

Abstract

Nowadays, mechanical harvesting involved in olive-detachment through vibration is the most frequently used and extended technique. However, the mechanical processes lack in the development of efficient harvesting machinery. With the aim of obtaining an optimum design, a dynamic analysis of the harvesting machinery is needed, especially in those machines whose functioning depends on vibratory systems. In this sense, modal testing proves to be a useful method to identify the dynamic behavior of the structure. This research attempts at determining the dynamic behaviour of the vibrating heads used in the olive detachment process so as to achieve an optimum design that seeks for reduction of damage to the tree's bark. The results obtained from modal testing have established the most important natural frequencies in the shaker. Furthermore, the dynamic characteristics of the shaker have been identified according to its modal shapes and mode participation factors. The comparison of these results and those obtained in the spectral analysis have shown the problems in the design and use of the shaker from the point of view of both the damages caused to the bark and the vibration transmission.