

# Differential effects of preharvest sprayable 1-methylcyclopropene application on fruit quality attributes and major targeted metabolites in cold-stored ‘Chuhwangbae’ pears

Hnin Phyu Lwin and Jinwook Lee

Horticulture, Environment, and Biotechnology 62: 53–61. 2021.

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## Abstract

The effect of preharvest sprayable 1-methylcyclopropene (1-MCP) on fruit quality and certain targeted major metabolites was investigated in ‘Chuhwangbae’ pears during short-term cold storage and shelf life. Preharvest 1-MCP application affected methionine, sucrose, and total flavonoid content and fruit decay. During cold storage and shelf life, numerous fruit quality attributes and specific targeted metabolites were affected not by preharvest 1-MCP application but by the storage duration. Overall responses in the normalized heatmap matrix and principal component analysis (PCA) loading plot showed that preharvest sprayable 1-MCP treatment enhanced the incidence of physiological disorders and suppressed the responses of targeted metabolites compared with that in untreated fruit. The results obtained using the PCA score plot showed that physiological and biochemical parameters of the fruit after preharvest 1-MCP treatment were highly separated and diverged based on the storage duration. Nevertheless, preharvest 1-MCP treatment did not significantly affect the physiological and biochemical responses associated with fruit parameters or soluble carbohydrates and free amino acids contents in cold-stored pears. Therefore, the results suggest that preharvest sprayable 1-MCP application may not have strong positive effects on the postharvest quality attributes of ‘Chuhwangbae’ pears during cold storage and shelf life.