Title Assessing the harvest maturity of Brazilian mangoes

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Abstract

No clear criterion exists to determine the optimum time to harvest mango. Some empirical relations are used to assess maturity, such as shoulder development. Moreover, as a result of the typical growing conditions in tropical climates, a huge variation in maturity and ripeness exists, seriously hampering the export of fruit in the global chain. The consequence for consumers in western countries is that sometimes mangoes are overripe at the retailer, or have to be kept for several days, even weeks, to reach the edible state, provided they do not rot in the meantime. To ensure an edible quality, the chlorophyll content in the fruit flesh, measured at harvest by Time-resolved Reflectance Spectroscopy (TRS), could be used as a maturity criterion for mango fruit. Commercially grown fruit were harvested in Brazil and transported to Italy by plane. Fruits were measured using TRS at 630 nm for absorption coefficient (μ_a) and skin colour. The development of μ_a was followed on 60 fruits during 15 days of storage at 20°C. The remainders of fruit were used to measure firmness destructively. Absorption coefficient decreased during shelf life according to a logistic pattern, as expected for colour development. Taking the variation between the individual fruit into account, 72% of the variation was accounted for. Nevertheless, μ_a assessed at harvest could be converted into a biological shift factor (BSF), as an expression of the maturity at harvest of each individual fruit. This biological shift factor explained about 70% of the variation in firmness development in individual fruit. These preliminary results indicate that TRS methodology coupled with BSF theory could be useful in assessing maturity at harvest and assuring acceptable eating quality of mango.