Cornell University
Cooperative Extension

Suggestions for Managing Thrips in the Greenhouse

John Sanderson, Assoc. Prof., Dept. of Entomology, Cornell University, Ithaca, NY
Dan Gilrein, Extension Entomologist, Cornell Cooperative Extension of Suffolk Co., Riverhead, NY

Western flower thrips (WFT) remains one of the most serious greenhouse pests for most growers of greenhouse flowers and bedding plants. Feeding by these tiny insects causes plant cells to collapse, resulting in scarred patches on mature growth and distortion of young leaves or flowers. The thrips' feeding can also transmit incurable tospoviruses, including impatiens necrotic spot virus (most common) and tomato spotted wilt virus, which can severely damage or kill greenhouse plants. Both the thrips and the viruses have a very wide host range including common flowers, vegetables, and many weeds. Following is a review of suggestions for managing western flower thrips:

• Thrips control should start at the end of the previous crop or season. Eliminate all sources of thrips at the end of each crop or growing season to avoid harboring a small population ready to infest an incoming or spring crop.

• Eliminate weeds inside and around the greenhouse perimeter, which may harbor thrips and/or the virus (plants don't always show symptoms of virus infection).

• Keep older plants segregated from newer crops and avoid moving clean new plants into thrips-infested areas. Older stock plants and long-term flowering pot plant crops such as cyclamen or holiday cactus can carry the thrips (and the virus) over from the fall to the following bedding plant season.

• Inspect incoming plant material for signs of thrips damage. Look for scarred patches with irregular outlines on upper leaf surfaces - tiny black fecal specks from the thrips is diagnostic. Insist on good thrips control from your plant suppliers.

• Don’t neglect hanging plants that can be an overlooked source of trouble. Hanging baskets of infested cutting crops over seedlings can spread a thrips infestation (and possibly virus) to other plants below.

• Discard heavily infested plants, which may be easier and more effective than treating.

• Pinch off and bag unneeded flowers, which removes a large part of the thrips population. Thrips lay up to four times as many eggs when pollen is present, compared to when only leaf tissue is available. While impractical in large ranges, this has worked on a small scale for some growers.

• Consider screening vents if outdoor sources are important. The National Greenhouse Manufacturers Association (NGMA) has compiled useful research data into its publication, “Helpful Hints: Insect Screening” (http://www.ngma.com/downloads.htm).

• Use yellow or blue sticky traps to monitor for WFT. Count and change cards weekly, noting upward population trends that signal the need for treatment. One 3 x 5-inch yellow or blue sticky card is spaced every 1,000 sq. ft. and positioned vertically just above the top of the plant canopy. The sticky cards may also be useful to detect when and where the thrips are originating by placing some traps near doors or vents. Flowers can also be checked for thrips by tapping a blossom over a white tray or sheet of paper and looking for the adults and tiny nymphs.

• When insecticides are needed, spray applications of Overture, Pylon (note sensitive plants) or Mesurol have been among the more effective options, followed by Avid (or generic version), DuraGuard, Acephate/Orthene TT&O, Safari (under SLN label, note restrictions), Marathon (or generic), or TriStar. Overture, Pylon, and Safari can only be used in greenhouses. There appears to be widespread resistance to Conserve but some growers are still reporting good results, particularly where the product has not been used recently. Some growers are incorporating insect growth regulators (IGRs, Azatin, Ornazin, Aza-Direct, Pedestal) or *Beauveria bassiana* (BotaniGard) in tank mixes or rotations. Kontos is also labeled; like the IGRs expect it to work best on immature thrips. Several pyrethroids (Talstar or generic, Decathlon, Scimitar, Mavrik) or aerosols/smoke generators (PT 1300 Orthene, Preclude, DuraPlex, Attain, Fulex Nicotine) are also labeled for control of thrips in greenhouses. Thrips can become tolerant or resistant to most insecticides and are difficult to control at best, therefore emphasis must be placed on sanitation and other non-chemical preventive measures.

Follow label directions for each insecticide used, but often a five-day treatment interval for two to three applications is needed to control thrips that later hatch from eggs or emerge from pupae. BotaniGard (*Beauveria bassiana)* should be used while the thrips infestation is still low; four to five applications at five-day intervals may be needed to keep low infestations in check. It has not performed well against serious infestations. The addition of Azatin may improve performance.

Use an application technique and equipment delivering small droplets that will give good pesticide coverage. As much as possible, insecticide should penetrate into thrips' hiding places such as buds and terminals, so tiny spray droplets are important. Pump-up sprayers may not be adequate.

• Consider biological control organisms. Success with biologicals has been increasing in recent years. Options include weekly preventative releases of tiny predaceous mites, *Neoseiulus cucumeris* or *Amblyseius swirskii*, to the foliage and flowers, as well as soil applications of *Hypoaspis* mites and sprays of insect-killing nematodes, *Steinernema feltiae* (Nemasys, Scanmask), to attack thrips pupae in the soil. (*A. swirskii* has the added benefit of attacking whitefly eggs). These natural enemies should be used preventatively before thrips are noticed, rather than in an attempt to reduce a serious infestation, and chances of success improve when releases of natural enemies are made to both the foliage and the soil. The minute pirate bug, *Orius insidiosus*, may be used, though it is often difficult to get established. The likelihood of its establishment in a greenhouse may increase by providing plants such as ornamental peppers that produce pollen as a supplemental food for *Orius,* and extending the daylength with lights if using it during winter and early spring.