

Title Semi-commercial ultralow oxygen treatment for control of western flower thrips, *Frankliniella occidentalis* (Thysanoptera: Thripidae), on harvested iceberg lettuce

Author Yong-Biao Liu

Citation Postharvest Biology and Technology, Volume 59, Issue 2, February 2011, Pages 138-142

Keywords Controlled atmosphere; Ultralow oxygen; Postharvest pest control; Lettuce; Western flower thrips

Abstract

Pallet-scale ultralow oxygen (ULO) treatment was applied to iceberg lettuce after various lengths of postharvest storage to determine the effects of pre-treatment storage on lettuce tolerance to ULO treatment for control of western flower thrips, *Frankliniella occidentalis* (Pergande) (Thysanoptera: Thripidae). Lettuce from seven cultivars was vacuum cooled and stored at 2 °C after harvest for 0, 2, 3, and 5 d before being subjected to 2-d ULO treatment with 0.003% oxygen at 10 °C ambient temperature. Complete control of thrips was achieved in all three tests. Temperature of lettuce increased from about 5 °C at the start of ULO treatment to 9.6 °C at the end of the treatment. Fresh vacuum-cooled lettuce from three of seven cultivars sustained injury to heartleaves by the ULO treatment. Lettuce that had been stored at the low temperature for 2, 3, or 5 d before the ULO treatment tolerated the ULO treatment and there was no significant quality reduction compared with untreated controls. Heavier heads were significantly more susceptible to heartleaf injury than lighter heads. This study demonstrated that 2-d postharvest refrigerated storage followed by 2-d ULO treatment was effective in controlling western flower thrips with minimal adverse effects on lettuce quality. The ULO treatment protocols developed in this study also have potential to be scaled-up for commercial ULO treatment applications.