Title Innovative application of non-destructive techniques for fruit quality and disease diagnosis

Authors G. Costa, M. Noferini, G. Fiori, F. Spinelli

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Abstract

To date non-destructive techniques, such as Near Infra Red Spectroscopy (NIRS) and the electronic nose, are used only to segregate fruit based on pre-selected quality attributes. Since these techniques allow rapid and easy determination of a wide range of internal attributes related to fruit quality, the collected data could be used in the field to establish proper harvesting time or, in packing houses, to optimise storage strategy. In addition, analysis of volatile compounds performed via e-nose allows early diagnosis of important fruit diseases such as "grey mould" and *Sclerotinia* rot. This report presents preliminary results on the use of NIRS and e-nose techniques for fruit quality determination and as an alternative approach for early diagnosis on asymptomatic fruits. The research was carried on *Actinidia deliciosa* ('Hayward' and Summerkiwi™) and *Actinidia chinensis* ('Hort16A'). Fruit quality studies were performed on all cultivars in the field as well as in the packing house. The diagnostic studies were performed under controlled conditions on fruit experimentally inoculated with pathogenic fungi. The olfactory profiles of control and inoculated fruits were compared by means of PCA.