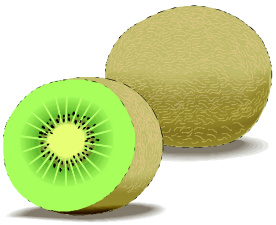
ORCHARD NOTES

KIWIFRUIT EDITION



The following is the introduction and abstract of a California Agriculture article by U.C. Postharvest Specialist, Carlos Crisosto. For a copy of the complete article, please call our office at 822-7515.

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KIWIFRUIT SIZE INFLUENCES SOFTENING RATE DURING STORAGE IN AIR AND IN CONTROLLED ATMOSPHERE CONDITIONS

Carlos H. Crisosto, David Garner and Katia Saez

Large (~101 g), medium (~93 g), and small (~81 g) 'Hayward' kiwifruits were stored in either ethylene-free air or in a controlled atmosphere (CA) of 5% C_O2 + 2% $_O2$ at 32ºF for 16 weeks. Under both storage conditions, large fruit had a slower rate of softening than smaller fruit. Air-stored kiwifruit softened approximately 2.6 times faster than CA-stored fruit. Under air conditions, large, medium and small kiwifruit reached 5.0 lbf (minimum firmness required for packaging with minimal bruising) by 12, 10, and eight weeks, respectively. Large, medium, and small kiwifruit stored under CA conditions softened to 5.0 lbf by 49, 30, and 20 weeks, respectively.

Any technology to reduce the cost of kiwifruit repackaging will increase profit to the growers and packers. Traditionally, kiwifruit is picked, sorted, sized, and packed immediately into various size containers. Generally, after 2-3 months storage, kiwifruit is repackaged to remove fruit infected with *Botrytis cineria.* In most cases, kiwifruit is packed into other size boxes to satisfy market conditions at that time. It is very difficult for the packers to predict the container/size combination that will be required by buyers 2-3 months after harvest. One approach to eliminate this repackaging cost is to store field-run kiwifruit in bins for up to three months before packaging in the final container. Short-term bin storage of up to 2-3 months will reduce packaging pressure, cooling time, ethylene contamination and repackaging costs. However, it has been demonstrated by Mitchell (1990) that kiwifruit is more susceptible to vibration damage which can occur during packaging and/or transportation when they soften below 5.0 lbf (pounds firmness). For this reason, we investigated the relationship between fruit size, storage atmosphere conditions, and the rate of softening.

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ADAPTING PERFORATED BOX LINERS TO THE CALIFORNIA KIWIFRUIT INDUSTRY

Paul Wiley, Carlos H. Crisosto and F. Gordon Mitchell

Abstract

The performance of California kiwifruit packed using solid liners, perforated liners, and micro-perforated liners on the rate of initial cooling time, water loss, and quality attributes after shipping was evaluated under controlled laboratory and commercial conditions. Controlled cooling tests using a portable cooling tunnel indicated an important cooling time reduction (reaching 7/8 cooling time) without affecting quality when perforated liners were used instead of solid ones. These vented box liners will result in direct energy savings to packinghouses proportional to the reduction in cooling times. Also, shorter cooling times will allow scheduling operations for the off-peak utility periods. Perforated liners allowed for some vapor exchange, and thus reduced problems associated with condensation in the package. Fruit quality attributes such as fruit firmness, soluble solids, and titratable acidity were not affected by any of the box liner treatments. Kiwifruit weight loss depended on the box liner vented area (VA). After 18 weeks at 0ºC kiwifruit packed in the solid (0.0% VA), perforated (.6% VA) and micro-perforated (1.2% VA) box liners had water losses of 0.7, 2.4 and 5.2%, respectively. Fruit shrivel was only observed on fruit packaged in the micro-perforated liners when water loss exceeded 4.0% in relation to the harvest fresh weight. In one of the two seasons, pitting incidence was measured on fruit from the micro-perforated box liner treatment.

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