FRUITION® NOVA®

The Revolutionary Lure & Trap for a Range of Fruit Flies

The Only Traps Effective Against Egg-Laying Female Fruit Flies

Fruition® Traps were introduced into the Australian market in 2016 for monitoring and managing Queensland fruit flies (QFF) in susceptible crops. New Fruition Nova® Traps attract and trap all of the key pest fruit fly species in Australia. Fruition Nova Traps consist of a unique lure attached to two yellow interlocking, adhesive-coated discs which attract and trap fruit flies. The combination of specific disc colour, shape, and size is particularly attractive to all of the pest fruit flies which are economic pests of Australian crops. The lure in Fruition Nova Traps, developed by the International Centre for Management of Pest Fruit Flies at Griffith University, is designed to mimic the odour of ripe fruits to attract mature, egg-laying female fruit flies.

Fruition Nova Trap placed in a pumpkin crop, showing cucumber fly (*B. cucumis*) on the trap surface (photo courtesy of S. Sheppard)

Losses caused by Pest Fruit Flies

In Australia, economic losses due to fruit fly infestation have been estimated as high as $100 million per annum. Crop losses due to fruit fly infestation can be as high as 80%. Adult fruit flies lay their eggs under the skin of ripening host fruits. When the eggs hatch, larvae feed in the flesh of the fruit, causing direct damage which results in fruit decay and fruit drop. In some crops, such as passionfruit, the larvae do not successfully establish in the fruit. Instead, a hard callus forms around the oviposition site, making the fruit unsaleable or considerably reducing the market price of the fruit.

Fruition Nova Traps Attract and Trap Key Pest Fruit Fly Species

Fruition Nova Traps are unique in that they attract and trap all of the important pest fruit flies in Australia: Queensland fruit fly (*Bactrocera tryoni*), Lesser Queensland fruit fly (*Bactrocera neohumeralis*), Jarvis' fruit fly (*Bactrocera jarvisi*), Mediterranean fruit fly (*Ceratitis capitata*), cucumber fly (*Bactrocera cucumis*), and the Island fly (*Dirioxa pornia*).

Unique Mode of Action

Fruition Nova Traps are the only traps available which attract and trap egg-laying female pest fruit flies, and this is the only segment of the fruit fly population which has the potential to cause crop damage. Extensive field trials show that approximately 70% of trap catches are egg-laying female fruit flies. Fruition Nova Traps can attract fruit flies over a distance of 30–50 metres and are effective for up to 12 weeks.

Use in an IPM Program

When Fruition Nova Traps are used in a full IPM program for management of pest fruit flies, they are effective in managing fruit fly populations and reducing crop damage.

An ideal IPM program for the management of pest fruit flies includes:

- Orchard hygiene (removal and destruction of infested and fallen fruit)
- Use of Fruition Nova Traps to monitor changes in pest fruit fly populations
- Trapping of pest fruit fly populations using Fruition Nova Traps
- A weekly protein bait spray program using Fruition Natflav® 500 protein bait combined with an approved insecticide
- Use of insecticide cover sprays (where allowed) when required
- Post-harvest tree spraying and removal of unharvested fruit

Innovation. Quality. Solutions.

FRUITION® NOVA®

Fruit Fly Control Strategies

Populations of fruit flies can be classified into four segments: immature females, immature males, mature females and mature males.

Immature female and immature male fruit flies emerge after pupating in the soil. They need to feed on protein to progress to sexual maturity and to mate successfully.

Mature females, having progressed to sexual maturity and successfully mated, seek a suitable host fruit in which to lay their eggs. Generally, mature female fruit flies are not attracted to protein baits because they no longer need to feed on protein. **This is the only segment of the fruit fly population which is capable of damaging fruit, and Fruition Nova Traps are the only traps which selectively attract this segment of the population.**

Mature males are not attracted to protein traps or protein baits. Mature male QFF and lesser QFF are attracted from up to 400 metres away to cue-lure traps which are used to monitor populations of these male fruit flies in crops. Cue-lure traps do not reduce fruit fly damage unless they are used at very high densities in a strict Area Wide Management Program. However, cucumber fly (*B. cucumis*) and Jarvis' fruit fly (*B. jarvisi*) are not strongly attracted to cue-lure, so these male lure traps are ineffective in monitoring or trapping programs targeted at these species or where these species are present in the general population.

Fruit fly damage on persimmon (photo courtesy of G. Hardwick); and pear, showing QFF 'sting' on the surface (circled) (photo courtesy of M. Drew)

Understanding the life cycle of fruit flies, combined with knowledge of which traps and baits attract which segments of the fruit fly population, informs the design of effective monitoring, trapping, and control strategies:

