

Title Methods to analyze physico-chemical changes during mango ripening: A multivariate approach

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Abstract

Canonical discriminant analysis (CDA) was used to identify the best method to discriminate between maturity and ripening stages, assessed in terms of dry matter content, firmness, color (peel and flesh), total soluble solids content attributes, before and during 'Keitt' mango ripening at 20 °C. Dry matter content was determined by hot-air oven and microwave oven methods. Fruit firmness was determined non-destructively by hand squeezing, with a durometer, using acoustic resonance and low-mass elastic impact methods (AWETA), as well as destructively by the penetrometer. Peel and flesh color were expressed as L^* , a^* , b^* , h^0 and C^* values. Total soluble solids content was analyzed from filtered juice from whole fruit tissue and from unfiltered juice squeezed out by hand. Canonical discriminant analysis indicated that the durometer and the penetrometer were better methods to assess firmness than hand firmness, acoustic resonance or impact methods. The best color attributes to follow changes during early stage of 'Keitt' mango ripening were a^* and b^* values of the flesh, whereas b^* value of the peel was considered better during later stages of ripening. Results of total soluble solids content in filtered juice from whole fruit tissue were less variable compared to unfiltered juice squeezed out by hand. Dry matter content was better assessed by drying the sample in a microwave oven than in a hot-air oven. A combined CDA including the best methods to assess each ripening attribute, as well as titratable acidity, showed that the best tools to assess changes in fruit during ripening were the penetrometer, followed by flesh a^* value and total soluble solids content (from filtered juice from whole fruit).