

# Understanding Fruit Flies: Know Thine Enemy!

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Recent estimates suggest that Queensland fruit fly (Q-fly) is costing the Australian horticultural industry around \$300 million per year, considering crop damage, control measures and lost market access. This is a broad national estimate and doesn't necessarily take into account the 'opportunity cost' factor. For example, strawberry growers in south east Queensland could continue production longer into the spring window were it not for the population explosion of these pesky flies as the weather warms up.

On 11 November this year, the Australian Pesticides and Veterinary Medicines Authority (APVMA) confirmed it has suspended the product registration and label approval of chemical products containing dimethoate for use on blueberries, raspberries and blackberries.

The APVMA published notice of the suspension in the APVMA Gazette No 23, Tuesday 11 November 2025, including a brief statement of reasons for the decision, and instructions for use during the suspension period, which allow the continued use of dimethoate with a 14-day harvest withholding period when used on blueberries, raspberries and blackberries under a permit valid for one year.

We understand that many berry growers have relied on the use of dimethoate up to this point, but with the withdrawal of this chemical option, it is important to understand what other resources are available to help you to make changes to your fruit fly Queensland Fruit Fly management plans.

One excellent resource that is available in the industry Resource Library at [bit.ly/BA-RL](https://bit.ly/BA-RL) is '**Fruit Fly Management for fruit and vegetable growers**', by Dr Jenny Ekman from Applied Horticultural Research (Version 2 2024). The following summary has been based on this guide, and growers are encouraged to download the full version to boost their understanding of this pest.

In the past, insecticides were the go-to solution for tackling fruit flies. Today with fewer chemical options available and a growing focus on sustainable production, it's more important than ever for growers to really understand their fruit fly foes. Instead of spraying first and asking questions later, the modern approach is about knowing how to combine a range of control strategies to keep these pests in check.

A range of management tools can be used to produce a pest free crop. These include exploitation of fruit fly biology and behaviour, chemical controls, food-based and parapheromone lures, sterile insect technique and physical barriers. Integrated pest management (IPM) for fruit flies involves combining two or more of these strategies with excellent crop hygiene, improving overall effectiveness.

**A fruit fly can develop from a freshly laid egg to a fully mature adult capable of producing hundreds more eggs in under a month. Understanding this rapid lifecycle and how it responds to environmental conditions is key to developing effective management strategies to keep these pests under control.**

There are several weak points in the fruit fly lifecycle that can be exploited to put downward pressure on population numbers:

- Assassinate the males before they can successfully mate
- Poison the females before they can lay the eggs which form the next generation
- Repeat the process consistently, in line with the lifecycle timing

Chapter 3 of the guide provides a detailed understanding of the lifecycle, and this is key to getting your timing right.

## Key fruit fly behaviours

### Where They Live & Feed

- **Forest edge dwellers:**  
Fruit flies naturally thrive along forest margins, where trees provide food, moisture and shelter
- **Feed on more than fruit:**  
They also feed on bacteria and bird droppings on leaves and branches, not just host fruit
- **Love irrigated environments:**  
Orchards and gardens with moisture and vegetation mimic their ideal conditions

### When & Why They Enter Crops

- **Females lead the invasion:**  
Because their primary goal is egg-laying, female flies are the main threat inside crops
- **Edges are high-risk zones:**  
Fruit near the crop edge is most likely to be infested especially when trees or shrubs are nearby
- **Avoid open ground:**  
Pastures and low crops (like strawberries, capsicums, tomatoes) lack shelter or food so flies enter briefly to lay eggs then retreat to nearby trees

### How They Move

- **Poor fliers, great walkers:**  
They walk more than they fly, hopping only 5–50 cm at a time, or around 2 m high between trees
- **Short-range homebodies:**  
Around 90% stay within 600 m of where they emerged
- **Limited by weather:**  
Can't fly below ~15°C, and movement drops in high winds or low humidity

### Their Love-Life

- **Social but selective:**  
Mating happens only at dusk and lasts about 30 minutes
- **Males form leks:**  
Groups of males gather to release pheromones, attracting females
- **Strength in numbers:**  
A single male can't attract a mate alone so flies rely on group scent plumes, which limits long-distance dispersal

## How can you tackle these pesky pests?

### Establish who's in your crop

Monitoring is all about knowing whether fruit flies are around and whether their numbers are on the rise or falling.

It's important to remember that monitoring doesn't tell you exactly how many flies are in your crop, whether they're female, or if fruit is already infested. In fact, trap catches can be misleading: a high number of flies in traps doesn't always mean infested fruit, and sometimes there'll be flies in the crop but none in the traps if other smells or attractants are competing for their attention.

What monitoring does show is how well your control strategies are working. It also helps pinpoint those trouble spots where extra effort like an extra trap or two could make all the difference.

Chapter 4 of the guide provides a detailed view of the types of traps and how to best deploy them on your farm, but the key action is regular and systematic monitoring and recording of the data the traps are providing. Plus remember that traps have a limited zone of attraction and so they need to be placed where fruit flies are most likely to be. And don't forget that you also need to check your crop for damage at the same time as checking the traps!

