

Title Application of different treatments (CA, MA, N₂O and 1-MCP) to improve quality of two peach varieties

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Abstract

Postharvest storage and commercialization of peaches is limited by their short storage life even when stored at low temperatures. Chilling injury or internal break-down occurs at low temperatures above freezing but below 10°C, mainly expressed as internal browning and wooliness. Consumers detect these disorders in both locally grown and imported fruit. Cultivar, growing and climatic conditions affect the development of these disorders. We used two peach varieties: Merry O'Henry and Mestret (Roig d'Albesa) to evaluate the effects of several postharvest treatments on the development of low temperature disorders and to examine the possible role of ethylene. Treatments included packing in polyethylene bags (MA), 1-methylcyclopropene (1-MCP) and nitrous oxide (N₂O). Fruit of both varieties were selected according to size and flesh firmness and placed at 1°C. 1-MCP (1000 ppb) was applied for 24 h. Some fruit were treated continuously with 50% N₂O in air; others were kept under MA in plastic bags. Controlled atmospheres (CA), O₂:CO₂ at 1:1, 3:3 and 3:20 concentrations were applied only to the Mestret variety. Untreated control fruit were stored in air at 1°C. Samples of fruit from all treatments were transferred to 20°C at intervals during storage for up to 45 days for Merry O'Henry and 60 days for Mestret and assessed after 3 days. Respiration and ethylene production were monitored, also ACC content and ACC oxidase activity. Quality parameters were determined in the flesh (pH, texture, soluble solids and qualitative presence of disorders). Ethylene biosynthesis was influenced mainly by 1-MCP and N₂O. Disorders, mainly internal browning, appeared in Merry O'Henry after 30 days storage in all samples, but N₂O reduced development of this disorder even after 45 days. Mestret fruit remained in good condition after 60 days storage in CA, especially CA of 1:1 and 3:3.