

Title Postharvest physiological disorders in citrus fruit
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Abstract

Purpose of the review: Various types of postharvest physiological disorders have been described in citrus fruit, but how they are related to each other is not understood. We still lack knowledge of mechanisms governing them and appropriate methods for reducing their incidence. The purpose of this review is to give an overview of the most important postharvest physiological disorders occurring in citrus fruit and the efficacy of different methods used for controlling them, and to outline the physiological and molecular basis of the different types of rind disorders.

Recent findings: Efforts have been made in recent years to reveal factors responsible for different postharvest citrus disorders and to develop new strategies to control them. Special attempts have been made to understand the physiological and biochemical basis of low temperature tolerance in citrus, including the role of plant hormones, alteration in lipids, carbohydrate and phenylpropanoid metabolism, and in oxidative stress-associated processes. Molecular events by which citrus fruit may tolerate chilling are in their early stages, however, recent studies have shown the complexity of the molecular mechanism underlying chilling tolerance, which requires expression of transcription factors, activation of secondary metabolism and stress-related proteins. In contrast, information on the mechanism governing other non-chilling related physiological disorders is still scarce.

Directions for future research: Further work is necessary to understand the precise cause of the postharvest alterations occurring in each cultivar and to implement successful commercial postharvest treatments to control them. To obtain a general picture of the nature of the main postharvest disorders in citrus, it is necessary to delineate the precise function of the identified physiological and molecular disorder-associated responses. The availability of new high throughput molecular strategies and comprehensive cDNA libraries from rind citrus fruit tissues will provide excellent tools to continue the study of the mechanisms underlying them. This knowledge will lead to improvements in the technologies used to maintain external fruit quality and to reduce subsequent commercial losses of citrus fruit.