

**Title** Effects of calcium content and calcium applications on softening of 'Hayward' kiwifruit  
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### **Abstract**

Despite the importance of calcium content and the effects of calcium applications in many fruit species, no clear relationship between fruit Ca content and early softening is established in kiwifruit. Diverse results have been reported with Ca applications in kiwifruit, particularly regarding fruit firmness. Thus, experiments were undertaken to define the influence of fruit Ca status and Ca applications on kiwifruit quality, with an emphasis on fruit softening in cold storage. Fruit samples from the major kiwifruit cultivation areas in Chile were analysed for Ca content in two seasons, and related to the time required for the fruit to soften to 18N when maintained at 0°C and 90% RH. Although the time to reach 18N varied widely, no significant relationship was established, suggesting that additional factors to Ca content are relevant in determining softening susceptibility. During two seasons Ca was applied to fruit by spraying vines (fruit), and by postharvest dipping. In 2003/2004, CaCl<sub>2</sub> was applied by spraying in 2 orchards at 0.8% commercial product (1700 ppm Ca), during fruit development (9 and 17 applications), or by one postharvest dip treatment with 2% of CaCl<sub>2</sub> (4250 ppm Ca). In vines sprayed 17 times, fruit Ca content was higher, and storage life 50–80% greater, than fruit from vines sprayed 9 times and in fruit from control vines. In 2004/2005, 600 ppm Ca was applied 4 times preharvest using 3 commercially-available sources (plus, one water-applied control). In a different experiment, the same sources of Ca at 2000 ppm were applied as postharvest dips. Preharvest Ca application produced phytotoxic effects on both leaves and fruit; postharvest applications did not produce any phytotoxicity but in both cases significantly increased storage life. Reducing the concentration and times of Ca applications (up to 4) in 2004/2005 eliminated phytotoxic effects, but the beneficial effects on fruit quality were reduced.