



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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Tower Silos: Know The Facts



- Unloading Capabilities
- Filling Capabilities
- Dry Matter Losses

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Filling A Tower Silo

Once thought to be one of the major bottlenecks in the operational speed of a tower, the speed at which tower silos can be filled has been revolutionized over the last few years. The forage blowers used to fill tower silos are now designed to fill towers at up to 180 tons per hour for corn silage and 110 tons per hour for hay silage¹.

These advances in speed are being accomplished with equipment that is used in much the same manner as the machines that have been used for years. Tower silos are filled with a PTO driven forage blower connected to a filling pipe that runs up the silo. Collecting systems have been developed to work with the dumping wagons or trucks of large scale operations.

Even though the appearance of the equipment has remained quite similar, the forage blowers of today utilize improved engineering to deliver forage at high speeds. When delivery rates in excess of the capacity of one forage blower are required, there are a couple options available².

Towers should be filled as quickly as possible. This minimizes the forage's exposure to oxygen, which helps to reduce dry matter losses. Filling quickly also makes it more likely that the forage will be removed from the field while it is at peak quality.

Unloading From A Tower

The unloading process in tower silos has been revolutionized by engineering advances in the machinery. Traditional unloaders have been improved to be longer lasting, and capable of higher volumes. Often these systems will operate at speeds equal to those of flat storage methods. Unloading speed is no longer a bottle neck in the feed handling process.

Along with the improvements to traditional unloaders a couple of new options are available. The first of these options is center discharge unloading. This is a top unloading system that drops silage down the center of the silo. As the silo is filled, the unloader rides on top of the forage packing it around a 20-inch diameter tube that follows the unloader up throughout the filling process. A tunnel is built in the forage, which is used as an unloading chute. A conveying system at the bottom of the silo carries the silage out of the structure. Using center discharge systems, towers have been unloaded at over 1000 pounds of forage per minute. Because this system distributes the forage as the silo is filled, it provides better distribution and higher volume.

Other systems include a blower-less top unloading system. These systems provide higher volumes, less plugging, and fewer maintenance problems. Bottom unloading systems have also been improved to increase unloading volumes.

Dry Matter Losses

Low dry matter loss is the primary advantage offered by tower silos. Tower silos create dry matter densities that are extremely high. Because of these high dry matter densities dry matter losses in tower silos are consistently the lowest of any forage storage system. A conventional tower silos will have average dry matter losses of 6-9%³. The losses in oxygen-limiting units will range from 3-5%⁴. These loss rates will differ with varying dry matter percentages, length of chop, and rate at which the silage is fed. Detailed information on these factors is available at www.CropStorage.com.

Lower dry matter losses can mean big dollar savings. Reducing dry matter losses by just 5% can have large impacts on the bottom line. If a producer storing 1000 tons of forage per year reduces loss by 5%, he will save at least \$1000 in feed cost.

Lower losses do not only save feed costs, but also contribute to higher feed quality. Feed quality has a large impact on the bottom line. Research shows a strong correlation between forage quality and milk and beef production. Quality forage also helps to drive dry matter intake⁵, which is the number one factor in raising milk production⁶.

- 1) New Holland Forage Blower Specifications
- 2) Contact the International Silo Association, www.Silo.org
- 3) Dry Matter Retention in Storage Units, Dr. Howard Larson, UW
- 4) Contact Engineered Storage Products, (815) 756-1551
- 5) Feed It or Pitch It, Dr. Keith Bolsen, Kansas State
- 6) Dr. Limin Kung, University of Delaware, Presentation 2/10/03