

Avoid Wounds This Harvest Season

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As we were preparing a new University of Idaho Bulletin on recognizing and managing potato diseases in storage, one important fact kept coming up: Every one of the diseases discussed can be made worse if the tubers are wounded. Wounding of tubers during the harvest and handling operation will make tubers more susceptible to pink rot, late blight, Pythium leak, dry rot, soft rot, early blight, and even silver scurf infection. A wound is actually necessary for Pythium leak and dry rot disease development; but the other diseases listed don't necessarily don't need a wound but are greatly favored by wounding. Wounds can be in the form of nicks, cuts, punctures, abrasions, broken knobs, shatter-bruised areas, or essentially any area where there is a break in the skin. Minimizing both wounding and the presence of inoculum will decrease the potential for disease development in storage.

If you think about it, a wound is a perfect place for a disease to get started. For one, the skin or "periderm" of the potato tuber provides excellent protection from storage rots. A number of the important storage diseases do not require wounds for entry but the length of time for favorable disease development conditions must be longer for the disease organisms to overcome an intact barrier. One universal factor required for these tuber diseases is the presence of moisture. This moisture could be in the form of rain, irrigation or condensation. Wounded areas on tubers provide another source of moisture – plant sap. The sap or juice of the tuber contains water and nutrients, both of which favor pathogen development.

So, tuber wounds serve a twofold negative purpose, they provide a breach in one of the tuber's most important defenses, the skin, and they provide the moisture necessary for disease development. To make matters worse, often the agent (rock, sharp edge on handling equipment, etc.) that causes the mechanical damage to the skin will inoculate the wound at the same time. This means that fungal spores or bacterial cells are deeply embedded in the wound where post harvest treatments are not very likely to be effective. Deep or angled wounds are also shielded from circulating air and decreases your ability to quickly dry off the moisture and stop the infection process.

The next thought that naturally follows, is that reducing or avoiding wounding during harvesting and handling tubers can go a long way toward minimizing storage rots. This is exemplified in some research conducted at the University of Idaho on pink rot. Russet Burbank tubers were either rolled in a modified cement mixer for two minutes to create "wounded" tubers, or else were not wounded. Tubers were then dipped in a suspension of spores of the pink rot pathogen. At 60°F, 68% of inoculated, wounded tubers developed pink rot while only 5% of inoculated, unwounded tubers developed disease. The test was also performed at 70°F. The level of disease was higher in both treatments, but was still greater for the wounded tubers (98%) versus the unwounded tubers (78%).

This study emphasizes two excellent management tools to minimize tuber pink rot development: minimize wounding and avoid harvesting at pulp temperatures above 65°F.

Wounds are obviously bad when trying to minimize losses due to storage diseases but wounds can lead to another loss—water. It is predicted that water loss from wounded potatoes can be easily three to five times greater than non-wounded potatoes. A significant amount of moisture can be lost within the first few days before healing of the wound slows the water loss down. That water loss can equate to greater shrinkage and increase potential for pressure bruise in long-term storing.

So how do you avoid wounding potatoes at harvest and handling? It is best to follow university recommendations for proper tuber maturity, hydration and pulp temperatures, and adjust all harvest and handling equipment to minimize impacts (see <http://www.ag.uidaho.edu/potato/production/index.htm> for more information).