

Title Effect of the exposure to static magnetic field on the ripening and senescence of tomato fruits

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Abstract

Tomato fruit is a climacteric produce sensitive to chilling injury, which limits the use of low temperatures to slow down its respiratory rate and increase its shelf life. Alternative methods must be developed to extend the storability. Exposure to a static magnetic field has been shown effectively to promote germination of seeds and to stimulate the growth of plant seedlings. The effect of a static magnetic field on ripening of tomato fruit was studied. Mature-green tomato fruit were exposed to a static magnetic field (2.5 mT) throughout the storage period at 16°C and 90% RH. Control fruits were stored in the same conditions but not exposed to magnetic field. Weight loss and color development were monitored every 3 days during storage. Lycopene was assayed every 6 days and concentration was determined using spectrophotometry (absorbance at 473 nm). Firmness of fruit was measured by performing a penetration test with a 5 mm cylindrical probe on tomato pericarp discs using a texture analyzer. Membrane permeability was assessed by ion leakage (conductivity of tomato pericarp discs in isotonic mannitol solution). No significant difference was observed in color change and weight loss between control and magnetic field exposed fruits. Lycopene concentration, firmness and membrane permeability were also not different between control and exposed fruits. Magnetic field, at the low doses used in these experiments, did not influence ripening of tomato fruit during storage at 16°C. It was concluded that a higher intensity of magnetic field may be necessary to have an impact on the ripening behavior of tomatoes.