Title The effect of the transition between controlled atmosphere and regular atmosphere storage on bulbs of onion cultivars SS1, Carlos and Renate

Author Gemma A. Chope, Leon A. Terry and Philip J. White

Citation Postharvest Biology and Technology, Volume 44, Issue 3, June 2007, Pages 228-239

Keywords Abscisic acid; *Allium cepa* L.; Non-structural carbohydrates; Respiration rate

Abstract

Controlled atmosphere storage (CA) is used to increase the storage life of onions; however detrimental effects on the shelf-life have been reported. The effect of the transition between CA (5 kPa CO_2, 3 kPa O_2) and air (and vice versa) on onion cvs. Renate, Carlos and SS1 in terms of the respiration rate, sprout growth, dry weight, firmness, pungency, total soluble solids, abscisic acid concentration and non-structural carbohydrate composition was assessed. Removal of bulbs from CA storage resulted in an immediate increase in the respiration rate (measured in air), which then reverted to a lower rate following subsequent storage under air conditions for 21 days. In some cultivars, this could be sufficient to trigger the onset of sprouting and thus account for the detrimental effect of CA storage on shelf-life. Delaying the start of CA storage of onions cv. SS1 for 21 days was as effective in suppressing sprout growth as CA storage for 42 days. Further investigation into the use of CA storage in this manner with relation to the optimum time to begin CA conditions could decrease the cost of CA storage without compromising storage life. Abscisic acid concentration has been associated with storage life of onions. There was a significant decrease in the bulb ABA concentration between the time of harvest and the beginning of storage. This is likely to be due to the effects of curing and suggests that current curing practices are having a detrimental effect on storage potential.