Optimal Tuber Cooling a Key Step Towards Successful Pile Management

Harvest is complete, your crop is in storage and the November skies are threatening snow. As fall turns into winter, your tubers' respiration is slowing as they prepare for dormancy. Once your potato crop is dry, suberization is complete, and – in the case of processing varieties – colour is achieved, turn your attention to cooling your tubers to an optimal storage temperature so your crop holds its value through the months ahead.

A potato's intended use determines the final temperature it should be held at during storage. While it is always best to verify final holding temperatures with your local potato specialist, it is generally recommended that potatoes destined to become chips or french fries require 45-50 F; fresh potatoes (table potatoes) 39-42 F; seed potatoes and potatoes that will be processed into potato starch 37-39 F. Some processing companies are currently working on breeding potato varieties that can accommodate lower storage temperatures, so be sure to stay abreast of changing recommendations.

Bringing tuber temperature to the optimal storage temperature correctly is as important as holding them at that temperature throughout storage. An effective cooling protocol is vital to decrease temperature fluctuations and in-crop temperature variation, limit unnecessary shrink, decrease disease development and reduce the likelihood of storage-shortening shock in the tubers.

A crop must always be cooled gradually and consistently in order to make sure the temperature of the crop follows the supply temperature downward and no significant temperature differential develops. A well-equipped control system typically allows for pre-set and automatic temperature management.

Slow cooling is also important because fall temperatures can be inconsistent: pulling the temperature down too quickly may present issues if the crop is cooled too much and no cool air is available during warm days.

The rate of cooling will depend on the availability of cool air, the airflow capacity, and the uniformity of airflow. Remember that consistent, adequate airflow is vital to successful cooling and long-term storage.

Aim to lower the supply temperature by approximately 0.1-0.5 F per day, depending on the crop requirements and so long as the supply air is not more than 2-5 F lower than the return air. Maintain relative humidity of cooling air at 95 per cent, otherwise moisture will be drawn out from the inside of the tubers through transpiration.

It is very important, once cooling begins, that the supply air temperature does not increase at any point during the cooling process. Tubers entering storage are living organisms that enter temporary dormancy when confronted with cooling temperatures. Any sudden increase in supply air could trigger sprouting.

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