

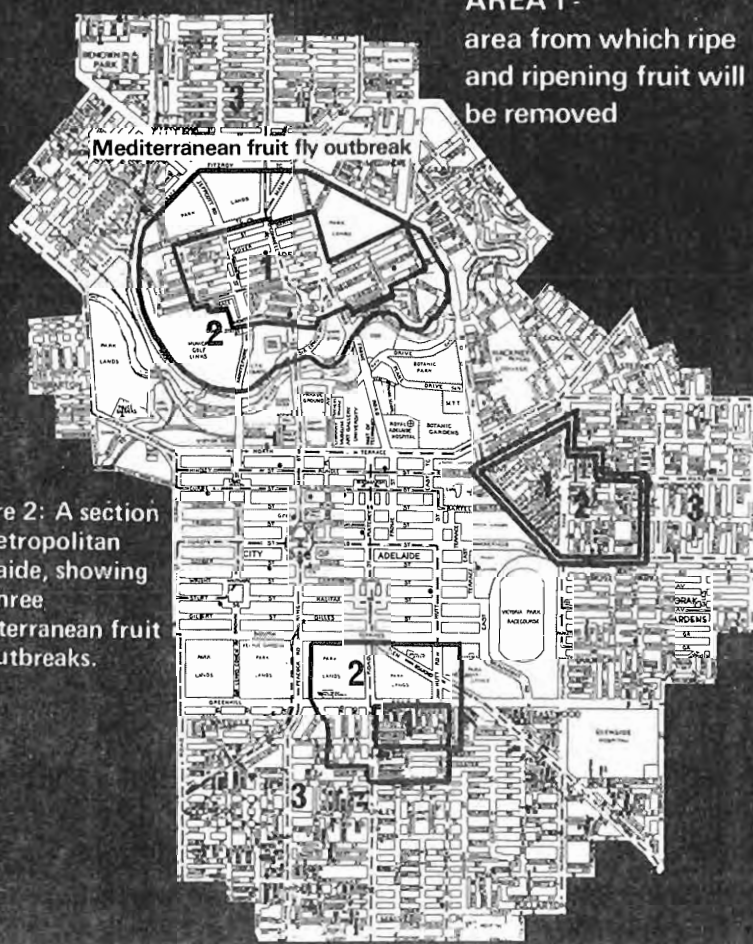
FRUIT FLY

the current situation in metropolitan Adelaide

Figure 1: A section of metropolitan Adelaide showing Queensland fruit fly.



Figure 2: A section of metropolitan Adelaide, showing the three Mediterranean fruit fly outbreaks.



Four outbreaks of fruit fly have been found in the metropolitan area this season. Three of these are the Mediterranean fruit fly and one the Queensland fruit fly (Figures 1 and 2).

Eradication measures

Eradication procedures start as soon as the maggots are identified by an entomologist.

1. Proclaiming the area a quarantine area.

The quarantine area is proclaimed by Executive Council — the area extends for a radius of about 1.6 km which is centred on the infested trees. The procedures that may be taken for successful eradication are outlined in Figures 1 and 2 and include a general prohibition on the removal of fruit from the quarantine areas by the householders.

2. Bait spraying.

Splash baits are applied with a knapsack spray at the rate of 5 litre per ha (20 sites) in 100 ml doses on shady trees and shrubs where adult fruit flies are likely to be found sheltering.

The bait contains:

- (1) 30 g maldison 115 per cent W/V concentrate.



Worker applying splash baits to a tree.

- (2) 120 g a.i. — protein extract.
- (3) 18.2 litre of water.

The application is made weekly. The protein extract is a source of food and attracts the flies; the maldison kills the flies once contact is made.

3. Cover spraying.

A full cover spray is applied to shady trees, shrubs and the ground surface under infested trees. Cover spraying is limited to a smaller inner area and is designed to kill adult flies on emerging from the pupal stage in the soil or sheltering in the shady areas.

The spray mixture is Fenthion 280 g of 50 per cent emulsive concentrate in 390 litre of water, applied at about 14 day intervals.

