



Market Access Research

Hort Connections
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Queensland
Government



Why do market access research?

1. Increase international and domestic horticulture **market access**
2. Reduce the impact of **endemic fruit flies** on sustainable horticulture crop production
3. Improve **business continuity** with informed preparedness for incursions of exotic fruit flies
4. Facilitate a national, industry-driven and **coordinated approach** to market access and fruit fly research activity
5. Maintain and increase research **capacity** for continued support of horticultural exports



DAF 20 year track record!

- **Vapour Heat Treatment of mango to China**
- **Vapour Heat Treatment of mango to Korea**
- **Vapour Heat Treatment of mango to Japan**
- Cold treatment of Citrus to China (1°C)
- Cold treatment of Citrus to Korea (1°C)
- Cold treatment of Citrus to Japan (1°C)
- Cold treatment of Citrus to United States (1°C)
- Cold treatment of Stonefruit to China
- Cold treatment of Stonefruit to United States
- Fumigation of Peaches to China
- Fumigation of Peaches to United States
- Fumigation of Nectarines to China
- Fumigation of Nectarines to United States
- Systems approach for capsicum to New Zealand
- Fumigation of capsicum to New Zealand
- Dimethoate treatment for melons to New Zealand*
- Dimethoate for tomato to New Zealand*
- Dimethoate for capsicum to New Zealand*
- **Irradiation of mango to United States**
- **Irradiation of mango to New Zealand**
- Irradiation of lychee to United States
- Irradiation of lychee to New Zealand
- Irradiation of tomato to New Zealand
- Irradiation of capsicum to New Zealand
- Irradiation of grapes to New Zealand



Current work program

1. MT14052 Essential Market Access Data Packages (Hort Innovation)
2. BB19001 Additional cold treatment schedule for Queensland Fruit Fly in Blueberries for market access to China (Hort Innovation)
3. FF1900 Sex determination of fruit fly pupa using Near Infrared Spectroscopy* (Hort Innovation)
4. Phenology, demography and distribution of Australia's fruit flies (DAWE)
5. Efficacy data to support methyl bromide disinfestation treatments against fruit flies (DAWE)
6. Development of area wide management approached for fruit flies in mango for Indonesia, Philippines, Australia and the Asia Pacific Region (ACIAR)
7. Technical Cooperation Project in the Asia and Pacific promoting Food Irradiation by Electron Beam and X-Ray Technology to Enhance Food Safety, Security and Trade (IAEA)
8. Irradiation Technology for Phytosanitary Treatment of Food Commodities and Promotion of Trade (IAEA)

Research & Confidentiality

- Projects often confidential
- Difficulties in communicating
- Data not provided
- Data report/packages to DAWE

Low-dose methyl bromide fumigation as a quarantine disinfestation treatment for nectarines against Queensland fruit fly (*Diptera: Tephritidae*)

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Abstract

White nectarines (*Prunus persica* var. *auriprurina*) were fumigated with methyl bromide (MB) at a nominal treatment dose of 18 g m⁻³ at 18°C for 5 h and 30 min as a quarantine disinfestation treatment against *Bactrocera tryoni*, the Queensland fruit fly. Three large scale trials were conducted against each of the four immature life stages, eggs and first, second and third instars. There were no survivors from the estimated 43,614 eggs, 41,873 first instars, 41,345 second instars and 33,549 third instars treated, thereby resulting in an efficacy of >99.99% mortality at the 95% confidence level for each life stage. Of the 12 trials reported herein, the highest concentration of MB, sampled from the chamber headspace analyzed by gas chromatography, was 18.7 g m⁻³. The maximum chamber temperature from 5 min readings was 19.7°C and the maximum fruit core temperature was 19.5°C. The treatment time for all trials was exactly 5.5 h. Thus the recommended treatment dose to disinfest nectarines from *B. tryoni* is 19.0 g m⁻³ MB at 20.0°C for 5.5 h. Fruit quality trials were conducted on white nectarines at three combinations of treatment parameters: 15 g m⁻³ MB at 19°C for 5.25 h; 18 g m⁻³ MB at 19°C for 5.5 h and 21 g m⁻³ MB at 19°C for 5.5 h. The fruit were stored at 0, 4 and 8 days at 4°C and 8 days at 4°C followed by 4 d at 22°C. They were then assessed for skin colour, flesh colour, skin defects, flesh defects, fruit weight loss, flesh firmness, total soluble solids, titratable acidity and rots. There was no significant difference between untreated control and MB treated fruits in any of the parameters measured. Thus the treatments did not have adverse effects on fruit quality.

Keywords: *Bactrocera tryoni*; fruit quality; export; *Prunus persica* var. *auriprurina*

INTRODUCTION

Australian-grown nectarines are a host to Queensland fruit fly, *Bactrocera tryoni* (Froggatt). Thus they are required to undergo a disinfestation treatment against fruit flies before they can be exported to markets with quarantine barriers against this pest. Current protocols for nectarines utilizing cold disinfestation with treatment durations of 12-22 days restrict exporters to using sea freight. Quarantine protocols incorporating air freight are required to effectively target market opportunities in Asia, especially during peak demand. Fumigation treatments can be combined with air freight and have the additional advantages of being easy and relatively inexpensive to apply. Methyl bromide (MB) is currently the predominant fumigant for phytosanitary purposes. It is used for disinfestation of many fruits and vegetables (Heather and Hallman, 2008). Methyl bromide was identified as a stratospheric ozone depleting chemical however, quarantine and pre-shipment (QPS) applications are exempt from the general ban (Johnson et al., 2012). Commercially available recapture systems for MB offer fumigation within sealed chamber without the loss of the fumigant to the atmosphere.

Current fumigations schedules for phytosanitary treatments for fresh fruit and

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Market Access Team

- National and international collaborations
- Multiple commodities, multiple flies
- Novel approaches
- Multiple funding sources



daf.qld.gov.au/business-priorities/agriculture/rde/market-access-team



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