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Drop Test Simulation of Table Grapes (*Vitis vinifera L.*) with Finite Element Method

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SUMMARY

Table grapes is a second industry in viticulture in Turkey and have been grown in primarily Mediterranean region a popular fruit for local consumption and export to many European and Asian countries as a fresh dessert and for this reason this product has to be transport so long distances for marketing. This simulated drop test experiment with Alphonse Lavallée and Antep Karası (*Vitis vinifera L.)* table grape cultivars grown in Konya province was conducted in lab condition Selcuk University Faculty of Agriculture. To produce main knowledge, and to improve the application of resources used to produce, pack, transport, and merchandise Turkish table grapes by increasing efficiency, controlling cost and managing risk throughout the supply chain. This study focuses on the deformation behavior of the grape berries under drop case. In the drop test the mechanical parameters such as maximum force, deformation, Poisson ratio, modulus of elasticity and deformation energy of grape berries were determined. These parameters were used in the drop test packaged program of Solidworks 2010. For modeling the grape berry; a three dimensional scanner and high speed camera were used. Eventually, the important parameters as stress and displacement were determined according to finite element results. The results of this study shed light on new investigations of mechanical parameters of fruits by using finite element method.

Keywords: *Vitis vinifera L.*, Konya, mechanical parameters