

Title Effect of controlled atmosphere storage on abscisic acid concentration and other biochemical attributes of onion bulbs

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Abstract

Onion bulbs (*Allium cepa* L.) of cultivars with long-, medium- and short-storage lives, viz. Renate, Ailsa Craig and SS1, respectively, were stored in controlled atmosphere (CA) conditions (3.03 kPa CO₂; 5.05 kPa O₂; 2 °C). Bulb abscisic acid (ABA) concentration, pyruvate, fructans, total soluble solids (TSS) and firmness were measured throughout storage.

In all cultivars, bulb ABA concentration declined exponentially during storage. The greatest decrease in ABA concentration occurred during the first 80 days of storage. Although the pattern of decline was similar for the long-, medium- and short-storing onion bulbs, onion cv. SS1 bulbs had the lowest initial ABA concentration. Onion bulb ABA concentration at harvest (measured on a fresh weight basis) may prove to be a better indicator of storage life. The ABA concentration at harvest (DW) may be indicative of a greater difference in sprouting during storage between cv. SS1 and the other cultivars than between cvs. Renate and Ailsa Craig.

It is hypothesised that the storage potential of bulbs of different onion cultivars is inversely related to the time at which they reach a minimal ABA content. Thus, the storage life of short-storing cultivars (e.g. cv. SS1) might be prolonged by slowing the decline in ABA concentration. This could help extend the period for supplying these onions from temperate regions. Onion bulbs of cvs. Renate, Ailsa Craig and SS1 were characterised by high, intermediate and low concentrations of pyruvate, fructan and total soluble solids, respectively.