



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Chaitra S. Subbarao	Project Number J1931
Project Title An Elegant Test to Measure Post-Harvest Decay of Different Lettuce Cultivars	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Lettuce is an important commodity in the Salinas Valley, and a popular vegetable. Four principal types of lettuce are grown in the Salinas Valley; and with the popularity of salad mixes, different lettuce types are mixed even though not all lettuce types have the same shelf life. I wanted to determine which lettuce type had the longest shelf life and the reason behind it. I hypothesized that decay is related to the number of ruptured cells. My project developed a method to measure decay based on which people can select cultivars with a longer shelf life.</p> <p>Methods/Materials I harvested six lettuce cultivars of various types from an experimental field. I processed each cultivar with a processor that chopped the lettuce into small pieces, bagged them, and placed them in the cold storage maintained at 3.5°C. Each bag was visually evaluated for pinking and decay of lettuce once a week for 7 weeks using a scale of 1-5 (1=worst and 5=best). I wanted to determine the reason for difference in decay of the cultivars. The percentage of ruptured cells was estimated indirectly through measuring of electric conductivity (EC). With fresh tissue, all the cells are whole and none of them are ruptured, so less electricity is conducted from one electrode to another.</p> <p>Results Two of the cultivars were fully (or almost fully) decayed at the end of the experiment, with the rating of less than 2. Pinking occurred much faster than decay; three cultivars showed severe pinking (values below 3) already in the first week. Some cultivars with severe pinking did not decay fast, indicating that the two processes are independent. The cultivars with the most decay had the highest electric conductivity.</p> <p>Conclusions/Discussion Lettuce cultivars differed in their shelf life with some lasting many weeks post-harvest and some breaking down within a few weeks. This break down could be measured by visual evaluation of decay and pinking. Both decay and pinking ranked cultivars similarly suggesting any one of these measurements was sufficient to evaluate cultivars. For example, La Brillante was the best cultivar for both decay and pinking. However, it is possible that in a different set of cultivars this relationship will not be observed. EC was directly proportional to the decay rating. The higher the decay for a given cultivar, the higher was the EC value. The study of my experiment reveals that ruptured cells are the cause of faster decay.</p>	
Summary Statement I studied the variation in lettuce cultivars for post-harvest shelf life and developed a method to measure it.	
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