

Title The potential benefits from storage of 'Hort16A' kiwifruit in controlled atmospheres at high temperatures

Author N. Lallu, J. Burdon, D. Billing, P. Pidakala, K. McDermott and G. Haynes

Citation ISHS Acta Horticulturae 913:587-594.2011.

Keywords *Actinidia chinensis*; chilling injury; degreening; disorders; rots; energy use; softening

Abstract

The storage life of 'Hort16A' kiwifruit is limited by softening and chilling disorders when stored at 1.0-1.5°C. Chilling disorders are most prevalent in fruit harvested when flesh colour is >103 °hue, even when fruit have been degreened at 5°C before storage. Chilling disorders may be avoided by using higher storage temperatures, which may also reduce energy use during storage. The objective of this study was to determine whether 'Hort16A' fruit can be stored at high temperatures by using controlled atmospheres (CA) of 1.6% O₂ with 2, 5 or 10% CO₂ to retard softening and disorder development. Storing fruit harvested at 6.2 kgf when not fully degreened directly at 7°C in CA delayed softening compared with that of fruit degreened at 5°C in air and then stored at 1°C in air; firmness four weeks after harvest was 3.6 kgf and 1.6 kgf, respectively. After 12 weeks of storage, all fruit were approximately 0.6 kgf. There was no significant difference in the softening of fully degreened fruit when stored at 7°C in CA or 1°C in air. There was no significant effect of CO₂ concentration on softening, but the highest incidence of rots and disorders was in fruit held in a CA with 10% CO₂. Chilling disorders were absent in fruit stored at 7°C, but present at up to 3-5% in fruit stored at 1°C. It is concluded that it is possible to store 'Hort16A' fruit at 7°C by using CA (1.6% CO₂ with 2% CO₂) to retard softening with no detrimental effects to fruit quality compared with that of fruit stored at 1°C in air. The potential benefits are a reduction in chilling disorders and energy use, plus for fruit that require degreening off the vine, greater firmness retention early in storage. To achieve energy savings, the production of respiratory heat at 7°C in CA should be comparable to the rate at 1°C in air. If so a difference in energy use of 35% is possible.