Ventilation in Early Storage – Key to Long Term Sucess

What happens during the earliest days of tuber storage sets the stage for long-term storage success. Potatoes need ventilation in their first two weeks of storage for three major reasons.

The first is to dry surface moisture and any adhered soil on the surface of the tubers, which would otherwise favour the growth of microorganisms. The greater the difference between the amount of moisture in the ventilating air and the amount on the surface of the tuber, the faster the drying. Because the vapour pressure differential decreases as moisture evaporates into the air, resulting in slower evaporation, it is important to adequately exhaust ventilating air. To determine when tubers' surface moisture is adequately dried, watch for a decrease in the relative humidity of the return air.
The second reason to ventilate is to heal (suberize) any wounds sustained during harvest to decrease both weight loss and disease pressure. Process growers typically suberize by default as they hold at a warm temperature until optimal fry colour is achieved. Table stock growers often cool down without suberizing sufficiently.

Lastly, ventilation is necessary to remove the heat of respiration. Respiration it at its highest rate immediately after harvest, drops sharply over the next two weeks, and then evens out to a low, consistent level for the remainder of storage. Managing the heat of respiration is essential to prevent disease.

While ventilating is absolutely key to maximizing and maintaining tuber quality, it can have negative consequences if handled incorrectly.

Due to the existence of a vapour pressure differential during ventilation, moisture will start to be removed from the inside of tubers once available moisture has been evaporated from tubers' surface. While internal drying occurs more slowly than surface evaporation, it will cause shrink and pressure bruise and cost yield and profit.

Ventilation must also stop if the dew point temperature is higher than the tubers' temperature, otherwise ventilating air will condense on the crop.

Dew point can be calculated as follows:

Incoming air temperature in °F – ((100 – Relative Humidity)/5) = DP

So, ventilating air at 55°F and 95% relative humidity has a dew point of 54°F:

55 – ((100 – 95)/5) = 54

A simple dew point calculator is available at dpcalc.org.

If excess tuber moisture or high humidity mean drying is too slow, speed drying with heaters or dehumidifiers. Heaters are effective when the ambient temperature is cool as warming the air forces the intake of cool and dry outside air and the exhaust of high humidity air. A dehumidifier such as a door mounted refrigeration system speeds drying regardless of temperature.

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