4. Removing fruit.

In the smaller inner area ripe and ripening fruit is removed and destroyed. Unripe fruit is left on the trees as a further attraction to flies. The intention is that

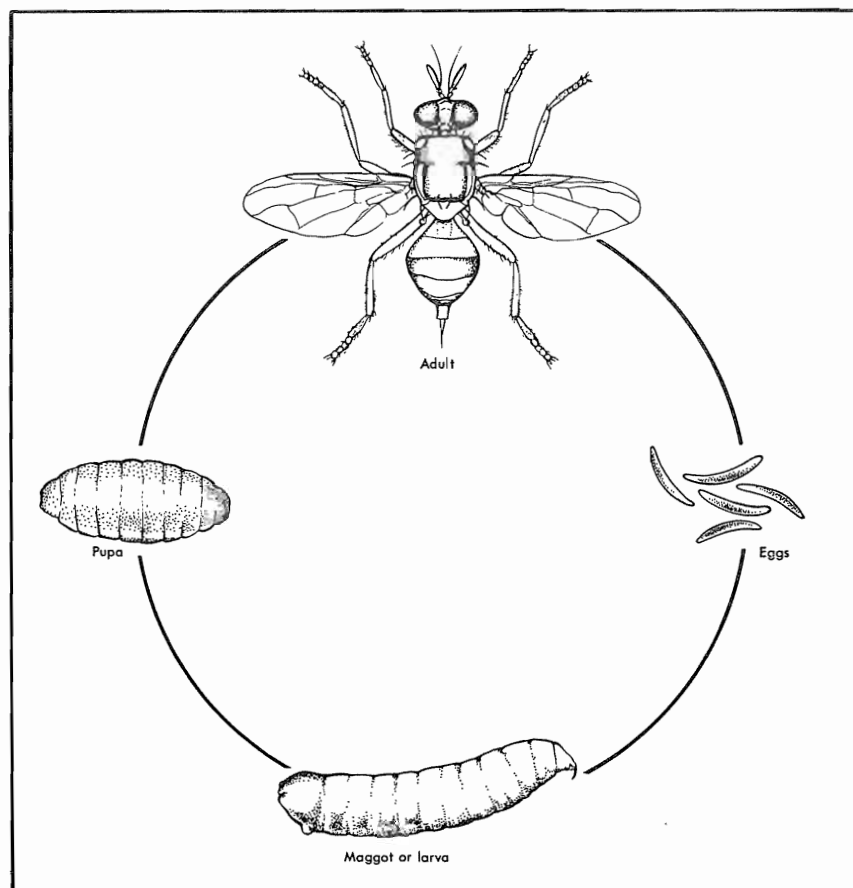


Figure 3: Life cycle of the Queensland fruit fly. Both Mediterranean and Queensland species have similar life cycles.

they remain inside the area where baits and sprays will kill them.

Householders are encouraged to use as much of this fruit as possible. They are reminded that no fruit should be removed from the area. If fruit is removed and it is infested, the maggots could form the nucleus of a new outbreak in another area.

Facts about fruit fly

Only two species of fruit fly of economic importance have been recorded in Australia. One of these, the Mediterranean fruit fly, permanently inhabits the fruit-growing areas of Western Australia; the other the Queensland fruit fly, permanently inhabits those parts of the Northern Territory, Queensland, New South Wales and eastern Victoria where fruit is grown.

South Australia is the only mainland Australian State in which no

species of fruit fly occurs naturally.

This State is protected from natural invasion by the extensive areas of low rainfall which isolate it on the west, north and east. Neither fruit fly can exist in these areas, and the distances across them are much too great for the adults to fly.

With our geographic isolation, we can never have an outbreak of pest in South Australia unless fruit infested with living eggs, maggots, or both, is brought in from the other States. Further, we can eradicate the pest in the same season as maggots are detected in locally-grown fruit. We can be sure there will be no further outbreaks in that area unless more infested fruit is brought in.

The life cycle of fruit flies

Like most insects, there are four stages in the life cycle — eggs,

maggot, pupa, and adult fly (Figure 3).

1. Egg

The egg is very small, banana-shaped, and white in colour. Eggs are seldom or never seen by householders.

2. Maggot

Soon after the eggs have been laid within the fruit, they hatch and a small maggot emerges from each. The maggot increases in size, as it feeds, so that when fully grown, it may be about 1 cm long. It is commonly cream-coloured. One end (the head) is sharp-pointed, the other is blunt. The head contains a pair of dark brown, or black, cutting jaws with which the maggot tears off pieces of the fruit small enough to swallow.

As the maggots tend to eat their way towards the centre of the fruit, decay begins inside. But from the outside, the fruit always appears sound. As each maggot completes its growth, it chews its way out of the fruit (which, by then, has usually fallen), and burrows about 2.5 cm into the soil.

3. Pupa

The larva now becomes inactive, and changes into an elongated, oval, brown hard pupa, smaller than a grain of wheat.

4. Adult fly

The fly forms inside the pupa, and when development is complete, it bursts the pupal skin and forces its way through the soil to the surface. It rests for a short time before seeking food.

