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FRUITITION®

The **Revolutionary** Lure & Trap for Queensland Fruit Fly

FRUIT FLIES IN AUSTRALIAN AGRICULTURE

Current estimates are that fruit flies cost Australia approximately \$300 million per annum in control costs and lost/ inaccessible markets, with over 75% of Australian fruit and vegetables susceptible to attack. Damage from fruit flies includes fruit decay, premature ripening and fruit drop, and physical damage to fruit that makes it unmarketable.

Recent regulatory reviews have significantly restricted the number of insecticides available for use as cover sprays for control of fruit flies, placing emphasis for control back onto well-constructed and executed Integrated Pest Management (IPM) programs. A key part of these IPM programs is the use of traps to monitor fruit fly populations and to indicate when control measures need to be implemented.

TRAPPING FOR FRUIT FLIES

WHY USE TRAPS?

Trapping fruit flies has been successful for many decades for:

- Monitoring -
 - Detecting activity in crop production areas;
 - Quarantine surveys detecting new introductions into countries and guaranteeing area freedom for trade.
- Pest management as a component of a wider IPM control program.



Queensland fruit fly laying eggs – note ovipositor, at the base of the abdomen, inserted into fruit. (Photo courtesy of Ruben Bensley, International Centre for the Management of Pest Fruit Flies, Griffith University).



QFF larvae in an orange

BACKGROUND

Since the early 1950s powerful male lures have been used in dry traps such as the Steiner trap and the Lynfield trap. A sticky surface trap, the Jackson trap, was used in the past along with the Israeli trap for Mediterranean fruit fly. The long-term male lures used are Cue Lure, methyl eugenol and trimedlure, with latilure and zingerone being more recent developments. At the same time, liquid lures based on protein and fruit juices were tested in traps such as the McPhail trap, generally without success.

BEST PRACTICE METHODOLOGY

- Set traps in fruiting host plants that attract flies into their precinct;
- Set traps in the fruit zone, usually 1.5 to 2 metres above the ground for tree crops;
- In vegetable crops traps should be hung immediately above the crop and adjacent to trees/ vegetation within 5 metres of the crop;
- Set traps out of direct sunlight, within foliage where they receive broken sunlight;
- Prevent predators such as ants from destroying the content of traps;
- Monitor traps regularly, preferably on a daily basis, and maintain records for each monitoring event by collecting and examining fruit flies, and record data.

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WHAT RESULTS CAN BE EXPECTED?

Different male lures will attract different fruit fly species, and different trap types attract different segments of the fruit fly population.

Male lure traps attract large numbers of sexually mature male fruit flies. The lures are highly effective and can attract flies from distances believed to be up to several hundred metres. Therefore, they only indicate when flies enter the district, but not necessarily the orchard. **Note: It is often the case that male fruit flies will be trapped in an orchard before female fruit flies enter the area.**

Protein and liquid lure traps generally catch small numbers of flies. The protein traps attract immature males and females seeking protein as amino acids necessary for development to sexual maturity. The fruit juice-based traps are difficult to maintain and attract very small numbers of mature fruit flies.

Note: egg-laying females do not seek protein, and instead are attracted to ripening fruit.

Fruition® Traps have been developed to attract mature egg-laying female Queensland fruit flies (QFF). Because mature egg-laying female fruit flies are only a small percentage of the overall fruit fly population in an orchard, the number of trapped flies will vary depending on a number of factors, including the crop and its susceptibility. Importantly the Fruition Trap attracts mature egg-laying female fruit flies at the stage of the lifecycle where they directly damage crops and hence should be used as part of an IPM control program, according to the Fruition Trap label. **Note: the mature egg-laying female fruit fly is attracted to both the Fruition Trap lure and the colour and shape of the trap itself.**



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The differences in attractiveness of alternative trap & lure systems has been demonstrated in the field:

Trial 1 – South East Queensland, 2015 (release and trapping of 3-week old, protein-fed QFF)

TRAP TYPE	NUMBER OF FEMALE QFF TRAPPED	NUMBER OF MALE QFF TRAPPED	COMMENTS
Fruition Trap	98	0	Mature egg laying females trapped
Cera* Trap	1	0	Immature females trapped
Biotrap*	1	61	Males attracted by Cue Lure

Trial 2 – South East Queensland, 2015 (release and trapping of 3-week old, protein-fed QFF)

TRAP TYPE	NUMBER OF FEMALE QFF TRAPPED	NUMBER OF MALE QFF TRAPPED	COMMENTS
Fruition Trap	99	1	Mature egg laying females trapped
Cera Trap	10	0	Immature females trapped
Biotrap	0	70	Males attracted by Cue Lure

