

Title Characterization of mechanical injury to sweet cherry cultivars
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Abstract

Sweet cherry is recognized as having tissue which is very sensitive to impact and compression damage. A protocol was developed to screen, over two years, the susceptibility of Alex, Bing, Glen Red, Lapins, Santana, Stacatto and Sweetheart cultivars to mechanical injury. Each fruit was subjected to a 5 mm probe. A controlled force was then applied to the depth of penetration and measurements were taken, using a texturometer (TA-XT2i Godalming, England), at 0.5 mm intervals from 2.0 mm to 4.0 mm. The compression damage caused by the probe was recorded by a curve stress-strain and the severity of the injury (i.e. a damaged area of mm²) in each fruit was evaluated. The relationship between the rheological properties of the tissue and the severity of damage was used to characterize the fruit's sensitivity to mechanical injury. Greater penetration of tissue by the probe increased fruit deformation until asymptotic value, where no deformation occurred. A depth of 3.0 mm was preferred for screening the cultivars. Among the rheological properties evaluated, the percentage of fruit deformation was the best parameter for enabling characterization of the susceptibility of the fruit to mechanical damage. Screening of each cultivar produced different scores in the two seasons during which the study took place but the deformation parameter allowed the differences to be separated out. In both years of the study, the Bing cultivar presented the highest deformation values. This research was funded by Conicyt (Comisión Nacional de Investigación), Científica y Tecnológica (Chile), Fondecyt grant no. 1110379.