

What are thrips?

Background

Thrips are tiny, slender, cigar or sausage shaped insects with fringed wings, all from the order Thysanoptera (pronounced Thigh-san-op-terra). The word thrips is both singular and plural and originates from ancient greek, meaning “woodworm”. This factsheet provides a general introduction to thrips biology and will assist growers in identifying their presence in a crop. For details on their management, including registered pesticides, refer to the [thrips pest management plan](#). In addition, there is a factsheet specific to [western flower thrips](#).

Most thrips encountered in production nurseries are pale to dark brown, but may sometimes be black (Fig. 1). They have tiny needle like mouthparts that feed by rupturing the outer layer of plant cells and sucking up cell contents. When feeding occurs on new growth the primary result is scarring and deformation of subsequent expanded leaves and flowers. Some species can also transmit certain plant viruses. Not all thrips are plant feeders, some species feed on fungi or pollen and are often non-damaging. Certain thrips are predators that feed on other insects (including thrips) and mites.

General biology

Thrips are small insects ranging from 0.5-2mm and occasionally up to about 14mm in length. They are cylindrical in shape with their head often being more narrow than the prothorax or the rest of their body (Fig. 1). Adults may be winged or wingless. When present, both pairs of wings are slender, with long comb-like hairs.

The life cycle of thrips includes an egg, two larval stages that actively feed, followed by two or three non-feeding pupal stages (Fig. 2). Eggs are often laid into plant tissue (stems, leaves, flowers or



Fig. 1. Various species of thrips showing diversity in size, shape and colour. Each individual is a different species.

fruit), but some species lay their eggs on the plant surface. Immature thrips (larvae) are similar in appearance to adults, but are generally paler in colour and are always wingless (Fig. 3). Many species pupate in soil or leaf litter layers, but some pupate on the plant itself, particularly in flowers and other protected areas on the plant. Females tend to be slightly longer and wider than males.

Under good conditions, adult thrips may live for 2-6 weeks, depending on the species. Females may lay 80-300 eggs, depending upon the species, host plant and environmental conditions. As such, thrips have the capacity to build up to large numbers in a relatively short period of time.

World-wide there are about 6000 species of thrips currently described. Of this number, less than 10% are considered economic pests of plant commodity crops. There are two groups (sub-orders) of thrips. The most commonly encountered group in production nurseries are relatively small, cream to pale, dark brown or sometimes black. Larvae tend to be cream to pale brown in colour. This suborder (Terebrantia – pronounced Terra-brant-ee) includes many of the serious economically damaging species, e.g. western flowers thrips, onion thrips, plague thrips and other species that often feed on a relatively large number of plant species. This group tends to feed in flowers and growing tips and on leaves and fruit. Some of these species are known to transmit significant and damaging plant viruses.

The other sub-order (Tubulifera – pronounced tube-you-lif-era) tend to be larger (up to about 14mm) and often have a relatively long tube-like terminal abdominal segment (hence the name) (Fig 5). This group is dominated by fungal feeding, leaf-litter species, but some species feed on plants and may cause economic damage. In many cases, tubuliferan thrips are black, heavily sclerotised and larvae are often yellow to orange in colour.