Trial 3 – South East Queensland, 2015 (release and trapping of 1-week old, protein-starved QFF)

TRAP TYPE	NUMBER OF FEMALE QFF TRAPPED	NUMBER OF MALE QFF TRAPPED	COMMENTS
Fruition Trap	12	2	Mature egg laying females trapped
Cera Trap	34	39	Immature females trapped
Biotrap	20	25	Males attracted by Cue Lure

Trial 4 – South East Queensland, 2015 (release and trapping of 1-week old, protein-starved QFF)

TRAP TYPE	NUMBER OF FEMALE QFF TRAPPED	NUMBER OF MALE QFF TRAPPED	COMMENTS
Fruition Trap	5	3	Mature egg laying females trapped
Cera Trap	27	58	Immature females trapped
Biotrap	48	70	Males attracted by Cue Lure

These two trials demonstrate that Cera Trap and Biotrap are more effective at attracting immature female and immature male QFF when compared to Fruition Traps. Immature QFF do not cause damage to crops.

The label directions for Fruition Traps are as follows:

HOW TO USE FRUITION TRAPS

Fruition Traps can be used for both population monitoring and, in conjunction with other control strategies, for control of mature egg-laying female Queensland fruit flies as part of an IPM control program, when susceptible crops are fruiting.

It is important to deploy Fruition 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. Compliment protein bait spraying with use of Fruition Traps to allow monitoring of fruit fly population dynamics. If numbers of mature egg-laying female fruit flies detected on Fruition Traps continue to increase following implementation of a program of Fruition Natflav 500 protein bait sprays and Fruition Traps, cover spraying of an approved insecticide may be required.

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DIRECTIONS FOR USE

PEST	SITUATION	TRAPS/HA	CRITICAL COMMENTS	
Queensland fruit fly (<i>Bactrocera tryoni</i>)	Monitoring fruit fly populations	15 traps/ha	<p>Fruition Traps are suitable for all crops where there is a need to monitor for the presence of mature egg-laying female fruit flies before crop damage occurs.</p> <p>For optimal management of fruit fly populations use of Fruition Traps for monitoring should commence well before the fruit becomes attractive to mature egg-laying female fruit flies i.e. from the early stages of fruit set, when fruit is still hard and green.</p> <p>Ideally neighbouring crops will also be monitored as these can be a source of fruit fly populations. Read section on PLACEMENT OF FRUITION TRAPS below.</p> <p>Fruition Traps should be monitored daily, with trap catches recorded and records maintained for each monitoring event.</p> <p>As soon as fruit flies are detected on Fruition Traps a full IPM control 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.</p>	
	Implementing a full fruit fly IPM program			<p>Efficacy of a fruit fly control program is dependent on a range of factors including pest pressure during the season. For effective management of fruit fly, Fruition Traps should be used as part of a broader strategic control program, involving other approved products and strategies approved for the control of fruit fly.</p> <p>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.</p>
		15 – 30 traps/ha	Low susceptibility crops	
		30 – 50 traps/ha	Moderate – High susceptibility crops	
			<p>Fruition Trap numbers may need to be greater than the minimums 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.</p> <p>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. A registered insecticide must be included with Fruition Natflav 500 according to the insecticide label.</p> <p>Continue to monitor and record trap catches until immediately after final harvest to ensure that the control program is adequate. If trapped fruit fly numbers on Fruition Traps indicate high or erratic pest pressure as fruit develops and becomes more susceptible to fruit fly, additional fruit fly control measures may need to be implemented, such as insecticide cover sprays where product registrations and Permits allow.</p> <p>Typically, an effective IPM control program will result in the number of freshly trapped fruit flies declining over time.</p>	

PLACEMENT OF FRUITION TRAPS

Fruition Traps should be placed evenly around and throughout the site.

TREE CROPS: Fruition Traps should be hung in the fruit zone, usually 1.5 to 2 metres above the ground. Ideally traps will be in the tree canopy in a location away from surrounding branches and clearly visible within the orchard.

BERRY & VEGETABLE CROPS: Fruition Traps should be hung immediately above the crop canopy (around 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 metres from the crop where the traps can intercept mature egg-laying female 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 populations.

FRUITION 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 Trap gel lure in the open sachet will continue to be effective for at least 8 weeks, at which time the Fruition Trap and lure should be replaced. The attractant gel will gradually change colour from blue to very pale blue or white. This change in colour does not reduce the effectiveness of the lure;
3. The lure sachet or trap is damaged or missing.