

Abstract

The cold storage life of lime (*Citrus latifolia*) fruit can be restricted by a number of factors including chilling injury, degreening (which impacts adversely on consumer acceptability of the product) and rots. The objective of this study was to investigate the effects of various postharvest treatments on quality changes in lime fruit. Controlled atmosphere storage (CA; reduced oxygen with 0 or 3% CO₂) was compared to regular air storage (RA) and intermittent warming (IW; varying durations) treatments across a range of temperatures. The impact of storage regime on nutritional retention in the fruit was also investigated. Lime fruit selected by weight and colour were harvested mid- and late-season from orchards in Northland. Mass loss, colour score, hue angle, compressive firmness, respiration rate and ethylene production were measured prior to and at various times up to 10 weeks during cool storage. The location, nature and extent of rots and chilling injury were also assessed and recorded. Chilling injury limited storage of fruit under all conditions at constant low temperatures. CA storage at 3% CO₂ delayed yellowing and gave better fruit quality than the low CO₂ treatment. High CO₂ CA treatments at 5 or 7°C significantly decreased the rate of colour change compared to other constant temperature treatments but did not protect against chilling injury. IW storage benefited fruit quality and provided the highest overall fruit quality of all postharvest treatments tested. These results confirm the potential of intermittent warming treatments to extend the high quality storage life of citrus fruits. Further optimisation of the storage regime for limes will be undertaken and will integrate the findings with respect to changes in nutritional quality.