

Preparing Spain and California table olive industries for mechanical harvesting

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Abstract

Worldwide table olive production is becoming unsustainable due to stagnant economic returns and increasing hand harvesting costs. Successfully developing mechanical harvesting will require identifying a successful removal technology that produces marketable processed fruit, fabricating a functional harvester with a catch frame and adapting the orchards for efficient and economic olive removal. The major impediments are a low tolerance for bruising, a high fruit removal force and low fruit weight. California and Spanish researchers, supported by local olive industry funding, have been cooperating on a multidisciplinary project simultaneously focusing on: (1) development of both trunk shaking and canopy contact mechanical harvesting technologies, (2) fruit damage reduction, (3) pruning current orchards and developing new orchards and (4) developing an abscission agent to decrease fruit removal force. Reducing the damage caused to fruits and tree bark during harvesting is a key factor for improving the mechanical harvesting process. Tree adaptations to the machines with new orchard designs and pruning are necessary to improve the fruit removal efficiency and reduce fruit and canopy damage. A final 80-85% fruit harvesting efficiency is a reasonable aim with trunk shakers for table olives. However, canopy contact harvesting methods are useful to get a complete mechanical harvesting of table olives. Table olive bruise susceptibility showed the importance of a pre-process within one hour of harvesting and the use of antioxidants to limit the bruising effects. However, an acceptable abscission agent has not been found for table olives.