Wisconsin Crop Manager

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What is happening in the corn plant during the month of September?

Joe Lauer, Wisconsin Corn Agronomist Corn

In mid-August, USDA-NASS made their initial corn yield projections for the 2016 season. However, September is really the month when we project how our farming skills and previous decisions come together to produce a corn crop. By this time, yield becomes secondary because the season and growth of the crop is largely over. A lot can still happen, but the focus of many decisions are based upon plant and grain moisture.

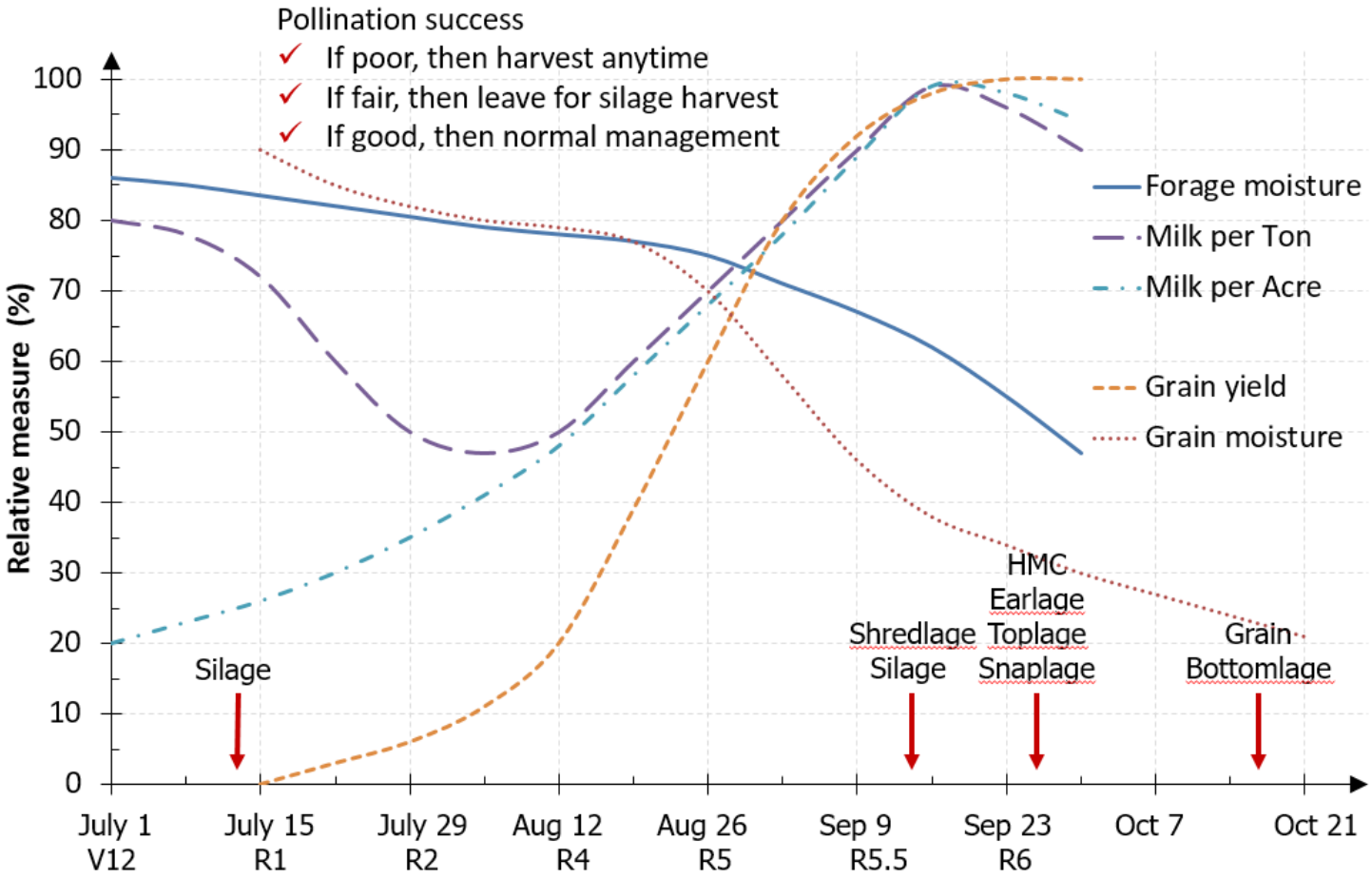
During the September, the crop has usually dented and the kernel milkline is progressing towards the kernel tip. Physiological maturity is reached when all kernels on the ear have attained their dry matter maximum accumulation. Eventually a black abscission layer forms indicating that moisture and nutrient transport from the plant has ceased. Once physiological maturity (R6-Black layer) is achieved it is a physical process to dry the grain down to a harvest moisture between 20 and 25%.

