

Purdue University Department of Agronomy
Corny News Network

Published 12 May 2008

URL: http://www.kingcorn.org/news/articles.08/DelayedPlt_Hybrids.html

Late Planting/Replanting & Relative Hybrid Maturity

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- Planting delays continue.
- Consider switching to earlier maturity hybrids by early June.
- Check seed availability with seed dealers now.

Frequent rains of recent weeks delayed the start of corn planting throughout Indiana. Rains late last week and over the weekend will further delay the completion of planting, especially in the southern third of the state. Rainfall over the 7-day period ending 8 am EDST May 12 ranged from 2 to 4 inches throughout central, eastcentral, and southern Indiana (Fig. 1). Rainfall amounts elsewhere in the state ranged from one-half to 2 inches.

As of May 11, the Indiana office of USDA's National Ag. Statistics Service estimated that only 61 percent of the state's corn crop was planted compared to the most recent 5-year average of 72 percent (USDA-NASS, 2008). The good news is that this year's planting pace is not the slowest in recent memory. The two slowest planting years in the past five were 2002 and 2003 (Fig. 2). In contrast, the fastest planting year in the past five was 2004. The 2008 pace is between the slowest and fastest of the past five years and is interestingly not that much slower than that of last year.

The planting delays are greatest in the southern third of Indiana, where USDA-NASS estimates only 34 percent completion as of May 11 in contrast with 61 and 74 percent completion in the northern and central areas of the state (USDA-NASS, 2008). With more rain in the current forecast for the coming week, many of those planters will likely not return to the fields before next week. Consequently, much of the remaining 39% of the state's corn crop will be planted later than desired. Additionally, a few early-planted fields may require replanting if plant populations are reduced due to soggy soils and/or disease.

Some of the locals who frequent the Chat'n Chew Café are beginning to question whether they should consider replacing their remaining full-season corn hybrids with shorter-season versions. They worry that full-season hybrids planted from here on out may not mature safely before the first killing fall frost. After all, hybrid maturity ratings are closely associated with the accumulation of Growing Degree Days (GDDs) after planting (Fig. 3) and there are only so many GDDs available in a given growing season prior to killing fall frosts.

Fortunately, we know from previous research (Nielsen et al., 2002) that corn hybrids adjust their GDD needs downward as planting is delayed. This means that late-planted hybrids mature in fewer than expected GDDs from planting. The number of GDDs required from planting to physiological maturity in corn decreases nearly 7 GDDs per day of delayed planting after May 1. For example, a hybrid planted June 1 will mature approximately 210 GDDs sooner than it would if planted May 1 (30 days times 7 GDDs per day of delayed planting).

The bottom line from this research is that a given hybrid maturity can be planted later than we once thought possible and still mature safely before a killing fall frost. Nevertheless, at some point on the calendar, growers eventually need to consider switching to earlier maturity hybrids to minimize the risk of frost damage in the fall.

The tables that follow summarize the delayed planting effect on hybrid GDD requirements and present the results in terms of "safe" hybrid maturities for a range of delayed planting dates (see Nielsen & Thomison, 2003, for more information). Both tables assume "normal" GDD accumulations for the remainder of the growing season and a fall frost date that is based on a 50% risk of frost occurring by a given date for individual crop reporting districts around the state (Indiana State Climate Office, <http://iclimat.org>).

Table 1 targets physiological maturity occurring the same week that a killing frost is expected to occur. Table 2 targets physiological maturity occurring the week before a killing frost is expected to occur. The "safe" hybrid maturities listed in Table 2, therefore, are a bit less risky relative to maturation and killing fall frosts.

The hybrid maturities listed in the tables are described in terms of "CRM" or comparative relative maturity ratings as defined by Pioneer Hi-Bred (2008). Pioneer publishes relative maturity data for hybrids in terms of both CRM ratings and GDDs from planting to physiological maturity. Such data can be used to define the relationship between CRM ratings and GDD requirements (Fig. 3). That relationship coupled with our previous research on the effects of delayed planting on GDD requirements allow me to estimate "safe" hybrid maturities for a range of planting dates (Tables 1 & 2).

DISCLAIMER: I am NOT suggesting that Pioneer hybrid maturity definitions are the industry standard. Nor am I promoting Pioneer hybrids. I work with Pioneer's hybrid maturity data because a) many farmers and consultants can relate to Pioneer hybrid maturity ratings and b) I cannot easily find similar on-line datasets for the complete hybrid lineup for any other major seed corn supplier.

