## Abstract:

The firmness of apple cultivars Liberty and Pinova was monitored during storage using acoustic impulse-response technique. The samples came from different orchards: one of them have been treated as organic and the another one as integrated orchard. During the three-year study the cultivars, growing systems, seasons, harvest time and storage technology were compared. Fruits were stored at 2-4 °C, 98-99% relative humidity in a normal storage-room and in season 2001/2002 also under ultra low oxygen (ULO) atmosphere (2°C, 90% RH, 3%O2, 1,2% CO2). The firmness was investigated at monthly intervals. Firmness decreased significantly during storage and the loss of weight of apples was monotonous. Most of the cases there were significant differences between the cultivars. The apple cv. Liberty was firmer than cv. Pinova. Samples from later harvest were firmer at harvest than those harvested earlier. There were also considerable differences between the seasons. The samples stored in ULO-storage remained firmer than those stored in normal storage-room. Regression analysis was used to model the softening process of apples during storage. Exponential model was found to be a correct model in every tested case. According to the regression analysis significant linear correlation was found between the cumulative activity of polygalacturonase enzyme and the reciprocal of the firmness on the basis of data of cv. Pinova in season 2001/2002.