



## Correlation of Soybean Yield to Planting Date - MN, ND, SD

Soybean planting date often affects yield potential. However, with 2008 and 2009 planting delays as recent reminders, soybean planting date is not always in our control. Growers can examine planting date data and try to make an informed decision on planting date for soybeans in order to maximize yield potential. Examining yield data from several universities suggests planting soybeans “early”, prior to late May, can help maximize yield potential. While there are risks, the potential yield benefits for early planting are compelling and tools are available to help mitigate most risks.

### Yield of Early vs. Late Planting Date

Research from several Midwestern universities lends support to early planting of soybean, when field conditions are suitable.

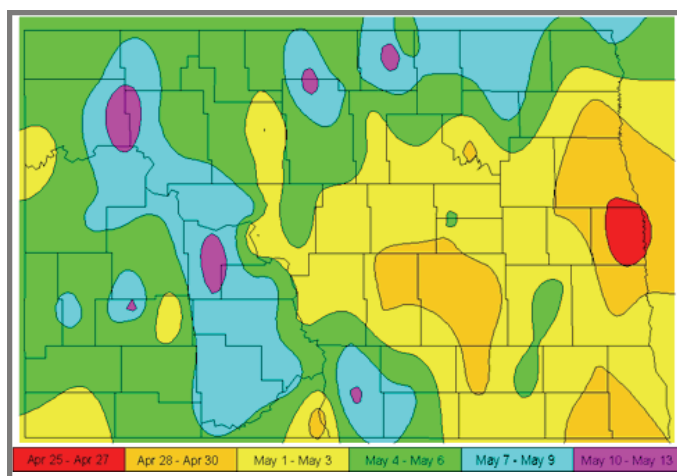
**Minnesota.** Early planting increases yield potential in Minnesota (Table 1). Trial results indicate maximum soybean yield is obtained when planting between May 1 – 15.<sup>1</sup> Yield results from Crookston in 2007 and 2008 showed no yield loss at an April 25 planting date compared to May and early June planting dates; thus, lending support to early planting.

**Table 1. Percent yield loss at various planting dates for soybean in Minnesota.**

Planting Date	Percent Yield Loss
May 10	0
May 20	3
May 30	9
June 10	18
June 20	30
June 30	43

Source: Adapted from P. Glogoza. 2009. Soybean Planting Date and Delayed Planting. Minnesota Crop News. June 11, 2009.

**North Dakota.** In an effort to maximize yield potential and reduce risk of frost injury, planting between May 10 and May 25 is recommended in North Dakota.<sup>2</sup> Planting no sooner than five days before the average last killing frost is a general rule of thumb (Figure 1). Earlier planting allows soybean to utilize more of the growing season for development, as well



**Figure 1.** North Dakota map showing the 50% probability of a 28°F spring freeze occurring after each indicated date. Source: [www.ndawn.ndsu.nodak.edu](http://www.ndawn.ndsu.nodak.edu)

as use full-season varieties, which tend to have higher yields than shorter-season varieties. Based on planting date research at the North Dakota State University Fargo Experiment Station, late plantings resulted in lower yields, lower seed quality, lower oil content, shorter plants, and seeds set lower to the ground compared to optimum planting dates.<sup>2</sup>

**South Dakota.** Long-term research at South Dakota State University’s Southeast Research Farm in Beresford, SD has examined soybean planting date. Highest yields were attained at the earliest planting date (May 5) for both early and mid-season varieties (Table 2).<sup>3</sup> Optimum planting dates were shown to be between May 5 - 25.

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**Table 2. Sixteen-year average yields (bu/A) for soybean planting date study (1986-2001). South Dakota State University Southeast Research Farm, Beresford, SD.**

Variety	May 5*	May 15	May 25	June 4	June 14
<b>Early (Group I &amp; II)</b>	<b>45**</b>	<b>43</b>	<b>43</b>	<b>41</b>	<b>35</b>
<b>Mid (Group II)</b>	<b>44**</b>	<b>43</b>	<b>42</b>	<b>39</b>	<b>35</b>

Source: Adapted from R. Berg, et al. SDSU Southeast Research Farm report 0106.

\*Planting dates are averages.

\*\*15-year average due to wet conditions in early May 1999.

**In Summary,** planting into a suitable seedbed can require patience, especially if the goal is to plant early. The potential yield benefits of early planting can be realized by managing the early season risks.

Sources: <sup>1</sup>P. Glogoza. 2009. Soybean Planting Date and Delayed Planting. Minnesota Crop News. June 11, 2009. <http://blog.lib.umn.edu> (3/25/10)

<sup>2</sup>D. Berglund and T. Helms. Soybean Production. A-250 (Revised). June 2003. North Dakota State University. <http://www.ag.ndsu.nodak.edu> (3/25/10)

<sup>3</sup>R. Berg, M. Draper, D. DuBois, B. Jurgensen, R. Stevens, G. Williamson, and K. Ruden. Date of Planting Soybean with and without fungicide seed treatments. Southeast Farm – 0106. South Dakota State University. <http://plantsci.sdstate.edu> (3/25/10)

### Early Planting: Benefits vs. Risks

The potential benefit of yield gain when planting soybean early needs to be weighed with the potential risks. When planting early, delayed emergence may occur given the cooler soil temperatures. Although the ideal soil temperature for soybean is 77°F, soybean can germinate when the soil temperature is about 50°F at 2 inches. Emergence may take as long as 3 weeks at this temperature. During this time of delayed emergence, soybeans are dormant and can be vulnerable to diseases and insects. Several tools are available to help manage the risks of early planting (Table 3).

Cold soil temperatures slow root development and increase exposure of soybean seedlings to root-rotting pathogens. Fungicide seed treatment is recommended if there is a field history of seedling diseases from Phytophthora, Pythium, Rhizoctonia, or Fusarium.

While not always a concern with early planting, high populations of bean leaf beetles (BLB) can be a risk for newly emerged soybeans. In fields with a history of high BLB populations, insecticide seed treatments or foliar applied insecticide treatments are effective management options.

**Table 3. Risks associated with early planting and available management tools.**

Risk	Management Tools
<b>Seedling diseases such as Phytophthora, Pythium, Rhizoctonia, and Fusarium</b>	<b>Fungicide seed treatments; germplasm selection; soil drainage</b>
<b>1<sup>st</sup> generation Bean Leaf Beetles</b>	<b>Insecticide seed treatments; foliar-applied insecticide</b>
<b>Frost</b>	<b>none</b>

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