

Abstract

Various fruit gathering devices are important part of free shakers used in fruit harvesting. The catching surface is generally used in the form of a stretched thin sheet interacting with the falling fruit. This interaction depends on many factors such as the shape and mass of the fruit, the falling height and the mechanical properties of the catching material. In recent investigation different canvas, composite and silk materials were selected and their mechanical behavior was experimentally determined. Using the energy conservation principle, the main impact characteristics of the falling fruit was derived and used. Static and dynamic loading tests were carried out using spherical indenters and artificial fruits. Investigations have shown that, using the appropriate material characteristics, the catching surface can serve as a cushioning material and it can considerably reduce the impact stresses in the falling fruit