



MILL MATTERS

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TIMING IS EVERYTHING



You only get one shot to harvest corn silage correctly. Every year, you make numerous decisions with the end goal of producing high yielding, high quality corn silage. All will be for naught, however, if the silage cannot be chopped, stored, and ensiled at the proper moisture to allow for adequate fermentation and preservation.

HARVEST MOISTURE GUIDELINES

Corn for silage should be harvested at a moisture content that will ensure good storage. Corn chopped between 30 and 35 percent dry matter generally allows for excellent silage fermentation and animal performance, notes Bill Weiss with The Ohio State University. The optimal dry matter content varies by storage structure (table).

Optimal dry matter contents for different storage structures	
Type of Structure	Optimal % dry matter
Horizontal bunkers	30-35
Bags	30-38
Upright, top unloading	33-38
Upright, bottom unloading	35-40

If harvested too early, the silage will ferment poorly, nutrients seep out of the base reducing quality, and the cows have lower intakes. If harvest is too late, air pockets form that prevent proper fermentation and allow molds to develop, kernels become harder and less digestible, and levels of vitamins A and E decline. Forage quality declines, too, as fiber levels increase and digestibility decreases.

PREDICTING THE HARVEST DATE

Harvesting within the ranges shown in the table promotes good packing and minimizes losses due to heating or runoff. The first step for a timely harvest is predicting when a field will be ready to chop. The following guidelines from Joe Lauer at the University of Wisconsin, help predict when fields will be ready and the order in which

they should be harvested:

1. Note hybrid maturity and planting date of fields for silage.
 2. Note tasseling (silking) date. Half milk of the kernels usually occurs 42 to 47 days after silking.
 3. Once kernel milkline begins to move, start monitoring whole-plant moisture. Use an average dry down rate 0.5 percent per day to predict the date when fields will be ready to chop.
 4. Perform a final dry matter check prior to chopping.
- The average dry down rate provides a rough estimate for the harvest date. Many factors affect dry down rate, such as hybrid, planting date, crop health, soil type, and weather conditions.

DETERMINE SILAGE MOISTURE

The only reliable way to determine the optimal time to harvest corn silage is to sample and measure the percent dry matter of whole plants. This information combined with average whole plant dry-down rates can be used to roughly predict the right time to chop.

No plant indicators are accurate enough to estimate whole-plant moisture. We know that kernel milk stage is NOT reliable for determining the harvest date, but its appearance is a useful indicator of when to begin sampling fields and measuring plant dry matter.

To determine moisture, sample at least 5 to 10 representative plants from the field, avoiding the headlands. Watch for moisture variability within fields and collect separate samples from areas that may have different dry down rates.

Chop your sample uniformly using a harvester or chipper, and mix it thoroughly to obtain a sample with a representative grain to stover ratio for dry matter determination. Put the sample in a plastic bag and keep it cool if you aren't drying it down immediately. The accuracy of the dry matter value is largely affected by the care taken in collecting, drying, and weighing the samples.

Use a Koster tester, microwave or laboratory results to determine percent dry matter before harvesting. Be aware that samples have

residual moisture that is not removed when dried with a Koster or microwave but will be removed in laboratory ovens.

The Miner Institute has estimated that Koster testers and microwaves underestimate moisture by 2 to 3 percent. A 68 percent moisture sample reading is actually about 70 to 71 percent moisture. In a typical year, that 2 to 3 percent is equivalent to almost a week in harvest time. When using a Koster tester or microwave, taking the time to carefully dry the sample is important. The finer the sample is chopped, the easier it will be to dry and the more accurate the result.

As the corn plant matures, its composition changes. From a nutrition perspective, we are mainly concerned about harvesting corn silage too wet or too dry, notes Randy Shaver, University of Wisconsin. "When it's too wet, we're harvesting so early that we haven't optimized the starch content of that silage. We've also lost some yield. When we see silage that's below 30 percent whole-plant dry matter, we'll often see lower starch concentrations and more seepage," he added.

On the other hand, when it's too dry (above 38 percent whole-

plant dry matter) there is a risk of harvesting so late that the kernels become very hard and are poorly digested by the cow. Fiber digestibility has been found to decrease by over 10 percent as moisture decreases from 70 percent to 58 percent.

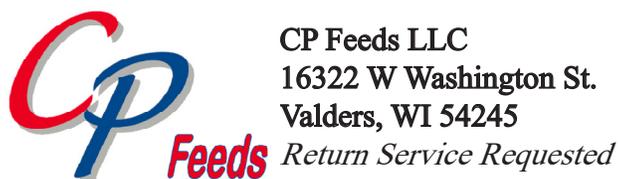
Corn silage quality and animal performance are significantly affected by the moisture and maturity of corn at harvest. Don't get caught harvesting corn silage outside the range of optimum moisture and maturity. Focus on harvesting at the correct moisture.

MEASURING MOISTURE WITH A MICROWAVE

To test the moisture content of corn silage with a microwave:

1. Weigh exactly 100 grams of fresh silage on a paper plate. Remember to adjust for the weight of the plate.
2. Spread the forage out evenly and place in a microwave.
3. Heat on high for 4 minutes. Weigh, and record.
4. Heat again on high for 1 minute, weigh, and record.
5. Repeat this procedure until the weight remains the same.

At this point, the weight in grams represents the dry matter content of the silage.



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