

Title Technological strategies for assuring and maintaining the quality of minimally processed lettuce
(*Lactuca sativa* L.)

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Citation ISHS Acta Horticulturae 712: 483-490. 2006.

Keywords harvest quality; postharvest quality; nitrogen supply; ascorbic acid; fresh-cut

Abstract

Development of novel approaches for assuring the quality of vegetables depends on a better understanding of the influence of preharvest factors, vegetable physiology and other functional components as affected by storage and handling. The objectives of this research includes different aspects: a) to reduce nitrate accumulation in lettuce crop cultivated in hydroponic system, b) to determine the influence of type nitrogen application in a field lettuce crop on the quality of fresh cut produce according to sowing date and genotype used, and c) to evaluate different calcium treatments as a technology to enhance the storage life of the produce. Three experiments were conducted in the Horticultural Department. Lettuce hydroponic crop were made with two nitrate-limited modified nutrient solution (100 and 50% N reduction of initial nutrient solution). Lettuce crop managed under conventional production system was carried out in open field plot of 240 m² during fall-winter and spring, and the treatments were vermicompost (24 kg•ha⁻¹), 75 and 150 kg N•ha⁻¹ applied as urea. Calcium treatments were 0 and 9 me/L in the nutrient solution of soilless lettuce crop (perlite) and after harvest lettuce leaves were dipped in CaCl₂ 2%. Leaves were selected, washed, weighted, packed in multilayered polyolefin bags and stored. Samples were taken at harvest and every two days for measuring general overall visual quality, color, O₂ and CO₂ concentrations in the packages, nitrate and calcium concentration. Both nitrate-limited nutrient solutions in hydroponic system achieved more healthy fresh cut lettuce with lower nitrate accumulation. Nitrogen fertilization increased nitrate accumulation especially in fall-winter season independently the lettuce genotype. At present, no significant differences between calcium treatments were found.