



What is the Crop Storage Institute

There are many universities researching different elements of forage production and storage. However, much of the information that they release is fragmented and difficult to understand. The Crop Storage Institute was created in 1994 for the purpose of compiling university information for use by the agricultural industry. We seek to piece together information from universities across the country and finally bring the facts to a meaningful conclusion for livestock producers.

We make a continuous effort to better our organization. If you have any suggestions for how we can better collect, organize, or distribute information pertaining to storing livestock feeds, please feel free to contact us.

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Storing Forage In Bunker Silos

“What You Need To Know”



- Dry Matter Density
- Dry Matter Losses
- Feeding Recommendations
- Packing Tips

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Filling A Bunker Silo

Achieving a high dry matter density in bunker silos during the filling process is not an easy task. It is the best way to reduce dry matter losses, otherwise known as shrink. There are a number of factors that affect dry matter density during filling. Among them are the weight of the packing tractor, forage delivery rate, percent dry matter of the forage going into the bunker, bunker height, and layer thickness when packing. A spreadsheet that correlates the effects of all of these elements is available from the University of Wisconsin or by contacting the Crop Storage Institute.

Packing

The packing process should be done continuously throughout the filling period. The heaviest tractor available should be used to pack. If there is an opportunity to use multiple packing tractors, it should be done. A progressive wedge method that spreads forage in thin layers is highly recommended. This method not only effectively packs the forage, but also exposes the least amount of feed to air as possible. As the feed is packed it should be covered back to front to minimize exposure to oxygen. Forage should be spread in the thinnest layers possible. Packing a bunker is labor and management intensive, but reducing dry matter losses is essential. Continuous proper packing is a significant factor in reducing dry matter losses.

Forage Delivery Rate

Slowing the rate at which forage is delivered to the bunker is a huge factor in achieving a high dry matter density. When the forage delivery rate is slowed, the layers in which the feed is being packed will also get thinner. Slowing delivery and packing in thinner layers can make the difference between marginal quality feed and a higher quality forage for the livestock.

However, slowing delivery rate creates some obvious problems. A slower delivery rate means the crop spends more time in the field, more time exposed to air before the bunker is covered, and more man hours to harvest the crop. For those using customer harvesters, slowing the delivery rate may not be an option.



Feeding From A Bunker Silo

The feeding process is a time when many dry matter losses can be avoided. Key to minimizing these losses is to disturb the bunker as little as possible. If a tractor and bucket is to be used to unload forage, the feed should be scraped off in a downward motion, then scooped up off the floor of the bunker. Lifting up on the pile creates cracks back into the face of the forage, allowing oxygen to enter. Recently, several tools have been developed that “shave” the face of the bunker removing feed with very little disturbance to the rest of the feed mass.

What About Moldy Feed?

Moldy forage must be removed from the ration. Research from Kansas State, concludes that feeding moldy forage has negative effects on its nutritive value, will destroy the cow's rumen mat, and dramatically decreases a forage's fiber digestibility.

Removing the spoiled feed can be very labor intensive, but it is a process that must be done. The negative effects are large and very real.

Dry Matter Density & Dry Matter Losses

<u>Dry Matter Density (lb/cubic foot)</u>	<u>Dry Matter Loss (% in 180 Days)</u>
10	22.2
14	16.8
15	15.9
16	15.1
18	13.4
22	10.0

The average dry matter found in the UW study was 14 lbs/cubic foot. In most situations, achieving densities higher than this requires a delivery rate of approximately 60 tons/hour. Good bunkers require slow deliver rates.