GUEST COLUMN

# Silage Too Wet or Dry? What Can We Do?

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Making perfect silage is always the goal. Silage fermentation is the best way to preserve the nutritional value of forage crops. And, in many cases, fermentation can actually improve digestibility of high fiber crops.[1]

The problem with making perfect silage – it is not always possible. Every farmer has experienced silage which was too wet or silage which was too dry. Too dry and the fermentation is not complete. Too wet and clostridial growth can result in the sour smell of butyric acid. Proper silage management can prevent many problems with silage, but what can farmers do when weather conditions will not cooperate? Is there anything we can do once silage, specifically alfalfa silage, has turned sour?

## Forage is too wet

We need to identify what causes the formation of butyric acid smell in silage. Alfalfa that is ensiled too wet undergoes a fermentation dominated by clostridia.[2] This is often because the forage is harvested too wet for the type of storage facility. Rain events in the field after mowing also increase the chance for clostridial growth because rain leaches soluble sugars from the forage.

The obvious solution to this situation is to ensile all forages at the correct dry matter (DM) content for the storage facility. Proper packing to a minimum density of 15 lbs DM/ft$^3$ excludes oxygen from the silage mass. Another way to help reduce the number of bacteria incorporated in the silage is to reduce the amount of soil or manure picked up with the forage.

There are several additives which have been used by farmers to control the growth of bacteria in wet forages. Organic acids, specifically formic and propionic acid, have been shown to exhibit selective antibacterial action.[3] Combinations of organic acids, or organic acid blends, have been shown over the years to provide control of fungi, specifically mold and wild yeast strains. Less well researched is the control of bacteria by organic acids in silage. However, farmers report good results related to improved fermentation of wet forages with an addition of 2-4 lbs of blended organic acid per ton of forage.

## Forage is too dry

At the other extreme, farmers are often faced with forages which are too dry. Harvesting high-DM forages can result in poor packing which leaves too much oxygen in the silage mass, leading to poor fermentation and heating of the forage. This poor fermentation means higher DM loss, greater risk of spoilage, and short bunk life during feed out.

Another risk with low-moisture corn silage is reduced starch and fiber digestibility. Dry corn kernels are too hard and pass through the cow undigested. To compensate for the dry kernels, operators can adjust the kernel processor to break the kernels to enhance digestibility.

There are several excellent guides online to help with managing dry forages. Bruce Anderson, extension forage specialist in the state of Nebraska, offers some excellent tips for handling dry corn silage.[4]

One practice farmers use with dry silage is to add water. This is often not a very practical way to raise the moisture of silage. Anderson writes, “Adding water to increase moisture content is next to impossible. It takes about 7 gallons of water for each ton of silage to raise moisture content just one point. Even if you have enough water, the chopped corn can't absorb it fast enough to do any good.”[4]

The goal with dry silage, and all silage for that matter, is to minimize oxygen. To help dry silage pack better, a common practice is to shorten its chop length. This is accomplished by adjusting chopper knives to cut finer. At the same time, adding extra packing weight to the silage pile will help ensure a better packing of the silage. The rule of thumb for packing tractor weight is the rule of 800; have 800 lbs of tractor weight for every ton of

silage delivered to the bunker each hour. If you are delivering 100 tons/hour, you need 80,000 lbs or 40 tons of packing tractor on the silage pile.

Another option is to blend wetter feed with the dry feed. Blending wet forages like fresh alfalfa, green chop, forage sorghum or green soybean can add enough moisture to enhance the fermentation. Proper blending of dry forage with wet forage is critical to ensure hot spots do not develop in the silage.

As with wet forage, there are additives which can help with dry forage. With dry silage, if we can control the growth of mold and wild yeast, we can provide a favorable environment for the growth of lactic acid-producing bacteria. Organic acid blends with propionic and acetic acid have been shown to help reduce the level of fungi in feed. By applying 2-4 lbs of blended organic acid per ton of forage, we can control the growth of non-beneficial organisms and create a favorable environment for beneficial bacteria to grow.

## Summary

We all try to put up perfect silage. However, everything from the weather to breakdowns to over-scheduled custom operators conspire to ruin our plans. Over the years, farmers have developed ways to make bad situations better. The use of blended organic acids has been a valuable way for farmers to make wet or dry silages into better-quality feed. These additives have a long track record of success in helping to make silage better.

References:
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[2] Muck, R.E. 1988. Factors Influencing Silage Quality and Their Implications for Management. Journal of Dairy Science, Volume 71, Issue 11 , 2992 – 3002.
[3] Woolford, M.K. 1975. Microbiological screening of the straight chain fatty acids (C2-C12) as potential silage additives. J. Sci. Food and Agric. 26:219-228.
[4] Anderson, Bruce. 2015. Making Silage from Dry Corn. Accessed on October 16, 2018 at https://cropwatch.unl.edu/dry-corn-silage.