

### Abstract:

To fulfil the demand for quality fruit around the year, apples are stored. The shelf life of the fruit depends on the status of the apples at the point of harvest. For measuring the quality of apples the starch degradation, the soluble solids content and the Magness-Taylor- (MT ) firmness test are commonly used in Northern Europe. Favourable tools to determine the status of fruit on the tree are non-destructive tests. The purpose of the presented research was to find out if firmness changes during maturation of apple fruit could be detected with the acoustic impulse response technique. This test is non-destructive and results in a stiffness factor, which is proportional to elasticity. In addition, it was examined if stiffness changes are related to the water status of fruits. Reference measurements to assess the maturity of the fruit were done. The change of mass, starch degradation, MT firmness and a/b ratio (a measure for the background colour of the apples) reflected the fruit development on the tree. Literature reveals, that the turgor of fruit tissue should affect its firmness and elasticity. This dependence could not be retrieved by linear correlation in this experiment. A difference of fruit development during maturation and storage was detected. The relation of stiffness to physiological properties needs further investigation.