Abstract:

Firmness changes while maturation of apple fruit (*Malus domestica* BORKH. ssp. *domestica*) were investigated. Fruits were measured on tree with the acoustic impulse response technique. The acoustic impulse response technique is a non-destructive method and known to be useful to monitor firmness changes of fruit in storage. The purpose of the presented research was to find out if firmness changes during maturation of apple fruit on the trees could be detected.

Apples were subject to measurement before and after commercial harvest date. Bloom of the trees and weather data were noted. Weekly the same apples were measured on the trees. About 18 of these apples were picked each week for reference. These were brought in cool storage, then were measured the next day with: a Minolta colorimeter, the acoustic impulse response technique, a balance, a universal testing machine for Magness-Taylor-firmness (MT-firmness) test.

The deviation of natural frequencies between apples is bigger than the decrease in frequency of a single apple measured continuously on a tree. Acoustic impulse response values that were measured a day after harvest indicate no significant change in firmness of apples during the experiment period.

Mass, MT-firmness and -a/b ratio are presented to document the development of the apples. The mass of the fruit increased and the MT-firmness, chlorophyll-content-measure and mid air temperature decreased over time.