

The Corn Cob

A focus on Corn Production

September 17, 2008

WHEN TO HARVEST CORN SILAGE

With the recent warm weather, the time to corn silage harvest is quickly approaching. Corn silage harvest needs to be based on the maturity of the crop, not on a date. Ensiling at the correct whole plant moisture and optimum stage of maturity is critical to achieving good quality feed.

Too Wet

Harvesting at moisture levels above 70 % will not only yield less, but will result in seepage and undesirable clostridia fermentation. Clostridia bacteria are very inefficient and convert forage sugars and organic acids into butyric acid, carbon dioxide and ammonia. This silage will have high levels of foul smelling butyric acid, with a higher pH, high dry matter losses, poor feed quality, palatability and intake potential.

Too Dry

Harvesting at moistures that are too low will result in poor packing, inadequate air exclusion, poor fermentation and heating. This will mean higher dry matter losses, greater spoilage and poor bunk life. Low moisture corn silage also has lower starch and fibre digestibility. Kernels that are too dry will become hard and pass through the cow undigested.

Optimum Timing

The best livestock performance and silage fermentation usually occurs when whole plant moisture is 65 to 70%. This corresponds well to horizontal and bag silos, but silage may have to be a bit drier in tall tower silos to prevent seepage. Variability between fields and within fields can make this even more complex. Recommended moisture contents for corn silage are as follows:

Horizontal bunker silos	65 - 70 %
Bag silos	60 - 70
Upright concrete stave silos	62 - 67
Upright oxygen limiting silo	50 - 60

The most accurate method of determining when to harvest is to determine the dry matter on samples of the whole corn plant. The microwave method for testing moisture content is quick, easy and accurate in the absence of a moisture tester. To test the moisture content, weigh out exactly 100 grams of silage (adjusting for the weight of the dish). Spread the silage evenly on the plate and place in a microwave oven. Heat on high for about 4 minutes (depending on the strength and age of your oven). Remove the silage, weigh and record. Heat the sample again on high for 1 minute. Weigh and record. Repeat this procedure until the weight remains the same. At this point, the weight in grams represents the dry matter (DM) content of the silage. To calculate the moisture content, subtract the DM content from 100. Example: after several heating cycles, the sample weight stabilizes at 34 grams. Thus, the DM is 34% and the moisture is 66% (100-34).

Using Milkline to Signal Silage Harvest

The kernel milk line is often used to determine when to harvest corn silage. The milk line is where liquid and solid portion of the kernel meet. The milk line will not appear until the corn is at the dent stage of maturity. To check for milkline, break a cob in half and look at the kernels; a whitish line can be seen on the kernels (see Figure 1). Milkline will progress from the tip of the kernel to the base. When it reaches to the base (100 % milk line), black layer will occur and the kernel is considered physiologically mature.

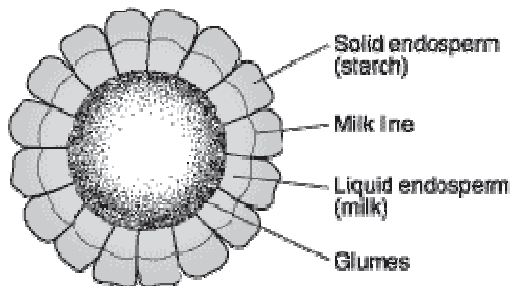


Figure 1: Diagram of milk line determination.

Some hybrids do not show the milk line as readily as others and the kernel may have to be cut lengthwise to determine the location. The milk line can also be determined by biting the kernel, starting with kernels from the tip. For optimum corn silage quality the corn kernel should be well dented and the milk line is half to two thirds down the kernel.

However, there is considerable variation in the percent kernel milk line and the moisture percent of the whole plant. University of Wisconsin data over many years show a range in whole plant moisture at one-half milk line of 52 to 72 %, with an average of 63 %. This will be too wet for some and much too dry for others. The two most significant causes of the variation are weather and hybrid differences.

Because of the variation between milk line and whole plant % moisture, the current recommendation is that shortly after denting, when the milk line is about 20%, whole plant moisture should be determined. This can be done by sampling, chopping, drying and measuring as described above. Experience shows that in a typical year corn silage at this stage dries approximately 0.5 % per day. Therefore if the sample was 70 % moisture and 65% moisture is the target, harvest should be done about 10 days after the corn was sampled. In dry years the drying rate will be more rapid and during wetter years the drying rate will be less. Moistures can be checked again closer to harvest.

Final Notes:

Best results with corn silage will be obtained if the material to be harvested reaches the ideal moisture content by maturing before frost occurs. Early planting and early varieties help to ensure reaching the desired maturity while weather conditions are most suitable for harvesting. Variations from the moisture guide "rule of thumb" can occur due to hybrid, location and weather conditions. Stage of maturity and moisture content of the corn plant should always be closely monitored prior to

beginning harvest.

Growers with a lot of acres to harvest may want to start with the more advanced fields first then proceed to later fields. Regardless of the harvest date, proper harvesting and storage are necessary to ensure that a good crop results in good feed.

If you have any questions or comments, don't hesitate to contact me at 745-5676 or email pamela.derocquigny@gov.mb.ca

Until the next issue of **THE CORN COB**, take care!

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Revised from an article by Joel Bragg, Forage Specialist with OMAFRA, titled "Harvesting Corn Silage at the Right Moisture"