Corn Silage Harvest Management

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With the upcoming harvest, it is a good time to review harvest management for high quality corn silage. Important factors to consider include dry matter (DM) %, particle size, kernel processing, and chop height.

Dry Matter Content

Monitoring DM content is likely the most important factor to make high quality corn silage. Harvesting silage too wet (<30% DM) will cause seepage and loss of nutrients from the silo, while too dry (>40% DM) will reduce digestibility of fiber and starch and cause packing issues. Ideal DM is 32-38% with lower DM silage working better in horizontal silos to allow better packing, while higher DM silage works well for upright silos to minimize seepage. Testing of corn silage for DM should begin once kernels are mostly dented and a milk-line is visible. Often the milk-line will be 1/2 to 3/4 to be in the ideal DM range. There is considerable variation in DM at any single milk-line value, so testing every few days will help dial in when harvest should occur. Test fields separately as there will be differences in planting date (see Corn Silage article, p. 19), drydown rates, and soil characteristics that will cause differences in corn plant moisture. Testing can be done by chopping through a wood chipper and dried using a microwave, koster tester, dehydrator, or sending to a forage testing lab.

Kernel Processing

Ensuring kernels are broken (ideally 1/4 kernel pieces) during chopping will lead to improved starch digestibility. Proper setup and use of a conventional roll-processor or newer processing equipment will help break kernels. Recommended roll gap for a conventional roll-processor is 1-3mm but will depend on crop moisture and chop length. Speed differential between rolls impacts breakage with higher differentials (30-40%) improving processing. Wetter or finely chopped silage will be less improved by processing. A dry silage (>40% DM) will likely have less digestible kernels due to higher prolamin content so processing will help less than if harvested at the ideal DM (Figure 1). Harvesting at a longer chop length will decrease the ability of the processor to contact kernels due to the longer forage particles covering them. Checking for kernel processing should be done prior to chopping. Simply use a tub of water, place a chopped silage sample in water, mix so kernels sink, then skim stover particles, and drain water to see kernels. Team Forage has an article with complete methods to separate kernels from stover (https://fyi.uwex.edu/forage/making-sure-your-kernel-processor-is-doing-its-job/). A new app to determine kernel particle size and processing allowing better assessment and management in the field is detailed in the equipment article (p. 8). Samples can also be sent to a forage testing lab to test for kernel processing score (KPS), which is % of starch passing 4.75mm screen. Optimal KPS is >70%. However, the delay in results doesn’t allow harvesting adjustments if KPS is not optimal.

Particle Size

Particle size is an important factor affecting silage packing and effective fiber (stimulates chewing). Recommended particle size depends on processor type used. If the harvester does not have a kernel processor, recommended theoretical length of cut (TLOC) is 3/4” to cause more kernel breakage. If using a conventional roll-processor, recommended TLOC is 3/4”. Length of cut is typically set longer (1-1.25”) for harvesters equipped with newer processing equipment (Shredlage™, intermeshing disks) to increase fiber length while still processing kernels optimally. Use of a Penn State particle size separator can help manage corn silage particle size with 8-15% of particles on top screen and up to 70-80% of particles on top 2 screens.

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Thus, extended time in the fall to achieve dormancy in perennial forage crops may make fall grazing of alfalfa/grass stands risky. Risk of extensive stand damage and lower yield potential following fall grazing may outweigh lower winter feed costs benefits.

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