Queensland Fruit Fly (QFF)

Plant Biosecurity Orange

There are over 250 species of fruit fly in the family Tephritidae which occur in Australia but only about ten are pests.

The fruit fly of major concern in New South Wales is the Queensland fruit fly (QFF) (*Bactrocera tryoni*).

QFF is native to eastern Queensland and north eastern New South Wales and has spread to urban and horticultural areas in Queensland, New South Wales, Victoria and the Northern Territory.

Figure 1 Queensland fruit fly adult (7 mm)

Introduction

Queensland fruit flies (QFF) are different from small dark brown drosophila flies (also called vinegar flies or ferment flies) that hang around ripe and decaying fruit. Drosophila flies are not agricultural pests but can be a nuisance where fruit and vegetables are stored.

QFF lay eggs in maturing and ripe fruit on trees and sometimes in fallen fruit. The maggots (larvae) hatch and the fruit is destroyed by the feeding maggots and by associated fruit decay. QFF can attack a wide range of fruit, fruiting vegetables and native fruiting plants.

Evidence of QFF activity is sometimes seen as puncture marks (stings) in the skin of fruit. The stings are where the female fruit fly has laid her eggs. Sting marks may appear as brown spots on persimmons, apples and pears or small holes that may become small raised lumps in citrus and avocado.

Description

Adult QFF are about 6 to 8 mm long and are reddish-brown coloured with yellow markings (Figure 1).

QFF are most active in warm humid conditions and after rain. QFF might be seen walking on the undersides of leaves or on maturing fruit. They readily take flight if disturbed.

Lifecycle

There are four stages in the life cycle of QFF: egg, larva (maggot), pupa and adult.

Completion of the QFF life cycle is dependent on temperature and moisture. Each stage may take from a week to several weeks. Under favourable conditions one generation takes about four weeks.

Eggs

QFF eggs are generally hard to see as they are less than 1 mm long. Eggs are white in colour and banana shaped (Figure 2).

Larvae (maggots)

A small creamy white legless maggot emerges from each egg (Figure 3). When fully grown larvae are about 6 to 8 mm long and pale yellow. Larvae tend to eat their way towards the centre of the fruit. Decay begins inside the fruit while the outside of the fruit may appear intact.

Pupae

Mature larvae leave the fruit and burrow into the soil beneath the tree. Each larva forms a hard, brown barrel-like shell from its skin (Figure 4). Inside this case the pupa develops into a fly.

Figure 2 Queensland fruit fly eggs (less than 1 mm)

Figure 3 Queensland fruit fly larvae (1–8 mm)

Figure 4 Queensland fruit fly pupae (8 mm)

Adults

QFF adults emerge from their pupal cases in the soil and burrow towards the surface. There they inflate their wings and fly to find shelter, food and water. Under favourable conditions adults are able to mate a week after emerging. Soon after mating female flies are ready to lay eggs.

The female QFF has a retractable, needle-sharp egg-laying organ (ovipositor) at the tip of her abdomen. Using the ovipositor she digs a flask-shaped chamber about 3 mm deep in the outer layer of the fruit where up to 12 eggs are laid at a time.

Female QFF are capable of laying several hundred eggs during their lifetime.

Adults can live for many weeks. Female flies usually mate once or twice. Male flies mate multiple times.

Seasonal development

QFF numbers tend to increase in spring when temperatures are warm and there is ready availability of suitable host fruit.

During winter months the QFF population may diminish. However some QFF may survive the winter (overwintering) as adults by sheltering in protected places.

QFF behaviour

Typically adult QFF:

- are most active from October to May
- large numbers commonly occur in March and April
- are most active from dawn and the first few hours of the day and then towards late afternoon
- feed on a protein source to become sexually mature
- feed on a sugar source (honeydew, nectar) for energy
- rest during the day in shady trees (fruit trees, ornamental trees and shrubs)
- mate at dusk
- can survive throughout winter in protected sites

Further information

Plant Health Australia (2011) The Australian Handbook for the Identification of Fruit Flies version 1.0

http://www.planthealthaustralia.com.au/go/phau/strategies-and-policy/handbook-for-the-identification-of-fruit-flies

Tri-State Fruit Fly Program – Host Check List Queensland Fruit Fly

http://www.pestfreearea.com.au/host-list-of-banned-poduce.html

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