

Considerations for Changing Corn Relative Maturities in Northern IL

There is growing concern amongst Northern Illinois Corn Growers regarding planting full season corn hybrids with the delayed start to planting. Due to slow growing degree unit (GDU) accumulation early in the growing season, and the ability of corn to adapt the GDUs required for flowering and maturity when planted late, switching to an earlier relative maturity (RM) should not be a consideration until around May 15th. Even around May 15th, the benefits of planting a full season hybrid can outweigh the potential risks, so deciding if an earlier hybrid should be planted is a decision that deserves careful thought and should not be rushed into.

GDU Accumulation

Corn requires approximately 1250 to 1360 GDUs to reach mid-pollination and 2550 to 2800 GDUs to reach black layer, depending on the hybrid. During planting, accumulation of GDUs is minimal compared to flowering and drydown (Table 1). A delay in planting of five days means a loss of 45 GDUs. That means it would take approximately 2 more days for the corn to reach maturity in the fall as GDU accumulation in July and August is approximately 21 per day.

Changes in GDU Requirements

As planting occurs after May 1st, corn requires approximately 1.6 fewer GDUs per day of delayed planting to reach flowering¹. GDUs required to reach physiological maturity, or black layer, decreases approximately 6.8 GDUs per day of delayed planting after May 1st¹. Table 2 provides an example of the GDU requirements of a typical full season corn product planted in April compared to May 15th. These adjustments are important to consider when contemplating switching to a different relative maturity.

Field Trial

In 2008, a field trial comparing planting dates in Rochelle, IL (Ogle county) was established. The "normal" planting date of April 27th averaged 187 bu/acre, while the "late" planting on June 2nd yielded 149 bu/acre. In general, the highest yielding hybrids in the

Table 1. Average daily accumulation of GDUs in DeKalb and Moline, IL, from 1996-2010 at key times during the growing season.

Dates	DeKalb, IL	Moline, IL
Planting April 15 - May 15	8	10
Flowering July 1 - July 31	23	24
Drydown Aug. 15 - Sept. 15	19	21

Source: Midwestern Regional Climate Center

Table 2. An example of GDUs required by corn when planted on different planting dates.

Planting Date	GDUs to Mid-pollination	GDUs to Black Layer
April 15	1320	2800
May 15	1298	2705

normal-planted trials were also the highest yielding in the late-planted trial. Despite the 5 week difference in planting date, the late-planted trial flowered just 1 week later than the normal-planted trial. These results illustrate the ability of a corn plant to develop with fewer GDUs available; however, depending on planting date, yield may be compensated. Economically, the three hybrids that had the smallest reduction in adjusted income (gross income minus drying costs) due to late planting were also full season (109 to 113 RM). With only one week difference in flowering, the ability of the full season hybrids to take advantage of a longer grain fill period likely contributed to their ability to maintain yield potential similar to that of the earlier planting dates. Their increased yields offset the increased drying costs. This result indicates that staying the course with a full season hybrid, despite late planting, can pay off.

The wet grain harvested in 2009 is still fresh in the memories of many Corn Growers. However, the poor drydown in the fall of 2009 was influenced more by the cool temperatures and slow accumulation of GDUs than the delayed planting. Since the accumulation of GDUs early in the growing season is low and corn requires fewer GDUs to reach maturity when planted after May 1st, it is not recommended to switch relative maturities before May 15th. Even around May 15th, the benefits of planting a full season hybrid can outweigh the potential risks, so deciding if an earlier hybrid should be planted is a decision that deserves careful thought and should not be rushed into.

Sources:

¹Brouder, S.M. et al. 2010. *Corn & Soybean Field Guide*. Purdue University Extension. ID-179.

²Midwestern Regional Climate Center (MRCC). <http://mrcc.sws.uiuc.edu/> (verified 4/19/11).

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. Technology Development by Monsanto and Design® is a registered trademark of Monsanto Technology LLC. ©2011 Monsanto Company. 04.22.2011.EJP