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Farm Update

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Graze Grass, Feed Baleage

Making baleage is a forage practice many people have adopted in our area. It is the process of cutting hay, usually a small grain such as wheat, triticale, or cereal rye, baling it green the following day, and immediately wrapping with plastic layers. The plastic cuts off oxygen and initiates an ensiling process. The initial equipment investment is substantial, but harvesting winter small-grain forage from land used for grain crops provides two crops each year. This reduces the grass forage harvested for hay, allowing additional cattle grazing or grain/baleage production from land formerly used for hay. If you are considering constructing a dry hay storage barn, I would encourage the money for that project to be spent on a hay wrapper and hay harvest equipment capable of handling green hay. University of Kentucky Extension Forage Specialist Dr. Jimmy Henning prepared the following comments on baleage.

Making baleage is a fairly simple process. It requires rakes and balers that can handle a heavy green crop and access to a hay wrapper. A conditioning mower is less necessary with baleage than hay because stems are not completely dry with baleage.

Inline wrappers are the most common type of baleage equipment. These machines will wrap more bales per hour and use less plastic than the individual bale wrappers. Baleage is an anaerobic process. In order for the forage to ensile, the bale needs to be tightly rolled in the baler

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chamber, squeezing out as much air as possible. It should be wrapped with at least 6 layers of plastic and preferably 8. Be sure to patch any holes in the plastic with tape made for the application to ensure an airtight seal. Use more plastic when transitioning between bales of different sizes in the line because this area will stretch the plastic, leaving it prone to tear.

The proper baleage requires carbohydrates in hay that will dissolve in water. This means that legumes should be cut at or before first flower or boot to early head for grasses, so that quality will be high. During ensiling, the soluble carbohydrates in the forage are converted to acetic, propionic, and lactic acid, dropping the pH of the bale and making it stable in storage. These volatile fatty acids give silage its distinctive smell, and the low pH prevents the formation of molds.

Bale when the moisture content is between 45 and 65%. Moisture is crucial to good baleage. Fresh forage is around 80% moisture and can be higher in the spring. Cut forage needs to wilt about a day before baling. Baling hay that has been allowed to dry too long in the field may not ensile correctly.

This is a time sensitive activity. Reliable labor and machinery are essential once hay is on the ground. Wrap fast. Only cut down as much forage as can be baled and wrapped in one day. Even delaying wrapping for 24 hours causes noticeable heating in the bales, lowering available carbohydrates for ensiling and the quality of the ensiled product.

Low pH stabilizes baleage. Ideally, the bales should ensile for 30 days before feeding. Feeding sooner than 30 days after wrapping will not harm livestock, but the bunk life of this forage will be reduced.

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Though extremely rare and preventable, one issue with hay not ensiled correctly is botulism. Botulism toxicity is caused by the excessive growth of *Clostridium botulinum* bacteria in haylage that has been baled too wet, above 60% moisture content, and has a pH above 4.5. *Clostridium* bacteria is common in Kentucky soil and in the carcasses of decaying animals. Forage can become contaminated during raking and baling when dead animals are trapped in the baled forage. The risk of botulism toxicity from baleage is minimized by baling at a moisture content of less than 60 percent, using at least four layers of plastic, and preventing puncture damage to plastic during storage. If botulism toxicity is suspected, analyze a sample of the forage for pH and moisture content at a certified forage laboratory. Smell is the indicator botulism could exist in the hay. Ensiled hay has a familiar, pleasant aroma, Botulism infected hay will have an unpleasant, rotten odor.

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