

Teerapong Pholpo 2014: Mechanical, Light Properties and Bruising of a Longan Fruit. Doctor of Philosophy (Postharvest Technology), Major Field: Postharvest Technology, Interdisciplinary Graduate Program. Thesis Advisor: Assistance Professor Siwalak Pathaveerat, Ph.D. 139 pages.

This study aimed to investigate the properties of longan fruit of E-dor, Si Chomphu, and Biew Khieo varieties: 1) some physical properties; 2) mechanical property based on compression and impaction; 3) damage forms of longans; and 4) reflective visible spectrum indicating bruise on fresh longans.

The study revealed the physical properties of the three varieties that the packing density of the E-dor variety, with a mean of 0.38 ± 0.01 more than the other two varieties. This indicated that the E-dor varieties of fruits can occupy container volume more than the other two varieties. It was also found that the fruit firmness of the E-dor varieties, with a mean of 5.09 ± 0.93 N/mm was less than the other two varieties, which indicated the softness of the fruit, resulting easier damage. It was corresponded to the highest percentage of damage after harvesting (15.50%), compared to the other varieties. Mechanical damage of longans in containers was most occurred at the top most trapezoidal and rectangular container laid at the rear of the truck. Most damages were in the forms of punctured, bruise, cracked, detached, deformed, decompose, and black (too much sulfur fumigation), respectively. The study of mechanical property based on compression and impaction revealed that compression energy (E_c) and impact energy (E_i) had an effect on 100% bruise area occurrence of longans at 0.027, and 0.034 J, respectively. And it also found that the reflective spectrum observed at 400-700 nanometers could differentiate bruise and non-bruise of fresh longans. The PLS-DA (Partial Least Squares Discriminant Analysis) model could correctly classify it for 100 percent and it was better than SIMCA (Soft Independent Modeling of Class Analogy) model.

Student's signature

Thesis Advisor's signature