

Title Physiological response of 'Whangkeumbae' pear to 1-MCP and ethylene during storage and simulated marketing

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Abstract

Mature 'Whangkeumbae' pears (*Pyrus pyrifolia* NAKAI var. *culta* NAKAI) were exposed singly to 10 and 100 ppm ethylene and 100, 500 and 1000 ppb 1-MCP at 20°C for 4 hours. Then transferred to air at 20°C at 80% RH for two weeks. There were distinct differences in ripening behavior in pears exposed to ethylene compared to those treated with 1-MCP. Ethylene treatment resulted in a rapid increase of flesh firmness and high respiration rate, while 1-MCP at >500 ppb effectively inhibited firmness loss through 14 days of simulated marketing. Following extended storage (14 days at 8°C) and simulated marketing (10 days at 20°C) of fruit exposed to 100 ppm ethylene and (author-should this be 'or' rather than 'and'? did the fruit receive a treatment with both these chemicals (in that case use of 'and' is correct), or did each lot of fruit receive the chemical treatment independent of each other (if so then 'or' would be required) 500 ppb 1-MCP, the 1-MCP treatment significantly reduced respiration rate and gave a higher external appearance index than for fruit treated with 100 ppm ethylene. Additionally, ripe fruit following simulated exportation (1°C and 8°C) for 20 days and marketing (20°C) for 7 days. with or without polyethylene wrapping treatment, exhibited increased flesh spot decay (FSD). Particularly in fruit subjected to the lower temperature (1°C) and without PE wrapping, but little damage was observed in unripe fruits. These data suggest the need to establish a clear fruit harvest maturity index and to improve postharvest temperature management of 'Whangkeumbae' pear during both export and local marketing.