

# Pacific Pests, Pathogens and Weeds - Online edition

## Thrips - general (086)

### Common Name

Thrips are named after the plants that they live on, e.g., bean thrips, chilli thrips, western flower thrips, melon thrips, onion thrips, tobacco thrips. Some species are predators.

### Scientific Name

*Thrips* and *Frankliniella* species. A number of thrips have been identified on vegetables and flowers in Pacific island countries.

### Distribution

Thrips of different species occur in every country. Those that are common in Oceania are the onion thrips, *Thrips tabaci* (see **Fact Sheet no. 117**), and the melon thrips, *Thrips palmi* (see **Fact Sheet no. 106**). The western flower thrips, *Frankliniella occidentalis*, (see **Fact Sheet no. 183**) has not been recorded in Pacific island countries, but is a threat as it is present in Australia and New Zealand.

### Hosts

Tomato, capsicum, melon (see **Fact Sheet no. 106**), onion (see **Fact Sheet no. 117**), and many other crops. Predatory thrips prey on plant-eating thrips and spider mites.

### Symptoms & Life Cycle

As thrips feed, the cells of the plant collapse forming pits, distortions and brown patches on the leaves (Photo 1); later, the leaves have a silver sheen, or a 'scaring' occurs on the fruits (Photos 2-5). Heavy infestations cause leaves to wilt, dry and die (Photo 4).

Adult thrips are narrow, less than 2 mm long, yellow to black depending on the species, with wings that have long hairs at the margins (Photos 7-9). The wings cover the body when they are not in use. Thrips are difficult to see without a hand lens. The eggs are bean-shaped, white, laid on or inside the plant. The lifecycle has six stages: egg, first and second larva (small, whitish and very active, found mainly on the underside of the leaf), pre-pupa, pupa (both stages occur in the soil in natural cracks), and adult. The pre-pupa and pupa are similar in shape to the larvae, but do not move, feed, and show the developing wings.

Thrips occur all year round, but are particularly active in hot, dry times following heavy rains.

### Impact

Thrips damage plants in two ways: first, they pierce the cells of the plants they feed on and suck out the juices; and second, they spread viruses. Feeding begins when the leaves are still inside the buds, or fruits are still inside the flowers, and damage is only seen when they expand. It may not be possible to find the thrips on damaged leaves because they have already moved to feed elsewhere. Damaged fruits may not be suitable for market. Leaves may dry out and die early. In Pacific island countries, it is not known if thrips spread viruses.

Elsewhere, thrips (*Thrips* and *Frankliniella* species) spread a group of viruses called 'tospoviruses' which cause important diseases in tomato (*Tomato spotted wilt virus*), capsicum, tomato, beans, lettuce and eggplant, flowers, and weeds. The tospoviruses group contains some of the world's most damaging viruses. They are the only insect that spreads these viruses.

### Detection & inspection

Look on the underside of the leaves and inside flowers. The larvae are very difficult to see with the naked eye, but with a hand lens the long slender, black bodies of the adults are easily recognised. Look for black or brown specks where the thrips feed; these are faeces. The presence of faeces is a way of telling thrips from mites.



Photo 1. Brown or bronzed leaf damage on tomato caused by thrips.



Photo 2. Scaring of capsicum at the calyx end of the fruit.



Photo 3. Scaring of capsicum fruit. The damage was done when the fruit was much younger and the thrips were enclosed in the flowers.



Photo 4. Thrips damage on capsicum fruit at calyx end.

## Management

### NATURAL ENEMIES

Several natural enemies feed on thrips. There are predatory thrips, minute pirate bugs (Photos 10&11), predatory mites, lacewing larvae and ladybird beetles (adults and larvae). Note, it is best to avoid pesticides to manage thrips, especially those pesticides that are long lasting, as they will destroy populations of beneficial insects.

### CULTURAL CONTROL

Before planting:

- Rotate crops with non-host plants to break the lifecycle. Crops commonly attacked by thrips include: beans, cucurbits, crucifers, tomato, and capsicum.

During growth:

- Intercrop with a non-host plant helps to slow the movement of thrips through the crop. For example, grow peppers between yard long beans.
- Destroy weeds within and around crops to prevent build-up of thrips populations.
- Use a hose with a strong jet of water to remove thrips from the plants.

