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How Late Can I Replant Corn?

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Even though essentially all of Indiana's 2015 corn crop was planted on the first go around, frequent and excessive rains from late May to date, and the subsequent ponding, flooding, or saturated soil conditions have caused extensive damage to the first planting on tens of thousands of acres around the state (Nielsen's very conservative estimate). Some growers, in desperation, are asking "How late can I replant corn?" in hopes of recouping some lost yield / income potential from severely damaged fields.

Most of the time when I receive this question in the last week of June, my stock answer to growers in the northern half of Indiana is "Perish the thought" simply because there are too few remaining calendar days and, more importantly, Growing Degree Days (GDDs), in the growing season to safely mature most adapted hybrids of corn prior to a killing fall freeze (Nielsen, 2015).

However, "desperate times call for desperate measures" and so one can speculate on whether or not corn could be planted the first week of July and safely mature. One of the primary keys to answering this questions lies with the relative maturity ratings of hybrids and, more importantly, their expected GDD requirements from planting to physiological maturity (Nielsen, 2012b). The common range of relative hybrid maturities grown in Indiana ranges from about 104 to 118 "days" or hybrid GDD ratings from about 2500 to 2800 GDDs from planting to physiological maturity.

We also know from past research that hybrids respond to delayed planting by maturing in fewer GDDs than expected (Nielsen et al., 2002). Our research some years ago indicated that for every day of planting delay beyond May 1, hybrids mature approximately 7 fewer GDDs than expected. That research included planting dates out to mid-June. We can only speculate that the reduction in GDDs to maturity continues beyond that date, but for the sake of argument, let's say that the trend continues. A hybrid planted on July 1 might mature in 420 fewer GDDs than expected (approximately 60 days x 7).

If this response to delayed planting holds true out to early July, then the next step is to estimate how many GDDs one might expect from that date to a date of your choosing in the fall. For this, the online U2U Growing Degree Tool offers some assistance in estimating GDD accumulations for specific counties and planting dates. Let's use Randolph County along the eastcentral side of the state where there are currently quite a few acres of severely damaged 1st-planting corn. The GDD

Tool indicates that October 21 is the average first killing freeze date in the fall (28°F), so let's use that as our ending date. The U2U Growing Degree Tool estimates that 1963 GDDs would accumulate "on average" from July 1 to October 21, with a range of 1615 to 2123 GDDs.

Now, let's work backward to relate that GDD estimate and the estimate that a hybrid planted July 1 may mature in 420 fewer GDDs than expected to estimate what relative hybrid maturity might have a chance of maturing safely. Get out your pencils...

The estimated 1963 GDD accumulation plus the 420 GDDs "gained" by the delayed planting might be equal to a hybrid maturity with a rated 2383 GDDs to maturity. With that estimate in hand, visit with your seed dealer and find out what relative hybrid maturity that would equate to. For many seed companies, a hybrid GDD rating estimate of 2383 would be in the neighborhood of a 95 to 100 "day" corn hybrid.

What if the remainder of the growing season remains a bit on the cool side (like it has been most of the season so far)? Use the low end of the GDD range provided by the U2U GDD tool and repeat the calculations. The estimated 1615 GDD accumulation plus the 420 GDDs "gained" by the delayed planting might be equal to a hybrid maturity with a rated 2035 GDDs to maturity. This would be equal to a relative hybrid maturity rating of 75 to 80 "days". Quite a difference compared to running the numbers with the "average" expected GDDs from July 1.

Another factor to consider is the consequence of the ending date you choose to run these calculations. I chose the average date of a killing fall freeze for my example. Understand, that a hybrid that simply matures on that date still requires quite a bit of field drydown of the grain before it reaches a harvestable moisture content. If you choose dates earlier than the average fall killing freeze to provide for more days of field drying, that will result in even fewer available GDDs to mature the crop in the first place.

The bottom line with this discussion is that it may well be possible to replant damaged corn fields in the northern half of Indiana as late as early July with hybrid maturities more suitable for parts of Minnesota or Wisconsin. But, therein lies some more challenges. Such early hybrid maturities are not adapted to the central Corn Belt for several reasons. In particular, one needs to focus on identifying candidate hybrids that have good genetic disease resistance "packages" for our important diseases here in Indiana, especially gray leaf spot, northern corn leaf blight, and some of the ear and stalk rot diseases. Furthermore, I suspect that available seed supplies for these early maturity hybrids may be difficult to obtain, either due to short supply or the logistics of moving seed from the northern Corn Belt to Indiana.

The final comment I would make is that growers who carry crop insurance policies need to visit with their crop insurance agents before taking the risky step of replanting corn this late in the season. There may be unforeseen ramifications to your coverage that would frustrate you later.

This article contains quite a few "ifs", "ands", and "buts". That should give you a hint of the riskiness of replanting a damaged corn crop back to corn at these late dates. But, as I said earlier... for some growers "desperate times call for desperate measures".

Related reading

Nielsen, R.L. (Bob). 2012a. Heat Unit Concepts Related to Corn Development. Corny News Network, Purdue Univ. [online] <http://www.kingcorn.org/news/timeless/HeatUnits.html> [URL accessed June 2015].

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Nielsen, RL (Bob). 2015. Hybrid Maturities for Delayed Planting. Corny News Network, Purdue Extension.
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Nielsen, Robert L., Peter R. Thomison, Gregory A. Brown, Anthony L. Halter, Jason Wells, and Kirby L. Wuethrich. 2002.
Delayed Planting Effects on Flowering and Grain Maturation of Dent Corn. Agron. J. 94:549-558.

Useful to Usable (U2U). 2015. Corn Growing Degree Day Tool. Useful to Usable Project, Purdue Univ. [online]
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