

Title Firmness measurement of peach by impact force response
Author Yong-wei Wang, Jun Wang, Chong Yao and Qiu-jun Lu
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Abstract

The impact force response of a peach impacting on a metal flat-surface was considered as nondestructive determination of firmness. The objectives were to analyze the effect of firmness, drop height, fruit mass, and impact orientation on the impact force parameters, and to establish a relationship between the impact force parameter and firmness. The effect of fruit firmness, drop height and fruit mass on the impact force parameters (coefficient of restitution, percentage of energy absorbed, and coefficient of force-time) was evaluated. The study found that the coefficient of restitution, percentage of energy absorbed, and force-time impact coefficient were significantly affected by fruit ripeness, but not affected by drop height, impact position (fruit cheek), and mass. The percentage of absorbed energy increased with ripeness, while the force-time impact coefficient and coefficient of restitution decreased with ripeness. Relationships were obtained between the three impact characteristic parameters (force-time impact coefficient, coefficient of restitution, and percentage of energy absorbed) and peach firmness using a polynomial model ($R^2=0.932$), S model ($R^2=0.910$), and exponential model ($R^2=0.941$), respectively.

<http://www.springerlink.com/content/g7565ln6522m4506/fulltext.pdf>