

## **ORGANIC FRUIT FLY CONTROL**

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Fruit fly is responsible for more bad language from gardeners than any other pest. If you are lucky enough to live in a fruit fly free zone then count your blessings and do your bit to keep it that way. If you live in fruit fly zone, unless you are prepared to put in effort from year to year then a chainsaw may be your best solution. Fruit fly is a pest that needs a community approach; it could be the perfect opportunity to meet your neighbours for a street BBQ so you can plan a coordinated effort.

There are several pests described as 'fruit fly' in Australia. The main one in the eastern states is Queensland fruit fly (Q fly) *Bactrocera tryoni*, which is native to rainforest habitat on the east coast of Australia. Other pest fruit flies include the Mediterranean fruit fly (Med fly) *Ceratitis capitata*, an introduced species currently only present in WA and the Cucumber fly *Bactrocera cucumis*. Cucumber fly is a major pest of melons, pumpkins and zucchini, it is similar in appearance to Qld fruit fly but is a bit larger. The fruits most commonly attacked by Q fly and Med fly are figs, cherries, stone fruit, apples, pears, loquats, guavas, feijoas, tomatoes and capsicum. There are over 200 native species of fruit fly in Australia, only a few are a problem for gardeners but can be a very significant one.

### **LIFECYCLE:**

The female flies lay their eggs in small groups just beneath the skin of fruit. The larvae are referred to as 'maggots' and are creamy white, tapering towards the head and between 7-9 mm long when fully grown. Mediterranean adult flies are 4-5 mm long with a yellow body and mottled wings. Q fly develop from eggs to adults within 5 weeks in hot weather, Med fly take only 4 weeks. The maggots hatch and by their feeding as well as bacteria they carry, cause the fruit to rot and drop. When the maggots are fully grown they leave the fruit and burrow into the soil, where they pupate. Adults can live for many weeks and flies commonly over-winter as adults, becoming active when the weather warms up around August and gradually the population builds to a peak in late summer.

The tiny flies that hover around the fruit bowl are fungal gnats and are attracted by decomposition; they are commonly mistaken for fruit flies.

### **PHYSICAL AND CULTURAL CONTROLS:**

#### **SANITATION**

All damaged fruit must be destroyed to break the cycle of infection. Remove any fruit from the tree with dimples or weeping clear sap as this is a sign that eggs have already been laid in the fruit. Destroy the fruit by feeding it to poultry, immersing it in water, or cooking it in a sealed, black plastic bag in the sun. Keep a container handy in the garden to dispose of infected fruit straight away. Getting in early is more effective than picking up rotten fruit from the ground as the maggots may have already left the fruit to pupate.

#### **SELECTION**

Ideally it would be best to avoid planting fruit fly prone trees - see below. Year-round management will be easier with dwarf or multi-grafted fruit trees. Alternatively you need the skill, time and tools to keep trees under 2.5m high. A good rule of thumb when pruning stone fruit is that if you can't reach it, cut it off. In areas that have long cold winters fruit fly die off, making control simpler to achieve. In these areas early fruiting trees may miss the onslaught of fruit fly whereas late fruiting trees may be severely affected, due to population numbers increasing, through successive generations. Avoid planting fruits that you rarely eat, as these can become a source of reinfestation. Consider replacing poor quality and overgrown diseased trees with some newer varieties. If you really want to grow stone fruit then dwarf trees or espalier trees will make management easier.

#### **BAITS AND TRAPS**

Preventing female fruit flies from laying eggs is fundamental to achieve your aim of luscious, ripe, home grown fruit. Eco-Naturalure Fruit Fly Bait is an organic, complete fruit fly control system for QLD & MED fruit fly. It is a protein based bait, highly attractive to both male and female fruit flies, containing the biologically produced insecticide spinosad. It is mixed with water and applied as a spot spray every 7 days. You can apply either to the trunk or foliage of fruit trees; or onto 2 boards at either end of a growing area 100m<sup>2</sup>. It is particularly useful for large or heavy bearing fruit trees such as mango and citrus where exclusion products are difficult to use.

The products that attract male flies are based on pheromones or 'sex attractants'. These include Bugs for Bugs Fruit Fly Trap and Wild May Fruit Fly Attractant. All are useful as effective 'early warning system' monitoring tools to help you recognize the start of the fruit fly season. Many gardeners will be familiar with the disappointment of only noticing fruit fly when it is too late and the fruit is stung and full of maggots. Traps for monitoring should be in place by late winter, in a position where they will be easily

observed. Many people find that by trapping large numbers of male flies, the local population of breeding fruit flies is reduced thereby helping to reduce damage. However, as the habitat for these flies is widespread including native landscapes, reserves, home gardens, and commercial orchards, it is not considered sufficient control to only trap the males.

Trapping fruit flies in containers with small entrance holes is generally ineffective as female fruit flies are unwilling to enter traps. Even though it may appear as though the trap is full of flies these are unlikely to be female fruit flies. Research on a range of homemade traps has found less than 1-2% of the insects caught are fruit fly.

