

Abstract:

High-quality standards and the need for shelf-life determination for the modern market have increased the interest for on-line evaluation of internal properties for each individual fruit and vegetable. Texture is one of the main attributes for the assessment of fruit quality, and can be characterized by the firmness of the fruit. The purpose of the study was to compare various testing methods in melons, avocados, nectarines and mangos. The nondestructive firmness tests were performed using a low-mass impact firmness system produced by Sinclair International, a commercial instrumented hammer and a piezoelectric film sensor. Appropriate indices were extracted from the signals of each system. Destructive tests were performed in order to extract the elastic modulus of the tested fruits, in room conditions of about 24°C and 50% RH from picking day up to full ripening stage. The collected data was analyzed and compared using statistical methods. In conclusion, the firmness of the various fruits, measured by the different tests, reasonably correlated the elastic modulus of the fruits. No significant difference was found between the two low-mass impact systems. A combination of the low-mass impact firmness parameter and the acoustic firmness index, which may perform better in various ripening stages of different fruit, can improve the sorting capacity of a multi-sensor machine.