BRITISH COLUMBIA | Ministry of Agriculture

Thrips
Biology and Control in Floriculture Crops

January, 2016

Introduction

Thrips have always been a common and difficult to control pest for growers of greenhouse flowers. Western flower thrips is the most widespread and troublesome thrips for British Columbia growers, but other species can also be serious pests. The following species have been encountered in local flower crops:

Echinothrips americanus

This thrips, which does not have a common name, is easily recognized by the white band across the thorax at the base of the wings. *E. americanus* first appeared in British Columbia in 1994. It has been found on poinsettias, cucumbers, and peppers. It occurs mainly on foliage, but as population levels increase the blossoms may be invaded. The pupal stage occurs on the host plant, unlike other species that drop to the ground to pupate.

Frankliniella intonsa (European flower thrips)

This thrips is found in the blossoms of several commercially grown greenhouse flower crops. It also occurs in field-grown cut flower crops. *F. intonsa* can only be distinguished from *Frankliniella occidentalis* by examination with a microscope.

Frankliniella occidentalis (western flower thrips)

This is a medium sized species (1.0 - 1.2 mm long). It varies in colour from yellowish to dark brown. This species can only be identified with certainty under a microscope, but the presence of large numbers of thrips in blossoms is a strong indicator of *F. occidentalis*. It feeds on a wide range of plants, and can spread tomato spotted wilt virus and impatiens necrotic spot virus to susceptible crops. This thrips can develop resistance to insecticides relatively quickly.

Thrips fuscipennis (rose thrips)

T. fuscipennis is very similar in appearance to the onion thrips, and can only be distinguished with a microscope. It is uncommon in British Columbia, appearing occasionally on roses and cucumbers. This thrips is easy to control with insecticides.

Thrips tabaci (onion thrips)

T. tabaci is a relatively small species, the female being 0.8 - 1.0 mm long. Colour variation makes colour an unreliable characteristic for identification. This thrips is found primarily on foliage, seldom invading blossoms. *T. tabaci* is usually easily controlled with insecticides.

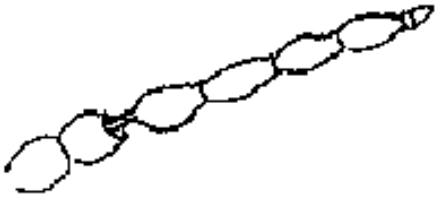
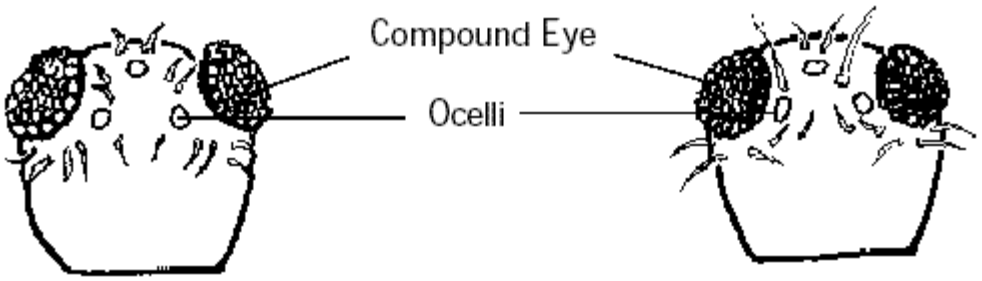
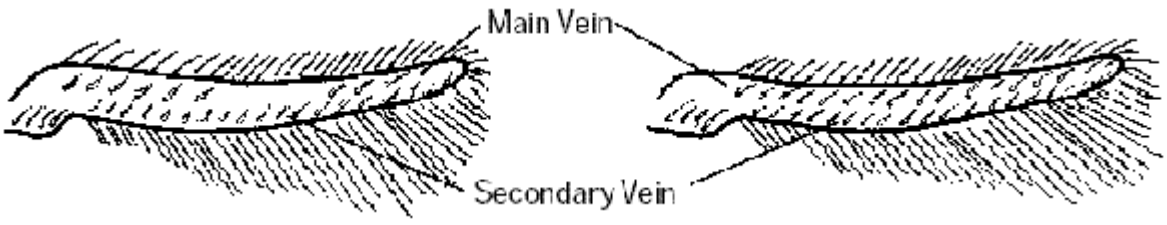
Other species occasionally found in British Columbia greenhouse flower crops:

