

# Which thrips is that?

## A guide to the key species damaging Stone and pome fruit in NSW



Western flower thrips

This brochure is a guide to identifying the key species of thrips damaging stone and pome fruit, particularly nectarines, in NSW. These are the very common native species, *Thrips imaginis* (plague thrips), and an introduced species, *Frankliniella occidentalis* (western flower thrips), now found in several fruit growing regions of Australia. Onion thrips, *Thrips tabaci*, has been implicated in damage in some countries, and is included in this key as a common species likely to be encountered during monitoring. Relatively uncommon thrips may be locally abundant and may even cause crop damage. If yours do not fit the description of those shown, and if they are numerous enough to cause concern, contact your local Department of Agriculture/Primary Industries or pest scout to have them identified by an entomologist. Be aware that specimens may fade over time: thrips are best examined fresh.



Plague thrips

This guide supplements a shortened version intended for field use. Accurate identification requires access to a binocular microscope (40x), which makes it relatively easy to identify the key thrips species associated with damage to a particular crop. Thrips may be on yellow sticky traps or in alcohol. A compound microscope can be used for slide mounts and will show additional details only visible at high magnification (100x).

### Key species in stone and pome fruit

- Western flower thrips, *Frankliniella occidentalis* (WFT)
- Plague thrips, *Thrips imaginis*
- Onion thrips, *Thrips tabaci*

### Key characters used to identify thrips at low magnification (40x)

- **Colour** (there may be seasonal and local differences between populations)
- **Setae** (strong hairs) - presence or absence on prothorax or abdomen
- **Number of antennal segments**
- **Colour of ocelli** (three simple eyes on top of head, between compound eyes)
- **Size**

### Key biological differences

- **Sex:** males, about two-thirds the size of females and pale yellow in colour. WFT are predominantly male at very low population densities, usually early in the season, and mostly female when numerous. Plague thrips are almost always female, particularly early in the season. Onion thrips are all female.
- **Seasonal incidence:** plague thrips are most numerous in mid to late spring and early summer, onion thrips in mid-summer and WFT in mid to late summer. WFT and onion thrips may be darker in winter; yellow forms of plague thrips occur in some areas.



Onion thrips

# Major pest thrips of stone and pome fruit

## Western flower thrips,

*Frankliniella occidentalis*

Largest of the three species,  
female 1.4-1.8 mm,  
male 0.9-1.1 mm.

Note black tip on female  
abdomen, banded antennae,  
pattern of darker spots on top  
side of abdominal segments,  
strong hairs on front margin of  
prothorax.



Female  
top side



Female  
underside



Male

## Plague thrips,

*Thrips imaginis*

Smaller species,  
female 1.1-1.3 mm,  
male 0.8-1.0 mm.

Note two last segments  
of female abdomen are  
darker, antennal segments  
are mostly dusky, no strong  
hairs on front margin of  
prothorax.



Female  
top side



Female  
underside



Male

## Onion thrips,

*Thrips tabaci*

Smallest species,  
female 1.0-1.2 mm,  
no males.

Note more uniform colour  
of abdominal segments,  
no strong hairs on front  
margin of prothorax.



Female  
top side



Female  
underside

No male

Note that sizes and colours vary, even within a species, and alone are not enough to separate species, particularly in the field. Adult thrips have two pairs of fringed wings. Larvae are white or yellow, wingless, with few distinguishing characteristics.

