

Title Multi-sensor non destructive assessment of peach quality: a collaborative approach

Author Wendy Schotsmans, Diana Molina-Delgado, Sébastien Lurol, Alexia Gobrechet, Constantino Valero, Lourdes Lleó and Christian Larrigaudiere

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Abstract

Soluble solids content and firmness are some of the most important attributes to evaluate internal and external quality, and to classify fruit in the peach (*Prunus persica* L. Batsch) industry. These attributes are usually measured by destructive methods, but in the last decades non destructive methodologies have shown good results in the evaluation of different aspects of quality of fruits. Reliable information about non destructive tests to evaluate internal and external quality in different cultivars of peaches is still needed. During 2006, 2007 and 2008, the quality of Ryan Sun, Rich Lady and O'Henry peaches was evaluated in collaborative experiments involving destructive measurements (Magness Taylor firmness (MTF) and other texture test, soluble solids content (SSC), flesh colour, diameter and weight) and non destructive tests (NIR Tromblon and Acoustic Firmness Sensor (AFS), IQ Sinclair, NIR Gun, Minolta Chromameter, Lateral Impactor - UPM) to study the capability of different non destructive tests to evaluate quality of peach and how they correlated with reference tests. Cultivar induced a high variability in the set of measurements and also affected the correlation between reference and non destructive tests. PLS models indicated that the impact test was the most appropriate non destructive technique to estimate MT firmness. NIR Tromblon prediction of SSC presented a better correlation with the SSC value from the refractometer. A combined PLS model using data from all cultivars and years and variables from acoustic and impact tests was the best option to estimate MTF. These results showed the feasibility of non destructive tests to evaluate quality of different peach cultivars.