

Abstract

Broccoli (*Brassica oleracea* L., Group Italica cvs, 'Premium Crop' and 'Green Valiant') heads treated with calcium chloride (CaCl_2) solutions of 0, 1 and 2% as well as a nontreated sample, stored for 4 weeks at 0 and 5°C with 85-95% RH, were evaluated for the effect of the Ca treatment on physical, physiological, and histological changes within the stored broccoli.

Broccoli heads were sampled weekly to determine Ca effects on changes in tissue Ca content, respiratory CO_2 and ethylene evolution, dry matter loss, color change, texture, and cellular cohesion. Fresh weight loss and wilt were determined at the end of the storage period.

The Ca-treated broccoli showed higher tissue calcium, and depressed CO_2 and ethylene evolution. Less color change and wilt, weight loss, and dry matter loss, and firmer texture, were observed in the treated broccoli. Cellular cohesion was not affected by the Ca treatment.

Magnesium chloride (MgCl_2) treatments similar to the CaCl_2 experiment, were designed to determine whether the observed responses to the CaCl_2 experiment were a function of Ca or Cl. Rapid color change, greater fresh weight and dry matter losses, higher CO_2 , ethylene evolution, and wilt occurred with the MgCl_2 treatment. From the results it can be assumed that the broccoli quality maintenance was a function of Ca and not Cl, since replacing the Ca treatment with Mg, while retaining the Cl accelerated the processes that resulted in rapid loss of quality in the stored broccoli.

Ca treatment was beneficial in maintaining the fresh quality of the stored broccoli. Ca treatment depressed and delayed the physiological and physical changes that promote loss of freshness in the stored broccoli. Such responses were not observed with the Mg treatment.