

Title Novel 1-methylcyclopropene immersion formulation extends shelf life of advanced maturity 'Joanna Red' plums (*Prunus salicina* Lindell)

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Abstract

A postharvest application, by immersion, of a new 1-methylcyclopropene (1-MCP) formulation delayed ripening changes and extended the shelf life period of plum fruit (*Prunus salicina* Lindell cv. Joanna Red) harvested at an advanced maturity stage when ripened immediately after harvest or after cold storage. Fruit were either immersed in a water solution (control) or in an aqueous solution of a formulation containing 10, 100, 1000 and 10,000 ng kg⁻¹ of 1-MCP. The fruit were allowed to ripen at 23 °C after 5-m immersion or after immersion and subsequent cold storage (5 °C, RH 90%) for 10 d, prior to being evaluated for quality attributes. 1-MCP immersion treatments reduced firmness loss, skin color changes, fruit weight loss and respiration rate. Furthermore, a pronounced suppression of ethylene production in fruit treated with 1000 and 10,000 ng kg⁻¹ 1-MCP was detected. All fruit ripened normally and did not show any chilling injury (CI) symptoms when ripe fruit were evaluated after cold storage. Overall, 1-MCP concentration of 1000 ng kg⁻¹ was the most effective in controlling fruit ripening changes and extending the shelf life of this advanced maturity (tree ripened), low CI susceptible plum. This is the first study, to the best of our knowledge, reporting the successful application of 1-MCP by immersion on the postharvest performance of fleshy fruit.