

Queensland Fruit Fly (*Bactrocera tryoni*)

For the Home Gardener

Gardening Australia - Bye Bye Fruit Fly



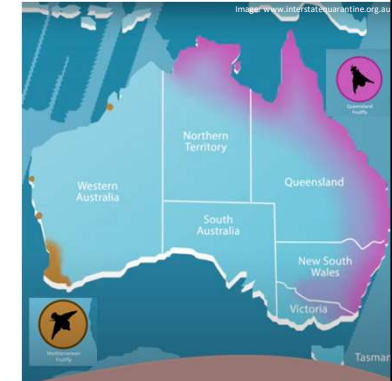
Series 31 | Episode 27 (Sept 2020)

Image: James Niland

edendale Nillumbik
The Green Wedge Shire

Queensland Fruit Fly– An Introduction (*Bactrocera tryoni*)

- An Aussie citizen. A native of SE Queensland and NE NSW
- Can live from 6 weeks to 4 months
- Female can lay approx. 2,000 eggs
- Is active at 13 - 14 °C and mates when dusk temperatures are at 15 - 16 °C
- Has been heading south for years and has landed in Melbourne
- Once it has a foothold it can establish itself
- An urban environment is a like a smorgasbord for Qfly. Lots of choices and warm hiding spots



edendale Nillumbik
The Green Wedge Shire

Identifying Qfly

- Many flies look similar
- Some of the characteristic of the adult fly are
 - Brown body
 - Relative small at 6→8mm long
 - Yellow GT stripes near the wings
 - Yellow shoulder pads
 - Yellow triangle on back of thorax
- The larvae is hard to identify. The only exact way to identify a Qfly larvae is through DNA testing
- If you think you may have Qfly, assume you have and follow the recommended actions



Image: Ag Vic

edendale Nillumbik
The Green Wedge Shire

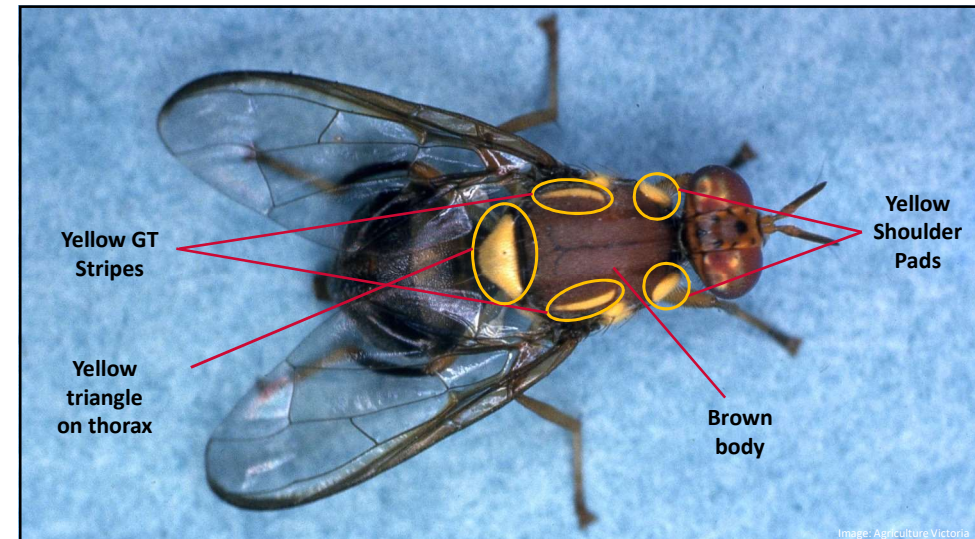


Image: Agriculture Victoria

There are Many Insects Mistaken as Qfly



Hover Fly
Pollinator and Beneficial Insect

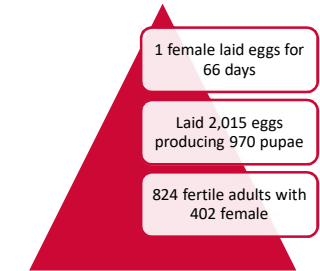


Vinegar Fly
Likes Rotting Fruit

Why is Qfly a Problem?