Husk leaves turn color and ears begin to droop. Most modern hybrids have the stay-green trait which allows for better stalk quality and standability in the field. High yielding years often put stress on the plant due to "stalk cannibalization" where nutrients are translocated to developing kernels at the expense of stalk health.

If ensiling can be used to store grain, then corn silage or high moisture grain can be harvested. Silage harvest would be slightly earlier than R6 as milkline moves down towards kernel tip (Figure 1). High moisture corn is usually harvested shortly after R6. Frost has no effect on yield at this point. However, lodging from disease, insect damage or can result in physical loss of yield.

September is the month when corn silage is harvested in Wisconsin. Silage choppers put a lot of material through a relatively small opening cutting (or shredding) plants to 3/4 inch TLC along with kernel processing to break kernels. Usually the window to harvest corn silage is about 7 to 14 days depending upon the maturities of the hybrids selected at planting. Owning your own chopper provides more flexibility for timing harvest. If dealing with custom silage choppers it is imperative to communicate accurately the whole plant moisture of your fields and the rate of drydown. Adjustments to silage moisture

Figure 1. Normal Pattern of Corn Forage and Grain Development



can still occur by raising or lowering the cutter bar because the driest part of the plant is the grain.

During September, dry grain is usually not ready for safe storage; it needs to be at 13-15% moisture for long-term storage. It may be advantageous to let crop partially dry in the field.

Timing Corn Silage Harvest

Joe Lauer, Wisconsin Corn Agronomist

Corn must be ensiled at the proper moisture to get fermentation for preservation. But, determining when to harvest corn at the right whole plant moisture is difficult. Each storage structure properly ensiles at slightly different plant moisture optimums. Harvesting corn too wet for the storage structure will result in reduced yield, souring and seepage of the ensilage, and low intake by dairy cows. Harvesting too dry reduces yield, can cause mold to develop, and lowers digestibility, protein and vitamins A and E.

Kernel milk is not a reliable guide for timing silage harvest

Dry matter content of whole plant corn varies with maturity. The position of the kernel milk-line is not a reliable indicator for determining harvest timing. Geographic location, planting date, hybrid selection, and weather conditions affect the relationship between kernel milk-line position and whole plant dry matter content.

Determining field harvest order and initial plant sampling

The first step to determine when a field is ready for harvest is to note the order in which you planted your fields.

Table 1. Kernal milk stage "Triggers" for timing silage

Silo Structure	Ideal Moisture Content	Kernel Milk Stage "Trigger"
	%	%
Horizontal bunker	70 to 65	80
Bag	70 to 60	80
Upright concrete stave	65 to 60	60
Upright oxygen limiting	50 to 60	40
"Trigger": kernel milk stage to begin checking silage moisture.		

Next, note silking dates of the fields to project calendar days to when a field will mature. Once corn silks, approximately 55 to 60 days is required to achieve maturity at R6 or the "black layer" stage (Abendroth et al., 2011). Development during grain filling is influenced by temperature, but not as much as during the vegetative leaf emergence stages. Instead the number of days between pollination and a killing frost influence the time to maturity. So if an average killing frost occurs October 1, then subtracting 55 to 60 days means that the crop must be silking by August 2-7.

