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Be Aware of Lenticular Soft Rot and How to Minimize it in Potatoes

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Pit rot or lenticular soft rot is a disease typically caused by one or more species of soft rot bacteria (such as *Pectobacterium*). Pit rot lesions are small (usually 0.01 – 0.2 inches in diameter) round, dark sunken lesions centered on lenticels (Fig. 1). Neighboring lesions may coalesce to form larger, irregularly shaped sunken areas (Fig. 2). Pit rot differs from normal tuber soft rot in that the infection is limited to the lenticel and conditions are usually unsuitable for full soft rot development. Unfortunately, as packing sheds scramble to meet fresh market demands, we hear reports of problems with this disease almost annually at this time of year.

These bacteria can be found on contaminated tubers, plant debris, in field soil, wash water, or handling equipment. They often become problematic in the packing shed after tubers are washed and placed in large totes, plastic bags or boxes when still wet. Natural openings in the tuber called lenticels are excellent points of entry for the bacteria, particularly when the lenticels become enlarged due to lack of oxygen, such as when they are covered by a film of water after washing. A healthy tuber with access to ample oxygen can usually guard against invasion of these pathogens through the lenticels due to oxygen-dependent host resistance systems. However, when oxygen is depleted, such as when tubers are covered in a film of water after washing and then stored at ambient temperatures (above 60°F), they are oxygen-deprived and their defenses are compromised. As carbon dioxide levels rise, lenticels open further, and the resulting enlarged lenticels allow easier entry of the anaerobic bacteria, which can still infect in the absence of oxygen and reproduce rapidly. Just a thin film of water can promote disease in as little as 12 hours, meaning that tubers washed and allowed to sit in wet conditions overnight may develop pit rot by the next morning. Pit rot rarely leads to full-blown soft rot if tubers dry out and then are able to limit infection.

To minimize the risk of promoting lenticular soft rot in the packing shed for fresh-pack potatoes that are being shipped soon after harvest, we recommend the following:

- Measures should be taken prior to harvest to avoid the build-up of soft rot bacteria on the tuber surface. These include reducing irrigation and allowing tubers sufficient time after vine kill to set skin and not harvesting in muddy conditions, to reduce the amount of soil on the tuber surface.
- If soft rot is present at harvest, the tubers should be graded as they are washed and packed or moved into storage.
- When washing or transporting tubers in fluming systems, tubers should not be submerged in flumes or dump tanks any longer than absolutely necessary. Bacteria in the water will be absorbed through lenticels and any wounds.
- If fluming systems are used, the system should be cleaned and sanitized frequently.

- Clean, chlorinated water or water treated with an effective biocide should only be used for washing fresh-market potatoes on the packing line. Dirt in wash water will deactivate most biocides. Wash-water should not be re-circulated.
- After washing, tubers should be stored below 60°F and in well-ventilated conditions, even if they are only being stored for a short period of time before shipping. This practice will dry up water films on the tuber surface and prevent infection.

Of the above recommendations, observations at packaging houses in Idaho suggest that the most important thing a grower can do to limit pit rot is to ensure that tubers are stored below 60°F with good ventilation after washing. There are many other strategies that can be implemented before, during, and after harvest, as well as before and during storage, for tubers that will be stored before packing. You can find more information about managing lenticular rot online at the following sites:

<http://cru.cahe.wsu.edu/CEPublications/FS066E/FS066E.pdf>

<http://pnwhandbooks.org/plantdisease/potato-solanum-tuberosum-bacterial-soft-rot-blackleg-and-lenticel-rot>

Figure 1. Tuber lenticel or pit rot.



Figure 2. Lenticel rot showing coalescence of lesions.



