Methods to Evaluate Pressure Bruise Susceptibility Early in the Storage Season

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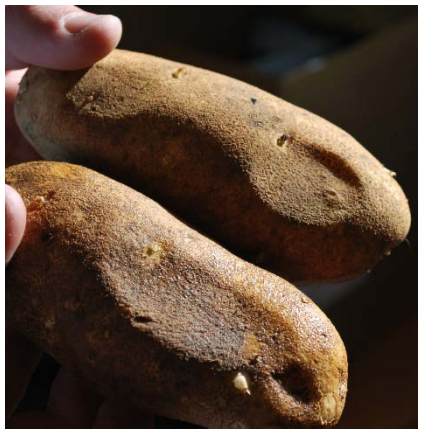
Texture analyzer

Pressure flattening in stored potatoes is a cause of significant economic losses for Colorado potato growers. Pressure flattening occurs as the tuber surface becomes depressed or flattened due to constant contact with a portion of an adjacent tuber and the additional weight of tubers above it in the pile. The development of pressure flattening is also a result of dehydration of the tubers that occurs before and after harvest, and during storage.



Pressure flattened tubers

We can offer a predictive tool to a storage manager in determining the length of storage time to insure quality tubers that can be marketed for a premium price. A predictive test that was developed at the CSU SLVRC uses a texture analyzer to determine the peak load required for deformation on samples collected at harvest. We determined that the potato skin and moisture loss had an effect on the peak load. For the last four years, we tested different tuber varieties from cooperating growers from different fields. The data from the texture analyzer clearly showed separations in peak loads when fields of different varieties were tested. These results matched with the experience of our cooperating storage managers during the testing. We now know the ideal range of the peak load values of russets, yellows, reds and specialties to store successfully without pressure flattening in a long term storage.

Causes of tuber pressure flattening

- dry soil prior to harvest and during harvest
- harvest damage
- moisture loss by poorly suberized potatoes
- vapor pressure deficit in storage

Texture analyzer analysis

- Higher peak loads meant firmer potatoes
- Higher peak loads tend to have lower pressure flattened area per tuber after 6 months of storage.
- Low peak loads in tubers from some fields found to have had problems related to fertility or crop maturity that were observed during the growing season.
- Based on our research at SLVRC an application of ¼" of water once a week after vine kill until harvest maintained the same soil moisture level preventing loss of water from tubers.
- Potato growers and shippers who have their fields and varieties tested and, when possible ship lower peak load fields earlier in the storage season, will have reduced losses due to pressure flattening.

The texture analyzer is an expensive and time-consuming device. We would like to test a new handheld penetrometer for texture analysis. I want growers and storage managers to participate in this test. I would like to distribute six handhelds devices to test 200 tubers in this harvest and storage season to collect data. *Please let me know if you are interested in participating in this research project.*

Hand held penetrometer