

Title Etiology and control of chilling injury in 'Ryan Sun' peaches: the role of ethylene or fruit antioxidant potential

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Abstract

Chilling injury (CI) is among the major problems limiting the storage potential and final quality of peaches stored under low temperature conditions. In the present study, overall quality, antioxidant potential, ethylene production and the incidence of CI disorders were evaluated in 'Ryan Sun' peaches up to 45 days of storage at 0 or 5°C. To control CI, fruit were treated with 1-MCP immediately after harvest (SF1) or immediately after harvest and after cold storage (SF2), preconditioned at 20°C prior to cold storage (PC) or exposed to intermittent warming at 20°C at fixed intervals during cold storage (IW). As expected, fruits stored at 0°C show little or no symptoms of CI (*viz.* wooliness and internal browning), in comparison to control fruits stored at 5°C where the severity of CI was noticeable already after 15 days of storage. Among the control strategies studied, SF1 treatment was very effective preventing the appearance of CI disorders, mainly wooliness both during cold storage and after removal. In contrast, a double application of 1-MCP (SF2) had the opposite effect and resulted in enhanced incidence of these disorders. Similarly to SF1, IW during cold storage led to a significant reduction in the number of fruits showing CI disorders after cold storage if compared to control or pre-conditioned fruits. Overall, the results from this study suggest that the etiology of wooliness in peaches may be related to the capacity of the fruit to produce ethylene upon removal rather than to endogenous changes in the antioxidant potential of the fruits.