After feeding, the sexes mate, and the female searches for ripening fruit. At the tip of her body is a small, hard, sharp-pointed, egg-laying tube with which she punctures the skin of the fruit and lays one or more batches of eggs inside. The punctures are so small



Every precaution is taken to prevent fruit being brought into South Australia. It could be infected and start an outbreak.

that they will be recognised only by an experienced person. If females are numerous, several may lay batches of eggs in the one fruit. Commonly, infested fruits contain ten or more maggots.

How fruit fly outbreaks are caused in South Australia

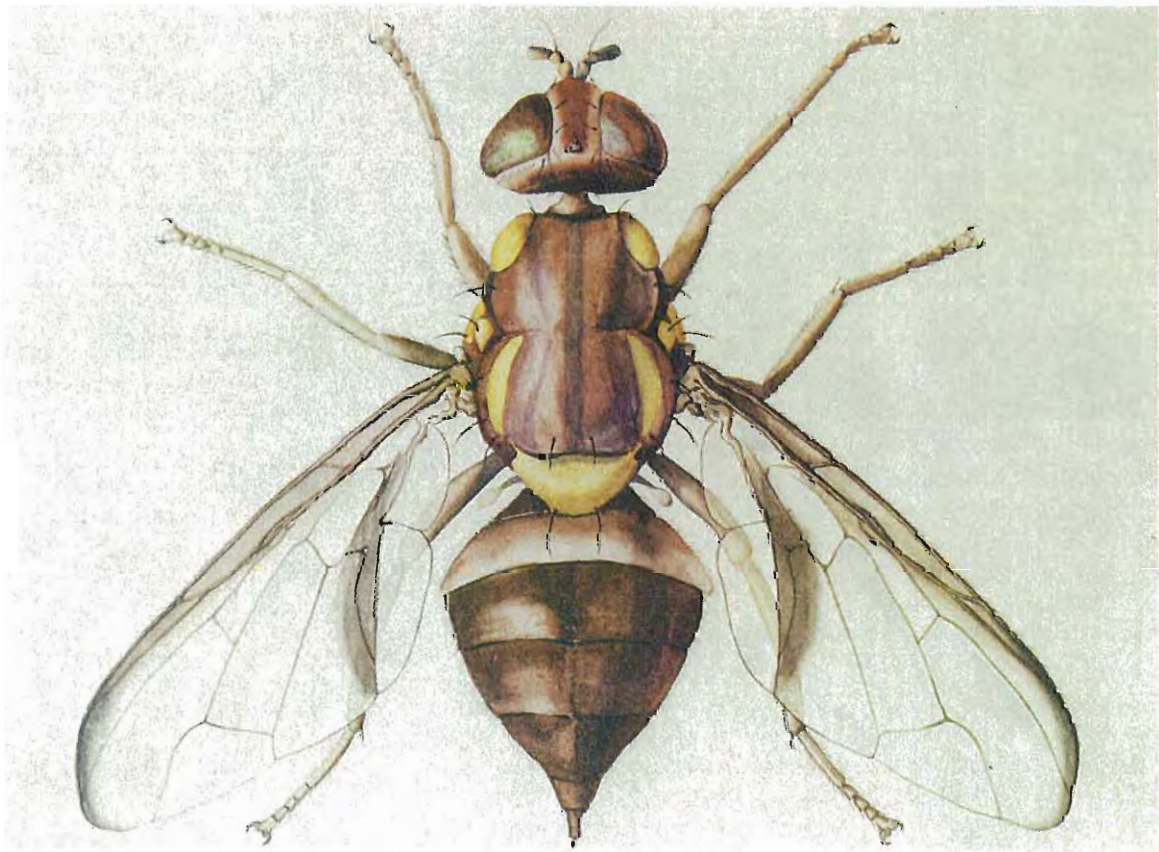
In areas permanently inhabited by fruit flies, the different stages may be found all the year round. In summer, the numbers of adults increase rapidly and become very active. Large numbers of fruits are then liable to be

"stung", that is, have eggs laid in them.

Should a traveller coming from another State into South Australia, buy or be given this fruit, by the time he arrives the eggs are likely to have hatched and the maggots grown considerably. If he succeeds, either accidentally or deliberately in bringing the fruit into the State, by the time he reaches the place where he is staying it will have softened and begun to rot. The fruit may then be thrown in a back yard or on a compost heap. As soon as the maggots are fully grown, they leave the fruit, enter the soil, and soon change to flies. After mating, the females "sting" fruit on trees, and so an outbreak begins.



