

**Title** Ethanol vapor and saprophytic yeast treatments reduce decay and maintain quality of intact and fresh-cut sweet cherries

**Author** Jinhe Bai, Anne Plotto, Robert Spotts and Nithiya Rattanapanone

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### Abstract

The objective of this study was to evaluate the use of an ethanol vapor release pad and a saprophytic yeast *Cryptococcus infirmo-miniatum* (CIM) to reduce decay and maintain postharvest quality of intact or fresh-cut sweet cherries (*Prunus avium*) cv. Lapins and Bing. Intact or fresh-cut fruit were packed in perforated clamshells (capacity 454 g) and stored at 1, 10 or 20 °C for up to 21, 14 and 8 d, respectively. For ethanol treatment, a pad made with silica gel powder containing 10 g ethanol and covered with perforated film, which allows ethanol vapor to diffuse gradually, was attached to the upper lid of the clamshells. Ethanol treatment caused accumulation of ethanol in the packaging headspace, about 10  $\mu\text{L L}^{-1}$  with little change within 14 d at 1 °C, 23  $\mu\text{L L}^{-1}$  at d 1 and decreased to 15  $\mu\text{L L}^{-1}$  at d 10 at 10 °C, and 26  $\mu\text{L L}^{-1}$  at d 1 and decreased to 13  $\mu\text{L L}^{-1}$  at d 3 at 20 °C. Ethanol content in fruit was less than 9  $\text{mg kg}^{-1}$  in all the control fruit, and increased to 16, 34 and 43  $\text{mg kg}^{-1}$  in ethanol-treated fruit at 1, 10 and 20 °C, respectively. Nonetheless, a sensory taste panel did not perceive any flavor difference from the ethanol treatment. The ethanol treatment retarded softening, darkening, and acid decrease in fruit as well as discoloration of the stems, and extended shelf-life of intact cherries. Ethanol reduced brown rot (*Monilinia fructicola*) in fresh-cut cherries stored at 20 °C, but not at 1 and 10 °C. A pre-packaging dip in CIM completely controlled brown rot in inoculated fresh-cut cherries stored at 1 °C, and in naturally infected cherries at 20 °C.