

Title Postharvest shelf-life discrimination of nectarines produced under different irrigation strategies using NIR-spectroscopy

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Abstract

Quick assessment of storage time in fruits is important for both growers and consumers due to the fresh fruit market is becoming increasingly demanding with regard to product quality. This study sought to evaluate the ability of near-infrared reflectance spectroscopy (NIRS) to classify intact nectarines in post-harvest storage, as a function of pre-harvest irrigation strategies applied and post-harvest cold storage duration. A total of 220 nectarine fruits (*Prunus persica* (L.) Batsch cv. 'Sweet Lady') were sampled after 7, 14, 21 and 28 days of refrigerated storage (0 °C, 95% RH) and at commercial harvest time. Two commercially-available spectrophotometers were evaluated for this purpose: a handheld MEMS spectrophotometer of 1600–2400 nm and a diode-array Vis/NIR spectrophotometer of 400–1700 nm. Models developed using partial least squares 2-discriminant analysis (PLS2-DA) correctly classified between 86 and 96% of samples by post-harvest storage time using the handheld instrument, and between 66 and 89% in the case of the diode-array spectrophotometer. Classification models based on pre-harvest irrigation treatment classified 57–84% of the samples correctly, due to the similarity in physical–chemical properties of fruits in both irrigation strategies. These results showed that NIRS could be used to monitor changes in nectarine quality parameters during pre- and post-harvest as an essential tool for decision-making both in-field and on-line.