- Qfly looks for soft / juicy fruit to lay its eggs in
- The sting mark is very small and sometimes hard to identify
- Bacteria are deposited with the eggs. The bacteria breaks down the fruit ready for the larvae to eat
- You may not know that your fruit is infected till you pick the harvest
- The life cycle of a Qfly can be as little as 22 days so there are many lifecycles in one season

Potential Population Growth
(based on laboratory experiment)



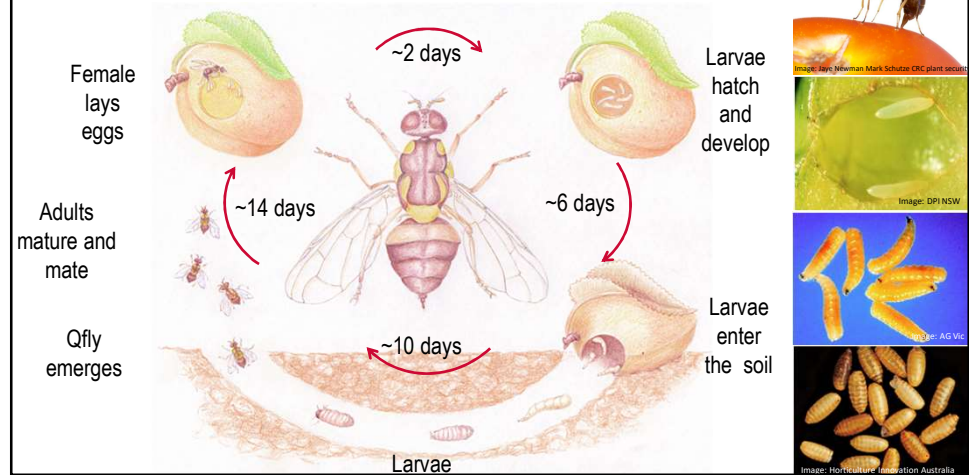
Source: Andrew Jessup

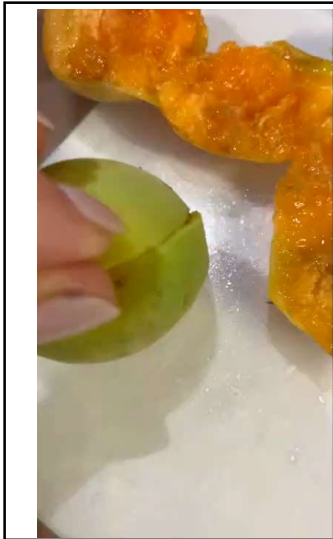
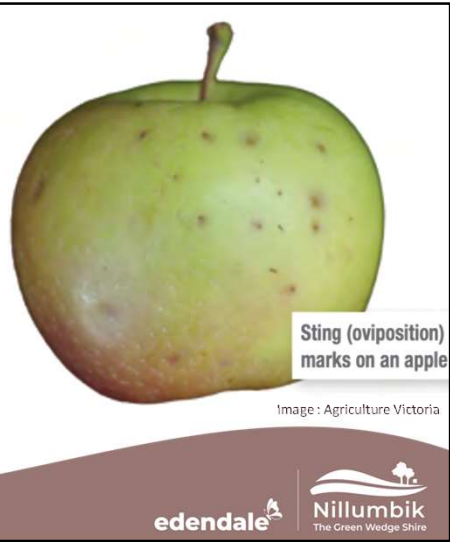
Source: Andrew Jessup

**9 untended feijoa trees (9,920 fruit) produced
120,645 flies**

edendale Nillumbik
The Green Wedge Shire

Qfly Lifecycle ~32 days





Videos : Keep Yarra Valley Fruit Fly Free

What fruit and vegetables do fruit fly like?

Source: https://fruitfly.sa.gov.au/_data/assets/pdf_file/0005/359303/309365_-_Fruitfly_host_checklist_-_fruit_and_vegetables_list.pdf

