

Effects of 1-methylcyclopropene and aminoethoxyvinylglycine treatments on fruit quality and antioxidant metabolites in cold-stored ‘Sangjudungsi’ persimmons

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Abstract

After harvest, ‘Sangjudungsi’ persimmon (*Diospyros kaki* Thunb.) fruit quickly soften and develop physiological disorders during cold storage. The objective of this study was to evaluate the effectiveness of 1-methylcyclopropene (1-MCP) and aminoethoxyvinylglycine (AVG) treatments on fruit quality attributes and antioxidant metabolites in ‘Sangjudungsi’ persimmon fruit stored at 0.5 °C and 95% relative humidity over a 3-month period. The treatments caused a reduction in weight loss; in the middle of the cold storage, the soluble solids content was higher with the AVG treatment than with the 1-MCP treatment. Both treatments reduced the incidence and severity of peel blackening and fruit softening, whereas fruit decay was only affected by AVG. The content of total phenolic compounds was lower with AVG than with 1-MCP or in the untreated control during the same period. At the end of cold storage, the AVG treatment resulted in a greater total flavonoid and total antioxidant activity and a higher reduced glutathione level than with 1-MCP or in the untreated control. AVG likely evoked the least physiological and biochemical responses in persimmons, according to the results of a normalized heatmap matrix system. Correlation coefficient networking results showed that 1-MCP and AVG caused differential correlation responses between the fruit quality variables and targeted metabolites during cold storage. Overall, the results indicated that treatment of cold-stored persimmons with 1-MCP and AVG likely reduced the incidence of physiological disorders, although antioxidant metabolites were relatively less affected by both regulators.