ADULT STAGE	IPM TOOL	COMMENTS
Immature females & immature males	Protein traps	Effective in attracting immature fruit flies; Can putrefy quite quickly making identification difficult; Need frequent replacing; Attract large by-catch; many non-pest fruit flies and other insects are attracted to protein traps, confusing the result. **PROTEIN TRAPS DO NOT ATTRACT EGG-LAYING FEMALE FRUIT FLIES**
	Protein baits	Effective in attracting immature fruit flies; Acid hydrolysates have higher potential for crop damage due to salt content than yeast autolysates; MUST be applied weekly, and re-applied after rainfall; Best applied with xanthan gum. **PROTEIN BAITS DO NOT ATTRACT EGG-LAYING FEMALE FRUIT FLIES**
Mature males	MAT traps, Cue-Lure traps; SPLAT* products	Attract only mature males; Trap catches of mature male fruit flies do not necessarily indicate the presence of egg-laying female fruit flies in the crop – mature males can be trapped when no female fruit flies are present; egg-laying female fruit flies can enter a crop having been fertilised elsewhere and this will not be reflected in male trap catches. **MALE TRAPS DO NOT REDUCE FRUIT FLY DAMAGE** **MALE TRAPS DO NOT ATTRACT CUCUMBER FLY, JARVIS' FRUIT FLY OR MEDFLY** **MALE TRAPS DO NOT ATTRACT EGG-LAYING FEMALE FRUIT FLIES**
Mature (egg-laying) female fruit flies	**FRUITION NOVA TRAPS**	**SELECTIVELY ATTRACT EGG-LAYING FEMALE FRUIT FLIES** – typically around 70% of trap catch; Also attracts other segments of the adult fruit fly population, and Island fly.

Commercial use of Fruition Nova Traps

Greg Krenske, Spring Creek, Gatton, Qld; Mixed orchard: custard apples, feijoas, low chill nectarines, mangoes, persimmons

Greg Krenske has used Fruition Traps and Fruition Nova Traps for a number of years, and a number of the development trials to evaluate the Fruition technology have been conducted on Greg's property. Greg traditionally used a program of cover sprays to try to control fruit flies, but still had significant losses, around 50%, caused by the pests. He switched to a program of Fruition Traps and Natflav protein bait sprays and was able to reduce the level of damage due to fruit flies to less than 1%.

Kylie and Mick Carr, Bunya Grove Produce, Amamoor, Qld; Persimmons

In 2017, Mick and Kylie Carr purchased a 16 ha orchard with 11,000 persimmon trees at Amamoor in Queensland. Persimmons are particularly susceptible to fruit fly attack, with the female laying eggs in the ripening fruit; while the larvae do not generally develop in the fruit, a callus forms at the site of the 'sting' to leave the fruit unmarketable.

In the first year, Mick and Kylie relied mainly on male lure traps for their fruit fly control program and lost around 30% of the harvest to fruit fly damage, or the equivalent of around 20 tonnes of fruit.

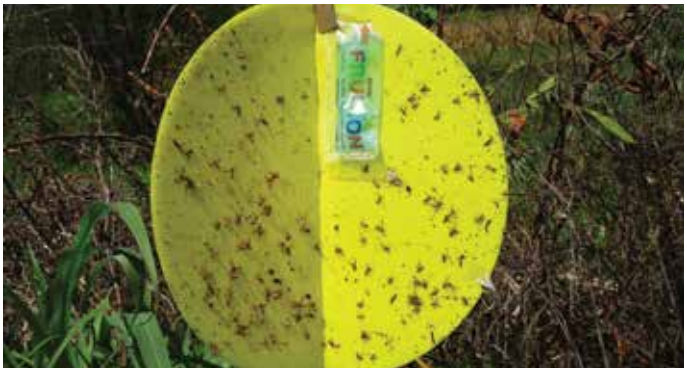
In their second year, the Carrs commenced a program of protein bait sprays and Fruition Traps and reduced crop loss to around 10–15%. In the third year (2018–19 season), they amended their program to include Natflav protein bait spraying from early in the season on a strict weekly schedule plus a combination of Fruition Traps and Fruition Nova Traps at around 25 traps per hectare. This latest program reduced crop loss due to fruit flies to less than 5%, despite the presence of cucumber fly (*B. cucumis*) and a high level of QFF that infested around 62% of native guava fruit on the property.

Safety to Beneficials

Fruition Nova Traps do not attract bees or beneficial insects. There has been no indication in any trial work that either the yellow colour of the Fruition Nova Trap or the Fruition lure are attractive to bees or other beneficial insects.

Summary

Fruition Nova Traps fill the gap in fruit fly control. Through the unique combination of trap colour, shape and the Fruition lure, they attract and trap mature, egg-laying fruit flies of all key pest species in Australia. Fruition Nova Traps efficiently and selectively attract the segment of the fruit fly population which damage crops.



Cucumber flies (*B. cucumis*) caught on a Fruition Nova Trap

Kylie, Mick and Patrick Carr - a family affair

Fruition Nova Traps are safe to beneficials including bees

Cucumber fly on a damaged pumpkin (photo courtesy of L. Radunz)

FRUITION® NOVA®

Fruition Nova Trap Label

HOW TO USE FRUITION NOVA TRAPS

Fruition Nova Traps can be used for both population monitoring and, in conjunction with other control strategies, for management of fruit flies as part of an IPM program when susceptible crops are fruiting. It is important to deploy Fruition Nova Traps early in the crop for early detection and hence optimal management of fruit fly populations.

