

Silage Moisture Testing of 2019 Corn Crop

August 2019

The 2019 corn silage harvest will present challenges due to the wide range of planting dates. Paying close attention to moisture and dry matter content is very critical this year.

The following information comes from articles written by Rory Lewandowski, Wayne County Extension Educator Ag/NR., Bill Weiss, OSU Dairy Nutrition, and Mark Sulc, OSU Extension Forage Specialist:

Late planted corn (after mid-June) has challenges if harvested in an immature state with little to no grain production. Late planted without mature grain will not start normal dieback and dry down until after the first frost. Therefore, plants are likely be in the 75-80% moisture range. The fermentation process requires certain plant moisture percentages and a favorable lactic acid bacteria population necessary to convert plant sugars into lactic acid and lower silage pH. These desirable bacteria work best in a moisture range of approximately 64-68%, which corresponds to a plant dry matter content of 32-36%. Varying more than a few percentage points to either side of this optimum range greatly increases the probability that you will end up with poor quality silage at best, and at worst, unpalatable junk. Other potential issues are a short harvest window and concerns with seepage if harvested too wet. Silage seepage will create negative impacts (fish kills) if reaching a water body. If moisture and dry matter conditions are too far off mold, yeasts and entero bacteria thrive and will degrade silage.

Using a milk line observation is not a reliable indicator of whole plant dry matter. In Ohio, we have seen considerable variation in plant DM content within a given kernel milk-line stage. Appearance of the kernels should only be used as a guide of when to begin sampling for DM content. The only reliable way to determine the optimal time to harvest corn silage is to sample and directly measure the percentage dry matter (DM) of whole plants (stock, leaves, and ears). Proper harvest timing is critical because it ensures the proper dry matter content required for high quality preservation, which in turn results in good animal performance and lower feed costs.

Harvesting corn too wet (low DM content) results in souring, seepage, and storage losses of the silage with reduced animal intake. Harvesting too dry (high DM content) promotes mold development because the silage cannot be adequately packed to exclude oxygen. Harvesting too dry also results in lower energy concentrations and reduced protein digestibility.

Corn silage that is too dry is almost always worse than corn silage that is slightly too wet. So if you are uncertain about the DM content, it is usually better to err on chopping a little early rather than a little late. Follow the guidelines below to be more confident in your assessment.

Determining the DM content is completed by drying the plant material using a Koster oven tester, microwave oven, convection oven, a vortex dryer, or taking it to your local Mill or Elevator who will analyze it or send sample to a lab. If you are interested in learning how to do a microwave test you can contact the Wayne or Holmes County Extension Offices who will supply that information. *Note: this testing should not be done in the microwave or conventional oven used daily in the home as it will leave an offensive odor in the unit.*

How to Sample Fields

Typically, a sample should contain five (5) representative plants from the entire field, from areas with representative plant population and not from edge rows. Collect separate samples from areas that may have different dry down rates, such as swales, knolls, etc. The moisture concentrations of plants can vary within a field (plants will be wetter in low-lying area and drier on knolls), and this should be considered when collecting your sample plants.

As soon as the plants are collected, chop them uniformly (using a cleaver, machete, chipper shredder, or silage chopper, or delivered to location as whole plants) and mix thoroughly to obtain a sample with representative grain to stock/leaf ratios for DM determination. If pre chopped, put the representative sample in a plastic bag and keep it cool (refrigerate if possible). Using less than five (5) representative plants across a field is not recommended as it may not represent the variation across the field.

Harvest Timing Based Off Test Results Using Harvest Moisture Guidelines

Corn preserved between 30% and 38% DM (62% to 70% moisture) generally provides excellent silage fermentation and animal performance. The optimal DM content varies with type of storage structure (Table 1).

Well-eared corn plants generally dry down about 0.5% percentage points per day during warm, dry weather.

Type of Structure	Optimal % DM
Horizontal bunkers	30% to 35%
Bags	30% to 38%
Upright, top unloading	33% to 38%
Upright, bottom unloading	35% to 40%*

**The higher DM concentration for bottom unloading silos is a compromise between forage quality and unloader requirements.*

Once whole-plant percentage of DM is determined, use an average dry down rate of 0.5% unit per day to estimate days until the optimal harvest moisture is reached. For example, if a given field measures 30% DM at the first sampling date, and the target DM is 35% for harvest, then the field must gain an additional 5% units of DM, thus requiring an estimated 10 days (5% units divided by 0.5 unit change per day).

This procedure provides only a **rough estimate** for the harvest date. Many factors affect dry down rate, such as hybrid, planting date, general health of the crop, landscape position, soil type, and weather conditions. Early planted fields and hot and dry conditions can accelerate dry down rates to 0.8 to 1.0 % unit per day. Fields should be monitored closely and more frequently under those conditions. As mentioned above, corn silage that is slightly too dry is usually worse than corn silage that is slightly too wet. So harvesting a little early is usually better than waiting too long.

Locations Within The Holmes/Wayne County Area Who Will Assist With Dry Matter Analysis:

Producers should call location of their choice for details on sample submission.

Holmes County Testing Sites:

Gerber & Sons, Baltic Mill, 101 S. Ray St., Baltic, OH 43804, (330) 897-6011

Gerber & Sons, Farmerstown Mill, 2849 St. Rt. 557, Farmerstown, OH 43804, (330) 897-4453

Holmesville Ag. Services, 301 E. Jackson St., Holmesville, OH 44633, (330) 279-2501

Mt Hope Ag Center, 8070 St. Rt. 241, Mt Hope, OH 44660, (330) 674-0416

Wayne County Testing Sites:

Gerber Feed Service, 3094 Moser Road, Dalton, OH 44618, (800) 358-9872

L.E. Sommer & Sons-Kidron Ohio, 13363 Jericho Road, Dalton, OH 44618, 800-221-8036

Maysville Elevator, 10583 Harrison Road, Apple Creek, OH 44606, (330) 695-4413

Mt Eaton Elevator, 15911 Berry St., Mt Eaton, OH 44659, (330) 359-5028

Questions Contact: Rory Lewandowski, Ohio State University Extension-Wayne County (330) 264-8722 or Gary Graham, Ohio State University Extension-Holmes County (330) 674-3015



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