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Soybean Planting Dates in Northeast Iowa

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Soybean Planting Dates in Northeast Iowa

Abstract

Soybean planting date studies of various types have been conducted at this site since 1976. Earlier tests included later planting dates (May through mid-June), differing variety maturities, and comparisons with starter fertilizer and Ridomil fungicide soil treatments. Research reports on these studies can be found in previous annual progress reports with the last summary in the 2001 and 2009 reports.

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Disciplines

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Soybean Planting Dates in Northeast Iowa

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Introduction

Soybean planting date studies of various types have been conducted at this site since 1976. Earlier tests included later planting dates (May through mid-June), differing variety maturities, and comparisons with starter fertilizer and Ridomil fungicide soil treatments. Research reports on these studies can be found in previous annual progress reports with the last summary in the 2001 and 2009 reports.

Materials and Methods

The intended planting dates for the 2009 through 2011 soybean planting date studies were early April or as early as the ground was ready, followed by planting dates at 14-day intervals, resulting in the last planting date in early June. The exact dates varied slightly from year to year, depending on soil conditions and rainfall prior to planting. Two relative maturities (RM) of untreated soybeans were tested for each planting date. A conventional tillage program (fall chisel plow and spring field cultivation prior to planting) was used, with 30-in. rows planted, following the previous year's corn crop. The test is a randomized complete block design with four replications. A late-July or early-August insecticide, fungicide, and an insecticide + fungicide comparison was made to see the yield advantage for insect and/or disease control.

Results and Discussion

The optimal planting date varies from year to year due to weather. However, each year starts with 100 percent yield potential and then yield

is subtracted from that, for growing season conditions that reduce yield potential. From long-term data there is little to no yield penalty for soybeans planted from mid-April through mid-May. However, in years with ideal (warm, dry) soil conditions for planting and emergence, followed by an injuring or killing frost (May 3, 2005 and May 9, 2010), yield potential can be reduced by early plantings. The effects of insecticide and fungicides are not discussed in this report.

In 2009, soil conditions were ideal for early planting and conditions throughout the growing season remained ideal, despite cooler than normal, which didn't affect yields. There was no significant yield penalty for planting in early April (Table 1). Soybean aphid management resulted in additional yield benefit, more than disease control. Yields of soybeans planted on June 2 were reduced slightly due to low summer heat unit accumulation.

In 2010, early planting conditions were ideal. Soybeans were planted on April 1 and April 14 and emerged on April 24 and April 30 (Table 2). A May 9 (26°F) frost injured April 1 planted soybeans and reduced plant stands when soybeans were in the first trifoliolate stage. The April 14 planted soybeans were also emerged, but had no frost damage when they were in the unifoliolate stage. Growing points of surviving plants were killed and new growth came out of axillary buds, three weeks after injury. This caused delayed plant maturity and reduced yields. Weather throughout the rest of the 2010 growing season was ideal, causing no yield penalty for late planted soybeans.

In 2011, early- and mid-April planting conditions were ideal, but 3.4 in. of snow and 3.04 in. rainfall from mid- to late-April,

delayed plant emergence by up to 40 days after planting (Table 3). Plant stands were excellent and late plantings had minor yield reductions, despite a mid-September frost. Areas to the north and west of the research farm had more frost injury.

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Table 1. Influence of planting date on yield of a 1.7 and 3.0 relative maturity soybean variety at Nashua, IA (2009).¹

Planting date	Emergence date	Early maturity (untreated) (bu/ac)	Early maturity (insecticide) (bu/ac)	Early maturity (fungicide) (bu/ac)	Early maturity (insect+fung) (bu/ac)	Average yield (bu/ac)
April 2	May 5	58.0 ab	60.7 a	61.0 a	62.5 a	60.5 a
April 15	May 6	59.6 a	60.9 a	61.4 a	62.9 a	61.2 a
May 4	May 20	56.4 b	59.8 a	58.7 ab	63.1 a	59.5 ab
May 17	May 26	53.9 c	57.9 a	56.1 b	62.5 a	57.6 bc
June 1	June 13	48.2 d	58.1 a	51.8 c	61.8 a	55.0 c
LSD (0.05)		2.3	NS	3.0	NS	2.7
Average		55.2	59.5	57.8	62.6	58.8
Planting date	Emergence date	Late maturity (untreated) (bu/ac)	Late maturity (insecticide) (bu/ac)	Late maturity (fungicide) (bu/ac)	Late maturity (insect+fung) (bu/ac)	Average yield (bu/ac)
April 2	May 5	61.1 ab	66.9 a	66.4 a	72.5 a	66.7 a
April 15	May 6	64.0 a	67.5 a	66.4 a	69.9 ab	66.9 a
May 4	May 20	58.2 bc	64.0 a	61.9 b	68.9 ab	63.2 b
May 17	May 26	54.9 c	63.8 a	60.6 bc	66.3 b	61.4 bc
June 1	June 13	53.9 c	63.1 a	58.0 c	61.0 c	59.0 c
LSD (0.05)		4.7	NS	2.6	4.1	3.2
Average		58.4	65.1	62.7	67.7	63.5

¹Means within a column sharing a common letter do not differ ($P \leq 0.05$).

