (April 10, April 25, May 10, and May 25). In 2019, P1197AM was replaced with P1366AM. The plots were set up in a split plot arrangement with four replications. Target planting date was the whole plot and hybrid was the split plot. A target seeding rate of 35,000 seeds/acre was used. Data collection included growth staging, stand counts, grain yield, and grain moisture.

Results and Discussion

Only in 2017, the study was able to be planted in the second week of April. Due to wet soils earlier, the earliest field work possible in 2018 and 2019 was the third week of April. May through September growing degree unit (GDU) accumulation was similar for 2017 and 2019, averaging 2570 GDU although 2018

received 2,860 GDU. The GDU from planting to emergence was reduced as planting dates were delayed. As soil temperatures warm up, less heat units are generally needed from planting to maturity, as planting dates are delayed (Table 3).

In 2017, there was no yield advantage to any of the four planting dates (Table 1). Grain moisture was significantly higher for the last planting date only, which was for the 105 RM and 111/113 RM varieties. Yield increased when planting longer hybrid maturities. This presumably was due to optimal heat unit accumulation since pollination occurred by August 2 and the first killing frost occurred October 29, providing a long grain fill period (Table 2). The GDU to get to silking stage (R1) and maturity (R6) was similar for all planting dates (Table 3).

In 2018, the corn yield was highest for the first date of planting (DOP) regardless of hybrid maturity, and consistently lower as DOP was delayed regardless of hybrid maturity (Table 1). No significant yield difference was noted from any hybrid maturity when averaged over planting dates. The GDU was highest for the earliest planting date, which presumably added yield in a growing season with heavy rainfall from planting through harvest (Table 3).

In 2019, grain yields were highest for the second DOP (Table 1), and yields were generally higher for longer maturity hybrids. GDU to get to R1 and R6 decreased as plantings were delayed (Table 3).

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Table 1. Corn grain yield and grain moisture (H₂O) at harvest for three hybrids at four planting dates at the ISU Northeast Research Farm, Nashua, IA, in 2017, 2018, and 2019.

Actual date of planting	P0157AM		P0589AM		P1197AM/P1366AM		Average	
	101-day		105-day		111-day/113-day			
	H ₂ O %	Yield bu/ac	H ₂ O %	Yield bu/ac	H ₂ O %	Yield bu/ac	H ₂ O %	Yield bu/ac
4/11/2017	18.3 a	222.4 d	18.5 a	239.3 bcd	19.3 a	257.7 a	18.7	239.8
4/25/2017	18.3 a	229.2 d	19.0 a	250.0 abc	20.0 ab	259.1 a	19.1	246.1
5/9/2017	18.6 a	233.7 cd	18.8 a	253.2 ab	19.9 ab	257.3 a	19.1	248.1
5/26/2017	19.9 ab	223.2 d	21.9 bc	250.6 abc	23.7 c	252.6 ab	21.8	242.1
Average yield (bu/ac)	18.8	227.1	19.5	248.3	20.7	256.7		
LSD _{0.05} Moisture = 2.4, Yield = 17.8								
4/25/2018	16.3 ab	225.2 ab	16.0 ab	222.5 ab	17.2 a	230.1 a	16.5	225.9
5/7/2018	16.7ab	218.5 ab	16.7 ab	218.5 ab	17.8 ab	216.2 ab	17.0	217.7
5/18/2018	17.4 b	211.7 b	17.2 b	209.3 b	18.9 b	212.9 b	17.8	211.3
5/29/2018	19.4 c	189.1 c	19.1 c	183.3 c	23.2 c	190.7 c	20.5	187.7
Average yield (bu/ac)	17.4	211.1	17.2	208.4	19.2	212.5		
LSD _{0.05} Moisture = 1.1, Yield = 15.8								
4/21/2019	19.8 ab	236.4 cde	19.4 a	244.3 bcd	20.9 bc	271.8 a	20.1	250.9
5/4/2019	19.6 a	244.7 bcd	19.4 a	254.3 b	20.5 abc	271.7 a	19.8	256.9
5/16/2019	20.1 abc	225.2 e	20.5 abc	249.3 bc	21.1 c	254.6 b	20.6	243.0
6/1/2019	20.9 bc	222.4 e	22.3 a	236.9 cde	24.4 d	230.1 de	22.5	229.8
Average yield (bu/ac)	20.1	232.2	20.4	246.2	21.7	257.0		
LSD _{0.05} Moisture = 1.2, Yield = 15.1								

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. Corn dates of emergence (VE), silking (R1), and maturity (R6) for three hybrids at four planting dates at the ISU Northeast Research Farm, Nashua, IA, in 2017, 2018, and 2019.

Actual date of planting	VE			R1			R6		
	P1197			P1197			P1197		
	P0157 101-day	P0589 105-day	P1366 113-day	P0157 101-day	P0589 105-day	P1366 113 day	P0157 101-day	P0589 105-day	P1366 113-day
4/11/2017	5/5	5/5	5/5	7/16)	7/17	7/20	9/16	9/20	9/24
4/25/2017	5/12	5/12	5/12	7/18	7/19	7/23	9/22	9/24	9/28
5/9/2017	5/16	5/16	5/16	7/19	7/21	7/23	9/24	9/26	9/30
5/26/2017	6/1	6/1	6/1	7/28	7/30	8/2	9/30	10/15	10/24
4/25/2018	5/9	5/9	5/9	7/9	7/10	7/14	9/10	9/14	9/18
5/7/2018	5/19	5/19	5/19	7/12	7/14	7/16	9/11	9/16	9/24
5/18/2018	5/25	5/25	5/25	7/17	7/19	7/23	9/15	9/21	9/28
5/29/2018	6/3	6/3	6/3	7/28	7/30	8/1	10/3	10/9	10/14
4/21/2019	5/15	5/15	5/15	7/19	7/20	7/23	9/30	10/1	10/3
5/4/2019	5/20	5/20	5/20	7/19	7/20	7/23	9/30	10/1	10/3
5/16/2019	5/28	5/28	5/28	7/24	7/25	7/29	10/4	10/5	10/9
6/1/2019	6/6	6/6	6/6	8/1	8/2	8/5	10/9	10/12	10/17

Table 3. Corn growing degree units (GDU) from planting to emergence (VE), emergence to silking (R1), and emergence to maturity (R6) for three hybrids at four planting dates at the ISU Northeast Research Farm, Nashua, IA, in 2017, 2018, and 2019.

Actual date of planting	VE			R1			R6		
	P0157 101-day	P0589 105-day	P1197 111-day	P0157 101-day	P0589 105-day	P1197 111-day	P0157 101-day	P0589 105-day	P1197 111-day
			P1366 113-day			P1366 113 day			P1366 113-day
4/11/2017	138	138	138	1212	1236	1310	2304	2363	2462
4/25/2017	104	104	104	1187	1213	1314	2335	2390	2457
5/9/2017	94	94	94	1146	1200	1247	2324	2370	2413
5/26/2017	76	76	76	1195	1234	1295	2258	2401	2487
4/25/2018	165	165	165	1193	1216	1320	2451	2522	2620
5/7/2018	147	147	147	1154	1209	1262	2353	2460	2597
5/18/2018	108	108	108	1194	1235	1315	2344	2476	2544
5/29/2018	119	119	119	1186	1217	1252	2338	2372	2396
4/21/2019	133	133	133	1201	1231	1294	2493	2518	2538
5/4/2019	128	128	128	1138	1169	1232	2431	2455	2475
5/16/2019	134	134	134	1164	1182	1277	2392	2397	2430
6/1/2019	88	88	88	1184	1201	1264	2289	2305	2313