

A total systems approach to developing a sustainable, stem-free sweet cherry production, processing and marketing system

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Abstract

Sweet cherry (*Prunus avium* L.) is a model specialty crop – high potential returns per hectare, high costs of production, and ephemeral in its supply. Faced with increasing competition and imminent shortages of harvest labor, the U.S. sweet cherry industry must improve harvest efficiency without compromising consumer appeal of the fruit. Further, for research to have meaningful and sustainable impact on industry, innovation, discovery and outreach must integrate the total value chain, from genetics and breeding to processing and marketing, while partnering with stakeholders and end users. This presentation describes an innovative, multi-disciplinary research program funded through the USDA's Specialty Crop Research Initiative. The program's long-term goal is improving the sustainability of the U.S. sweet cherry industry by developing a highly efficient, production, processing and marketing system for fresh market quality sweet cherries. Project directors address these issues this with an integrative project built around the development of mechanical, mechanical-assisted and novel hybrid harvest technologies. In this presentation, research results and a model, total systems approach integrating critical elements of a profitable, sustainable cherry industry are presented including:

- Genetics and genomics research to establish the genetic bases for abscission in cherry; utilizing marker-assisted breeding strategy to accelerate the generation of new cultivars amenable to mechanization and with high consumer appeal.
- Development of high efficiency fruiting wall orchard management systems, novel compostable packaging, retail markets for mechanically-harvested cherries and models of system profitability to facilitate adoption.

- Engineering research to develop and deploy innovative mechanical and/or mechanical-assist cherry harvest technologies and consumer/packaging research to extend the shelf life and improve consumer appeal of fruit.