

Chopping and Storing Quality Corn Silage

Utah growers annually produce approximately 990,000 tons of corn silage. Properly harvested and stored, corn silage is extremely palatable, superior to other forages in energy content, a great fiber source, and relatively consistent in quality. The high palatability of corn silage encourages feed intake which contributes to higher milk yields, greater weight gains and additional farm profits.

There are four basic phases in the ensiling process. In the aerobic phase (phase 1), oxygen trapped in the air spaces of the silage mass is consumed by plant respiration and aerobic microorganisms. If the silo is well-packed, the amount of available oxygen is minimal and soon the lag phase (phase 2) begins. Almost immediately plant cell membranes break down, allowing cell juices to become a growth medium for anaerobic bacteria. Fermentation (phase 3) begins as the anaerobic lactic acid bacteria begin to grow and rapidly multiply. As the bacteria grow, they use plant sugars and produce lactic and acetic acids, the accumulation of which reduces the pH of the forage. When the pH reaches approximately 4.0, the bacteria die and the silage begins the stable phase (phase 4). If the silo is properly packed and sealed, this phase lasts until the silo is opened and silage again comes in contact with oxygen.

The practice of kernel processing corn silage improves dry matter intake, starch digestion, and lactation performance. Several studies have reported increased milk flow from dairy cows fed processed corn silage. Steers and heifers receiving processed corn silage usually show greater weight gains and are more efficient than cattle fed unprocessed corn silage. There is also less sorting and cob refusal at the feed manger. Kernel processors break corn kernels into smaller fractions as the forage passes through two rollers that have a clearance about the thickness of a dime. The two rollers operate at different revolutions per minute, which results in a shearing of the stover.

Forage specialists advise a short length of chop without a kernel processor or a longer length of chop if a kernel processor is used. A general recommendation is to chop corn silage with a chop length ranging from .50 to .75 inches if not kernel processed at harvest, or 1.00 to 1.50 inches if a kernel processor is used. Particle size at harvest depends on knife sharpness, harvest speed, shear bar setting and crop moisture.

Forage particles need to be long enough to float in the rumen and maintain the rumen fiber mat. This is critical to stimulate rumination, increase milk production, and augment growth rates. Corn silage that is chopped too fine or over-processed passes through the rumen too quickly, leading to reduced feed efficiency. Dairymen can usually expect higher butter fat and protein percentages and fewer displaced abomasums with a longer chop. Drier corn needs to be cut shorter to facilitate packing.

Numerous additives are available that may enhance the ensiling process. The most common bacterial inoculants are the lactic acid forming type, Lactobacillus. They work by accelerating the acid production needed to preserve the silage. Silage treated with a legitimate inoculant will generally stabilize faster and therefore maintain higher amounts of nutrients than untreated silage. Inoculants can be a good management tool when used with other best management practices. Forage harvester manufacturers have made impressive progress in designing low volume inoculant applicators that work in concert with yield monitors. In areas of the field where yields are lower, the technology applies less inoculant. Where yields are higher, it applies more to ensure the forages are not under inoculated. This method is far superior to spreading inoculants to loaded trucks or manually spreading the product at the silage bunker. Inoculants contain live bacteria that can lose their viability if not handled and stored properly.