

Abstract

AVG (aminoethoxyvinylglycine) is a valuable preharvest tool for fruit drop control with apparent postharvest benefits. Postharvest effects of MCP (1-methylcyclopropane) on apples fruit quality are being widely documented. However, there is not much information about the interaction between AVG and MCP. Our goal is to determine how AVG and MCP interact to influence ripening traits and postharvest storability of 'Gala' apple. An aqueous solution of AVG was applied to 'Gala' apple trees 4 weeks before normal harvest (H1) at 124 g ha⁻¹ a.i. Control and AVG-treated fruit were treated for 20 h at 30°C with MCP at a final headspace concentration of 1 µL/L. Fruit were ripened at ambient temperature immediately after harvest and treatment, or after storage at 4°C for 6 and 12 weeks. Fruit treated with AVG were also harvested 2 weeks after H1 (H2), and a sub-sample treated with MCP. During ripening at ambient temperature immediately after harvest, control fruit exhibited a respiratory climacteric peak before reaching maximum ethylene production. AVG-treated apples reached a lower respiratory peak and showed almost no ethylene production, while MCP-treated fruit had no respiratory peak and ethylene production decreased over time after harvest. The combined treatment of AVG and MCP repressed ethylene production and reduced respiration rate the most. After 6 and 12 weeks in cold storage following both harvest dates, fruit treated with AVG plus MCP had the lowest ethylene production and highest flesh firmness. AVG alone was consistently more effective than MCP alone in reducing ethylene production and maintaining flesh firmness in cold storage. Respiration rate varied between treatments and ripening times, though AVG plus MCP generally repressed it more effectively than the other treatments. Overall, the combination of AVG and MCP was the best treatment to improve the storability of 'Gala' apples by reducing ethylene production, respiration rate and loss of firmness. AVG was the best single treatment. The difference between the combined and AVG treatments was more evident in fruit harvested at H2.