

**Title** The effect of heat conditioning treatments on the postharvest quality of horticultural crops

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### **Abstract**

**Purpose of the review:** While postharvest heat treatments (heat therapy) were first applied to horticultural crops during the first decades of the past century to control fungal diseases and insect infestation, they were later abandoned with the advent of synthetic fungicides. This is because heat treatments are more expensive and more difficult to apply than chemical treatments, as the conditions that are lethal to fungal decay or the fruit fly may be close to the treatment threshold tolerance of fruit. In recent years, the use of synthetic chemicals on harvested fresh produce has become more difficult to justify due to consumer requirements, environmental concern and regulatory issues. Thus, current studies are focused on alternative strategies and there has been renewed interest in heat therapy. This article provides a brief overview of studies published over the last five years on postharvest heat treatments, with emphasis on the effects on the quality of horticultural crops.

**Recent findings:** Postharvest heat treatment may be applied to horticultural crops in several ways: vapour or hot dry air, hot water dips, or by hot water rinsing and brushing. The range of temperatures may vary depending on treatment type and application time. Effects on the quality of horticultural commodities originate from the following factors: limited effectiveness in the control of moulds, insects or physiological disorders and the need to integrate heat therapy with other treatments; direct internal or external damage; effects on ripening and senescence processes; and modification of physiological patterns with loss/retention of nutritional, technological and external quality of commodities.

**Limitations/implications.** Heat treatments are difficult to apply on a commercial scale as the conditions for decay control or those that are lethal to the fruit fly, for example, may be close to the treatment threshold tolerance of fruit. Thus, heat therapy may have beneficial effects on certain cultivars and detrimental effects on others. Furthermore, its efficacy may be influenced by preharvest factors.

**Directions for future research:** Goals for future investigations include prevention of direct damage and the understanding of risk margins for safe application of postharvest heat. The

potential application of many practices to a wide range of commodities is also the direction for selecting the most quality-saving processes. Additionally, future studies should be addressed to enhance both the nutritional and functional properties of horticultural crops.