# Where to look for thrips on stone and pome fruit

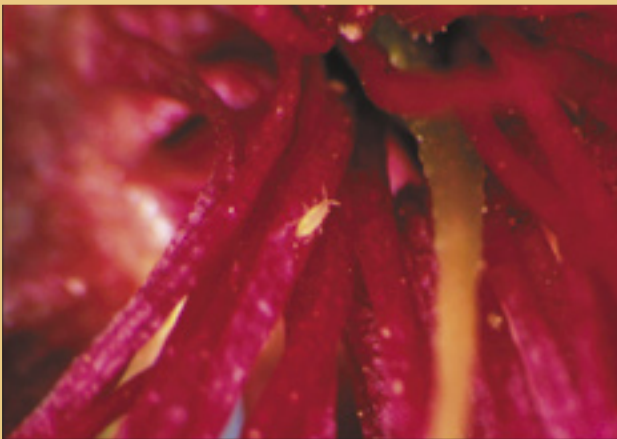
## *Early season*

Adult thrips are mostly found in flowers. Females lay eggs in sepals and other flower parts as early as bud swell. These hatch into larvae by late bloom. Few thrips are found on leaves. Plague thrips is usually the most common species during the flowering period. WFT is more likely to be found during summer on ripening fruit, but even low spring populations in flowers may cause economic losses, especially in nectarines. Plague thrips may migrate from some distance away, but WFT usually winters nearby on broadleaved weeds or garden plants.

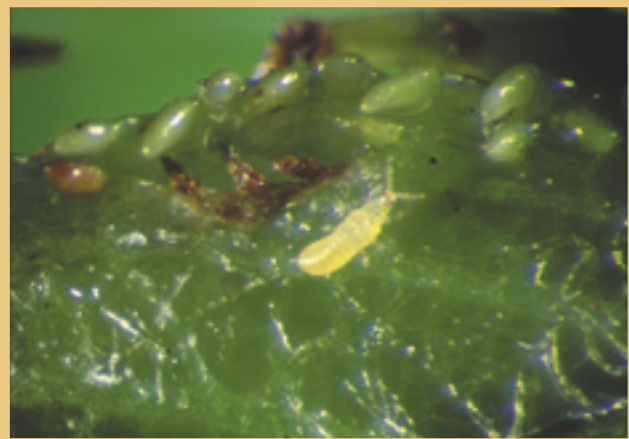
## *Late season*

Thrips feed in protected places on fruit, often under leaves or between fruits. Weeds, particularly clover, may harbour a large breeding population.

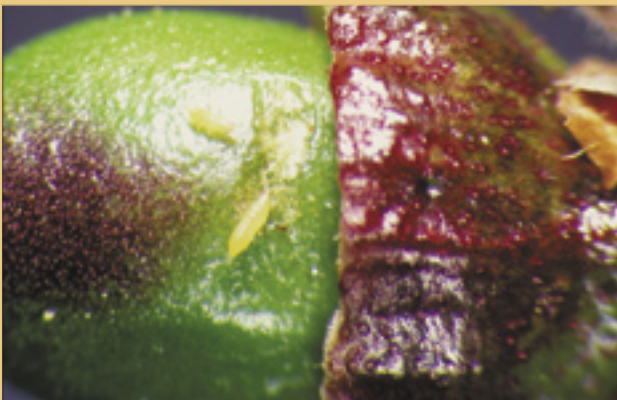
Thrips are best collected from buds or flowers. Collect 20-30 from each area and place in labelled zip-lock bags. Transfer thrips to 70% alcohol to preserve for identification. Yellow sticky traps are useful for monitoring the two pest species, particularly for the presence or absence of WFT, or major flights of plague thrips into the crop, but are also likely to catch non-pest species. Thrips on sticky traps are often damaged and expertise is needed to identify them with certainty.



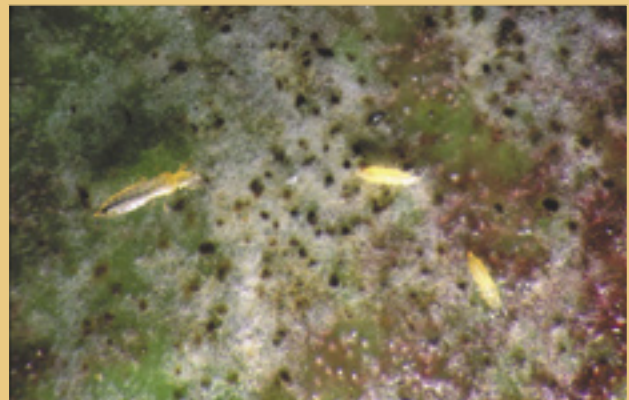
Above: Thrips larva in nectarine flower



Above: Thrips larva in nectarine shoot



Above: Thrips larvae on nectarine fruitlet, perianth removed



Above: Adult and larval WFT on nectarine fruit causing late season silvering damage

