

What works for Medfly, works for marula fly



A study recently proved that the disinfestation treatment for Medfly works equally well for another fruit fly species.

SOME OF SOUTH AFRICA'S FRUIT export markets require disinfestation treatments to ensure that fruit being traded are fruit fly free. Disinfestation treatments that are developed are then adopted through bilateral agreements between exporting and importing countries. Such treatments are either specific to fruit fly species that are considered of quarantine importance in the importing countries, or are coincidentally also effective for other fruit fly species.

Many of the currently adopted cold disinfestation treatments target Medfly.

Another fruit fly species that occurs in parts of South Africa and is associated with some fruit types, although citrus fruit is not a host, is the marula fly (*Ceratitidis cosyra*). The efficacy of the existing cold disinfestation treatment for Medfly was accordingly determined for marula fly.

The study was led by Dr Aruna Manrakhan, from Citrus Research International (CRI), with financial support from the Citrus Growers' Association and the Postharvest Innovation Programme.



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Study design

As their benchmark, the researchers selected an existing Medfly cold disinfestation schedule of at or below 1.11°C for 14 days.

The project set out to:

- Compare the in-vitro cold tolerance of Medfly and marula fly.
- Determine the treatment conditions for complete mortality of the third larval stage of marula fly at approximately 1°C for 14 days.
- Confirm the treatment schedule at 1°C for 14 days for disinfestation of marula fly through large-scale tests.

PROJECT INFORMATION

Project title: Development of new cold disinfestation treatments for fruit fly pests on citrus

Principal investigator: Dr Aruna Manrakhan

Duration: 01/04/2019 - 31/03/2021

PHI Programme and Industry

Contributions: R86 950 and R86 950

Lead institutions: Citrus Research International

Beneficiary: The South African citrus industry

Human resource development: 1 MSc student

Focus area: Market access, quarantine, post-harvest disinfestation, fruit flies

Findings and results

In terms of the first objective, the study found that Medfly larvae are more cold-tolerant than those of the marula fly. This tied in with the existing knowledge that disinfestation treatments that are effective against Medfly are equally (or more) effective against other fruit fly species of concern on South African fruit.

Experiments to achieve the second objective found that no third-instar marula fly larvae survived beyond 11 days of cold treatment at 1°C. Based on the observed mortality rates, the researchers estimated that 11.27 days of cold exposure would be adequate to achieve 99% mortality.

In the large-scale confirmation tests, none of the 18 437 third-instar marula fly larvae that were treated at the lowest mean temperature of 1.25°C for 14 days survived.

This research showed that larvae of the marula fly will be killed by a cold treatment at or below 1.11°C for 14 days that is used for Medfly. ❤️