

Determining impact bruising thresholds of peaches using electronic fruit

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Abstract

Bruising of fresh fruits during harvest and postharvest processing is a major problem in the horticultural industry. Damage is largely a result of impact, particularly during sorting, grading and packing operations. In this study, fruit-to-surface impact on commercial packing lines were simulated in the laboratory by individually dropping fresh ‘Glohaven’, ‘J.H. Hale’ and ‘Loring’ peaches onto 3 impact surfaces from a range of heights (10–120 mm). A specially constructed impact-testing device with a 500-mm pendulum arm was used to drop fruit onto an uncovered steel impact surface or the same surface covered in either the poron or rubber foam typically used by packing houses as cushioning surfaces. After the impact testing of fruit was completed, the procedure was repeated using an electronic fruit (IRD), which recorded peak impact acceleration and velocity changes. Bruising threshold values for the different peach varieties were determined by evaluating the relationship between peak impact acceleration and velocity changes of the IRD and the areas of bruising of the fruit. The experimental data was used to calculate the drop height required to produce a bruising area of 100 mm² for each of the three peach varieties and impact surfaces. The findings showed poron to be a more appropriate material for surface padding than rubber foam.