

Packaging in the maintenance of postharvest keeping quality of 'Parthenon' broccoli during long term storage and subsequent shelf-life

T. de Beer, E.M. Crouch

Acta Horticulturae 1007: 65-72. 2013.

Abstract

Maintenance of broccoli quality during export from South Africa is often limited by the duration of the voyage. Storage of broccoli under optimal conditions will maintain product quality during exports for up to 3-4 weeks; however, the effect of long term storage on quality of shelf-life post storage is scarcely documented. Different types of polyethylene bags (PE), were thus assessed for their efficacy in maintaining postharvest keeping quality of broccoli (*Brassica oleracea* 'Parthenon') during long term storage and subsequent retail simulated shelf-life. Products were packaged in: a) 20 µm high density polyethylene (HDPE20) bags, b) modified atmosphere packaging specifically designed for the bulk storage of broccoli at 0°C (Xtend[®]) or c) loosely into crates without any packaging (control) and stored at 0°C for 35 days. Products were evaluated five times at 7 day intervals, at which time a sub-sample was placed under retail simulation at 10°C in order to determine maximal storage duration which would allow for quality retail sales of up to 3 days. Broccoli heads were evaluated for colour change (% yellowing and hue angle), weight loss and decay. Between 21-28 days during storage the control products had a significantly ($P < 0.05$) higher mean weight loss ranging from 11.37(±1.57) to 18.51(±1.76)% compared to Xtend[®] and HDPE20 treatments which maintained less than 1% weight loss throughout the 35 day storage period. In terms of yellowing percentage HDPE20 and Xtend[®] bags extended storability by more than 14 days, compared to controls which reached a cut-off point of 25% yellowing at 21 days. No incidence of decay was recorded throughout storage and shelf-life. Maximum storage duration, allowing 3 days quality retail sales at 10°C, for these three packaging types was 14 days and could be achieved when products were packaged in Xtend[®] MAP. The most limiting factor in storage duration was yellowing.