# Where to look for thrips damage

## *Early season*

Adult and larval thrips damage both flowers and fruit. In flowers they cause bronzing of petals and sepals, and occasionally flower abortion through severe damage to stamens and styles. Check in flowers at very early petal fall for tiny white thrips larvae on stamen filaments. Feeding damage to ovaries by larvae late bloom to shuck fall may cause small scars that enlarge as fruit grows, resulting in surface russetting and corkiness in mature fruit (usually caused by plague thrips). 'Ghost spotting/pansy spot' may occur around the site of egg laying.

## *Late season*

Feeding by WFT on ripening stone fruit 2-3 weeks before harvest may cause silvering damage or white patches at the stem end, particularly where physical contact with other fruit or foliage provides shelter for the thrips.



Above: Thrips oviposition punctures in fruit of nectarine (left), apple (centre) and plum (right)



Above: Damage to nectarine fruitlet (perianth removed) by larval thrips



Above: Nectarine shoot damaged by thrips larvae

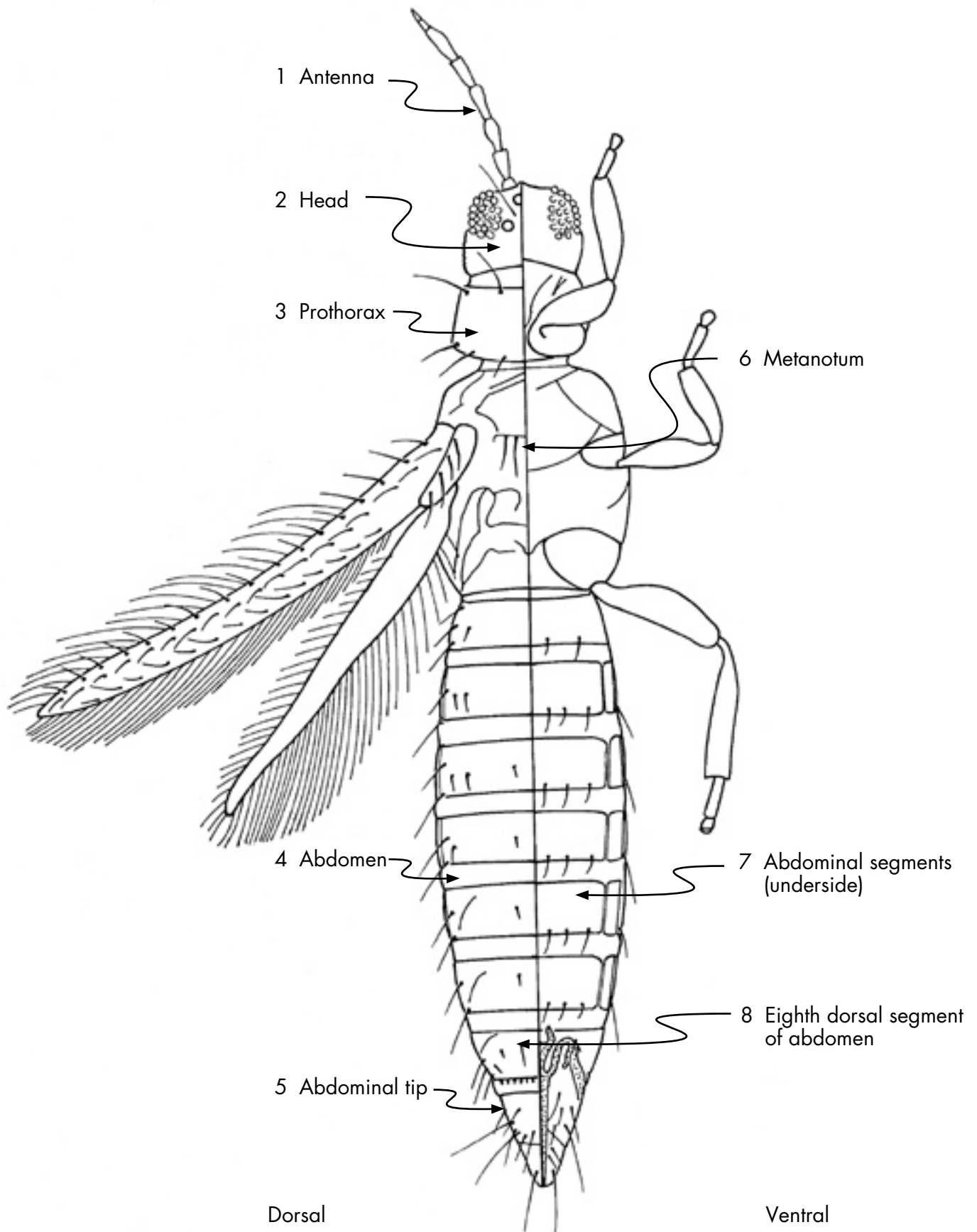


