

Title Effect of penetration speed on flesh firmness measured on stored kiwifruit

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Citation Postharvest Biology and Technology, Volume 61, Issue 1, July 2011, Pages 29-34

Keywords Penetrometer; *Actinidia deliciosa*; *Actinidia chinensis*; Maxwell model; Loading velocity

Abstract

The effect of penetration speed on flesh firmness (FF) measurement by motorised penetrometer was examined for ‘Hayward’ (*Actinidia deliciosa* var. *deliciosa*) and ‘Hort16A’ (*Actinidia chinensis* Planch. var. *chinensis*) kiwifruit. Data was collected for penetration speeds varying from 4 to 40 mm s⁻¹ using stored fruit of FF 10 N; a typical minimum FF threshold for export from New Zealand. Measurements were made on a number of instruments (Instron, GUSS FTA, HortPlus, TA.XTplus), using fruit from different orchards and in each of two different seasons. As expected, FF values increased with increasing penetration speed. A firmness-speed model was developed, based on the Maxwell rheological model for viscoelastic materials, which proved adequate in describing the FF data in terms of the effect of penetration speed. The effect of penetration speed was not adversely influenced by cultivar, season or instrument type. Within the range of fruit firmness examined – stored fruit below 20 N – it was concluded that the firmness-speed model could be successfully used to compare firmness values generated using instruments operating at different penetration speeds.