

#### Abstract:

The influence of 1-methylcyclopropene (1-MCP) on storage duration and quality has been documented for horticultural crops of diverse morphological origins. Although most horticultural commodities do respond to 1-MCP, the most dramatic effects are evident for organs displaying climacteric behavior and those exhibiting specific responses to exogenous ethylene. Among fruits, many features of ripening are influenced by 1-MCP. In the context of postharvest handling protocols, delays in softening are of particular interest. The influence of 1-MCP on firmness changes is most certainly multi-faceted. Firmness of tomato fruit in response to 1-MCP remains unchanged for several days, declining eventually at rates comparable to those of control fruit and paralleling the recovery of other ripening properties. In avocado fruit, softening continues following 1-MCP treatment but at dramatically reduced rates. More generally, trends of softening also reflect fruit maturity at the time of treatment, and 1-MCP concentration and exposure temperature. In avocado fruit, 1-MCP delays changes in the activities of several cell wall enzymes and affects the metabolism of pectins and, to a lesser degree, hemicelluloses. The recovery patterns of wall enzyme activities in 1-MCP-treated avocado fruit differ significantly, indicating that these proteins are differentially influenced by ethylene. Disparities in the recovery of normal enzyme activity trends may explain reports that 1-MCP treatments (i.e., deficiencies in ethylene perception) can sometimes result in abnormal texture. In watermelon fruit, 1-MCP prevents ethylene-induced placenta water soaking and phospholipid breakdown, the latter being consistent with increases in phospholipase and lipoxygenase activities in response to ethylene. Suppression of ripening is observed in some fruits when 1-MCP is applied after ripening initiation, and beneficial effects have also been reported for fully ripe fruits. A few reports suggest that 1-MCP appears promising for maintaining the firmness of fresh-cut fruits; however, the more advanced maturity of these commodities will likely require adjustments in 1-MCP treatment strategies.