

Abstract

To improve the prediction of optimum harvest date, more exact and rapid sensing of apple fruit maturity development is required. Destructive methods are currently used to determine the optimum harvest date. Because of high variability of individual fruits, the accuracy of this method is limited.

Spectrophotometry in VIS wavelength range can sensitively detect pigment content. Robust miniaturised spectrophotometer technique could be promising for practical use in fruit production and marketing.

Research tests were carried out with two apple cultivars during twelve dates of the season 2004. Specific portable equipment with miniaturised spectrometer module and glass-fiber probe was used for measurements of fruit on tree. The light transmission through a part of fruit tissue could be measured in wavelength range from 500 to 1000 nm.

According to fruit maturity progress, the spectral signatures showed an increase of light intensity around 680 nm due to decreasing chlorophyll content. The chlorophyll decrease was very clear indicated by the red-edge index. A decrease of light intensity between 500 and 570 nm was recorded due to increasing blush colour pigments. The progression of blush colour could be demonstrated by means of an anthocyanin index. The two cultivars showed typical differences in variance of fruit maturity development. The results could be useful for development of more objective and precise monitoring the optimum harvest date of apple fruit.