

**Title** AVG and 1-MCP effects on maturity and quality of apple fruit at harvest and after storage  
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### Abstract

'Gala', 'Royal Gala' and 'Imperial Gala' apples (*Malus × domestica* Borkh.) from commercial orchards in Southern Brazil were sprayed with 120 g ha<sup>-1</sup> AVG (aminoethoxyvinylglycine, ReTain™) 4 weeks before the estimated commercial harvest date in two growing seasons. Fruit were harvested every 5 to 7 days, starting 2-3 weeks before the estimated commercial harvest date. AVG-treated and untreated fruit, harvested at the end of the optimum commercial maturity window for long term storage (~75 N) were treated with 1 µL L<sup>-1</sup> 1-MCP (1-methylcyclopropene, SmartFresh™) on the day of harvest, and stored for 3, 5 or 7 months in air (0.5°C), or in controlled atmosphere (CA, 1.5 kPa O<sub>2</sub> + 2.5 kPa CO<sub>2</sub> at 0.5°C). Fruit maturity and quality were determined at harvest and after cold storage plus 7 days at 20°C. Treatment with AVG delayed fruit ripening on the trees as indicated by internal ethylene concentration, fruit firmness, starch index and peel ground color. AVG treated fruit reached creamy-white peel background color and firmness of approximately 75 N 8 to 18 days later than untreated fruit, depending on cultivar and season. Pre-harvest treatment with AVG had little or no effect on rate of fruit softening and incidence of senescent internal browning after storage when fruit were harvested with firmness equivalent to that of control, regardless of storage conditions and post-harvest treatment with 1-MCP. The highest fruit firmness and the lowest incidence of senescent internal browning were observed on CA stored fruit treated with 1-MCP, regardless of pre-harvest treatment with AVG. Results indicate that possible differences in fruit quality after storage between AVG- and non-AVG-treated fruit are normally relative to differences in fruit maturity at harvest.