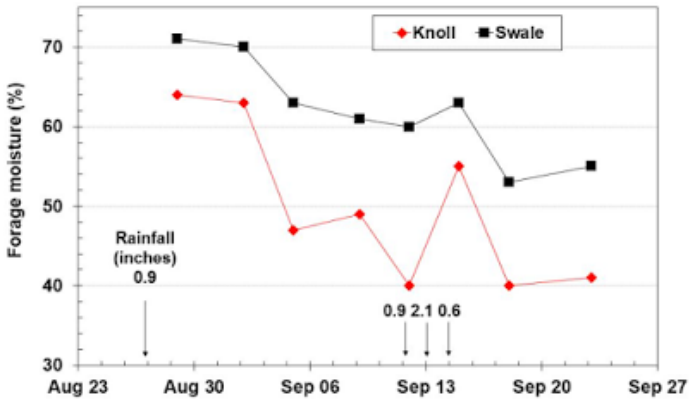
We know that kernel milk stage is not reliable for determining the actual harvest date, but it is a useful indicator of when to sample fields to measure plant dry matter. Silage harvest usually begins around 50% kernel milk which is 42 to 47 days after silking, so silking must occur by August 15-20 in order to mature before typical killing frost dates; but remember that the timing of silage harvest is dependent upon achieving the proper moisture for the storage structure (Table 1). Noting the order that fields silk will help plan the harvest queue of your fields and scheduling of custom choppers.

Determining Silage Moisture

The only reliable method of determining the optimal time to harvest corn silage is to sample the crop and directly measure the % dry matter of whole plants. This information combined with average whole plant drydown rates can be used to roughly predict the proper time to harvest corn silage.

The next plant indicator that determines the order of fields to harvest is movement of the kernel milkline. Once kernel milkline begins to move, measure moisture of fields intended to be harvested for silage (Table 1). Corn should be first sampled to measure dry matter shortly after full dent stage (80% kernel milk) for bunker silos and bags, at 60% kernel milk for conventional tower silos, and at 40% kernel milk for sealed (oxygen-limited) tower silos. It is important to begin sampling early as a precaution against variation in dry down. You will likely be too wet, but you will have an indication of how quickly drydown is occurring when the next sampling date takes place.

Figure 1. Forage moisture of corn growing on a knoll and a swale at Arlington during 2003.

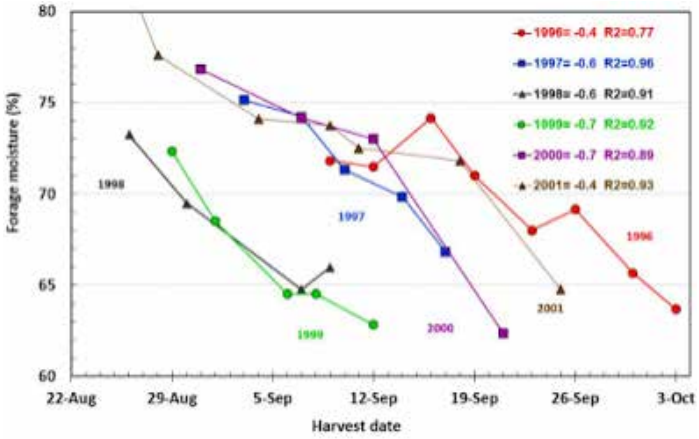


Sampling a field for whole plant moisture

Ideally the field to be harvested is uniform in development, but the reality is that uniformity is rarely achieved. Separate uneven fields into representative groups. Figure 1 describes the moisture drydown patterns of two locations in the same field. Knoll areas were as much as 20% units different from swale areas.

Sample two or more locations for each representative group in the field. Over time, sample the same locations – trying to determine the rate of drydown. Scott Hendrickson (Manitowoc county agent) measured whole-plant moisture over time at three sites in the county by always returning to the same location in the field (Figure 2). Depending upon year the average drydown rate ranged from 0.4 to 0.7 percent per day.