### Exploiting the need for protein

Protein bait is a powerful lure for both male and female fruit flies, but it's especially tempting to newly emerged females that need a good dose of protein to mature and start laying eggs. The secret to success lies in the **what**, **how**, and **when**: the ingredients you use, how you apply them, and the timing all make a big difference to how effective your baiting will be in the field. You want to knock out the females once they are sexually mature but before they can get busy laying.

Fruit fly bait is a mix of protein lure and insecticide. The protein has to be partly broken down (hydrolysed) to give off the smells that attract flies and that's where the magic (and the stink) happens. Yeast autolysate or hydrolysate are the usual ingredients, and while they might make you wrinkle your nose, to a fruit fly they're absolutely irresistible. Chapter 5 of the guide covers baiting in detail.

### Male Annihilation Technique (MAT) turns attraction against them

Chapter 6 investigates the art of annihilating males! Think of MAT as using the fruit fly's own instincts against it. The technique uses the same lures and insecticides found in monitoring traps, but without the trap itself. Instead, a parapheromone such as cue-lure is combined with an insecticide, drawing in male flies and wiping them out on contact.

Male fruit flies simply can't resist cue-lure as feeding on it makes them more attractive to females so young, maturing males are especially vulnerable. Deploying MAT early in the season, before fruit becomes susceptible, helps knock down numbers before they can cause trouble.

Each MAT device remains effective for three to six months, depending on conditions. They should be placed around the crop edges and near likely fly hangouts such as trees near watercourses at 1.5 m high, spaced about every 20–30 m.

However, even the best MAT system has limits. Male flies can mate many times, so removing a large proportion won't completely stop females from laying eggs. It's also worth noting that if you're using the same lure type for MAT and traps, you might see fewer males caught in traps, even though females are still active.

For the best results, MAT should always be part of a broader management strategy, working alongside protein baiting and other control methods. And as always wear the right PPE, follow label directions, and dispose of spent devices safely.

### Let nature join the fight

Sometimes, the best weapon against fruit flies is another insect. Nature has its own army of helpers like tiny parasitoid wasps and beneficial fungi that quietly go to work keeping fruit fly numbers in check. Chapter 9 provides more information on harnessing these natural allies who target fruit flies at their most vulnerable stages. Parasitoid wasps lay their eggs inside fruit fly eggs and larvae, while entomopathogenic fungi attack the pupae and adults in the soil. Between them, they can make a serious dent in fruit fly populations.

In fact, Australian pest fruit flies (including Qfly and Medfly) are attacked by at least 11 native wasp species, and recent reports show natural parasitism rates of around 30% in infested fruit, a figure that's risen as growers move away from broad-spectrum organophosphate sprays.



**Queensland Fruit fly *Bactrocera tryoni*** Photo credit: James Niland

Eight wasp species are known to target Queensland fruit fly, three attack Mediterranean fruit fly, and two go after less common species. Once limited to the tropics and subtropics, these wasps are now spreading further south, with at least one species already established in Victoria.

For an extra boost, growers can also use inundative releases of large numbers of wasps to overwhelm pest populations. This approach works best when fruit fly numbers are already low, with research suggesting around 10 wasps per fly is an effective ratio.

Harnessing these natural allies is an important part of an integrated pest management strategy, reducing reliance on chemicals and helping create a more balanced, resilient orchard ecosystem.

Encouraging natural enemies to not just stick around but truly thrive can make a big difference to long-term fruit fly management. Here are some practical ways to help your local parasitoid wasp population do its best work:

**Go easy on broad-spectrum sprays:** these can wipe out beneficial wasps along with the pests, so where possible, choose target-specific or softer options instead

**Keep some shelter and flowering vegetation nearby:** wasps need nectar, pollen, and shade to survive between host encounters so native shrubs, flowering herbs, or mixed groundcovers can provide ideal refuge and food

**Reduce chemical disruption in the soil:** beneficial fungi and soil-dwelling wasp stages thrive best in healthy, organic-rich soils with minimal disturbance

**Use integrated control timing:** if you're planning inundative wasp releases, do so when fruit fly numbers are low and other control methods (like protein baiting) are already in place

**There is no silver bullet to managing fruit fly:** it's about combining knowledge, timing, and the right mix of tools to stay one step ahead of the pest. Whether it's understanding their behaviour, perfecting your baiting routine, combining male annihilation, or harnessing nature's own army of helpers, every tactic plays a part in protecting your crop and your markets. And don't forget just how important good crop hygiene is! Removing residual fruit immediately, disposing of graded out fruit away from the farm and destroying neglected fruit trees all contributes to removing the food sources which fruit flies depend on.

To take your understanding further, download the full '**Fruit Fly Management for Fruit and Vegetable Growers**' guide by Dr Jenny Ekman from the Industry Resource Library at [bit.ly/BA-RL](http://bit.ly/BA-RL) and while you're there, explore the other 20+ practical fruit fly resources available covering everything from monitoring and lure types to sterile insect techniques and post-harvest hygiene. Every extra bit of knowledge strengthens your defence against one of horticulture's most persistent enemies.

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