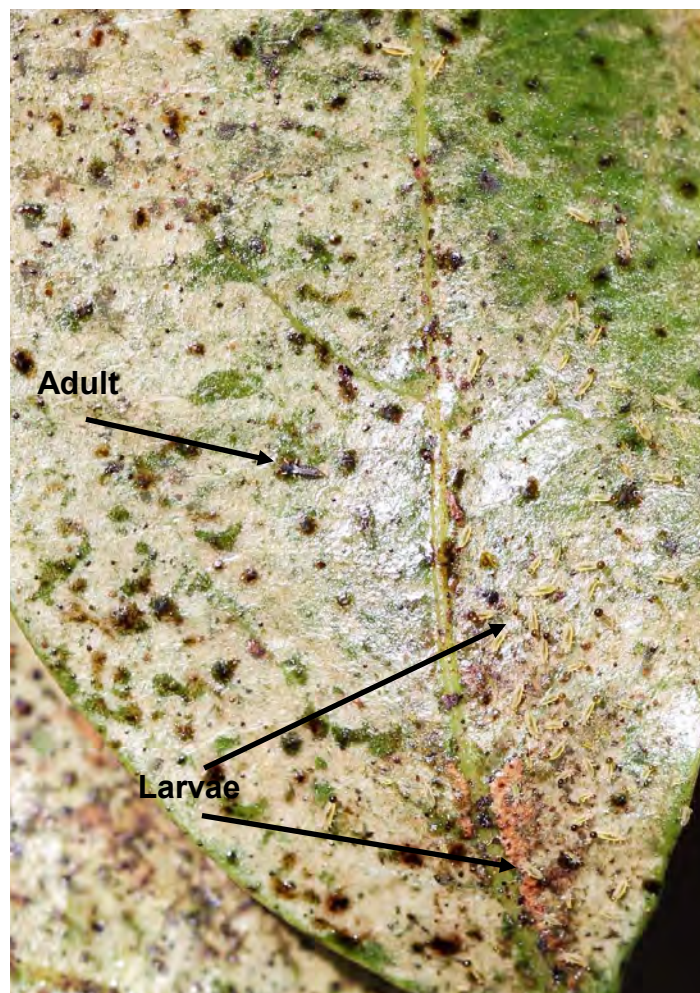


Fig. 3. Greenhouse thrips larvae and adults on viburnum (above - photo by Whitney Cranshaw, Bugwood.org). Minor leaf damage caused by thrips (below) .

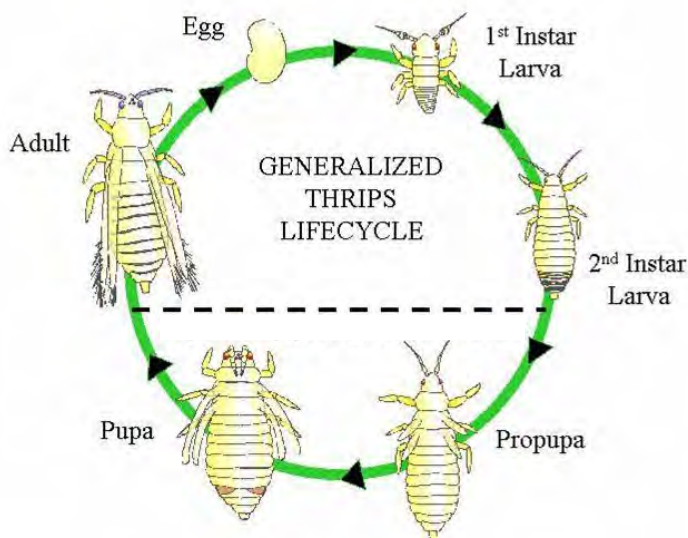


Fig. 2. Generalised thrips lifecycle (below - reproduced with permission, Mark S. Hoddle, UC Davis).

Damage

In Australia, only a relatively small number of species are considered pests. Thrips larvae and adults feed on various plant parts, pupal stages are relatively immobile and do not feed. Members of both sub-orders probe vegetation with their stylets, using their rasping-sucking mouthparts to damage individual cells, emptying cell contents that are sucked up. While collectively thrips can feed on growing tips, flowers buds, petals, pollen, new and old leaves and stems, some species feed in specific areas. Some species may exclusively feed within flowers, others may feed on flowers, leaf buds and expanding leaves.

Feeding on older leaves may cause relatively mild damage including the formation of silvery patches that turn brown as the cell tissues dry up beneath the epidermis (Fig. 6). This reduces photosynthesis and can induce premature leaf fall. Damage tends to be visible almost immediately after feeding occurs. Damage resulting from feeding on new growth or between plant parts tends to be delayed, i.e. plant growth must occur for the damage to become visible. As the tissue develops it may then cause leaf distortion (Fig. 6), leaf scarring, petal scarring (Fig. 4) and or leaf drop and rind blemishes. Faecal droplets, which turn black as mould grows on them, frequently accompany damage (Fig. 3). Larvae tend to be more damaging than adults as they are often in greater numbers and are less mobile than adults. As such, damage is concentrated. Oviposition can also cause damage to developing fruits, e.g. tomatoes. Damage from thrips can also predispose plants to fungal or bacterial infection, allowing a point of entry to the pathogen.

Monitoring

Plants susceptible to thrips damage should be inspected on a weekly basis for the presence of thrips and data recorded, preferably electronically. Increase the frequency of monitoring during expected periods of infestation, spring and summer, particularly during periods with strong winds. Frequent monitoring will enable infestations to be spotted while they are still light, and thus easier and cheaper to manage. Monitoring for thrips should include observations of the plant, the use of sticky traps and plant beating (described in the pest management plan).