Recent research has found that Q fly responds best to a blue colour while Med fly responds best to yellow. Homemade traps of coloured styrofoam balls covered with a non-drying glue may catch a lot of fruit flies. Researchers in the USA have found coffee bean juice from ground up ripe coffee berries a great success as bait for female Med flies.

## **EXCLUSION**

The most effective organic solution for the home gardener is exclusion. This simply involves covering either the individual piece of fruit, fruit clusters or the whole tree. It sounds time consuming but can be surprisingly easy and fast compared to the process of donning protective gear and spraying a chemical control several times through the fruiting season. Commercial fruit fly exclusion bags are available in either waxed paper or cloth. In SE Asia newspaper is glued to make a bag to cover fruit.

Excluding fruit fly from the entire tree is also possible by using a lightweight fabric such as an exclusion fabric, mosquito netting, shade cloth or nylon flyscreen material. These generally need to be supported by a frame. Only leave these covers in place for the period that fruit is ripening to avoid damage to the tree.

## **USING EXCLUSION PRODUCTS**

This easy 'set & forget' method needs to be in place early in the season, ideally as soon as the fruit is pollinated i.e. when the flower petals drop. Choose from either exclusion fabrics (PestGuard Cover, PlantGuard, Vege Net) or exclusion bags or sleeves (PestGuard Bags, Paper Exclusion Bags, Fruit Protection Bags, Cloth Fruit Bags, Small and Large Mesh Bags and Sleeves). Check the size of the fruit to make sure the bag selected will fit. Often a combination of products will be needed on a single tree so try the Exclusion Sampler. The Cloth Fruit Bags and Mesh Bags and Sleeves also offer protection from birds and possums. Some fruits, like tomatoes and capsicums are self-pollinated and can be covered any time. Early in the season, thin any fruit such as peaches or nectarines, to a spacing of 20-25 cm (9"). Then simply place a bag or sleeve over each remaining fruit or clusters of fruit. Tie on, taking care to avoid knots that will be hard to undo later. Fruit ripens beautifully inside the covers and may also be larger and sweeter. Covering the fruit with these products does not interfere with ripening as it is the leaves that are primarily responsible for photosynthesis.

### **Exclusion Bags**

Enjoy unsprayed, fruit fly free fruit with this organic solution for the home gardener! These imported waxed paper fruit bags come in 2 sizes, the smaller size is suitable for nectarines, peaches and persimmons, the larger size for mangoes. Early in the season, thin the fruit, then simply twist a bag over each remaining cluster of fruit, using the built-in twist-tie. Also useful for the control of codling moth. Offers some protection from birds and may last more than one season.



### **Fruit Protection Bags**

Easier to use for stone fruit including peaches, nectarines, plums and apricots. This horticultural waxed-paper bag is specifically designed to attach around the lateral branch rather than the fruit stem.



### **Cloth Fruit Bags**

A great idea to protect fruit from fruit fly, but strong enough to protect it from marauding possums, fruit bats and birds. Also useful for the control of codling moth. These bags are sturdy washable calico cloth with a drawstring; they can be used year after year. The fruit ripens fully within the bag. Includes FREE information sheet on organic control of fruit flies.

### **Mesh Sleeves and Bags**

These innovative products are made of sturdy UV resistant fly screen.

The sleeves are open at both ends and come in two sizes: 600mm by 250mm and 800mm – 300mm. They are designed to slide along a branch, or over a large bunch, and protect fruit from fruit fly, birds and possums. Once in position, it can be tied closed with the attached long lasting 'brickies string'.

The bags come in two sizes: 300mm x 250mm and 600mm x 500mm.

The smaller bag suits any individual or small clustering fruit while the larger size would suit fruit with several pieces closer to the end of a branch (loquat, mango, lychee etc).

### **BIOLOGICAL CONTROLS**

Fruit fly has no specific predator, generalist predators include: braconid wasps which are egg parasites; ants and ground beetles feed on maggots; spiders catch adults in webs; predatory flying insects such as dragonflies and robber flies; birds such as swallows, Restless Flycatchers and Willy Wagtails. Increasing the range of habitats available will not give full control but will inevitably give a wide range of benefits.

Poultry are an enormous help in fruit fly control. If you design your orchard to incorporate chooks they will reward you by turning rotten fruit into eggs and happily spend hours scratching beneath trees looking for fruit fly pupae. Adult fruit flies are trapped on the ground for up to 24 hours after emerging from the pupae as it takes this long for their wings to harden. During this time the adult flies are also vulnerable to a roving chook. Where it isn't possible to allow chooks free range, small demountable fences can be used under trees vulnerable to attack by fruit fly.

### **FRUIT FLY RESISTANT FRUITS:**

Avocado, avoid thin-skinned Fuerte and Rincon

Bananas

Blueberry, sometimes affected

Citrus, avoid thin-skinned varieties such as Meyer lemon

Custard Apple, winter ripening varieties are best

Grapes, sometimes affected

Grumichama

Ice Cream Bean

Jaboticaba

Kiwifruit Longan & Lychee

Macadamia

Mulberry, sometimes affected

Nashi Pears, sometimes affected

Passionfruit

Pawpaw

Persimmon, early varieties like Fuyu are susceptible

Pineapples

Pomegranate