

Title Short term high CO₂ in Combination with 0°C as a potential disinfestation treatment for Queensland Fruit Fly (*Bactrocera Tryoni* (Froggatt))

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Abstract

Queensland Fruit Fly *Bactrocera tryoni* (Froggatt) (QFF) is a major quarantine pest for many Australian summer fruit and cherry producers, particularly as treatment to combat infestation can often affect fruit quality, restrict marketing flexibility and affect grower returns. The current cold disinfestation treatment (in air) for 14 days is too long and inflexible, as the storage and shelf life of summerfruit and cherries are often less than 28 days. This project examined the potential of a high carbon dioxide (CO₂) treatment in combination with cold storage to reduce the time in cold disinfestation. A range of different peach, nectarine and cherry varieties was infested with QFF and the fruit were treated with 95% CO₂ at 0°C for varying lengths of time before storage in air. To examine if high CO₂ had any effects on fruit quality, storage trials were conducted on a range of yellow and white flesh peaches, nectarines, plums, pluots and cherries. The results showed that a 95% O₂ treatment at the beginning of the cold disinfestation period significantly reduced the time to kill first instar QFF. It is important that any potential disinfestation treatment does not affect fruit quality. Storage trials showed that there were no adverse effects of the high CO₂ treatment on fruit quality across a range of treatment times (one to three days high CO₂), varieties (Diamond Bright, Spring Bright nectarines, Summerfresh, Snow King, peaches, Tegan Blue plums, Flavor Heart® pluots and Bing, Lapin, Rons and Stella cherries) with different removals. The results demonstrated that a short term high CO₂ treatment at 0°C temperature was effective in reducing the time in cold disinfestation without detriment to fruit quality during storage.