Managing Queensland Fruit Fly in Berries

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Pest Identification

Adult Queensland fruit flies (QFF) are about 6–8 mm long and are coloured reddish brown with yellow markings (Figure 1). They are most active in warm, humid conditions and after rain. QFF lay eggs in maturing and ripe fruit on trees and sometimes in fallen fruit. The female fruit fly must feed on a source of protein before her eggs will mature.

Figure 1.
Photo Credit: NSW DPI

Damage

The maggots (larvae) hatch inside the fruit, then their feeding and the associated decay destroys the fruit (Figures 2 and 3).
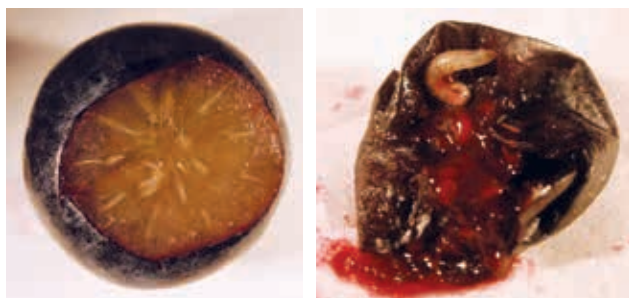

Figure 2 and 3.
Photo Credit: John Golding NSW DPI

Management

A single control method by itself is not sufficient to eradicate QFF from an area; the best results are gained from a combination of methods.

Monitoring using fruit fly traps, ideally placed at 1.5m high in a warm but shady area of foliage of the plant to monitor QFF population trends. In male para pheromone traps replace wicks generally every three months, replenish wet traps according to rate of dehydration, however, ensure you always check the label.

Commence monitoring in spring and continue throughout the year. Monitoring over time will give good information on how the fly behaves, where to focus efforts and to access the impact of your management strategies. The natural habitat of fruit flies is the forest. Flies tend to feed and rest in trees, preferring those near moist areas such as creek lines or dam edges. Trees are also where they go to mate. The best place for traps is therefore in tree lines around the edges of the crop and also at the entrance of tunnels.

Extra traps can be placed around areas where infestation may come from, such as neighbouring orchards, town areas with backyard fruit trees, or creek lines. Areas with abandoned or unmanaged fruit crops are a particular risk, so well worth monitoring. A grid of 200m or 400m is recommended.

Field hygiene is essential as fallen and rotting fruit are a source of fruit fly infestations. Remove infested or potentially infested fruit from the field and practice good packing shed hygiene with thorough inspection to remove any infested fruit and dispose or treat (fermentation, freeze, heat etc.) fruit appropriately.

Male Annihilation Technology (MAT) This is an 'attract and kill' strategy for male flies. The aim is to reduce male populations to low levels over large areas like towns, clusters or properties or large isolated production systems to reduce the mating opportunities for females.

The technique involves distributing cups or blocks (Figure 4) which contain the male fly attractant cue-lure and an insecticide.

Place the lures throughout the crop and in alternate hosts (i.e. fruiting or non-fruiting windbreaks) at a density of about 16-20 per hectare.

Place these lures every 20 metres around the perimeter of the property early in the season (late winter) to reduce the number of male flies entering.

Place into your production area three times per year.

Figure 4.
Photo Credit: Bugs for Bugs

Examples of commercial Male Annihilation products include:

Mat Product	Product Company	Includes Pheromone and Insecticide	Comments
Qfly wick MAT cup	Bugs for Bugs	Pheromone and Maldison	Pheromone lures with insecticide that attract and kill MALE Qfly
Eco-lure male fruit fly wick and cup	Organic Crop Protectants	Pheromone and Maldison	Pheromone lures with insecticide that attract and kill MALE Qfly
Amulet Cue-lure	Nufarm	Pheromone and Fipronil	Pheromone lures with insecticide that attract and kill MALE Qfly
Amulet® Cue lure	BASF	Pheromone and Fipronil	Pheromone lures with insecticide that attract and kill MALE Qfly
Searles fruit fly trap and wick	Searles	Pheromone and Maldison	Pheromone lures with insecticide that attract and kill MALE Qfly
SPLAT (Cue-Lure) male QFF bait	Organic Crop Protectants	Only Pheromone no insecticide	Can be applied manually or mechanically via OCP's SPLATAGATOR. Need to add insecticide.
VA-VA-Voom QFF male trap	Gepro	Only Pheromone no insecticide	Wet trap' pheromone only, attract and drown MALE
Fly Bye™ fruit fly lure	Nutri-Tech Solutions	Only Pheromone no insecticide	Wet trap' pheromone only, attract and drown MALE
Wild May fruit fly attractant	Wild May Essential Oils Pty Ltd	Only Pheromone no insecticide	Wet trap' pheromone only, attract and drown MALE