ABIU	ACEROLA	APPLE	APRICOT	AVOCADO	BABACO	BANANA	BLACK SAPOTE	BLACKBERRY	BLUEBERRY	BRAZIL CHERRY	BREADFRUIT
CAIMITO	CAPE GOOSEBERRY	CAPSICUM	CARAMBOLA	CASHEW APPLE	CASIMIROA	CHERIMOYA	CHERRY	CHILLI	CHOKO	CITRON	COFFEE BERRY
CIMQUAY	CUSTARD APPLE	DATE	DRAGON FRUIT	DURIAN	EGGPLANT	FEJIOA	FIG	GNANADILLA	GRAPES	GRAPEFRUIT	GRIMCHAMA
GRAPEFRUIT	GRIMCHAMA	GUAVA	HOG PLUM	JABOTICABA	JACKFRUIT	JEW PLUM	JU JUBE	KIWIFRUIT	LEMON	LIME	LOGANBERRY
LONGAN	LOQUAT	LYCHEE	MANDARIN	MANGO	MANGOSTEEN	MEDLAR	MIRACLE FRUIT	MONSTERA	NECTARINE	MULBERRY	NASHI
OLIVE	ORANGE	PASSIONFRUIT	PAWPAW	PEACH	PEACHARINE	PEAR	PEPINO	PERSIMMON	PLUM	PLUMCOT	POMEGRANATE
PRICKLY PEAR	PUMMELO	QUINCE	RAMBUTAN	RASPBERRY	ROLLINIA	ROSE APPLE	SANTOL	SAPODILLA	SHADDOCK	SOURSOP	STAR APPLE
STAR FRUIT	STRAWBERRY	SWEETSOP	TAMARILLO	TANGELO	THAN LUNG	TOMATO	VAI APPLE	WAX JAMBU	WHITE SAPOTE	YULE	MED FF

* Strawberries attract only Queensland fruit fly. Restrictions apply to moving strawberries in affected areas in the Riverland and some parts of metro Adelaide.
 † Breadfruit and monstera attract only Mediterranean fruit fly. Restrictions apply to moving them in affected areas of metropolitan Adelaide.

Are Some Fruits Resistant?

- To a degree it depends on what else is available
- In Southern Australia melons / pumpkins/ cucumbers don't seem as attractive as they are in warmer climates
- Fruits harvested before Christmas are at less risk (Early Cherry, Apricot, Loquat, Tomato)
- Eggplants
- Small shiny fruits seem to be at less risk (cherry and roma tomato)
- Green limes and finger limes
- Thick skinned acidic lemons and citrus (Eureka and Lisbon)
- Winter fruits
- **There are no guarantees though**



edendale

Nillumbik
The Green Wedge Shire

There Is No Single Control Method for Qfly

An effective approach to reduce the risk of Qfly should include a number of control strategies:



edendale

Nillumbik
The Green Wedge Shire

1. Planning and Maintenance

- Plan your Qfly Action Plan
- Remove old fruit trees that you can't maintain
- Hard prune fruit trees to get them back to a manageable (nettable) size
- Plant fruit trees grafted onto dwarfing root stock or espalier trees to keep them manageable
- Undertake summer / winter prunes for tree health and size management
- Thin out large crops as the fruit grows
- Don't plant too many veggies (e.g. tomatoes)



edendale

Nillumbik
The Green Wedge Shire

2. Monitoring Traps

- Lots of options available, all should catch flies
- Can be used all year round to monitor the presence of Qfly
- Not an effective control method on its own
- What makes an effective trap?
 - A lure to attract the Qfly
 - Designed to keep the flies in
 - Kills the flies
- Sticky panel traps should be used with a protective cage or lid with holes to prevent negative impacts on other animals



edendale

Nillumbik
The Green Wedge Shire

2. Monitoring Traps

- Lures to attract Qfly
 - Protein – female and males
 - Para pheromone – males
- Pesticide based traps
 - Maldison
 - Diclorvos
- Pesticide free traps
 - Sticky insert
 - Drowning
- At Edendale we sell BioTrap with sticky insert
 - Closed at the moment - ebay / Biotrap



edendale Nillumbik
The Green Wedge Shire

BioTrap Products Sold at Edendale (once re-opened)



Traps and Protein Gel



Male Attractant Wafer
(attract flies up to 400 meters)



Stickies

edendale Nillumbik
The Green Wedge Shire

DIY Monitoring Trap



Recipe 1 – in a bowl or jug

- 1 tblsp vegemite
- ½ cup warm water (to melt vegemite and sugar)
- ¼ cup brown sugar
- finely chopped banana peel or fruit scraps
- dash of dishwashing liquid (pref. lemon scented) to break surface tension of water
- additional cold water to fill number of bottles to 1/3 full (too much will cause branch to droop or break) – up to 3 with this recipe

Recipe 2

- 1 tsp vanilla essence
- 2 tsp cloudy ammonia
- ½ cup sugar
- 2L water
- 1 finely chopped apple OR orange juice (fruit source)

Note: Never add honey as it will attract bees

Directions

- Place holes in bottles 1/3 of the way down from the lid
- Fill with lure mixture
- Hang in tree prior to fruit ripening with string fastened around the neck of the bottle
- Check regularly