After harvest:

- Destroy crop remains after harvest to prevent thrips spreading from old to young crops.

### CHEMICAL CONTROL

It is unlikely that thrips populations will be high enough to justify use of pesticide. In any case, the use of pesticides is likely to do more harm than good, as they will kill natural enemies. Also, thrips tend to hide in sheltered places on plants - in leaf and flower buds or under the 'calyx' (see Photo 2) of the fruit - and they are also difficult to reach with pesticides. If pesticides are applied, try plant-derived products (botanical sprays) first, and always try to treat the undersides of the leaves. Do the following:

- Use plant-derived pesticides, such as derris, chilli, garlic, onion and papaya (**see Fact Sheet no. 56**). The toxicity of these PDPs is lost within a few days in sunlight.
- Note, a variety of *Derris*, brought many years ago to Solomon Islands from Papua New Guinea may be effective as a spray. It contains rotenone, an insecticide, so it should be used with caution. There may be varieties of *Derris* (fish poisons) in your country that can be tried (**see Fact Sheet no. 56**).
- Alternatively, and possibly a better choice, is to use horticultural oil (made from petroleum), white oil (made from vegetable oils), or soap solution (**see Fact Sheet no. 56**).
  - White oil:
    - 3 tablespoons (1/3 cup) cooking oil in 4 litres water.
    - 1/2 teaspoon detergent soap.
    - Shake well and use.
  - Soap:
    - Use soap (pure soap, not detergent).
    - 5 tablespoons of soap in 4 litres water, **OR**
    - 2 tablespoons of dish washing liquid in 4 litres water
- Commercial horticultural oil can also be used. White oil, soap and horticultural oil sprays work by blocking the breathing holes of insects causing suffocation and death. Spray the undersides of leaves; the oils must contact the insects. A second application of soap or oils may be necessary after 3-4 weeks.
- Use neem to discourage adults from feeding and laying their eggs on the plants (**see Fact Sheet no. 56**).
- Do not use broad-spectrum insecticides such as dimethoate (*under review in Australia, and not allowed for use in home gardens*), malathion and permethrin. They have a greater effect on the natural enemies of thrips than on the thrips.

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*When using a pesticide (or biopesticide), always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval. Recommendations will vary with the crop and system of cultivation. Expert advice on the most appropriate pesticide to use should always be sought from local agricultural authorities.*



Photo 5. Thrips damage on capsicum fruit.



Photo 6. Wilt, drying and early death of potato leaves caused by thrips infestation.



Photo 7. Thrips adults and nymphs on the underside of a potato leaf.



Photo 8. Adults and larvae of Cuban laurel thrips, *Gynaikothrips ficorum*, on *Ficus*. They puncture the leaf surface and pits develop.



Photo 9. Cuban laurel thrips, *Gynaikothrips ficorum*, on *Ficus benjamina*, with eggs, nymphs and adults.



Photo 10. White banded thrips, *Aeolothrips* sp., a predatory thrips.



Photo 11. A minute pirate bug, *Orius* sp., attacking whitefly larvae.

AUTHORS Suzanne Neave & Grahame Jackson

Information from Trips (2021) Wikipedia. (<https://en.wikipedia.org/wiki/Thrips>) and J. Bethke JA (2014) Thrips. How to manage pests in gardens and landscapes. UC/IPM. (<http://ipm.ucanr.edu/PMG/PESTNOTES/pn7429.html>); and from Which thrips is that? A guide to the key species transmitting Tomato spotted wilt virus in NSW. Compiled by Marilyn Steiner. NSW Department of Primary Industries. ([https://www.dpi.nsw.gov.au/\\_data/assets/pdf\\_file/0006/177324/tswv-transmitting-thrips.pdf](https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0006/177324/tswv-transmitting-thrips.pdf)). Photos 4-7 Mani Mua, SPC, Sigatoka Research Station, Fiji. Photo 10 Diane Alston, Utah State University, Bugwood.org. Photo 11 Wikipedia. (<http://en.wikipedia.org/wiki/Orius>). It is not known if this insect is in Pacific Island countries; it is given as an example of this type of bug.

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