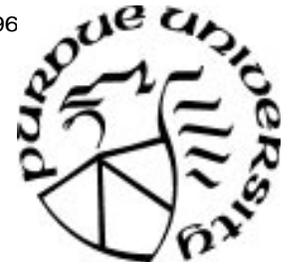


CROP AND LIVESTOCK



Update

Frost Fearmongering Update for Corn (Revised)

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Purdue University agronomy professor Bob Nielsen offers an update on fall frost conditions for corn.

- The 1996 corn crop is dangerously behind schedule.
- Estimates of remaining GDDs and grain fill GDD requirements can be used to assess frost risk for specific fields.
- As of September 16, corn across the northern and eastern third of Indiana needs to be at least to the full dent stage to be reasonably safe from a normally occurring killing fall frost.

What is important from here on for any given corn field is 1) What is its stage of development? and 2) How many growing degree days (GDDs) are expected to accumulate from now until a killing frost? These two pieces of information (or guesstimates) can help

determine the relative risk of a field to a killing fall frost.

Grain fill stages of development can be determined from the descriptions presented in an article in P&C Newsletter, August 16, 1996. For any given grain fill stage, the approximate GDD accumulations required to reach kernel black layer (physiological maturity) are listed in Table 1.

So, let's say you've sampled ears from a field-at-risk and determined the grain fill stage. The next question, based on the grain fill stage of that crop today, is whether you can expect to receive enough GDDs between now and a killing frost to mature the crop safely. One of the few ways to estimate the GDDs remaining in the season is to use historical GDD accumulations.

Table 1. Approximate GDDs from specific grain fill stages to kernel black layer for corn hybrids that typically require 2700 GDDs from planting to black layer.

Grain fill stage	Description	GDDs to black layer
R1	Fresh silks	1300
R2	Blister	1040
R3	Milk (roasting ears)	900
R4	Dough	775
R4.5	Late dough/early dent	510
R5	Fully dented	250
R6	Black layer	0

Adapted from Table 3, NCH-40, Growing Season Characteristics and Requirements in the Corn Belt, Ralph E. Neild and James E. Newman, 1986.

Working with 30-year GDD normals obtained from Ken Scheeringa (Indiana's acting state climatologist), I've created Table 3 that estimates 1) remaining GDD accumulations and 2) the youngest safe grain fill stage that should mature normally prior to a median frost date for each Crop Reporting District in the state. The estimates in Table 3 reflect the date of September 16. Follow my earlier example to make frost risk assessments for fields of your own.

Bottom line: Fields throughout the northern and eastern third of Indiana, where the acreage of delayed planting was greatest, need to be at least in the full dent stage of grain fill development by September 16 in order to have a reasonable chance of maturing before a normally-occurring killing fall frost. An earlier than normal frost event would damage even more acres of immature corn. Cooler than normal temperatures from here on will further delay the grain maturation process and also increase the risk of a field for fall frost damage.

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Table 3. Estimates of youngest safe grain fill stage relative to fall frost risk in Indiana. Estimates valid for crop development as of September 16, 1996 and median fall frost dates.

Indiana Crop Reporting District	Median frost date (50 % probability)	Estimated GDD remaining from Sept. 16 to fall frost	Approximate youngest safe grain fill stage
Northwest	October 6	252	Fully dented
Northcentral	October 6	243	Fully dented
Northeast	October 6	244	Fully dented
Westcentral	October 13	340	Majority dented
Central	October 13	329	Majority dented
Eastcentral	October 6	246	Fully dented
Southwest	October 20	450	A few dented
Southcentral	October 13	365	Majority dented
Southeast	October 13	370	Majority dented