

# Securing our overseas markets: citrus, summer fruits and cherries into Taiwan - a case study

October 2009



*Nectarines are known to be a host to Queensland fruit fly.*

## Background

In January 2006, the Taiwan Bureau of Animal and Plant Health Inspection and Quarantine (BAPHIQ) excluded entry for all Australian fresh produce known to be a host to the Queensland fruit fly (Qfly).

Until then Taiwan was an important export market for Australian fruit, receiving around \$30 million of product annually, so this decision cost Australian growers millions of dollars in lost trade.

Using cold to disinfest fruit has the advantage that it does not use toxic fumigants, can potentially be conducted during sea freight, and is relatively low cost.

Researchers at Industry & Investment NSW (I&I NSW) conducted trials during 2007 – 2008 to demonstrate that 12 or more days storage at 1 – 3°C could kill all life stages of Queensland fruit fly. These treatment protocols were submitted to the Taiwanese authorities (BAPHIQ) in order to regain access to this valuable market.

While the Taiwanese accepted the results in principle, they requested that verification trials be conducted in the presence of a BAPHIQ inspector, to confirm the results.

## Verification trials

Verification trials were conducted at the I&I NSW Qfly research laboratory at Gosford. The citrus trial during July-August 2008 was designed to demonstrate that 20 days at 3°C kills Qfly larvae in oranges.

Trials during December-January aimed to show that a less severe treatment of 14 days at 3°C kills Qfly larvae in nectarines, cherries and plums.

To conduct the trials, fruit were placed on the Qfly cages so that the flies could lay eggs directly into the flesh. The eggs were allowed to hatch and develop to the most cold tolerant stage of their life cycle. For citrus, nectarines and cherries this had previously been shown to be 1<sup>st</sup> instar (young larvae) while 3<sup>rd</sup> instars (mature larvae) were the most cold tolerant in plums.

Control fruit (20% of the total batch) were then incubated at 26°C and pupae were removed and counted. This allowed us to estimate how many flies would have survived in the fruit without any treatment. The remaining fruit were stacked randomly inside a cold room loaded to >35% capacity and set at 3°C. Temperature was monitored using probes inserted into fruit at different positions around the room.



*Industry & Investment NSW Researcher Katina Lindhout infesting oranges*

At the end of the required disinfestation time (20 or 14 days) the fruit were taken out of the coolroom and allowed to warm to 20°C. Samples of fruit were cut open and examined for signs of larval feeding or survivors. In the case of citrus, 300 fruit were cut open and examined. Other fruit were crushed through a series of sieves to remove larvae from the fruit flesh. These were then examined under the microscope.



*The BAPHIQ inspector checks cherries for live Qfly larvae*

### **Outcomes**

No live Qfly larvae were found in any of the cold-treated fruit. Based on the numbers of pupae recovered from control fruit, this meant that 64,700 (oranges), 79,700 (nectarines), 12,600 (cherries) and 12,800 (plums) insects were treated with no survivors. This confirmed previous research that cold treatment would be a suitable control method.



*Dead larvae in nectarine*

The BAPHIQ inspectors were satisfied that the trials were conducted properly and enough insects were treated to provide confidence in the data. The results from the citrus trial have already been accepted, enabling Australian growers access Taiwan using in-transit cold storage at up to 3°C.

Biosecurity Australia and quarantine officials in Taiwan are now meeting to discuss the results from the stonefruit and cherry trials (14<sup>th</sup> July 2009). If this meeting is successful, trade may be re-opened in time for the 2009 season. This will be a major boost to Australian stonefruit and cherry growers, who will once again be able to send their fruit to this valuable export market.

Data from these trials has also been submitted to authorities in the USA. The work conducted by I&I NSW researchers could be the key which gains access for Australian cherries into this potentially multimillion dollar market - cherries for Thanksgiving anyone?

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