

Title Effect of radio frequency heating as a potential quarantine treatment on the quality of 'Bing' sweet cherry fruit and mortality of codling moth larvae

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Abstract

'Bing' sweet cherry (*Prunus avium* L.) fruit quality and fifth-instar codling moth (*Cydia pomonella* [L.]) mortality were evaluated after radio frequency (RF) heating. The fruit were heated with radio frequency energy to four target temperatures (50, 52, 53 and 54 °C), held in the RF-heated water for various holding times from 0.5 to 6 min, and stored under simulated air or sea shipment conditions (5 °C for 24 h or 0 °C for 2 weeks, respectively) before quality evaluation. There was no significant effect on cherry color, decay or shrivel, and RF had only a slight effect on berry browning. Regardless of shipment, stem browning and berry pitting were affected by RF-heating. Cherry quality was most affected when fruit were treated with RF and stored to simulate sea shipment. Heating the fruit to 53 or 54 °C assured 100% codling moth larval mortality. Treatments that may provide quarantine security include heating fruit to 52 °C and holding for 4 min, 53 °C for 1.5 min or 54 °C for 1 min, but quality of the cherries following these treatments was only acceptable when fruit were stored to simulate air shipment.