

Design Engineering of Fruit Packaging Trays

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Abstract : Bruises in apples affect the quality and acceptance of the apples and consumers' willingness to accept apples after harvest, transport and storage. This paper seeks to analyze the impact of various drop heights on bruising when apples are dropped on structural steel, material that is frequently used in fruits pallets. In this study, 27 simulations were carried out using SolidWorks at three drop heights, including 500 mm, 1000 mm and 1500 mm, and nine types of trays to determine the stress. The results reveal that the level of bruising rises with the increase in drop height and that stress impact velocity and surface hardness are decisive for it. Among the nine designs of the tray, the tray design 1 was the best one in terms of least stress measured at different drop heights. The findings imply the desirability of minimizing drop height and increasing packaging to reduce mechanical damage, increase apple quality, and increase shelf life.

Keywords : bruising, apple, SolidWorks, drop test

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