



THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

Hardin County Extension News Release

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Finish Line in Sight for Grain Farmers

Hardin County – Timely rainfall in early August is critical for optimal to record breaking yields in soybean and corn. Soon, the flowering period will end in soybean and adequate soil moisture will be required to prevent pod and seed abortion. If a farmer has an adequate soybean stand, August rains will determine whether bean yields are large or just average. For corn, most of it had successful pollination, but adequate soil moisture will be required to prevent kernel abortion and to ensure good grain fill. So far, rain events have been hit and miss across the county, putting more importance on timely August rains.

Each year farmers are concerned that their corn crop will mature before the first killing frost. To be 'safe', the corn needs to reach physiological maturity before a frost. Physiological maturity is when kernels have obtained maximum dry weight. Generally, a black layer will form at the tip of the kernel at maturity – to see the black layer an individual may have to break the point at the kernel tip. Farmers use the phrase, 'their corn is at black layer' to indicate the field is mature and is safe from frost damage.

Kernel black layer typically occurs about 65 days after silking. Silking occurred when the silks first appeared out of the ear husks. For early planted corn (late April/early May), silking occurs in early July. However, corn planted in late May/early June, silking may not occur to mid-August depending on maturity of the hybrid. The kernel maturity by September 10 is often a good indicator of whether a crop will mature before frost.

If corn has dented as of September 10, it should be safe from a normal frost date. The normal frost date is around October 10-15. Dented is defined when the top of the kernels has shrunken-in as a result of the drying effect on the different starches found in the grain. However, if your corn is in the "milk" stage as of September 10, it's a different story. Milk stage is defined when the fluid in the kernel has a whitish color. Research has shown that corn at the milk stage in early September has a high probability of not maturing before the normal frost date.

The next development stage, "dough", corn would have 50/50 chance to mature depending on temperatures and the frost date. Corn is in the dough stage when the fluid material is not found in the kernel, but the tissue is soft like cooking dough. Even corn at milk and dough stages in early September can reach physiological maturity if the latter part of the month is warmer than normal and the frost date is one to two weeks later than normal.

Once corn achieves physiological maturity, farmers are concerned how quickly it will dry down to a desirable grain moisture (18 to 20% moisture). Corn grain moisture is about 35% moisture at physiological maturity. Dry down depends on warm fall temperatures. Some of the early corn will reach black layer in the latter half of September. In September, grain will dry approximately 3/4 to 1% per day. By early to mid-October, dry-down rates will usually drop to 1/2 to 3/4% per day. By late October to early November, field dry down rates will usually drop to 1/4 to 1/2% per day and by mid-November, probably 0 to 1/4% per day. By late November, drying rates will be negligible. Thus, for the corn harvest, farmers would like fall conditions that are dry with above average temperatures.

Farmers may estimate dry down rates by using what is called Growing Degree Days (GDDs). To determine the GDD for a day, average the high and low temperature and subtract 50. If the low temperature is below 50, use 50 for the low reading. Add the GDDs for each day for a specific time for GDD accumulation. Generally, it takes about 30 GDDs to lower grain moisture each point from 30% down to 25%. Field drying from 25 to 20% requires about 45 GDDs per point of moisture. In October, we accumulate about 5 to 10 GDDs per day.

However, note that these estimates are based on generalizations, and it is likely that some hybrids may vary from this pattern of dry down. Some seed companies indicate considerably lower GDDs for grain moisture loss, i.e., 15 to 20 GDDs to lower grain moisture each point from 30% down to 25% and 20 to 30 GDDs per point from 25% to 20%. Past Ohio research evaluating corn dry down provides insight on effects of weather conditions on grain drying. During a warm, dry fall, grain moisture loss per day ranged from 0.76 to 0.92%. During a cool, wet fall, grain moisture loss per day ranged from 0.32 to 0.35%.

In summary, farmers are hoping for timely rains in August to fill bean pods and corn kernels. Most of the corn should mature before a killing frost since pollination occurred in July. Soybean maturing before a killing frost is not as much a concern since farmers can adjust in season by planting different maturing bean varieties. However, maturing before a killing frost may be a problem for double crop soybean (planted in harvested wheat fields) since they were planted late June or early July. This year may be a bigger problem for double crop beans since many fields were dry at planting.

But farmers know that it 'ain't over till it's in the bin'. Farmers will want timely rains and moderate temperatures in August. But come fall, a corn and soybean farmer will want warm temperatures to encourage crop maturity and dry conditions to speed up harvest. However, fall rainfall is needed for successful wheat and forage seedings at this time. Whoever said that farming is easy. But farmers are an optimistic group, or they would never plant a crop, and will hope that Mother Nature will bless them with a bountiful harvest.

Article written by Ed Lentz – OSU Extension, Hancock County and edited by Mark Badertscher – OSU Extension, Hardin County.