

**Title** Ripening regulation in SmartFresh Bartlett pears  
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### **Abstract**

The active ingredient in SmartFresh™ is 1-methylcyclopropene (1-MCP), an inhibitor of ethylene perception that has been used to delay fruit ripening rates and ethylene-related physiological disorders. The effects of 1-MCP on 'Bartlett' pear ripening have been characterized. Untreated 'Bartlett' pears ripen to a buttery, juicy texture in 5 to 7 days, while 1-MCP-treated pears fail to ripen, even after much longer times. Our laboratory and others have demonstrated that ethylene treatments prior to 1-MCP application and extended cold storage after 1-MCP application can stimulate ripening capacity in 1-MCP-treated pears, including 1-aminocyclopropane carboxylic acid (ACC) oxidase and ACC synthase activity and transcript levels of genes for ethylene biosynthesis and perception proteins. While it is expected that ethylene biosynthesis will increase in 1-MCP treated pears that are recovering their ripening capacity, up-regulation of transcript levels of the ethylene receptors, which we observed, was not expected since they negatively regulate the ethylene response. The relationship between transcript and protein levels for ethylene receptors in 1-MCP-treated 'Bartlett' pears will be presented and discussed. Elucidating the abundance of ethylene receptor proteins prior to and after 1-MCP applications could facilitate the development of technology which will help to deliver and maintain pears with higher quality both during cold storage and subsequent ripening.