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Interpreting Hybrid Maturity Ratings

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Hybrid maturity ratings have always been a sort of mystery to farmers and consultants alike. One factor that contributes to the mystery is that your definition of ‘maturity’ may not be the same as my definition.

Agronomists usually refer to ‘maturity’ as that point in time when maximum weight per kernel has occurred. The usual term for this is ‘physiological maturity’ and is often associated with the development of the black layer at the tip of the mature kernel. Grain moisture content at the onset of physiological maturity ranges between 25 and 35 percent.

Another definition of ‘maturity’ is that point in time after physiological maturity when a hybrid can be safely harvested with minimal harvest loss, either by kernel loss or kernel damage. My term for this is ‘harvest maturity’ and is usually associated with a grain moisture content of around 25 percent.

The traditional method for rating hybrid maturities (i.e., 'days to maturity') is based on comparisons among hybrids near the time of ‘harvest maturity’, with the assumption that grain moisture loss in the field is about 0.5 percentage point per day. For example, if the grain moisture content of a new hybrid is two percentage points wetter than that of a ‘standard’ hybrid with an assigned relative maturity value of 110, the new hybrid is assigned a relative maturity value of 114.

Historically, folks have added the word ‘days’ to this hybrid maturity rating value (i.e., 114-day hybrid), but it is important to recognize that this value does not refer to actual calendar time between planting and harvest maturity. Consequently, traditional relative maturity ratings of hybrids are of little help in determining whether a hybrid will safely mature before a killing fall frost.

The other common method for assigning relative hybrid maturities is based on the thermal time between planting and physiological maturity. Terms used to describe thermal time include ‘growing degree days’ (GDD), ‘growing degree units’ (GDU) and ‘heat units’ (HU). GDD values represent the amount of heat accumulated over a period of time. Since this method depends on actual measurement of thermal time, there is no need to compare hybrids in order to assign maturity rating values. Common values for such maturity ratings range from about 2500 (earlier maturity hybrids) to 2800 (later maturity) for hybrids commonly grown in Indiana.

The relationship between these two maturity rating methods is close but not always exact because each is based on a different definition of ‘maturity’, the difference being the time period between physiological and harvest maturity. If hybrids vary for rates of grain moisture loss, their comparative maturity values may differ between the two maturity rating methods. Neither method is perfect, either, because of the influences of climatic conditions and plant stress on the grain maturation process.

Another ‘fly in the ointment’ is the fact that there are no agreed upon standards within the seed industry for the application of either method for assigning relative hybrid maturities. Minor differences in methodologies among seed companies often result in the farmer's frustration in comparing maturity values among different brands of hybrids.

Unfortunately, the lack of industry standardization can make it difficult for growers who need to make a hybrid maturity decision for late planting situations based on remaining GDD availability. Fortunately, one of the larger seed corn companies rates their hybrids according to GDD accumulations from planting to kernel black layer. Consequently, we can describe the relationship between their relative hybrid maturity ratings and growing degree days to kernel black layer (Figure 1.)

One can use this relationship to estimate the GDDs from planting to black layer for other companies’ hybrids of similar relative maturities. For example, if the relative maturity of a hybrid is comparable to a 112-day (CRM) Pioneer™ brand hybrid maturity, then Figure 1 suggests that the GDDs from planting to black layer would be approximately 2700. With this estimate in hand, growers can then begin the process of determining safe hybrid maturities for late planting situations.

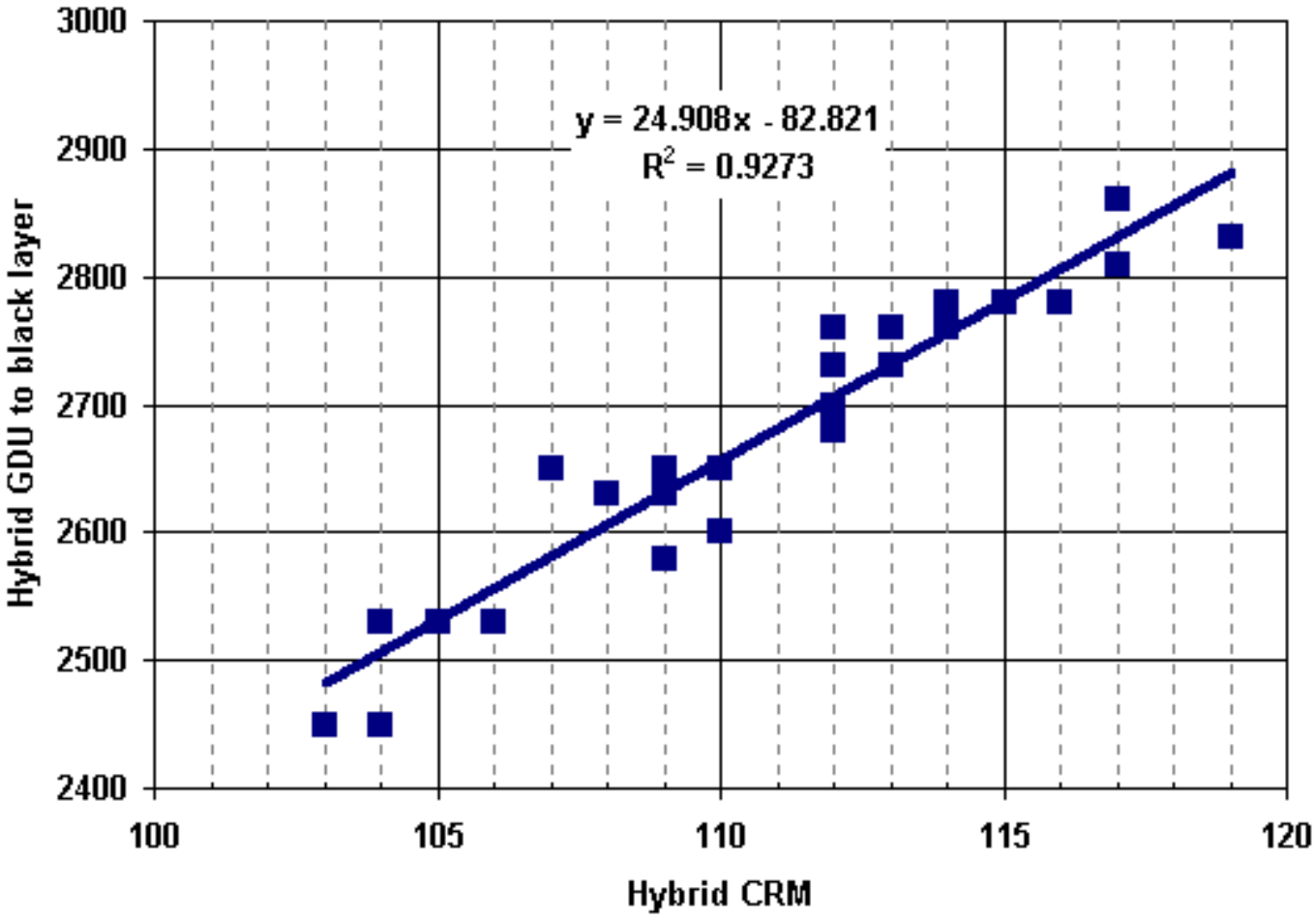

Figure 1. Relationship between hybrid comparative relative maturity (CRM) and hybrid growing degree units (GDU) from planting to kernel black layer for a group of Pioneer" brand corn hybrids(1). (Source of data: Pioneer Hi-Bred International sales literature, 2001.)

For other information about corn, take a look at the Corn Growers Guidebook on the World Wide Web at

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