

Title Monitoring of kiwifruit (*Actinidia Deliciosa*) total soluble solids and dry matter content during field ripening by means a NIR - AOTF Spectrophotometer

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Abstract

Total soluble solids and dry matter are two important commercial parameters to evaluate the right harvest data for kiwifruit. Dry matter is formed for 75% by carbohydrate, it is sugar and starch at harvest and it is mostly sugar at eating ripe. Non - destructive techniques are required from kiwi fruit industry to choose the harvest data, to predict the fruit storability and to screening for different sweetness classes. A NIR (Near infrared) - AOTF (Acousto Optically Tunable Filter) spectrophotometer has been tested on kiwifruit (*Actinidia deliciosa* cv. Hayward) to investigate total soluble solids and dry matter evolution during 4 different sampling data until the harvest data. Kiwi fruit were collected from three different orchards site in Latin (Lazio region, Italy). Detection was conducted in the 1100-2300 nm range, with 2 nm wavelength increments and 100 spectra per average, which represented a single measurement. Four NIR spectra were acquired as diffuse reflectance for each kiwifruit from the equatorial region and at the same time the fruits were processed for dry matter and total soluble solids determination. Raw spectra were transformed in absorbance spectra (1/R) and different statistical pre - treatments were carry out to reduce the baseline shift and the noise. Partial least square (PLS) was built on the full spectrum (1100-2300 nm) and was applied an internal full cross validation (leave one out). The better statistical pre - treatment was selected for each variables. Determination coefficient for cross validation (R^2_{cv}) and the standard error for cross validation (SECV) were respectively 0.86 and 1.45° for °Brix and 0.70 and 0.90% for dry matter. PLS regression models obtained can be applied on a wide range for measured variables: between 5.9° and 16.7° for °Brix and in the range 9.3 -16.7% for dry matter content.