BOTTOM LINE:

The tables indicate that growers in the central and westcentral Indiana plus the entire southern third of Indiana could continue to plant full-season hybrid maturities through at least the end of May. That's good news for southern Indiana where planting delays are the greatest. Growers in the northern third of the state and eastcentral Indiana who routinely "push the limits" of adapted hybrid maturity may want to consider switching to something less than 110 day hybrids before the end of May. In addition to managing the risk of not maturing prior to a killing fall frost, the eventual agronomic decision to switch to earlier maturity hybrids with delayed planting should result in drier grain at harvest (approximately one-half percentage point of grain moisture difference per "day" difference in hybrid relative maturity) and thus lower grain drying costs and less risk of low test weight grain. At a minimum, growers facing further significant delays in planting corn may want to begin talking with their seed dealers about the possible availability of earlier maturity hybrids.

Related References

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- Pioneer Hi-Bred. 2008. Pioneer® Brand Products. [On-line]. Available at https://www.pioneer.com/growingpoint/product_info/catalog/PrdSelection.jsp [URL accessed 5/11/08] [NOTE: The Pioneer GrowingPoint Web site requires a login; either as a current Pioneer customer or as a guest. After you've completed the Web site registration process you will be routed to the "Search Products & Traits" Web page. From here, select "Corn grain" from the "Product Line" dropdown menu and click "Enter".]
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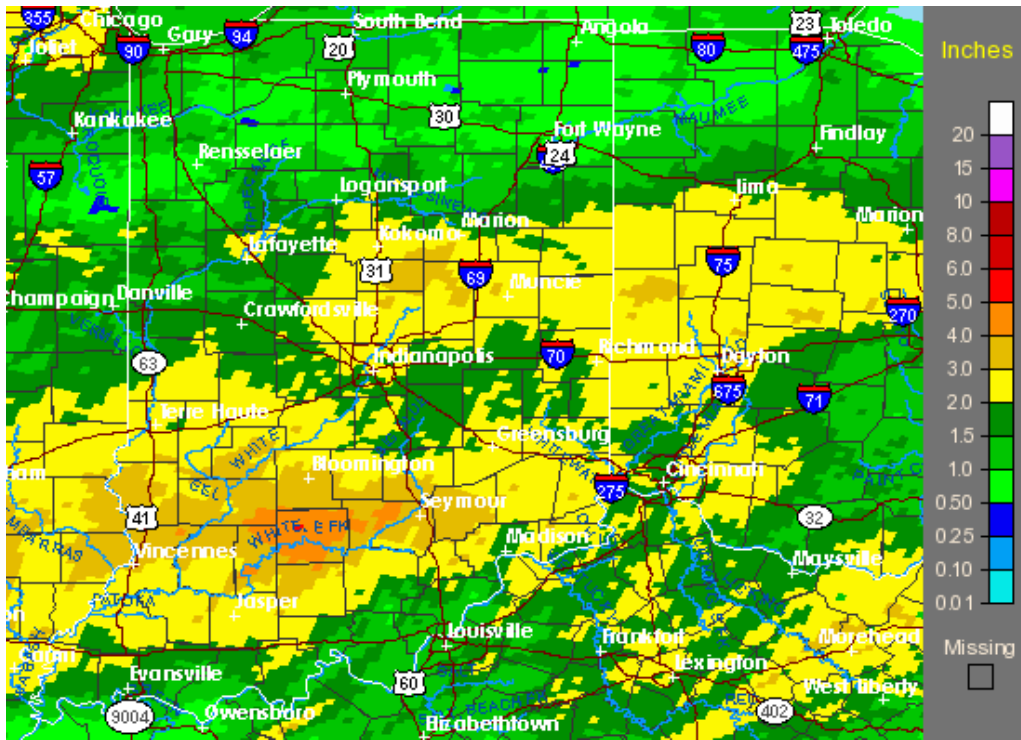


Fig. 1. Estimated 7-day precipitation throughout Indiana as of 8 am EDT on 12 May. [Source: National Weather Service]