- *Aelothrips fasciatus*
- *Ceratothrips ericae*
- *Heliothrips haemorrhoidalis*
- *Hercinothrips femoralis*
- *Parthenothrips dracaenae*
- *Thrips atratus*
- *Thrips nigropilosus*
- *Thrips simplex*
- *Thrips trehernei*
- *Thrips vulgatissimus*

Thrips Identification

With the exception of the striped *E. americanus*, it is very difficult to distinguish between thrips species except under a microscope. Figure 1, adapted from Koppert's "Knowing and Recognizing: The Biology of Glasshouse Pests and Their Natural Enemies", outlines the subtle differences used to identify *T. tabaci* and *F. occidentalis*.

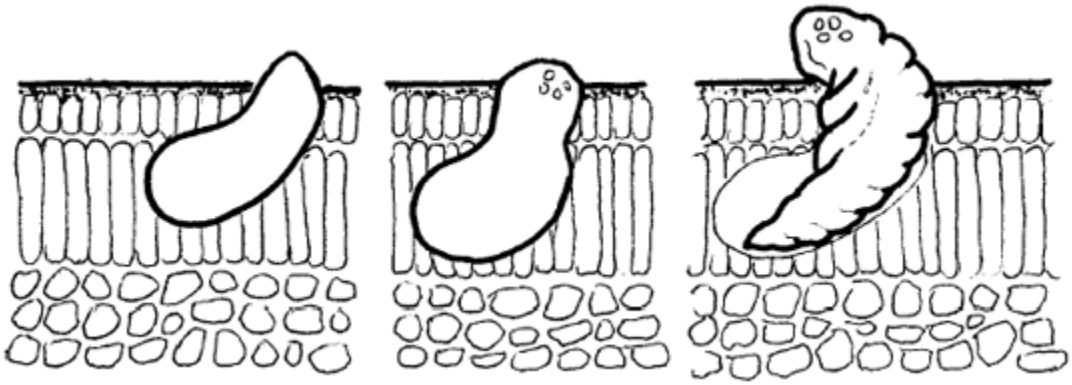
Figure 1.

Thrips tabaci	*Frankliniella occidentalis*
BODY:	
Colour - yellow to dark-brown; if two-coloured, the thorax is lighter than the abdomen **Length** - 0.8 mm	**Colour** - light yellow to dark-brown, often darker yellow with irregular brown spots on thorax and abdomen **Length** - 1.2 mm
	
ANTENNA:	
7 Segments	8 Segments
HEAD:	
	
Setae	
➢ two short hairs between the ocelli ➢ only short hairs behind the compound eye	➢ two long hairs between the ocelli ➢ one long and some short hairs behind the compound eye
FRONT WING:	
	
Main Vein	
➢ 6 to 7 hairs at the base, 4 (sometimes 3 to 5) at the tip	➢ Covered with hairs over the whole length
Secondary Vein	
➢ Covered with hairs over the whole length	➢ Covered with hairs over the whole length

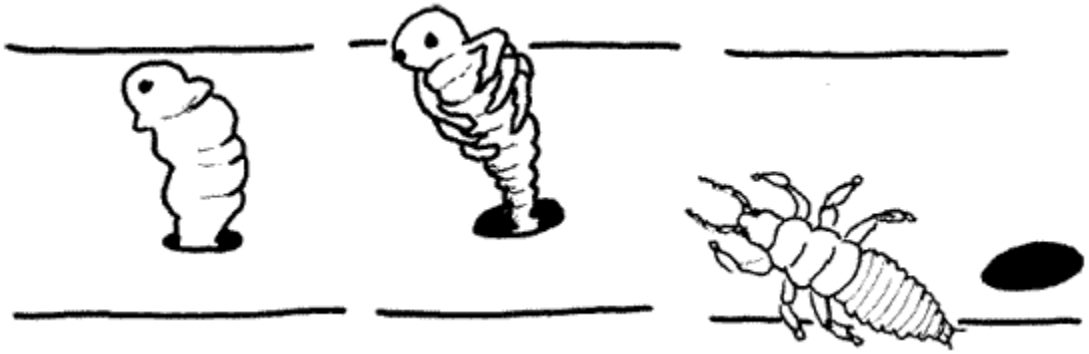
Thrips Life Cycle

Thrips go through six stages: an egg, two larval stages, a prepupal and pupal stage, and an adult. One generation takes about a month, but this can vary somewhat with temperature and the species involved.

