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Silage season is upon us



Gary Graham
Your OSU
Extension Edge

Silage time is right around the corner. Silage season only lasts a few weeks, but it is an important link in the food chain for many Holmes County farms. First and foremost, to those harvesting the silage, please be safe. For those living in farm country, please help by giving farmers grace and space for being on the road and moving quickly. The window for prime silage harvesting can sometimes be narrow. It needs to be harvested in a timely manner for optimal storage and usage.

Two important reminders of silage season include safety and proper testing.

Safety

Safety starts first with all personnel wearing high-visibility reflective outer clothing. April and September rank as the highest months for farm fatalities. Falls, being struck by something and overexertion are the three most frequent injury types. With all the moving parts of a silage harvest, it is hard for equipment operators to keep watch on what people on the ground are doing. Wearing high-visibility clothing helps track folks on the ground.

Second is transportation from the fields to the bulker/silo/bag. Having the equipment and wagons highly lit up will make it easier for all involved and motorist safety too. Flashers and strobe lights should be on at all times day and night for safety.

Lastly, at the bunker/silo/bag, caution must be taken to keep people away from the many moving parts. Whether packing silage into a bunker or packing it in bags or blowing into a silo, there are many dangerous parts where an accident can happen in a split second. Having a plan and having all involved following a strict protocol will keep everyone safe. Every year there are news releases where someone is killed or injured when they are run over by equipment or a silage wall collapses or one of the other dozens of dangers in the typical silage operation.

Testing

Silage moisture and dry matter are critical — too wet

for dry matter content. In Ohio we have seen considerable variation in plant DM content within a given kernel milk-line stage.

The only reliable way to determine the optimal time to harvest corn silage is to sample and directly measure the percentage of dry matter of whole plants (stalk, 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, air fryer, convection oven, vortex dryer or taking it to your local mill or elevator, who will analyze it or send a sample to a lab. This testing should not be done in the equipment 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 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, et cetera. The moisture concentrations of plants can vary within a field

or too dry and you can have issues. This is why when silage is at the optimum condition, the race is on to get it put up in a hurry. Taking samples preharvest will help time the optimum period for silage harvest.

Late-planted corn (after mid-June) has challenges if harvested in an immature state with little to no grain production as it will not start normal dieback and dry down until after the first frost and 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 you will end up with poor-quality silage at best and unpalatable junk at worst. The optimal numbers vary depending on how you are storing the silage (bunker, silo or bag).

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, then mold, yeasts and entero bacteria thrive and will degrade the silage.

Using a milk-line observation as a moisture indicator varies in reliability and should only be used as a guide in decision-making. Typically, the very beginning appearance on milk line (less than a quarter of the way down the kernel) that starts after kernels become slightly dimpled is a good indication of when to begin sampling

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— plants will be wetter in low-lying areas 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 prechopped, put the representative sample in a plastic bag and keep it cool (refrigerate if possible). Using less than five representative plants across a field is not recommended, as it may not represent the variation across the field. Get the samples to the testing location quickly. Fresh samples assure the most accurate results, and if you cannot get to the testing location quickly, freeze the sample before shipping or next day delivery.

Harvest timing based off results using moisture guidelines

Corn preserved between 30% and 38% DM (62-70% moisture) generally provides excellent silage fermentation and animal performance.

The optimal DM content varies with type of storage structure: horizontal bunkers, optimal percent of DM 30-35%, optimal percent moisture 70-65%; bags, optimal DM 30-38%, optimal moisture 70-62%; upright, top unloading, optimal DM 33-38%, optimal moisture 67-62%; upright, bottom unloading, optimal DM 35-40%, optimal moisture 65-60%. 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 units 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 0.8-1.0% units 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.

Nitrate levels may increase under droughty conditions. Due to possible acute toxicity, nitrate tests should be carried out for drought-damaged silage. Raising the

cutter bar in corn silage can help if nitrate levels are suspected to be high. The only real way to know is to have a nitrate test performed on the questionable silage.

Nitrate testing for forages: nitrate ion percent 0.0-0.44%, nitrate-nitrogen ppm 0-1,000, safe to feed under most conditions; nitrate ion percent 0.45-0.75%, nitrate-nitrogen ppm 1,000-1,700, introduce restricted gradual rations; and nitrate ion percent 0.76-1.00%, nitrate-nitrogen ppm 1,700-2,300, possible acute toxicity. Drought-related issues in dairy cattle nutrition can be found at www.extension.psu.edu/drought-related-issues-in-dairy-cattle-nutrition. If forage contains over 0.44% nitrate ion or 1,000 ppm nitrate-nitrogen ppm, test all forages and water to factor total nitrate dietary intake.

Locations within the Holmes/Wayne area that will assist with dry matter analysis (producers should call location of their choice for details on sample submis-

sion) are as follows:

Holmes County testing sites

—Gerber & Sons, Baltic Mill, 101 S. Ray St., Baltic, 330-897-6011.

—Gerber & Sons, Farmerstown Mill, 2849 state Route 557, Farmerstown, 330-897-4453.

—Holmesville Ag. Services, 301 E. Jackson St., Holmesville, 330-279-2501.

—Mt. Hope Ag Center, 8070 state Route 241, Mt

Hope, 330-674-0416.

Wayne County testing sites

—Gerber Feed Service, 3094 Moser Road, Dalton, 800-358-9872.

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

—Maysville Elevator, 10583 Harrison Road, Apple Creek, 330-695-4413.

—Mt. Eaton Elevator, 15911 Berry St., Mt. Eaton, 330-359-5028.

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