Table 2. Influence of planting date on yield of a 1.8 and 3.0 relative maturity soybean variety at Nashua, IA (2010).¹

Planting date	Emergence date	Early maturity (untreated) (bu/ac)	Early maturity (insecticide) (bu/ac)	Early maturity (fungicide) (bu/ac)	Early maturity (insect+fung) (bu/ac)	Average yield (bu/ac)
April 1	April 24	47.9 b	51.6 c	49.6 b	53.6 b	50.7 b
April 14	April 30	57.2 a	58.4 ab	59.7 a	57.2 a	58.1 a
May 2	May 19	58.2 a	62.8 a	58.8 a	59.4 a	59.8 a
May 16	May 24	57.3 a	58.7 ab	58.9 a	61.4 a	59.1 a
June 1	June 8	56.5 a	57.3 b	55.6 a	58.8 a	57.0 a
LSD (0.05)		7.1	5.4	4.1	4.5	2.8
Average		55.4	57.8	56.5	58.1	56.9
Planting date	Emergence date	Late maturity (untreated) (bu/ac)	Late maturity (insecticide) (bu/ac)	Late maturity (fungicide) (bu/ac)	Late maturity (insect+fung) (bu/ac)	Average yield (bu/ac)
April 1	April 24	61.3 a	60.1 a	63.1 a	63.1 a	61.9 b
April 14	April 30	62.4 a	64.5 a	65.9 a	66.1 a	64.7 ab
May 2	May 19	66.7 a	67.8 a	67.3 a	67.3 a	67.3 a
May 16	May 24	64.2 a	64.3 a	67.2 a	66.6 a	65.6 a
June 1	June 8	65.3 a	66.4 a	68.2 a	66.4 a	66.6 a
LSD (0.05)		NS	NS	NS	NS	3.0
Average		64.0	64.6	66.4	65.9	65.2

¹Means within a column sharing a common letter do not differ ($P \leq 0.05$).

Table 3. Influence of planting date on yield of a 1.9 and 3.0 relative maturity soybean variety at Nashua, IA (2011).¹

Planting date	Emergence date	Early maturity (untreated)	Early maturity (insecticide)	Early maturity (fungicide)	Early maturity (insect+fung)	Average yield
		(bu/ac)	(bu/ac)	(bu/ac)	(bu/ac)	(bu/ac)
April 2	May 9	58.0 a	60.7 a	61.0 a	62.5 ab	60.5 a
April 15	May 10	59.6 a	60.9 b	61.4 a	62.9 a	61.2 a
May 4	May 11	56.4 a	59.8 ab	58.7 a	63.1 a	59.5 a
May 17	May 25	53.9 ab	57.9 c	56.1 b	62.5 b	57.6 b
June 1	June 7	48.2 b	58.1 d	51.8 c	61.8 c	55.0 c
LSD (0.05)		4.8	2.9	2.3	4.0	2.2
Average		55.2	59.5	57.8	62.6	58.8
Planting date	Emergence date	Late maturity (untreated)	Late maturity (insecticide)	Late maturity (fungicide)	Late maturity (insect+fung)	Average yield
		(bu/ac)	(bu/ac)	(bu/ac)	(bu/ac)	(bu/ac)
April 2	May 9	61.1 a	66.9 a	66.4 a	72.5 a	66.7 a
April 15	May 10	64.0 ab	67.5 a	66.4 a	69.9 a	66.9 a
May 4	May 11	58.2 bc	64.0 a	61.9 a	68.9 a	63.2 ab
May 17	May 25	54.9 bc	63.8 a	60.6 a	66.3 a	61.4 ab
June 1	June 7	53.9 c	63.1 a	58.0 a	61.0 a	59.0 b
LSD (0.05)		3.6	NS	NS	NS	2.2
Average		58.4	65.1	62.7	67.7	63.5

¹Means within a column sharing a common letter do not differ ($P \leq 0.05$).