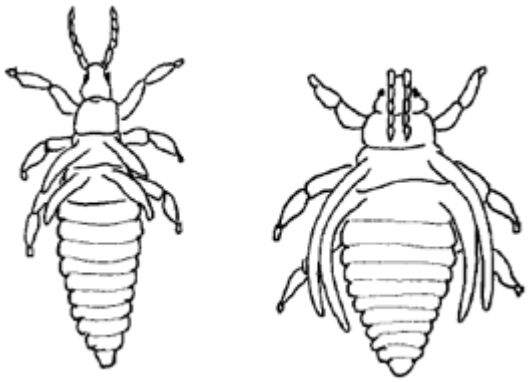
a) Hatching Eggs:



b) Emerging Larvae:

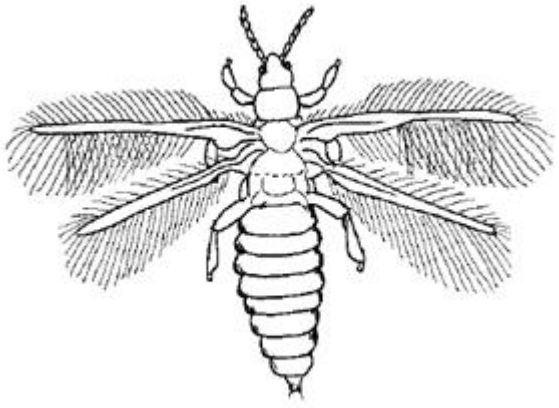


c) Prepupae & Pupae



At the end of the second larval stage, the thrips drop to the ground and pupate on or below the surface. In a few species, the prepual and pupal stages remain on the plant. The pupal stage is resistant to insecticides.

d) Adults:



Adults are the reproductive and winged stage. They are poor fliers but their feathery wings allow them to be readily carried by air currents.

Thrips Management

Producing a thrips-free crop requires a multi-faceted approach. However, with proper use of the following management practices, growers can economically keep these pests at non-damaging levels.

1. **Start clean:** An important part of keeping a crop thrips-free is to make sure the young plants are clean. Examine purchased or grower-propagated transplants for thrips before placing them in a greenhouse. Sticky card traps placed among the new plants for a day or two will quickly indicate the presence of thrips.
2. **Stay clean:** Covering the openings to greenhouses has been found to reduce pest problems by up to 70%. Screening used to exclude thrips must be very fine. Such screening, known as microscreen, has a maximum hole size of 0.16 mm. This significantly reduces air flow when placed over vents, and growers must modify ventilation systems to compensate for this. For some structures this is not practical.
3. **Eliminate Sources:** Thrips feed on a wide variety of plants and can readily be found in weeds outside a greenhouse. Thrips are not strong fliers so maintaining a weed-free zone immediately around a greenhouse can reduce the number of thrips entering a greenhouse. Proper disposal of plant residues is also important. Optimally, plant residues should be buried or hauled away. At the very least, they should be disposed of downwind from the structure.
4. **Monitor:** The most reliable way to detect thrips in a greenhouse is with either yellow or blue sticky traps. By installing traps and checking them weekly, a grower can discover thrips when they first infest a crop so immediate action can be taken. On-going monitoring tells growers if a thrips control program is working. Optimally, there should be one trap for every 100 m^2. Be sure to record the number of thrips captured each week.
5. **Insecticides:** It is difficult to devise a spray program that would be equally effective for all growers. The effectiveness of insecticides can vary between greenhouses as local populations have developed resistance. This is especially true for the western flower thrips.

   Also, thrips are found deep inside flower buds, which makes them hard to reach with most insecticides.

   Growers should incorporate at least two insecticide classes (different group numbers) in their spray program to reduce the possibility of resistance.

   If you are using a product or formulation for the first time, do a test spray to check for phytotoxicity (crop injury). Crops with open flowers are more susceptible to spray damage.
6. **Biological Control:** There are a number of commercially available biological agents to control thrips. Trials have demonstrated that they can be used successfully on some flower crops. However, there have also been a number of unsuccessful attempts, usually failing because pesticides had to be applied to control other pest problems resulting in mortality to the biological agents. Another challenge to the success of biological control in floriculture is the low tolerance level by customers for pests and their damage on flowers.