Mediterranean fruit fly



Queensland fruit fly

It is only when infested fruit is opened that the maggots are found. That is why, the housewife is usually the first to give warning of an outbreak when she finds and reports maggots whilst preparing fruit for jam or bottling.

Because, in summer, development from egg to adult needs a few weeks only, it is important that maggots in fruit be reported to the Department of Agriculture as soon as possible. Each female may lay between 50 and 300 eggs. If we assume that the average is about 100, there will be 100 times as many maggots in the next brood. If nothing were done about an early spring outbreak, there would not be a sound fruit on a tree in the metropolitan area after Christmas. This, of course, never happens; thanks to the co-operation of householders, all outbreaks are discovered early, and the pests are eradicated.

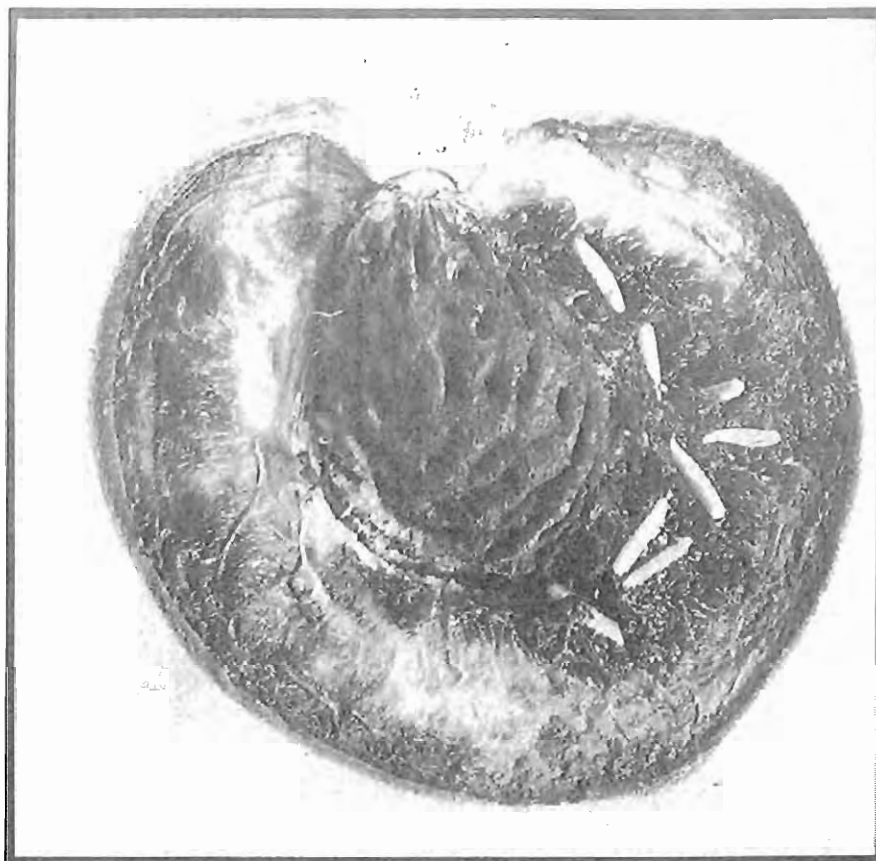
Eradication

Eradication procedures are started as soon as the maggots have been identified by an expert. Early detection may confine an outbreak to a single tree; if the outbreak were not detected, a whole district could be infested later.

The aims of eradication are firstly to limit spread of fruit fly from the infested tree to those uninfested. Next, to ensure that no stages of fruit fly remain alive in the area to cause later outbreaks.

Householders' reports of suspected fruit flies in fruit

Every year, hundreds of householders over the State report the presence of suspect fruit fly maggots in fruit to the Fruit fly Eradication Unit at Glenside (Phone: 79 2236). While most of the suspect insects prove to be maggots of various scavenging flies, or the caterpillars of established fruit pests, about one in



Fruit fly maggots.

every thousand reports, are the maggots of fruit flies.

Department of Agriculture officers are most keen to receive reports of insects in fruit for investigation and identification as quickly as possible. Keeping South Australia free from fruit fly is a never-ending battle. Every householder reporting maggots becomes another observation post with another keen pair of eyes, doing his or her share of service to the community. **Early detection means easier, quicker, and cheaper eradication.** Over the years, householders' reports have been invaluable. South Australia can take pride in the fact that it is the householder who has been responsible for detecting most fruit fly outbreaks here.

Prepared by the Fruit fly Eradication Unit, Glenside, S.A.

**Report all
maggots detected
in fruit to the
Fruit Fly
Eradication Unit,
Glenside.
Phone: 79 2236**