

# GRAIN STORAGE MANAGEMENT

## Storing Your Grain During Winter

Harvest is complete and winter is coming – is your grain protected?

You've invested time and money in your fields, but protecting your crop doesn't stop after harvest. Understanding ideal temperature and moisture levels for stored grain is critical for winter storage. Whether you've had a hot, dry harvest or a wet one, knowing storage and aeration best practices will help you maximize your profits.

**#DidYouKnow** that more stored grain goes out of condition or spoils due to a lack of control over grain temperature than any other reason? The control of temperature in a stored grain bin is critical. In North America, some regions experience the most severe temperature fluctuations from one season to the next. The transition between these extremes can happen rapidly or gradually, impacting the quality of your stored grain.

Properly drying and cooling your grain in the fall is key to preserving grain quality through the fall and winter months. If you harvest grain during hot, dry conditions, you need to bring the grain's temperature down to enable safe storage through the winter. If the grain has higher than ideal moisture content, you will need to lower the temperature to store through fall and winter.

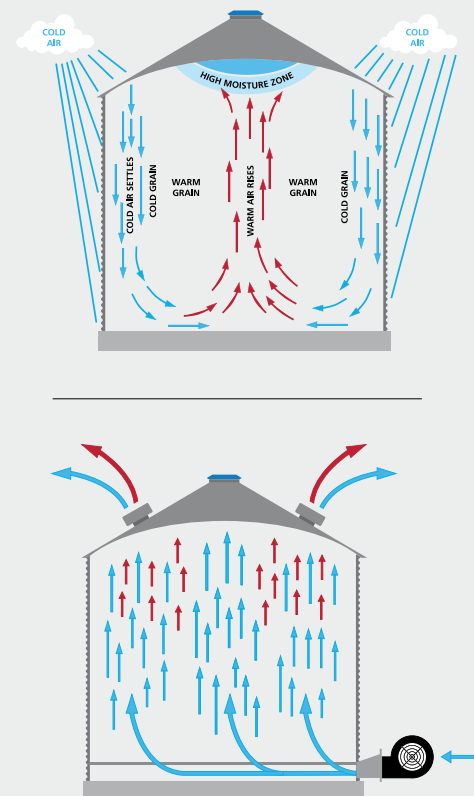
When the bin is first filled with grain, moisture content and temperature are relatively uniform throughout the bin. However, as outside temperatures begin to drop, continued monitoring of your grain is required. In the winter, as the ambient temperature outside the bin starts to drop, the bin walls will start to cool, which then cools the adjacent grain and air inside the bin. The cool air creates a current that moves downward through the grain along the outside perimeter of the grain mass. This air current then moves inward to the center of the bin, here it is warmed by the grain. As the air warms, it starts to move upward in the center of the bin and picks up moisture from the grain carrying it to the top of the bin where it starts to cool again. This results in a high moisture zone at the top center of the bin. This is where you can expect spoilage to occur.

If the grain is to be stored in the bin for a period of time, it is vital to bring the grain temperature down to prevent spoilage. The grain temperature in the bin should be lowered to, or just slightly below, the average ambient temperature for that time of year. This lower temperature will prevent the downward movement of colder air. In cooler regions of the country once a uniform grain temperature of approximately -10° C is achieved; further cooling is not required. In our article "Keeping Your Grain Cool", we shared safe storage charts for different commodity types. You can find charts online as well. You should reference these charts to determine ideal temperatures and compare it to the length of time you can store the grain at its current moisture and temperature levels.

Aeration (cooling) at this point should be accomplished with .05 to .1 CFM/BU, and only until the desired, uniform temperature throughout the bin is achieved. As the season proceeds, the temperature of the grain should be monitored regularly and controlled accordingly by proper aeration. Proper aeration inside grain bins minimizes the effects of moisture migration and maximizes the benefits of temperature control within your bin.

In summary, monitoring moisture and temperature conditions within your bin and having an aeration system to help regulate these conditions are critical to safe and successful grain storage

This diagrams show spring moisture migration in a bin without aeration versus with aeration..



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