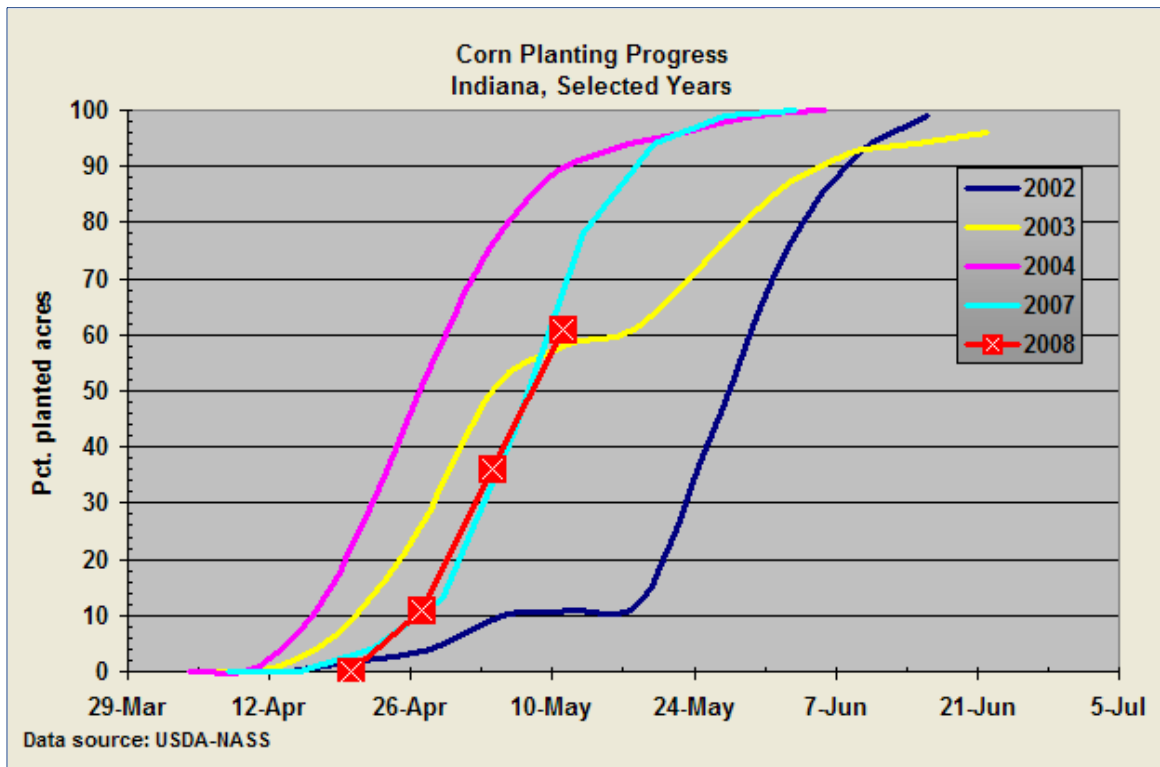


Fig. 2. Corn planting progress in Indiana for 2002 (slowest pace in past 5 years), 2003 (second slowest pace in past 5 years), 2004 (fastest pace in past 5 years), 2007, and to date (May 11) for 2008. [Source: USDA-NASS]

