



“Often Imitated, Never Duplicated”

Managing Relative Humidity Increases Your Profitability

Nathan Oberg, The Gellert Company, Twin Falls, Idaho
nathan@gellert.com or 1-888-GELLERT

Relative humidity (RH) is something that is often discussed when talking about potato storage, but is a concept that can be difficult to understand. The RH of the storage environment has a huge impact on potato quality, shrinkage, and pressure bruising. In order to make the best management decisions for your potato storage, you must have a clear understanding what RH is and what humidification equipment you will need.

Relative Humidity Defined

Relative humidity is the ratio of the amount of moisture in the air, compared to the maximum amount of moisture that air can hold at a given temperature. RH is most commonly expressed as a percentage (%). The key to understanding RH is that it is temperature dependent. This means that the RH of the air will change simply by changing its temperature. Figure-1, shows how temperature influences RH. In this example the air is warmed without adding any additional moisture. Notice that as the air temperature increases, RH decreases. In practical terms this means that in order to reach 95% RH, air at 55F will require more moisture to be added than air at 50F.

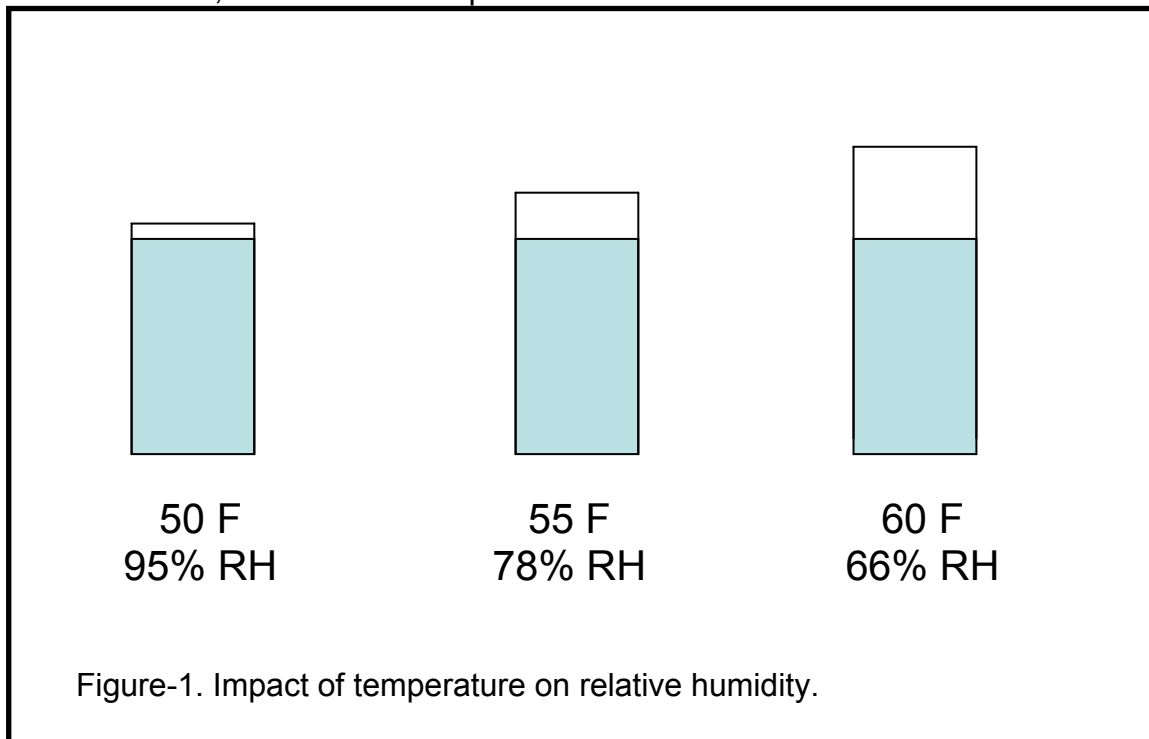


Figure-1. Impact of temperature on relative humidity.

Relative Humidity Impacts Your Potatoes

Stored potatoes primarily lose weight by giving up moisture to the surrounding air. This is referred to as transpiration or simply shrinkage. Transpirational weight loss cannot be completely stopped, only slowed by maintaining as high a RH as possible. Current storage management guidelines suggest that a RH of at least 95% should be maintained throughout the duration of storage. Ventilation with high humidity air is particularly critical during harvest and curing when the potatoes are especially susceptible to weight loss. In addition to limiting shrinkage, high RH levels also serve to minimize pressure bruise formation and other quality defects, such as flattening and shriveled skin. It is critical to understand that small changes in RH will translate into large differences in shrinkage and the profitability of your operation.

Storage Humidification

Armed with an understanding of how important it is to maintain high RH levels, we can now evaluate the kinds of equipment that are required to minimize shrinkage and maximize stored potato quality. The ClimaCell provides an excellent foundation for maintaining a high humidity storage environment as well as providing outstanding evaporative cooling capability. Evaporative cooling will significantly extend available outside-air cooling, especially in the fall, when you need it most. The beauty of the ClimaCell is that it provides humidification in conjunction with tremendous evaporative cooling, all for the incredibly low operational cost of a small, fractional-horsepower pump.

An excellent option to supplement the ClimaCell is a centrifugal humidifier, or spinner. Gellert centrifugal humidifiers are constructed of high quality copper and stainless steel components, and are specially designed to provide the smallest particle size of any centrifugal on the market. Small particle size translates into improved humidification efficiency. This means you put more humidity into the air and less free water on the floor and in the ducts. Gellert centrifugal humidifiers are a cost effective way to keep your potatoes in prime condition.

Humidification is a critical component of an overall storage management plan. Maintaining high RH levels will allow you to minimize shrinkage while maximizing potato quality. When the importance of humidity management is viewed in economic terms, it is clear that the profitability of your operation is directly linked to your ability to provide enough humidification. Make no mistake about it, good humidification equipment doesn't "Cost" money, it "Pays".

First published in the February, 2005 edition of Potato Grower Magazine