Maximizing Profit Depends on Managing Suberization

Ensuring optimal suberization when tubers enter storage allows a crop to maintain maximum quality and weight with minimum loss to disease, ultimately translating to maximum profit.

Despite high-tech equipment and careful attention, some tubers inevitably become wounded or bruised during harvest. Once damage occurs, a tuber begins to heal by synthesizing and then depositing a waterproof layer of suberin, an essential plant biopolymer, on the wounded cell walls. The suberin is nature's way of protecting the tuber from moisture loss and reducing its susceptibility to bacterial and fungal attack. Producers who understand and support this biological process will best protect their harvest's return.

The rate at which a tuber seals a wound depends on crop maturity, variety, and temperature; the level of bruising/wound damage; and the oxygen level, carbon dioxide ($C0_2$) levels and relative humidity in storage. In order to allow tubers to heal quickly and fully, a producer must control and balance all storage variables.

Tubers, especially suberizing tubers, consume significant oxygen and exhaust significant $C0_2$. Therefore, the first priority to optimize the wound healing process is adequate ventilation.

Second, manage temperature. Successful suberization requires a temperature of 50 to 55°F for 14 days. If tubers go into storage cooler than 50 to 55°F, raise their temperature by no more than two degrees per day to control condensation. Begin counting the 14 day suberization term when the temperature reaches 50 F.

Though suberization occurs much faster at 65 to 70°F, the associated jump in disease risk makes the higher temperature risky and not recommended. As such, if tubers enter storage warmer than 50 to 55°F, bring their temperature down in a managed and consistent manner. Ensure ventilation air is no more than three to five degrees lower than the tubers' temperature. Begin counting the 14 day suberization term as soon as the tubers enter storage, as suberization will occur as the temperature drops to the target range.

Though it might seem counter-intuitive, dry wounds are not well-healed wounds. The ideal relative humidity for suberization is 95 per cent, since high humidity allows a wound to seal without the intact cells below drying out. Farmers battling moderate to high disease pressure might choose to ventilate at a slightly lower 85 to 90 per cent humidity. Regardless of how severe your disease issues, do not ventilate at lower than 80 per cent humidity.

And finally, a low-tech trick: if you'd like to monitor how your crop's wounds are healing, make it easy to actually see the process. Cut a few potatoes in half, set them in an accessible area in your storage shed and watch to see how the wound closes over. Your intimate understanding of how suberization is unfolding in your storage area is the biggest key to making sure it occurs in a controlled and efficient manner.

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