

Title Combining radio frequency heating and cool storage to disinfest cherries against Queensland fruit fly

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Abstract

Queensland fruit fly (QFF) is Australia's most serious horticultural pest, affecting access to export markets as well as domestic trade. Increasing restrictions on use of chemicals and the extended time required for cold disinfestation means that alternative quarantine treatments are needed urgently. Insecticidal heat treatments are fast, leave no residues and can be tolerated by some products. Radio frequencies (RF) can heat quickly and evenly, so could potentially be incorporated into normal packing operations. A small RF test unit developed by Kearn Holdem, New Zealand was optimised for cherries. The effects of heating on mortality of QFF eggs and larvae in infested fruit was evaluated, along with the effects on quality of whole fruit. Unfortunately, none of the RF treatments tested (37-60C) resulted in 100% mortality of QFF. Extrapolation of the data suggests that cherries would need to be heated to at least 70C to achieve this target. However, mortality was greatly increased when infested fruit were stored at 0.5C for 5 days following RF treatment. Under these conditions 60C was enough to result in 100% mortality. The main injuries to fruit were stem browning and fruit softening, particularly at treatment temperatures >50C. However, cherries remained acceptable following RF treatment to 60C, 5 days storage at 0.5C and 1 day at 20C (as could occur during normal transport and marketing). The combination of heat treatment and cold storage resulted in higher mortality of QFF than either treatment alone and could be further developed as a quarantine treatment for Australian cherries.