HOT TIP – pour contents from bottle into a sieve over a large bowl. Tip sieve contents onto a sheet of kitchen paper and ID bugs caught. Return liquid to trap and top up or replace with fresh lure liquid

edendale Nillumbik
The Green Wedge Shire

3. Monitoring Traps – Best Practice

- Start monitoring program in late winter / early spring. Keep it going all year
- Replace the attractant and killing agent periodically (as per instructions)
- If trap gets too hot flies won't go into it
- Place on eastern side of a tree, close to the trunk. Shaded / protected by foliage. Not on the outside
- Inspect weekly and record numbers
- Escalate your actions if even one Qfly is trapped. It may be the start of a growth of Qfly in your garden
- In late autumn move traps into ever green trees in a warm spot (e.g. lemon tree)



edendale Nillumbik
The Green Wedge Shire

3. Area Wide Approaches

- Baiting and MAT (Male Annihilation Techniques) are not effective QFF control for the home gardener working alone unless on an isolated property
- Both baiting and MAT are most effective as a co-ordinated program using all the QFF management and prevention tools
- Baiting
 - A bait is a mixture of protein and pesticide which is placed on a tree (branch, trunk, leaf)
 - As it is protein based it attracts both sexes
 - Is applied as a spot spray or droplets and requires weekly application
- MAT (population suppression)
 - A male attractant / insecticide block with no trap
 - Needs a high density across a wide area



4. Hygiene Through The Fruiting Season

- Thin or remove fruit if you are not going to harvest it
- Regularly check your fruit as it grows and matures for Qfly
- Pick fruit as it is ripening. Don't let it fall to the ground
- Invite friends / families in to harvest your (Qfly free) excess harvest
- Remove damaged fruit and process / destroy
- Don't let fruit fall into the gathered netting
- Pick up any fallen fruit
- Running poultry under fruit trees can reduce the risk but not eliminate it
 - Eat fallen fruit
 - Exposing and eating pupae in the soil
- **Warning**
 - Don't put infected fruit in the compost
 - Food Swaps need to be very aware of Qfly



5. Exclusion

- Insect netting can keep Qfly out
- 2mm x 2mm and 1mm x 3 mm should be 100% effective
- Net after the fruit has set (and you have thinned it out) but before it matures
- Can individually net fruit or branches or net a whole tree
- A hole in the net will let Qfly in. Repair nets when needed
- Secure net at the base
- Make sure the netting **doesn't** touch the fruit



Exclusion Products Sold at Edendale

- Individual net bags
 - Small (15cm x25cm)
 - Medium (30cm x 30cm)
 - Large (30cm x 90cm)
- Netting - 45gsm - 2mmx2mm
 - Precut fitted net (2.4 top, 2.89 sides)
 - Cut to order veg net 45gsm - 6m wide



6. Disposal

- Do Not
 - Put into a Compost or worm farm
 - Put into the landfill of green waste bin
 - Bury in a shallow hole
- You need to destroy the eggs and pupae
 - Freeze till solid (2 to 3 days)
 - Boil, bake or microwave
 - Solarise in a black plastic bag (a week in the sun) and protected from animals breaking the bag
 - Deep burial is an Ag Vic solution
- Once treated, if you are **convinced** that all the eggs and larvae are killed, then:
 - Feed to the chooks
 - Feed to the compost
 - Green waste bin
- Otherwise, double bag and landfill it



Spring in the Garden

- Overwintering Qfly become active when temperature increases (Late Aug / Sep)
- Female Qfly search for protein to fuel egg development
- By late spring Qfly may have laid eggs in early ripening fruit.
- The cycle has begun and accelerates
- **Spring Actions**
 - Install male traps to try and stop mating
 - Install protein traps to monitor and capture females
 - Starting to monitor too late could allow Qfly to build up rapidly, undetected



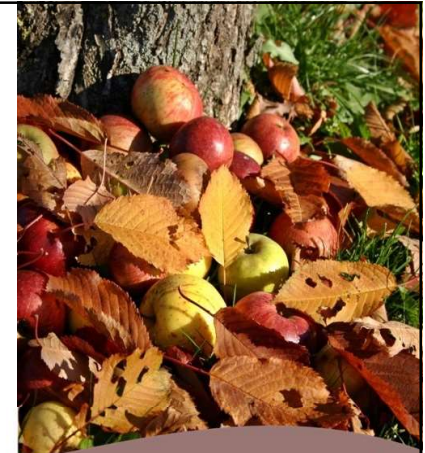
Summer in the Garden

- Qfly at its most active with an accelerating life cycle
- Adult flies are feeding, breeding, searching for suitable hosts, and laying eggs
- Resting in shady plants
- **Summer Actions**
 - Install and maintain monitoring traps
 - Thin crops to what you want to harvest
 - Net crops after fruit / veggie set and thinning (before ripening begins)
 - Harvest any damaged fruit
 - Pick up any fallen fruit
 - Dispose of affected fruit suitably
 - Summer pruning (after harvest) to maintain tree size
 - Get someone to harvest your fruit / veggies if you are on holidays



