

Title Effects of chilling temperatures on ethylene binding by banana fruit
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Abstract

Banana fruit are highly susceptible to chilling injury during low temperature storage. Experiments were conducted to compare ethylene binding during storage at chilling (3 and 8 °C) versus optimum (13 °C) temperatures. The skins of fruit stored at 3 and 8 °C gradually darkened as storage duration increased. This chilling effect was reflected in increasing membrane permeability as shown by increased relative electrolyte leakage from skin tissue. In contrast, banana fruit stored for 8 days at 13 °C showed no chilling injury symptoms. Exposure of banana fruit to the ethylene binding inhibitor 1-methylcyclopropene (1 *ml l*⁻¹ 1-MCP) prevented ripening. However, this treatment also enhanced the chilling injury accelerated the occurrence of chilling injury-associated increased membrane permeability. ¹⁴C-ethylene release assay showed that ethylene binding by banana fruit stored at low temperature decreased with reduced storage temperature and/or prolonged storage time. Fruit exposed to 1-MCP for 12 h and then stored at 3 or 8 °C exhibited lower ethylene binding than those stored at 13 °C. Thus, chilling injury of banana fruit stored at low temperature is associated with a decrease in ethylene binding. The ability of tissue to respond to ethylene is evidently reduced, thereby resulting in failure to ripen.