

Abstract

In the nearly 10 years since its introduction, the unsaturated cyclic olefin 1-methylcyclopropene (1-MCP) has emerged as a powerful tool for exploring the role of ethylene in the biology of harvested fruits and vegetables. The compound is being utilized successfully in commercial applications for delaying ripening and extending shelf life of a number of climacteric fruits. The ethylene antagonist has also been shown to protect and extend the shelf life of traditional non-climacteric fruits including watermelons, cucumbers, and green beans, confirming reports that extremely low levels of ethylene of exogenous or endogenous origin can exert significant deleterious effects on these commodities. Novel applications of 1-MCP have challenged the non-climacteric status of some fruits. The use of 1-MCP requires careful consideration of treatment concentration and duration, as well as characteristics of the commodity including cultivar, stage of development at the time of treatment, and the capacity of the commodity to recover fully from the suppression of ethylene responses. Ripening involves both ethylene-dependent and independent processes, and 1-MCP treatment in some instances results in asynchrony in the progress or timing of these events. Reports of 1-MCP-induced injury have been noted for some commodities. The efficacy of 1-MCP treatment on intact fruit is not consistently maintained with fresh-cut tissues, possibly due to the advanced ripening of the fruit at the time of treatment. Research and commercial tests with 1-MCP continue with a range of horticultural commodities, and the most important objective will be to identify treatment regimens that will ensure that quality attributes are not compromised. The compound may prove especially useful for commodities that can not tolerate the use of low-temperature storage.