In all situations, begin protein bait spraying early with Fruition Natflav 500 before fruit become susceptible to fruit fly infestation, and complement bait spraying with use of Fruition Nova Traps to allow monitoring of fruit fly population dynamics. If numbers of fruit flies continue to increase following implementation of a program of Fruition Natflav 500 protein bait sprays and Fruition Nova Traps, cover spraying of an approved insecticide may be required.

PEST	SITUATION	TRAPS/HA	CRITICAL COMMENTS
Cucumber fly (*Bactrocera cucumis*) Jarvis' fruit fly (*Bactrocera jarvisi*) Lesser Queensland fruit fly (*Bactrocera neohumeralis*) Queensland fruit fly (*Bactrocera tryoni*)	Monitoring fruit fly populations	15 traps/ha	Fruition Nova Traps are suitable for a range of crops where there is a need to monitor for the presence of fruit flies before crop damage occurs. For optimal management of fruit fly populations, commence use of Fruition Nova Traps well before the fruit becomes attractive to fruit flies i.e. from the early stages of fruit set, when fruit is still hard and green. Ideally neighbouring crops will also be monitored as these can be a source of fruit fly infestations. Read section on PLACEMENT OF FRUITION NOVA TRAPS adjacent. Fruition Nova Traps should be monitored daily, with trap catches recorded and records maintained for each monitoring event. **As soon as fruit flies are detected on Fruition Nova Traps, a full IPM program (as below) should be implemented to optimise fruit fly management for the season. This should include protein bait spraying with Fruition Natflav 500 if this has not already begun.**
Mediterranean fruit fly (*Ceratitis capitata*)	Implementing a full fruit fly IPM program	15–30 traps/ha Low susceptibility crops 30–50 traps/ha Moderate-High susceptibility crops	Efficacy of a fruit fly management program is dependent on a range of factors including pest pressure during the season. For effective management of fruit flies, Fruition Nova Traps should be used as part of a broader strategic control program, involving other approved products and strategies approved for the control of fruit flies. A fundamental part of any IPM program is practicing good crop hygiene, including removal of fallen fruit which may be infested with fruit fly larvae. Fruition Nova Trap numbers may need to be greater than the minimum stated above based on a range of factors, including numbers of fruit flies trapped during the monitoring phase; crop history and susceptibility; crop canopy, size and density; crop value; surrounding crop type and maturity stage; seasonal conditions; etc. If a protein baiting program has not already started, commence applications of gelatinised Fruition Natflav 500 according to the label and reapply at least every 7 days. An insecticide registered for this use must be included with Fruition Natflav 500 according to the insecticide label. Continue to monitor and record trap catches until immediately after final harvest to ensure that the management program is adequate. If fruit fly numbers on Fruition Nova Traps indicate high or erratic pest pressure as fruit develops and becomes more susceptible to fruit fly attack, additional fruit fly control measures may need to be implemented, such as insecticide cover sprays where product registrations and permits allow. Typically, an effective IPM program will result in the number of freshly trapped fruit flies declining over time.

PLACEMENT OF FRUITION NOVA TRAPS

Fruition Nova Traps should be placed evenly around and throughout the site. Where previous crop history indicates that fruit flies enter the crop from a particular location (such as adjoining forested areas, sheltered gullies, adjacent creeks or waterways, etc.), Fruition Nova Traps should be deployed at a higher concentration closest to these sources of infestation, but within the range specified in the Directions for Use table.

TREE CROPS: Fruition Nova Traps should be hung in the fruiting zone, usually 1.5-2.0 metres above the ground. Ideally traps will be placed in the tree canopy in a location away from surrounding branches and clearly visible within the orchard.

OTHER CROPS: Fruition Nova Traps should be hung immediately above the crop canopy (about 0.5 metres), suspended from a firmly anchored rigid support such as a 'star picket' driven into the ground, and in adjacent trees or vegetation within 5.0 metres of the crop where traps can intercept fruit flies flying into the crop to lay eggs.

Ideally neighbouring crops will also be monitored as these can be a source of fruit fly infestations.

In cucurbit crops, cucumber fly typically roosts in vegetation around the crop and enters the crop mainly to lay eggs. In this situation, Fruition Nova Traps should be deployed at a higher concentration closest to these sources of infestation, but within the range specified in the Directions for Use table. Use of protein bait sprays applied weekly to the surrounding vegetation can assist in the IPM program.

FRUITION NOVA TRAPS SHOULD BE REPLACED IF:

1. Sticky surfaces are heavily covered by fruit flies or foreign objects;
2. The lure sachet has expired – the Fruition Nova Trap gel lure in the open sachet will continue to be effective for up to 12 weeks; or
3. The lure sachet or trap is damaged or missing.

The information provided herein may include extracts from the product label and does not constitute the complete directions for use.
READ THE PRODUCT LABEL THOROUGHLY BEFORE OPENING OR USING FRUITION NOVA

AgNova Technologies Pty Ltd
ABN 70 097 705 158
Unit 4, 482 Kingsford Smith Drive
Hamilton, Qld 4007 Australia
Phone (03) 9899 8100
Email info@agnova.com.au