

Title Heat treatment application to increase fruit and vegetable quality
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Abstract

Purpose of review: Heat treatment has been used for quarantine and decay control in an increasing variety of crops, and its use has been extended to the inhibition of the ripening processes or the induction of resistance to chilling injury. Through a brief overview of certain studies about the physiological, pathological and physical principles of heat treatment with emphasis on the physical or engineering aspects, an effort is made to determine the focus of further research.

Main findings: Research effort on heat treatment in the postharvest stage has been increasing steadily in recent years, with successful laboratory investigations and some scale-up development of the use of hot water, radio frequencies, microwaves and hot air in disinfestation, disinfection, chilling injury control and the slowing down of the ripening process in various fresh horticultural crops. Several aspects of the mechanisms of heat treatment in terms of decay control, induction of thermotolerance, and heat transfer under uniform heating media have been thoroughly evaluated. The threshold temperature and uniformity in space throughout the entire duration of the process are the two most important factors that should be taken into account during heat treatment process development on an industrial scale.

Directions for future research: The challenge for heat treatment lies in the scale-up of some treatment methods by optimising the temperature range and duration, improving the uniformity of heat treatment, and conducting research into a protocol for the adoption of different heat treatments as part of the postharvest chain.