Figure 2. Corn silage drydown during harvest (Hendrickson, Manitowoc County, WI)



Procedure for measuring plant moisture

1. Sample 3 to 5 plants in a row that are well bordered and representative.
2. Put in plastic bag,
3. Keep plants cool,

4. Chop as quickly as possible,
5. Measure moisture using NIR spectroscopy and/or by drying using a, Koster oven, microwave, or convection oven (Peters, 2000).

Predicting silage harvest date

Use 0.5% per day during September to predict the date when a field will be ready for the storage structure. For example, if a given field measures 30% dry matter at the early sampling date, and the target harvest dry matter is 35%, then the field must gain an additional 5% units of dry matter, thus requiring an estimated 10 days (5% units divided by 0.5 unit change per day). If weather is warm and dry, use a faster rate of drydown (1999 and 2000 in Figure 2). If weather is cool and wet, use a slower rate of drydown (1996 and 2001 in Figure 2). We are most interested in the rate of corn silage drydown. Wisconsin county agents have been accumulating corn silage drydown information since 1996. Results from county "Drydown Days" can be checked at the websitehttp://fyi.uwex.edu/silagedrydown/ which averages and predicts area harvest dates.

This procedure provides only a rough estimate for the harvest date. Many factors affect dry down rate, including hybrid, planting date, general health of the crop, landscape position, soil type, and weather conditions. In general, corn silage that is slightly too dry is worse than corn silage that is slightly too wet. Therefore, starting harvest a little early is usually better than waiting too long.

Literature Cited

Peters, J. 2000. On-Farm Moisture Testing of Corn Silage [Online]. Available at http://fyi.uwex.edu/forage/files/2014/01/CSMoistTest-FOF.htm_.pdf(verified 25 August 2016). Focus on Forages, UW-Madison.

Abendroth, L.J., R.W. Elmore, M.J. Boyer, and S.K. Marlay. 2011. Corn growth and development. PMR1009. Iowa State University.

UW-Madison/Extension Plant Disease Diagnostic Clinic (PDDC) Update

Brian Hudelson, Sean Toporek, Jake Kurczewski and Ann Joy

The PDDC receives samples of many plant and soil samples from around the state. The following diseases/disorders have been identified at the PDDC from August 20, 2016 through August 26, 2016.

Plant/Sample Type, Disease/Disorder, *Pathogen,* County

Field Crops
Corn, Common Rust, *Puccinia sorghi,* Dodge
Corn, Southern Rust, *Puccinia polysora,* Rock
Soybean, Bacterial Blight, *Pseudomonoas syringae pv. glycinea,* Trempealeau
Soybean, Brown Spot, *Septoria glyinces,* Trempealeau
Soybean, Sclerotinia Stem Rot, *Sclerotinia sclerotiorum,-* Trempealeau
Soybean, Soybean Cyst Nematode, *Heterodera glyinces,* Trempealeau
Soybean, Stem and Pod Blight, *Diaporthe phaseolorum,* Trempealeau
Soybean, Stem Canker, *Diaporthe phaseolorum,* Trempealeau
Soybean, Sudden Death Syndrome, *Fusarium virguliforme,* Pierce

Forage Crops
Alfalfa, Crown/Root Rot, *Pythium sp. Fusarium oxysporum*, Washington
Alfalfa, Spring Black Stem and Leaf Spot, *Phoma medicaginis,* Columbia
Alfalfa, Stemphylium Leaf Spot, *Stemphylium sp.,* Columbia
Alfalfa, Summer Black Stem and Leaf Spot, *Cercospora sp.*, Columbia

Fruit Crops
Apple ('Honeycrisp'), Honeycrisp Leaf Chlorosis, None, Jo Daviess (IL)
Apple (Unspecifiified), Bitter Rot, *Colletotrichum gloeosporioides,* Dane
Pear, Fire Blight, *Erwinia amylovora,* Waukesha

Vegetable Crops
Pepper, Herbicide Damage, None, Jackson
Tomato, Bacterial Canker, *Clavibacter michiganensis subsp. michiganensis,* Wood
Tomato, Cucumber Mosaic, *Cucumber mosaic virus,* Portage
Tomato, Late Blight, *Phytophtora infestans*, Polk
Tomato, Tobacco Mosaic, *Tobacco mosaic virus,* Portage

Specialty Crops
Hop, Alternaria Cone Disorder, *Alternaria sp.,* Dane
Hop, Cone Tip Blight, *Fusarium sp.,* Dane

For additional information on plant diseases and their control, visit the PDDC website at pddc.wisc.edu.