Management

For plants that are susceptible to thrips it is recommended to put in place as many cultural management practices as possible. These actions reduce pest pressure passively, reducing the number of thrips that occur in each crop. Such actions include regular monitoring, managing weeds, checking new stock, growing resistant or tolerant varieties and other strategies detailed in the [pest management plan](#). Pesticides and biological control can also be used successfully, particularly when used in combination with other strategies.



Fig. 4. Typical scarring from thrips feeding on a flowers. Damage from gladiolus thrips, *Thrips simplex* (above - photo by Whitney Cranshaw, Colorado State University, Bugwood.org) and western flower thrips, *Frankliniella occidentalis* (below).

Biosecurity

There are many pest thrips not present in Australia that could cause significant economic loss if they were to become established. Poinsettia thrips, in particular, feeds on over 100 greenhouse crops and produces shallow puncture wounds, leaf chlorosis and shrivelling of leaves. Leaves also become soiled with their black faecal droplets (similar to greenhouse thrips—Fig. 3). It is known to feed on a wide range of host plants, particularly in a greenhouse situation. The most common hosts in the USA are *Impatiens*, *Euphorbia* (including poinsettia), *Dendranthema*, *Medicago* and various woody ornamentals. In other countries important hosts include *Dieffenbachia*, *Syngonium* and feeds on plants from *Acalypha*, *Dracaena*, *Fatsia*, *Ficus*, *Hibiscus*, *Spathiphyllum* and *Chrysanthemum* in protected cropping situations. It is also an important pest of greenhouse grown capsicums overseas. Its host range is large, where the only plant groups not reported as hosts are ferns and needle-leaved trees. It is known to occur across the USA, Canada, Thailand, Japan, Taiwan and many European countries.

Other exotic thrips could also become important pests in Australia. If you observe unusual symptoms, call the Exotic Plant Pest Hotline on 1800 084 881 and or submit a sample to a diagnostic laboratory for identification.

This document was prepared by Andrew Manners and John Duff (Agri-science Queensland, Department of Agriculture and Fisheries, Ecosciences Precinct, GPO Box 267, Brisbane QLD 4001) as part of the nursery levy and Hort Innovation funded project Building the resilience and on-farm biosecurity capacity of the Australian production nursery industry (NY15002) in 2017. All photos by DAF, unless otherwise stated.



Fig. 5. Ficus thrips, *Gynaikothrips* sp., an example of a species from sub-order Tubulifera. Note relatively long tube at the end of their abdomen (arrow).

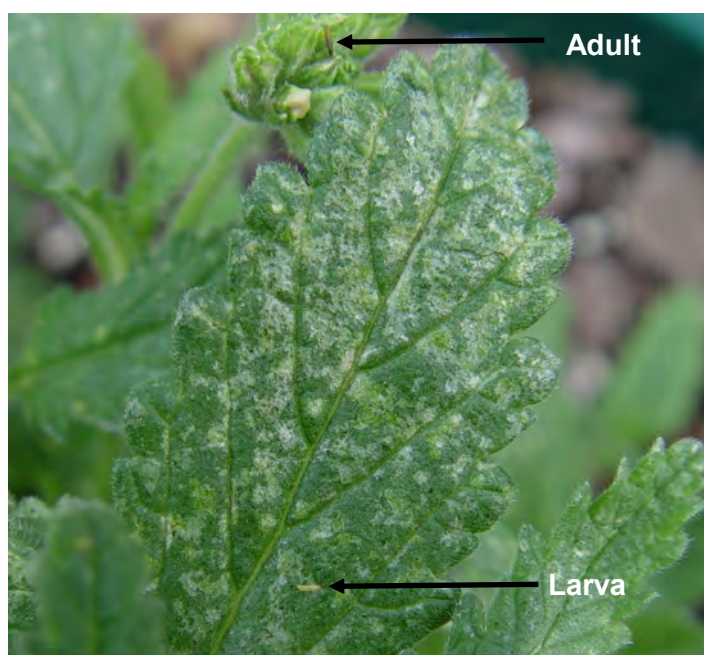


Fig. 6. Verbena infested with western flower thrips (above and middle - photos by Chazz Hesselein, Alabama Cooperative Extension System). Thrips damage to the growing tip of blueberry (below - photo by Jerry A. Payne, USDA Agricultural Research Service). All by Bugwood.org.