Above: White patches on nectarine fruit at stem end, a result of late-season feeding on maturing fruit



Above: Damage to nectarines resulting from feeding by thrips early-season (scarring, left) and late-season (silvering, right)

# Generalised diagram of an adult thrips



# Differentiating characteristics under low power magnification (40x)

## 1. Antennae

**Western flower thrips:** eight segments; two end segments small, narrow, black; general appearance banded.



**Plague thrips:** seven segments; first dusky, end one small, blunt.



**Onion thrips:** seven segments; first pale, end one small, blunt.



## 2. Head



**Western flower thrips:** ocelli red.



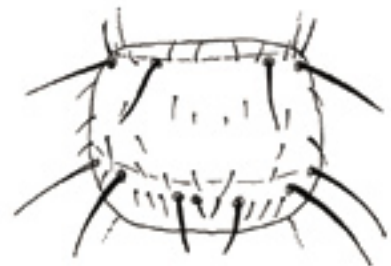
**Plague thrips:** ocelli red.



**Onion thrips:** ocelli pale.

## 3. Prothorax

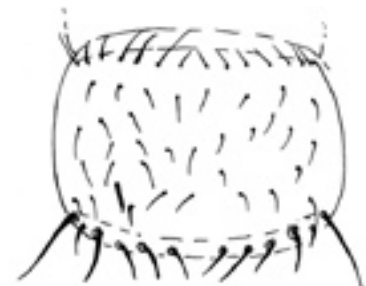
**Western flower thrips:** four pairs of strong bristles, one pair at each corner.



**Plague thrips:** two pairs of strong bristles, rear corners only.



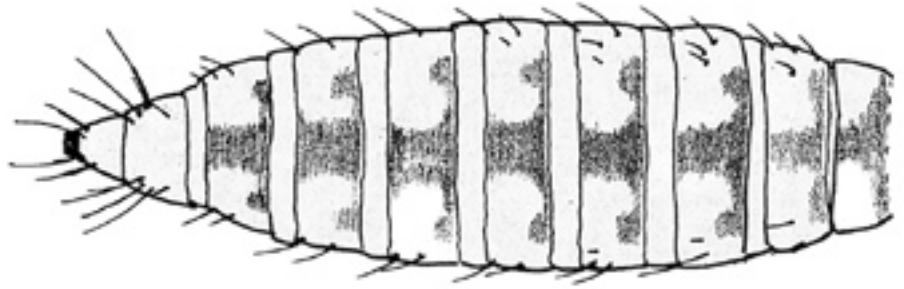
**Onion thrips:** two pairs of strong bristles, rear corners only.



