

Title Disinfestations of the oriental tobacco budworm in green hot pepper by ultra high carbon dioxide: Implications for postharvest fruit quality

Author Kim K.W., Bae R.N. and Lee S.K.

Citation Journal of Plant Biology, 51(3) p. 180-185, 2008.

Keywords *Helicoverpa assulta*; Postharvest quality

Abstract

To develop environmentally amenable insect disinfestations, effects of a carbon dioxide (CO₂) controlled atmosphere (CA) on the control of the oriental tobacco budworm *Helicoverpa assulta* were investigated in green hot peppers. Green hot peppers (cv. Nokgwang) were exposed to CO₂ at 80% and 100% in 0.08-mm polyethylene film bags for 24 and 48 h at 20°C. Mortality percentages of oriental tobacco budworm larvae were determined after gas exposure. The CO₂-CA at both concentrations for 24 h greatly reduced survival of the larvae, showing approximately 65% mortality when compared with control fruit. Prolonged exposure at both concentrations up to 48 h completely disinfested the larvae. To evaluate plausible deleterious effects of the ultra high CO₂-CA on green hot peppers, the fruit were stored at 10°C, and postharvest quality was analyzed in terms of firmness, electrolyte leakage, respiration rate, and content of vitamin C and capsaicin. There were no significant differences in postharvest fruit quality up to 20 days of storage, compared with control fruit. Meanwhile, respiration rates of exposed pepper fruit were approximately half the control's rate after 20 days of storage. These results suggested that ultra high CO₂-CA could disinfest *H. assulta* without significant differences in postharvest quality of green hot peppers, compared with control fruit. Exposure of 80% CO₂ for 24 h would be recommended as a reliable control means that is harmless to humans and can alleviate concern regarding pesticide residues.