Abstract

Physiological disorders occur when ‘Hass’ avocados are stored for more than approximately 4–6 weeks. The major disorder is diffuse flesh discolouration (“flesh greying”, or “internal chilling injury”), but others include vascular browning, vascular leaching (browning of flesh around the vascular bundles), stringy vascular tissue (thickening and separation of the vascular strands), and outer flesh blackening (blackening of the outmost layer of the mesocarp). We have examined 1-MCP effects on ‘Hass’ avocados stored for 4 or 7 weeks at 5.5 °C following treatment with 50–1000 nl l^{-1} 1-MCP for 6–24 h, at 6 or 15 °C. The effect of harvest date (fruit maturity) on responsiveness to 100 and 500 nl l^{-1} 1-MCP was examined. 1-MCP treated fruit were firmer following storage, had reduced skin colouration (purpling) at removal from storage (4 or 7 weeks), increased time to softening, and reduced physiological disorders associated with long-term storage. Relatively little difference was observed between fruit treated at 15 and 6 °C, and thus a treatment temperature of 6 °C was used in the remaining experiments. For lower 1-MCP concentrations, short treatment durations influenced time to ripen, but not fruit quality. Treatment times of 12 and 24 h produced similar results. Harvest date (fruit maturity) influenced the levels of disorders in non-1-MCP treated fruit, but had little overall effect on 1-MCP efficacy. 1-MCP treatment was of little benefit for fruit stored for 4 weeks but, particularly if the 1-MCP concentration was high (250 nl l^{-1}), excessively delayed the time to ripen. After 7 weeks storage 100 nl l^{-1} 1-MCP almost completely eliminated some long-term storage disorders. A small trial showed that 500 nl l^{-1} 1-MCP did not reduce external chilling injury (skin blackening) of ‘Hass’ avocados induced by 0 °C storage. Overall, 1-MCP shows promise as a tool for reducing internal physiological disorders due to long-term storage of ‘Hass’ avocados.