Wisconsin Corn Southern Rust Update – August 26, 2016

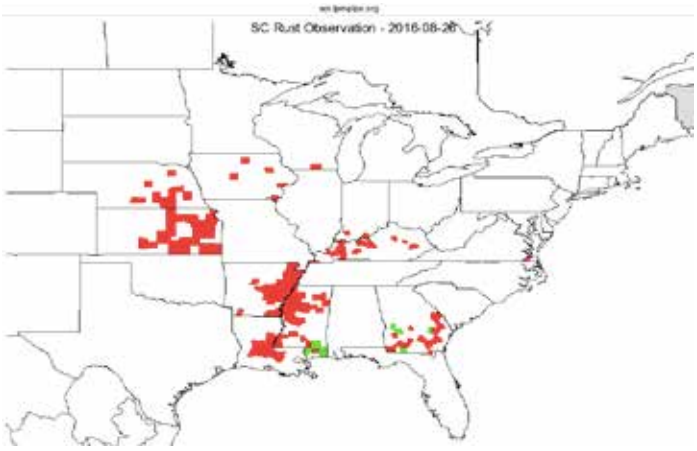
Damon L. Smith, Extension Field Crops Pathologist, University of Wisconsin-Madison

Southern rust of corn has been confirmed for the first time this season by the UW Plant Disease Diagnostic Clinic (PDDC) in Wisconsin. The positive sample was submitted from Rock Co. along the Wisconsin/Illinois state line and confirmed on August 25, 2016. As previously predicted, southern rust did make it to Wisconsin this year, however, its arrival is late enough that it should have minimal impact on yield. We published an article on WisContext about some reasons why this occurrence was expected in 2016, you can click here to learn more.

Most corn in Wisconsin is at least well into the milk stage (R3) or dough (R4). Once corn reaches the milk stage (R3), risk of yield loss from this and other foliar pathogens begins to quickly decline. Thus spraying fungicide at this time of the season is not recommended. If you would like to learn more about telling the difference between the two types of rusts that occur on corn, or management of southern rust specifically, see my previous article by CLICKING HERE.

If you need assistance in identifying rust on corn, leaf samples of corn plants can be sent in a sealed plastic bag with NO added moisture to the University of Wisconsin Plant Disease Diagnostic Clinic (PDDC). Information

Corn Southern Rust positive confirmation map, by state county



about the clinic and how to send samples can be found by CLICKING HERE.

Wisconsin Pest Bulletin 9-1-16

Krista Hamilton, Entomologist, WI Dept of Agriculture, Trade and Consumer Protection

Volume 61 Issue No. 18 of the Wisconsin Pest Bulletin is now available at:

https://datcpservices.wisconsin.gov/pb/pdf/09-01-16.pdf

PLEASE NOTE: This is the last regularly scheduled bulletin of 2016. A final summary issue will be published in November upon completion of the fall pest surveys. The bulletin authors would like to thank the numerous cooperators, farmers, county agents and consultants who contributed their time and expertise to the survey program this season.

INSIDE THIS ISSUE

LOOKING AHEAD: Two-banded Japanese weevil found in Dane Co., new state record

FORAGES & GRAINS: Potato leafhopper counts remain low to moderate in 2016

CORN: Higher corn rootworm beetle pressure likely for northern Wisconsin next year

SOYBEAN: White mold reminders for soybean growers

FRUITS: Fruit growers advised to be alert for brown marmorated stink bug this fall

VEGETABLES: Large corn earworm migration still underway

NURSERY & FOREST: Assorted reports from recent nursery inspections

DEGREE DAYS: Growing degree day accumulations as of August 31, 2016

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