

4-2-2007

## Corn planting: Consider soil temperature and date

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### Recommended Citation

Abendroth, Lori and Elmore, Roger W., "Corn planting: Consider soil temperature and date" (2007). *Integrated Crop Management News*. 1102.

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## Corn planting: Consider soil temperature and date

### **Abstract**

As of now, it looks like corn planting in some parts of Iowa could get started later than normal due to March showers and cool temperatures this first week of April. The current 6- to 10-day National Oceanic and Atmospheric Administration (NOAA) forecast calls for cooler than normal temperatures coupled with less than normal precipitation. What factors are important to consider regarding planting date of corn once field work is possible?

### **Keywords**

Agronomy

### **Disciplines**

Agricultural Science | Agriculture | Agronomy and Crop Sciences

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## Corn planting: Consider soil temperature and date

*by Lori Abendroth and Roger Elmore, Department of Agronomy*

As of now, it looks like corn planting in some parts of Iowa could get started later than normal due to March showers and cool temperatures this first week of April. The current 6- to 10-day National Oceanic and Atmospheric Administration (NOAA) forecast calls for cooler than normal temperatures coupled with less than normal precipitation. What factors are important to consider regarding planting date of corn once field work is possible?

### Wait to plant until the soil temperature is right

In general, corn should be planted when soil temperatures are near 50 °F. Seed will absorb about 30 percent of its weight in water, and temperature does not affect water imbibition much. This is different than radicle (root) and coleoptile (shoot) growth; their growth is correlated with soil temperature. In cold soil conditions (below 50 °F), seeds will readily absorb water but not initiate root or shoot growth; this leads to seed rots and poor emergence if poor seedbed conditions are prolonged. Recommendations are to begin planting when soils are near 50 °F or are quickly increasing to 50 °F.

Cool soil conditions early in the season is one reason there is more variability in final stands relative to seeding rate. In 2006 planting date trials, the corn production research lab evaluated final population relative to the seeding rate. These data are shown in Figure 1, which uses soil growing degree day (SGDD) units instead of calendar date. SGDD units were figured from January 1, 2006, to each respective planting date. These units give more consistency when evaluating responses across locations and years. SGDD units are simply a measure of accumulated heat units with a base of 50 °F.

As of April 2, 2007, most of the state has between 15 and 60 SGDD. Over the past several years, 300 SGDDs have, on average, occurred by May 15 in Ames, IA. You can find this and other up-to-date weather data on [Mesonet](#). Based on Figure 1 (2006 data), we expect to see increased variability in final population if seed is planted into soils that are below 150 SGDD units. Soils that are above 150 SGDD units should, on average and given normal seedbed conditions, result in a population that is between 90 and 100 percent of the initial seeding rate.

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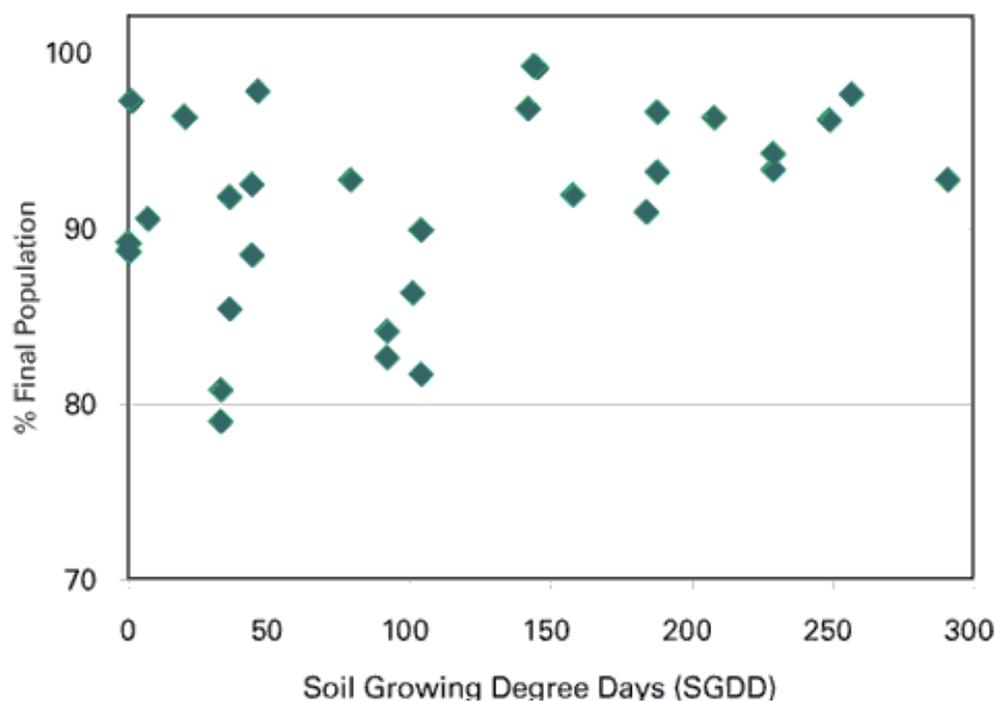


Figure 1. Final population as a percent of seeding rate by soil growing degree days (SGDD). SGDD are figured from January 1, 2006, to each respective planting date. Planting date research at nine locations in 2006, Iowa State University.

## Plant when able, given good seedbed conditions

Yields are reduced more when planted too late rather than too early. Some producers will be especially pushed this year when planting corn because of the increase in corn acreage. With more acres to plant, the possibility of having corn planted outside the optimum window is higher than other years.

In general, research has shown a small yield loss with very early planting dates and larger yield losses with significantly delayed planting dates. Three years of planting date research (1998-2000) at Lewis, Ames, and Nashua are summarized in an Iowa State University Extension publication, [Corn Planting Guide \(PM 1885\)](#).

Planting between April 20 and May 5 resulted in 100 percent yield potential, although a 99 percent yield potential could still be achieved with a planting date up to May 20.

Based on newer research (2003-2006), we believe that the planting window can be earlier than April 20 and reach near or at 100 percent yield. In general, 2006 research data show a positive yield response to early planting dates with yields dropping off past mid-May. The optimum window in 2006 was generally between April 15 and May 10.

Early plantings may not occur in many locations this year because of weather conditions, but understanding the planting date response is still important.

Yields are much more stable early in the planting season than late. Planting 10 days before the optimum window is generally a much safer practice than planting 10 days after the window. This is because yields will begin to drop off dramatically in mid-May. We recommend planting corn prior to May 15 if possible to avoid this "slippery slope" response. Of course, embedded within this planting date recommendation is the assumption that soil conditions are favorable and that good hybrids have been selected. Planting date is simply one criterion among many

that will allow high yields to be reached.

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This article originally appeared on pages 94-95 of the IC-498 (4) -- April 2, 2007 issue.

Updated 04/05/2007 - 12:09pm