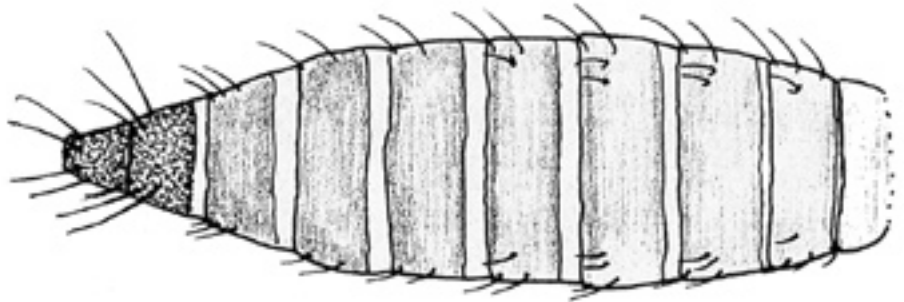
# Differentiating characteristics under low power magnification (40x)

## 4. Abdomen

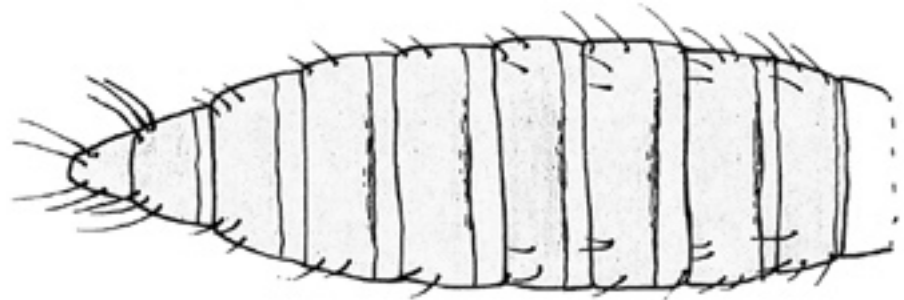
**Western flower thrips:** pale yellow to orange; dorsal side has dark markings down centre; darker in winter.



**Plague thrips:** yellow to dark brown; two last segments darker.

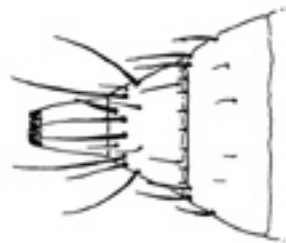


**Onion thrips:** variable, dark to light brown/grey, but fairly uniform over abdomen.

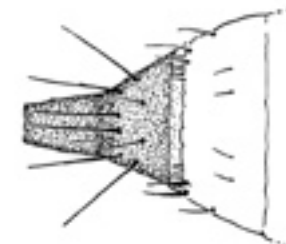


## 5. Abdominal tip

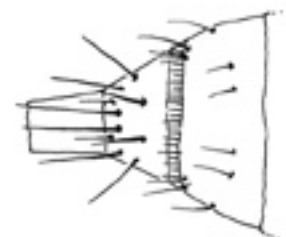
**Western flower thrips:** extreme tip black.



**Plague thrips:** last two segments dark.



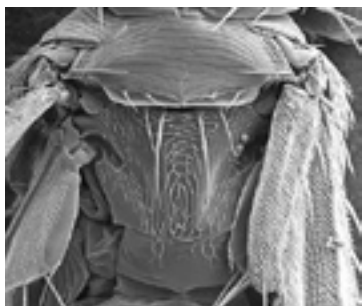
**Onion thrips:** uniform brown/grey colour.



# Differentiating characteristics under high power magnification (100x)

These are scanning electron microscope pictures. Characteristics are visible also in slide mounts of thrips viewed with a compound microscope.