Autumn in the Garden

- Fruit flies are still active in autumn (March to May)
- Life cycle will be slowing down
- Late ripening fruits like citrus, apples and pears are still susceptible to attack
- **Autumn Actions**
 - Continue with monitoring traps
 - Thin fruit load to what you will harvest
 - Continue netting unharvested fruiting trees and vegetables
 - Clean up fallen fruit
 - Post harvesting late summer pruning

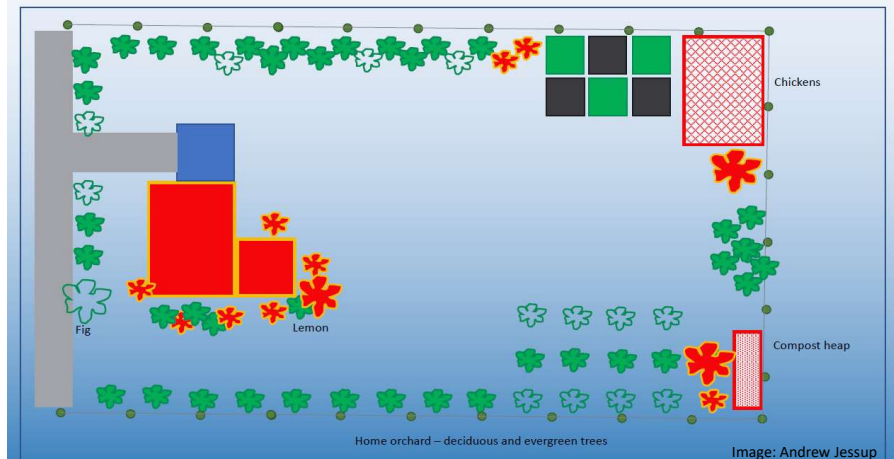


Winter in the Garden

- Qfly is inactive during winter
- Adult flies will overwinter in sheltered warm spots around the garden
- Eggs and larvae in fallen fruit and pupae in the soil may survive to some extent
- **Winter Actions**
 - Move monitoring traps into ever green trees in a warm spot (e.g. lemon tree)
 - Cleaning up any fallen fruit
 - Winter pruning to manage size of trees
 - Remove unwanted / unmanageable trees
 - Plant trees on dwarf fruit stock
 - Plan your spring program



Winter warm spots in a typical BACK YARD garden



Summary

- Remove unwanted fruit trees
- Prune large fruit trees to a nettable size
- Use monitoring traps through the year
- Escalate your actions if Qfly is caught in a trap
- Thin crops early to what you need
- Net crops with suitable insect netting (2X2mm, 1X3mm)
- Ensure netting doesn't touch the fruit
- Harvest fruit and pick up any that fall
- Run chickens under fruit trees
- If you have Qfly in your harvest, dispose correctly
- Be careful with shared harvests
- Plan for next season



Qfly Resources

- Edendale's Queensland Fruit Fly web page - www.edendale.vic.gov.au/QFly
- Nillumbik Website which includes QFF video <https://www.nillumbik.vic.gov.au/Environment/Pest-animals>
- When Edendale re-opens we will be selling netting, bags, monitoring traps and refills
- Fruit Fly Management for Vegetable Growers - https://www.mountalexander.vic.gov.au/Files/Environment/Fruit_Fly_guide_booklet_-_Horticulture_Innovation_Australia.pdf
- Controlling Queensland fruit fly in home gardens – Agriculture Victoria - <https://agriculture.vic.gov.au/biosecurity/pest-insects-and-mites/priority-pest-insects-and-mites/queensland-fruit-fly/controlling-queensland-fruit-fly-in-home-gardens>
- Meet Ernie the Fruit Fly - <https://www.mountalexander.vic.gov.au/FruitFly>
- Gardening Australia story at Edendale - <https://www.abc.net.au/gardening/factsheets/bye-bye-fruit-fly/12674168?iwsourc=c>
- Queensland Fruit Fly Yarra Valley <https://fruitflyfreey.com.au/>