Title Seasonal changes in the abscission site in bunch tomatoes and differential response to 1-methylcyclopropene

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Abstract

Cherry tomatoes harvested as bunches are susceptible to abscission during storage. Two abscission zones are present in the bunch: the joint (AJ) in the middle of the pedicel and the receptacle (AR), which connects the fruit to the pedicel. It is demonstrated in the present study that during the temperate winter, after storage at 12 °C abscission commences through the AJ and that during the spring there is a transition to AR. Fruit harvested in the summer mostly underwent the AR type. It has been shown that 1-methylcyclopropene (1-MCP) can prevent abscission in cv. R-819. It is now shown that in early winter lower doses of 1-MCP are required to suppress abscission than during the warmer season. Of three cultivars tested, cvs. Shiren and Conchita had less abscission after storage than R-819, and 1-MCP could suppress abscission in all of them to various extents. Exposure of cv. Shiren to 50 $\mu l\ l^{-1}$ of ethylene for 3 h did not induce abscission whereas 1-MCP reduced both AJ and AR abscission, and delayed ripening, as indicated by fruit color and firmness. Delay of red color development required lower doses of 1-MCP than inhibition of abscission. The variability in abscission of bunch tomatoes during the season indicates that multiple environmental signals determine the final quality of the produce.

Abbreviations: AJ, abscission from the joint; AR, abscission from the receptacle; AZ, abscission zone; 1-MCP, 1-methylcyclopropene; AVG, aminoethoxyvinylglycine; STS, silver thiosulfate