## 6. Metanotum



**Western flower thrips:**  
median pair of metanotal setae (hairs) arising at front margin.

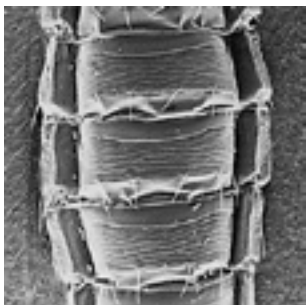


**Plague thrips:**  
median metanotal setae (hairs) arising behind front margin.



**Onion thrips:**  
median metanotal setae (hairs) arising behind front margin.

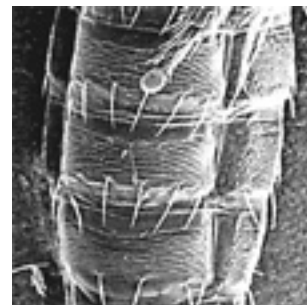
## 7. Abdominal segments (underside)



**Western flower thrips:**  
one row of setae (hairs) on lower margin of each segment.

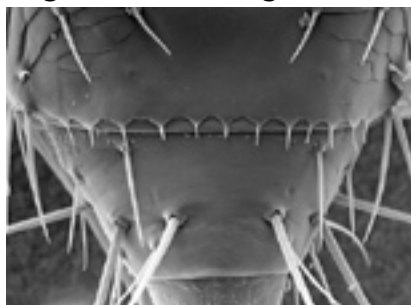


**Plague thrips:**  
at least three rows of setae (hairs) on each segment.

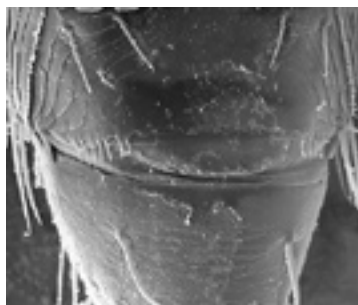


**Onion thrips:**  
one row of setae (hairs) on lower margin of each segment.

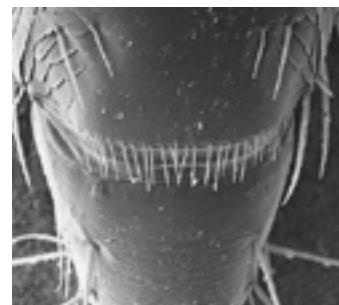
## 8. Eighth dorsal segment of abdomen



**Western flower thrips:**  
comb broad-based, complete.



**Plague thrips:**  
comb incomplete, at sides only.



**Onion thrips:**  
comb complete, long and fine.



# Sources of further information

## *Further reading on thrips identification:*

- *Identification Guide to Thrips Associated with Crops in Australia*. 1997. L.A.Mound and P.Gillespie. NSW Agriculture, Orange NSW.

## *Further reading on thrips of importance to stone and pome fruit:*

- *Orchard Plant Protection Guide for Deciduous Fruits in NSW*. Annual publication. NSW Department of Primary Industries, Orange NSW.
- *Integrated Pest Management for Stone Fruits*. 1999. Publication 3389, University of California, Oakland, California.

## *Help with thrips identification:*

- Laurence Mound, CSIRO, GPO Box 1700, Canberra, ACT 2601 Tel: (02) 6246 4280.
- State Departments of Agriculture (Diagnostic Laboratories): in NSW, Insect and Plant Health Enquiries, Orange Agricultural Institute, NSW Department of Primary Industries, Forest Road, Orange, NSW 2800 Tel: (02) 6391 3800 or Free Call 1800 675 821.

## *Help with control options:*

- Entomology Laboratory, Orange Agricultural Institute, Forest Road, Orange, NSW 2800 Tel: (02) 6391 3840.
- NSW Department of Primary Industries Fruit Advisory Horticulturists at: Alstonville, Tel: (02) 6626 2450; Camden, Tel: (02) 4640 6408; Gosford, Tel: (02) 4348 1916; Orange, Tel: (02) 6391 3822; Tumut, Tel: (02) 6947 4188; Richmond, Tel: (02) 4588 2105; and Young, Tel: (02) 6382 1077.
- *Orchard Plant Protection Guide for Deciduous Fruits in NSW*. Annual publication. NSW Department of Primary Industries, Orange NSW.

# Acknowledgements

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