

Postharvest innovation: current trends and future challenges in the global market

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Abstract

The ability of a country to ensure adequate and consistent food supplies for citizens is of major political, social and economic importance. Food losses/wastage in the supply chain from farmer to consumer can be 1.3 billion tons annually. Most food wastage occurred in developed countries at the retail/consumption end of the chain, while in developing countries high losses occur at the production/processing end. Such losses could be ameliorated by enhanced postharvest research, development, education and training; however <5% of funds allocated to agricultural research over the past 2 decades was directed towards postharvest science, technology and outreach. Postharvest science and technology aims to provide underpinning information for industries to deliver safe, nutritious and safe fresh horticultural products to consumers at the end of the supply chain from farm to mouth. This presentation aims to highlight some key preharvest and postharvest factors that are important or have potential, to contribute to product quality and safety and hence to the future success of horticultural systems producing for both local and export markets. Plant breeding and selection are key disciplines successful for introducing novel product types with important factors conferring precocity, productivity, size, pest and disease resistance/tolerance, phytonutrient content and consumer appeal. Innovative and imaginative growing systems have been developed to optimize productivity of attractive, tasty and nutritious fruit and vegetables including: crop management; harvest indices and optimal maturity; manipulation of ethylene; integrated pest and disease management. Postharvest achievements have occurred in high-speed non-destructive segregation systems; novel packaging; storage and transport systems; pests and disease control for market access; senescence control; supply chain optimisation; and track and trace systems to ensure delivery of premium quality products to discriminating markets. Future success will only occur with further R&D devoted to understanding

the genetic and molecular basis of quality traits including stress resistance; resistance to postharvest diseases and pests; integrating available technologies (bio-, info- and nanotechnology) through a systems biology approach to overcome postharvest food quality and safety issues; as well as to enhance specific health conferring components in fresh and processed products; use of robotics for harvesting, packing and handling of individual through bulk items; managing logistics and supply chains effectively and efficiently; using bioregulators and/or biostimulants to manage productivity and quality; and to understand and hence manipulate the underlying metabolic systems controlling physiological and biochemical systems regulating product deterioration and senescence.