



HINKLER AGTECH INITIATIVE

Fruit Fly Trapping and Forecasting Technology

INTRODUCTION

This trial was undertaken as part of CQUniversity's Hinkler AgTech Initiative. The Initiative aimed to increase the productivity and profitability of the Bundaberg region's agricultural sector through greater availability and utilisation of agricultural technology (AgTech). An extensive consultative process undertaken with agribusinesses identified on-farm needs that may be addressed using AgTech. Trials of selected AgTech products and services were then undertaken in partnership with agribusinesses and technology providers to determine the technologies' efficacy in on-farm conditions. This summary provides an overview of findings from one of the technology trials, including grower feedback and considerations for other growers when deciding whether to utilise the technology in their own enterprise.

Background

Queensland fruit fly (*Bactrocera tryoni*) is a significant pest affecting many Queensland horticulturalists. Management of fruit fly populations is usually based on regular monitoring of crops to detect early signs of infestation, followed by either chemical or biological controls. However, the overuse of chemical insecticides can lead to pesticide resistance in fruit fly populations and also cause harm to non-target insects. While these methods can be effective in managing fruit fly populations, integrated pest management (IPM) strategies that combine multiple methods are often necessary to achieve long-term control.

The Technology

'RapidFLY' by RapidAIM is a smart pest trapping system that detects fruit flies and delivers real-time pest information. The system consists of a portable, battery-powered trap that uses pheromone-based lures to attract insects and low powered sensors to detect and count insects such as fruit fly from their characteristic movements. The sensors send data to the Cloud via radio signal, providing growers with real-time data flow of the pests on their farms and regions through a linked mobile app. The RapidFLY system is scalable from individual traps to entire orchard or regional networks.

The Trial

This trial involved two phases aimed at assessing the efficacy of the RapidFLY system in commercial avocado and chilli crops in the Bundaberg region. For phase one of the trial, 11 RapidFLY traps were placed in an avocado crop and 19 in a chilli crop. The grower also collected data from manual fruit fly traps with Qlure-infused wicks, sited within 100m of each RapidAIM trap where environmental conditions were expected to be similar. As an additional ground truthing exercise, the grower manually counted insects trapped in 6 RapidFLY traps (3 traps each in avocado and chilli crops) to compare with numbers automatically recorded by the traps. This first phase was aimed at assessing the accuracy of the system for counting insect numbers. Pending the successful outcome of this phase, the grower then progressed to phase two of the trial aimed at assessing fruit fly behaviour patterns. This phase focused on data collected daily at sunrise and sunset and was combined with other data such as rainfall and temperature.

RESULTS

During phase one of the trial, the grower detected no significant differences between fruit fly numbers detected by the RapidFLY traps and the manual traps.





There were also no significant differences between automatically recorded and manually counted pest numbers in the six ‘ground truthed’ traps. Based on this success, the grower proceeded to Phase 2 of the trial and began utilising the RapidFLY trap data to identify fruit fly behaviour patterns.

Phase 2 identified significant behavioural patterns in fruit flies, which the grower was able to be incorporated into their IPM strategy. For example, the data indicated that male fruit flies tend to come into crops first and the female flies tend to come later. This finding was important because the primary pest for the grower is the egg-laying female fly. When high numbers of female flies were detected in the RapidAIM traps, the grower had enough reaction time to intensify management strategies and control the crop damage.

Since the trial, the grower continues to deploy the RapidAIM system, with fewer traps than trialed, in their avocado and chilli operations. They also noted their satisfaction with the level of technical and maintenance support provided by RapidAIM, during and since the trial.

Value to Business

The greatest value to the grower identified in this trial is the increased crop productivity and efficiency in control measures gained through prompt identification of fruit fly outbreaks and timely deployment of control measures.

Another direct value to the grower is the labour and associated cost savings achieved through the elimination of manual fruit fly scouting. Prior to deploying the RapidAIM system, the grower expended approximately 8 labour hours a week conducting intensive fruit fly scouting. Given the current labour shortage, sourcing reliable, skilled labour to undertake this task is not always possible. The grower estimated that deployment of the RapidAIM system reduced their fruit fly scouting cost by approximately 35% - 40%.

The price structure for deployment of the RapidAIM system is based on a per season leasing structure. For Queensland fruit fly, the cost is \$360 per sensor* for one season and includes unlimited access to the RapidAIM mobile app, real-time detection and alerts, and weekly data summary reports.

Grower Feedback

Trial Summary Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I see value in this technology				✓	
I found the technology easy to use				✓	
The technology was easy to integrate within my business				✓	
I was satisfied with the service provided by the AgTech company					✓
I intend using this technology in my business				✓	
I recommend this technology to other growers				✓	

Other Considerations

Correct siting and positioning of the RapidFLY traps are critical to their effectiveness. It is important that traps are hung in trees that are at least 10m away from buildings, e.g., packing sheds, as these can interfere with the trap signal. Poor on-farm mobile connectivity may also affect trap performance. The trap funnel openings that allow entry of insects to the sensing surface are very sensitive and it is important that these openings are kept as free as possible from leaves and branches. The manufacturer recommends pruning around the area in which the trap will be sited.

Further Information



For further information on this trial and results, email CQUniversity’s agricultural research team:
agriculture@cqu.edu.au

For further details on RapidAIM products and services, visit:
rapidaim.io

Summaries of other technology trials undertaken through the Hinkler AgTech Initiative are available at:
bundabergagtechhub.com.au

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