

Fruit Flies in the Home Garden

(*Bactrocera* spp.)

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Fruit flies are major pests of horticultural crops throughout the world and many species occur in Australia. Many fruit fly species have been recorded in the Northern Territory (NT). However, only two, *Bactrocera tryoni* and *Bactrocera jarvisi* have attained major pest status.



Figure 1. *Bactrocera tryoni*



Figure 2. *Bactrocera jarvisi*

HOST RANGE

In contrast to the other fruit fly species found in the NT, these two pest species have a wide host range.

B. tryoni has been recorded on over 70 hosts, 48 of which are cultivated plant species. *B. jarvisi* has a much narrower host range of 27 species, of which 15 are cultivated.

The more important fruits and vegetables that are attacked by *B. tryoni* include avocados, apples, bananas, Barbados cherries, Brazilian cherries, capsicums, carambola, guava, grapefruit, hog plums, lemons, loquat, mangoes, peaches, pears, sapodillas, tomatoes and water apples.

Those attacked by *B. jarvisi* include Barbados cherries, guava, Malay apples, mangoes, oranges and pomegranates.

It is probable that other potential hosts closely related to the species in the above list will also be infested by *B. tryoni*

LIFE CYCLE AND APPEARANCE

The two species of flies are similar in appearance, being slightly larger than a house fly and red-brown or yellow-brown in colour with yellow markings. The wings are clear with two dark bands forming a rough 'V' shape, which are normally held in a semi-spread position while walking or resting on fruit or the undersides of leaves. Females have an elongated ovipositor at the rear end for egg laying, which tends to give them a somewhat wasp-like shape.

Female flies deposit a clump of six to ten creamy white eggs about 1 mm in length just beneath the skin of ripening fruit but they are rarely seen. After a day or two, the eggs hatch to produce larvae, which burrow into the fruit. Within six to eight days, the legless larvae look like typical maggots, about 8 mm long and creamy white in colour with black markings, especially at the front end. When mature, larvae can move by curling over and flicking open to produce a considerable jump and they leave the fruit to burrow 2-3 cm below the soil surface. Here they pupate into brown barrel-shaped pupae about 5 mm in length. After 10 to 12 days, adult flies emerge from the pupal cases and wriggle their way to the soil surface. Flies become sexually mature after a further two weeks and after mating, females fly in search of ripening fruit. In the Top End, the life cycle is about four to five weeks. However, it is generally longer during the cooler weather experienced in the Alice Springs area in spring and autumn.



Figure 3. *B. tryoni* ovipositing into mango fruit



Figure 4. *B. tryoni* larvae

DAMAGE

Fruit spoilage is due to the activity of the larvae or maggots burrowing into the fruit tissue. This activity introduces bacteria, which hasten the spoilage process and lead to rotting and eventually to a complete breakdown of the fruit. Generally, the flies will only attack fruit approaching maturity but *B. tryoni* has been found in mangoes as early as 'golf ball size'. The latter pest has destroyed the entire crop on some individual trees in the Darwin area.

QUARANTINE AND EXPORT IMPLICATIONS

Before any fruit or produce is exported interstate or overseas, please contact the Northern Territory Quarantine at www.dpif.nt.gov.au or phone (08) 8999 5511 or email quarantine@nt.gov.au to find out if there are any export requirements.



Figure 5. Larvae and internal damage to mango fruit



Figure 6. Oviposition damage to tomato fruit

CONTROL MEASURES

Several measures can be imposed to reduce fly numbers or even to eradicate fruit flies from certain areas. However, in urban areas, exclusion, cover sprays and good sanitation are of most value. Baiting is also a good method of reducing populations over a wide area.

Harvest fruit before infestation occurs. As mentioned above, fruit flies generally only attack fruit approaching maturity. To avoid infestation, most types of fruit can be picked before ripening begins and held to ripen indoors. This should greatly reduce the chances of fruit fly infestation.

Protein bait spraying. Protein autolysate used in the bait comes from a brewing process, (such as stout or beer production) or production of health foods using yeast fermentation.

The bait is made by mixing 50 mL of 50% protein autolysate to 1 L of water and adding 4 mL of 50% a.c. malathion. This mixture may cause leaf burn on some tropical fruit trees, such as carambola.

The spray should be applied at the rate of 40 mL per tree to four trees for the average back yard. It is applied as a coarse spray at low pressure to one 'spot' in the tree. As fruit flies tend to congregate on the underside of leaves, it is best to apply the bait to this area.

Baiting should be carried out at weekly intervals.

Sanitation. It is essential that ripe fruit should not be left on the tree or lying on the ground to provide a breeding site for fruit flies. Unwanted or infested fruit should be collected and destroyed by placing in a sealed plastic bag and leaving in the sun for a few days before disposal in the garbage or by burning. Burying infested fruit is not recommended since adults can emerge from fruit buried to a depth of 1 m.

Bagging fruit. Large, high-value fruit, such as avocado, grapefruit, *Annona* spp. and *Rollinia* spp. can be protected from fruit fly attack by using individual paper bags, a method practised in some South-East Asian countries. Similarly, fruits which are borne in clusters can be bagged as a group. It is also possible that householders can bag a certain number (say ten per week) to enable harvest of that number for home consumption at maturity.

Fruit dipping. Work over the last few years has determined that dipping is required for commercial certification of produce against fruit flies. This method is unlikely to be used for back-yard production for home consumption and is not recommended.

Further information can be obtained from the Entomology Section at Berrimah Farm on 8999 2258 or email insectinfo@nt.gov.au.

Please visit us at our website:

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ISSN 0157-8243

Serial No. 425

Agdex No. 622

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