

Pramote Kuson 2014: Investigation of Minimally Destructive Maturity Assessing Indices of Durian. Doctor of Engineering (Agricultural Engineering), Major Field: Agricultural Engineering, Department of Agricultural Engineering. Thesis Advisor: Associate Professor Anupun Terdwongworakul, Ph.D. 124 pages.

This research studied the mechanical properties and the electrical impedance spectroscopy (EIS) of durian fruit to determine their relationship with durian maturity. Partial least squares regression (PLSR) and discriminant analysis were used to build models for predicting dry matter content and classifying durians into groups based on number of days after harvesting. The results showed that the mechanical properties were not applicable for evaluation of maturity with good accuracy. However, electrical parameters measured at stem and rind at frequencies of 1 kHz, 41 kHz and 200 kHz could be used to create a model for prediction of the dry matter content with the correlation coefficient of prediction (R_p) of 0.798. In addition, a classifying model based on the electrical parameters could discriminate durians into four maturity groups with accuracy of 83.3%. However, the predictive model using both electrical parameters and the frequency of durian improved the prediction accuracy with R_p increasing to 0.840.

Student's signature

Thesis Advisor's signature