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Kenneth T. Pecinovsky
Iowa State University, kennethp@iastate.edu

Garren O. Benson
Iowa State University

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Twenty-six Years of Soybean Planting Date Studies

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 maturity varieties, and soybeans planted with and without starter fertilizer and Ridomil fungicide soil treatments.

Keywords

Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Twenty-six Years of Soybean Planting Date Studies

Ken Pecinovsky, farm superintendent
Garren O. Benson, professor emeritus
Department of Agronomy

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 maturity varieties, and soybeans planted with and without starter fertilizer and Ridomil fungicide soil treatments.

Materials and Methods

From 1992 to the present, weather and soil conditions permitting, intended planting dates have been late April, early May, mid-May, and June 1, with exact dates varying slightly year to year. From 1976 through 1991, intended planting dates were early May, mid-May to late May, early June, and mid-June. From 1976 through 1980 and 1999 through 2001, two maturities of soybeans were added for each planting date. Ridomil fungicide soil treatments were tested from 1986 through 1991 and starter fertilizer was tested from 1981 through 1985. A conventional tillage program (fall chisel plow and spring field cultivation prior to planting) was used, and rows were planted with a 30" row planter following the previous year's corn crop. The test is set in a randomized complete block design with three replications.

Results and Discussion

The optimal planting date varies from year to year due to weather; however, longterm data from this study indicate that the most favorable planting time for soybean is from the last week of April through mid-May, given that soil conditions are ideal for planting and emergence. Surprisingly, a killing frost has never reduced the stands in 26 years of testing at the Northeast Research Farm. When many years' results were averaged for this site, there was little yield difference for planting dates throughout May. If

anything, there was a small (1–3 bushel) advantage for beans planted around mid-May. At other sites in Iowa, yields have often been higher with earlier planting.

Table 1 is a summary of the 1992–2001 planting dates and a yield comparison of an early and normally adapted maturity variety. Late May through early June plantings yielded 4.7 bushels/acre less than late April through mid-May planting dates. A six bushel decrease in yield was noted for the early maturing variety when all planting dates were averaged for the 1999–2001 study; a 3.1 bushel decrease was noted in the 1976–1980 study (Table 3). The differences decreased as the planting date was delayed, indicating that full season varieties benefited most from earlier planting. Another possible factor of yield differences—more so than variety maturity—may be variety selection. Longterm yields showed a 12 bushel/acre increase in yield, which can partially be explained by advances in soybean breeding through 25 years and longterm weather cycles.

Table 2 summarizes yield results for the 1986–1991 period, when a Ridomil fungicide soil treatment was tested, and yield results for the 1981–1985 period, when starter fertilizer was compared on four planting dates. Fungicide seed treatments have gained attention in the past few years, not only because soil conditions in early May can be cold and wet, but also because of the interest in late March/early April soybean planting. Yield increases for Ridomil were small, and in none of the years was a yield difference due to Ridomil statistically significant. When averaged through the length of the study, starter fertilizer had no effect on yield, likely because plots were established on soils that tested optimum to high for phosphorus and potassium.

Table 4 shows that planting dates through mid-May provide the best opportunity to attain maximum soybean yield potential when compared with planting dates in early June,

when yields can be reduced nearly 20% and also can be effected by fall frost, which typically occurs October 4.

Table 1. Influence of planting date on growth parameters and final yield (1992–2001).

| Planting date* | Emergence date* | Maturity date* | 1992–2001 yield (bu/ac) | 1999–2001 yield adapted variety (bu/ac) | 1999–2001 yield early maturity variety (bu/ac) |
|------------------------|-----------------|----------------|-------------------------|---|--|
| ------(month-day)----- | | | | | |
| April 23 | May 11 | Sept 16 | 51.0 | 50.7 | 43.1 |
| May 6 | May 20 | Sept 20 | 51.8 | 55.0 | 46.2 |
| May 18 | June 1 | Sept 24 | 50.7 | 53.8 | 49.1 |
| May 31 | June 10 | Sept 30 | 46.5 | 48.1 | 45.0 |

*Average date.

Table 2. Influence of planting date on growth parameters and final yield (1981–1991).

| Planting date | Emergence date | Maturity date | Average yield (bu/ac) | Ridomil fungicide* | Starter fertilizer** |
|------------------------|----------------|---------------|-----------------------|--------------------|----------------------|
| ------(month-day)----- | | | | | |
| May 6 | May 20 | September 16 | 43.2 | +1 | +0.3 |
| May 20 | June 1 | September 21 | 44.2 | +1 | +0.6 |
| June 2 | June 11 | September 28 | 43.1 | +0.7 | -0.6 |
| June 16 | June 24 | October 6 | 39.7 | +2.2 | +0.2 |

* Ridomil tested from 1986–1991.

**Starter Fertilizer tested from 1981–1985.

Table 3. Influence of planting date on growth parameters and final yield (1976–1980).

| Planting date | Emergence date | Maturity date | Average yield (bu/ac) | Early maturity soybean variety (bu/ac) | Normal adapted soybean variety (bu/ac) |
|------------------------|----------------|---------------|-----------------------|--|--|
| ------(month-day)----- | | | | | |
| May 1 | May 20 | September 15 | 34.6 | 31.9 | 37.3 |
| May 10 | May 24 | September 18 | 39.3 | 37.8 | 40.8 |
| May 20 | May 30 | September 22 | 39.6 | 38.3 | 40.9 |
| June 1 | June 10 | September 26 | 38.8 | 37.5 | 40.2 |
| June 10 | June 17 | October 1 | 33.9 | 33.0 | 34.9 |

Table 4. Effect of planting date on soybean yield in Iowa (1995–1997).

| Planting date | Northern Iowa | Central Iowa | Southern Iowa |
|---|---------------|--------------|---------------|
| Relative yield (percent of potential yield) | | | |
| Late April | 100* | 96* | 98* |
| Early May | 96* | 100* | 100* |
| Mid-May | 99* | 96* | 98* |
| Early June | 81 | 93 | 89 |
| Mid-June | 61 | 59 | 82 |
| Early July | 33 | 45 | 47 |

*Not statistically different from 100%.