Both male and female Qfly need protein to sexually mature and for daily nourishment, therefore **Protein bait spraying** is an effective control method that consists of a protein source (e.g. yeast autosylate PER13785) to attract QFFs and an insecticide (Maldison, Trichlorfon).

Begin applications as soon as fruit fly traps indicate fruit flies present and fruit is at a susceptible stage, if fruit fly is known to be a problem bait then early i.e. 6-8 weeks prior to harvest.

Avoid spraying fruit to eliminate concerns about residue and fruit damage. Repeat applications every 7 days, re-applying sooner if rain washes off the mixture. Adding a thickener helps to preserve bait in the environment.

Applying the bait onto a cloth/or carpet fixed to the trellis posts can help the protein to last longer. This is also a solution for providing somewhere to apply bait to in the situation where a crop couldn't tolerate bait applied directly to it i.e. strawberries.

Examples of commercial protein products include:

Product	Manufacturer	Formulation	Protein Content
Fruit Fly Lure™	Bugs for Bugs	Thick liquid	420g/L
Natflav 500	AgNova	Thick liquid	420g/L
Cerabait	Barmac	Liquid	360g/L
Hym-lure	Biotrap	Liquid	425g/L

N.B always check labels as concentrations and rates can change.

Female biased traps are also available and aim to attract and kill a large percentage of the fly population. They are based on food, fruit volatiles or fruit mimics as currently there are no pheromone-based lures for female fruit flies. Always check for other insect bi catch with these traps and verify trap finds, i.e. no point applying a corrective action if they are not catching QFF.

Examples of commercially available female biased traps include:

1. Food based attractant traps together (ceratrap and Biotrap), they are female biased but can catch males

Product	Manufacturer	Mode of Action	Comments
Cera trap	Amgrow	Food based, containing a liquid protein mixture with a mild ammonia smell	No insecticide is needed as flies simply drown. The liquid needs to be kept well topped up, so units need to be serviced regularly in hot weather
Biotrap fruit fly attractant gel and trap	Biotrap	Food based, containing a protein based gel	It is combined with a DDVP cube which kills flies entering the trap. Sticky insert available. A non-insecticide option is available – a sticky insert for inside the trap

2. Oviposition trap or an egg laying trap, they are known to have a higher percentage of their catch as pregnant females

Product	Manufacturer	Mode of Action	Comments
Fruition trap	Agnova	Flies attracted by visual and olfactory cues become stuck on the sphere	Attracts mature egg laying female fruit flies to an exposed sticky surface

Cover sprays may be required when pest pressure is especially high. An unintended consequence of cover sprays may include reducing the number of beneficial insects. Always ensure you apply sprays only according to the label instructions and your spray equipment is properly calibrated.

Chemical treatment options for Queensland Fruit Fly in berries

Treatment	Berry Category Allowed	Insecticide Group	WHP (days)	Effect on beneficials	Remarks
Spinetoram PER87408	Blackberries, Blueberries, Raspberries, Strawberries	5	1	Medium	Can be used in all states except VIC. Do not use more than four applications each season
Trichlorfon PER12486	Blackberries, Blueberries, Raspberries, Strawberries	1B	2	Medium	On label for blueberries in NSW. Permit only for ACT, NSW, NT, QLD, SA and WA
Dimethoate	Blueberries	1B	1	High	On label for use in NSW & WA only. Permit for QLD PER88174

Note: always check APVMA for up to date information on registered products and permits. Always check labels for rates and withholding periods.