Title Measurement of ripening speed and determination of the optimum ripeness of melons by a nondestructive acoustic vibration method

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Abstract

The ripening speed of the melon cultivar 'Miyabi-Haruaki' was determined by monitoring its elasticity index (EI) with a nondestructive acoustic vibration method. EI was determined by the formula $EI=f_2^2$, where f_2 is the second resonance frequency of a melon sample, and m is the mass of the sample. The speed of ripening, i.e., ΔEI/day, was determined to be 0.36×10^4 $kg^{2/3}$ Hz^2 d^{-1}, which was lower than the ripening speeds of previously studied melon cultivars 'Andes' and 'Quincy' (0.39×10^4 $kg^{2/3}$ Hz^2 d^{-1} and 0.50×10^4 $kg^{2/3}$ Hz^2 d^{-1}, respectively). Using a sensory panel test, the period of optimum ripeness of the melons was determined to be $5.3–7.1 \times 10^4$ $kg^{2/3}$ Hz^2. Nondestructive determination of the period of optimum ripeness in terms of the EI can be useful for estimating the shelf-life of melons. In addition, by determining the ripening speed, the time required for a melon to reach optimum ripeness can be predicted.