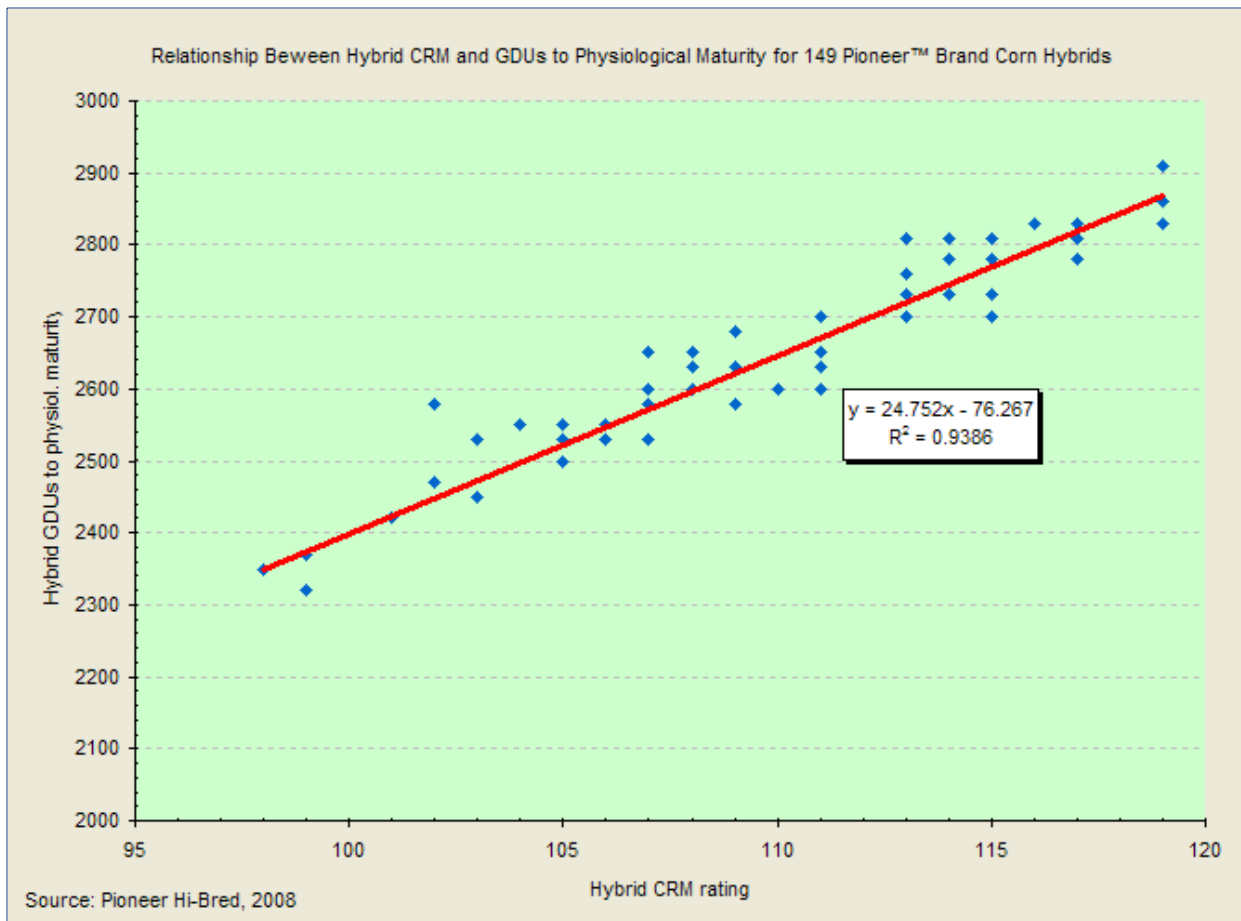


Fig. 3. Relationship between hybrid relative maturity (CRM) ratings and heat unit (GDU) accumulation from planting to physiological maturity.
[Source: Pioneer Hi-Bred, 2008]

Table 1. Approximate "safe" relative hybrid maturities for late planting dates in Indiana with the assumption that the hybrid will mature the week of the expected first fall frost date. The expected fall frost date is that based on a 50% risk of frost occurrence. The acronym "CRM" refers to Comparative Relative Maturity as defined by Pioneer Hi-Bred.

Approx. "safe" relative maturities for late planting dates in Indiana with assumption that the hybrid will mature the week of expected fall frost date.

Crop Rpt	"Typical" CRM	Planting date...			
		Expected fall frost date	Approx. "safe" relative maturity		
			17-May	24-May	31-May
NW	109	6-Oct	112	110	108
NC	109	6-Oct	111	110	108
NE	109	6-Oct	109	108	106
WC	112	13-Oct	118+	118+	118
C	112	13-Oct	118+	118	116
EC	109	6-Oct	112	111	108
SW	116	20-Oct	118+	118+	118+
SC	113	13-Oct	118+	118+	118+
SE	113	13-Oct	118+	118+	118+
		50	pct fall frost risk date		

Table 2. Approximate "safe" relative hybrid maturities for late planting dates in Indiana with the assumption that the hybrid will mature one week before the expected first fall frost date. The expected fall frost date is that based on a 50% risk of frost occurrence. The acronym "CRM" refers to Comparative Relative Maturity as defined by Pioneer Hi-Bred.

Approx. "safe" relative maturities for late planting dates in Indiana with assumption that hybrid will mature one week before expected fall frost date.

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WC	112	13-Oct	118+	118	116
C	112	13-Oct	118	116	113
EC	109	6-Oct	109	108	106
SW	116	20-Oct	118+	118+	118+
SC	113	13-Oct	118+	118+	118+
SE	113	13-Oct	118+	118+	118+
		50	pct fall frost risk date		

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