

Abstract

Granny Smith apples (*Malus domestica* Borkh) are very susceptible to various physiological disorders, being superficial scald the most important. Application of 1-methylcyclopropene (1-MCP) to Granny Smith apples may extend storage life by reducing storage scald, loss of firmness and acidity. However, other skin disorders may be enhanced by 1-MCP. The effect of 1-MCP on the incidence of disorders development, and ripening during storage and subsequent shelf life was investigated in 'Granny Smith' apples from different maturity stages (38, 42 and 52% starch degradation). Fruit were exposed to 0 (control) and $0.6 \mu\text{l l}^{-1}$ 1-MCP at 1°C during 24 hours. After 120, 180, 210 and 240 days in regular air at 0.5°C , the fruit was evaluated upon removal from storage and after 7 and 14 days at 20°C . Application of $0.6 \mu\text{l l}^{-1}$ 1-MCP effectively delayed the ripening rate of the fruit harvested at different times, as indicated by better retention of green peel color, firmness and titratable acidity. 1-MCP treatment significantly reduced superficial scald. Treated fruit developed scald after 240 days of cold storage, while controls developed scald after 120 days. Core flush incidence was also reduced by 1-MCP treatment, even in the fruit from the later harvest, which was the most affected by this disorder. In every evaluation, there was fruit affected by physiological disorders related to calcium deficit, such as bitter pit and lenticel blotch pit. In early-harvested fruit, 1-MCP treated fruit developed less bitter pit and more lenticel blotch pit, but the incidence of both disorders was higher in 1-MCP treated fruit than in control. No significant differences between treatment were detected in second and third harvest dates. We conclude that the effect of 1-MCP on different physiological disorders differs with fruit maturity stage. Disorders related to deficit of calcium were enhanced in 1-MCP treated fruit from early harvest, and as the length of storage increased.