

Abstract

The aims were to determine whether preharvest application of aminoethoxyvinylglycine (AVG) adversely affects the cool storage life of 'Arctic Snow' nectarines (*Prunus salicina*), and if so whether application of ethylene during storage could counteract these effects. AVG (as ReTain[®] Plant Growth Regulator) was applied at 125 mg L⁻¹ to 6-year-old trees in a commercial orchard 7 days before anticipated commercial harvest. First pick fruit were used for this study and untreated (UTC) fruit were harvested at commercial maturity based on changes in skin ground colour and flesh firmness. Two harvest criteria were used for AVG-treated fruit. ReTA fruit were harvested when the colour of the fruit was identical to the UTC (3 days after UTC first pick) and ReTB fruit were harvested when the fruit firmness had declined to the same level as the UTC (7 days after UTC first pick). Fruit were stored for 5 weeks at 1.0–1.5 °C with and without continuous ventilation with 30 µL L⁻¹ ethylene. All fruit had similarly low rates of ethylene production when received and ethylene production remained low in all AVG-treated fruit but exhibited a climacteric rise in untreated fruit. The fruit were assessed weekly for changes in flesh firmness and storage disorders (internal bleeding and percentage juice recovery) 6 days after transfer from cool storage to 20 °C. AVG-treated fruit remained firmer than untreated fruit after 6 days of ripening following harvest but this difference was absent in fruit ripened after 1 week of cool storage. Internal bleeding was detected after 2 weeks of air storage in ReTA and ReTB fruit but not until 3 weeks in UTC fruit. A decrease in percentage juice recovery was found in all treatments after 3 weeks of air storage but ReTA fruit were the most affected. A loss of ability to soften normally was found in all treatments after 4 weeks of storage in air but the continuous application of ethylene during storage maintained normal softening except in ReTA fruit. UTC and ReTB fruit started to go 'mealy' (<20 N firmness, loss of juiciness) after 3 weeks storage but by 4–5 weeks most fruit were 'leathery' (>20 N firmness, loss of juice). The addition of ethylene resulted in fruit softening more normally and changed the chilling injury from predominantly leatheriness to predominantly mealiness. ReTA fruit tended to go leathery and the addition of ethylene did not change this.