

January 30, 2020

Caffeine linked to rapid testicle growth, stronger sex drive in male fruit flies

In their quest to create the 'ultimate sterile male fruit fly' to attract wild females and curb a pest that is costing Australian farmers up to \$300 million in lost markets each year, scientists have turned to caffeine.

A recent study, conducted by Macquarie University through the Hort Innovation-driven [SITPlus initiative](#), has revealed that male Queensland Fruit Flies (Q-fly) reach sexual maturation faster after consuming caffeine supplements, partially due to a rapid increase in reproductive organ size.

Researchers also found that caffeine fed Q-flies become sexually active in 6-8 days while normal Q-flies take 10-12 days. The flies were also keen to mate for a longer period before losing interest.

Researcher Saleh Mohammad Adnan said the finding has the potential to make sterile insect technique (SIT) that focusses on QLD Fruit Flies even more effective.

"The whole idea of sterile insect technique is to breed an 'alpha' Q-fly that is sterile, and these are then released into the wild to attempt to procreate with wild pest females," he said. "Which, in turn, leads to population wide reproductive failure."

"Once the females mate with the sterile males, they live out the rest of their short lives happily, thinking they have done their innate reproductive duty."

Mr Adnan said researchers had bred a male Q-fly that is attractive to discerning female flies as part of the SITPlus program, and these new findings have the potential to make these sterile flies even more formidable.

"We have found that when we release sterile Q-flies from planes or ground vehicles to go and do their work with native females, some died before they could reach the age of sexual activity," he said.

"Supplementing their diet with caffeine may just address that issue by accelerating development."

In Australia, Q-fly presents a costly challenge to Australia's \$13.2 billion horticulture industry, affecting a wide range of fruit and vegetable crops.

The SITplus initiative has proven to be an important tool in reducing the impact of Queensland fruit fly reducing the reliance on more traditional approaches such as insecticide. SIT is a sustainable technology that is growing rapidly in favour given it has no impact on other species.

SIT has been used globally to combat some of the most damaging fruit fly species, including Mediterranean Fruit Fly, and a variety of other fruit fly species.

Detailed findings relating to Mr Adnan's work are currently undergoing a peer review process in a high-impact entomology journal.

This research has been delivered as part of the \$60 million SITPlus collaboration, developed by Hort Innovation, with co-investment from various universities, State Government agencies and contributions from the Australian Government. Mr Adnan was supported by a Macquarie University Research Excellence Scholarship.

Media contact: Hort Innovation Media and Public Affairs Manager Kelly Vorst-Parkes at kelly.vorst-parkes@horticulture.com.au or 0427 142 537.

