Title Non-destructive techniques and quality models for the supply chain

Author Maarten Hertog, Bart Nicolai, Bart be Ketelaere, Jeroen Lammertyn and Josse De Baerdemaeker

Citation Abstracts of 27th International Horticultural Congress & Exhibition (IHC 2006), August 13-19, 2006, COEX (Convention & Exhibition), Seoul, Korea. 494 pages.

Keyword non-destructive technique; supply chain

Abstract

In the quality assessment of horticultural products, a shift from destructive towards non destructive quality sensors is occurring. Although some of these sensors are commercially available they are not widely applied because people are in the habit of using established destructive techniques. Non-destructive sensors often express quality on totally different scales, making comparisons somewhat challenging. An overview is given of non-destructive techniques for measuring quality attributes of horticultural produce based on acoustic, optical and olfactory techniques. The relationship between these non-destructive measures and their destructive counterparts will be addressed. Besides being non-destructive, these techniques offer the appealing possibility of being able to monitor quality changes of individual products over time, which was not possible using destructive techniques. As a consequence, the evolution of the inherent biological variability of the quality in a batch of produce can be monitored. This type of repeated measures requires proper analytical techniques and has given rise to the introduction of new modeling approaches in the field of postharvest technology. In the area of inductive modeling techniques the concept of mixed models has been introduced while in the area of deductive modeling techniques the concept of stochastic kinetic models has been introduced. Both concepts allow the quantitative analysis of different sources of biological variation as a function of the storage conditions. Quantification of these different sources of variability is of great importance to researchers and growers, but was up to now only scarcely accounted for. The data obtained using non-destructive techniques can thus be used to calibrate a new generation of simulation models for analysing and predicting the changing quality components of produce under variable storage and handling conditions. These models can be used for shelf life predictions whereby the preferences for quality limits and acceptance of different consumer groups can be incorporated. Such models can be used as the basis for future innovative supply chain management.