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Thrips, Beneficials, and Bees in Greenhouse Tomato Production

Greenhouse tomato production is in full swing across the US, with many producers harvesting ripened fruit. Learn how to identify and control thrips to prevent damaged fruit - as well as provide the right environment for bumblebee hives.

Thrips. The Western flower thrips (WFT), *Frankliniella occidentalis*, is the most common species of thrips encountered in US greenhouses and can be found feeding on leaves, flowers and fruit - both on ornamental and edible plants. Thrips is a key pest of both greenhouse tomato and cucumber.

Thrips are tiny, cigar-shaped insects that feed on plant surfaces by piercing plant cells and sucking out the contents. Thrips feeding causes the plant tissues to die, often leaving white to silver-grey patches on leaves that desiccate and turn brown over time (Figure 1). Damage can also occur when thrips feed upon maturing fruits or lay eggs in the developing fruit leaving surfaces bumpy and deformed (Figure 2). In addition to physical damage, thrips also transmit plant viruses such as tomato spotted wilt virus (TSWV) and impatiens necrotic spot virus (INSV), among others.

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Figure 1. WFT feeding damage on tomato leaf. Photo by Beth Scheckelhoff

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Figure 2. Severe infestation of WFT on tomato. Extensive damage to fruit can occur when thrips populations are high (upper left). WTF females lay eggs in the developing fruit, leaving dimples called oviposition marks (upper right). WFT feeding on ripening fruit causes undesirable speckling (lower left). Photos by Beth Scheckelhoff

Growers should routinely inspect sticky cards, plants, flowers and fruit for the presence of thrips. Because of their small size, a simple way to detect thrips is to tap leaves, fruits or flowers over a piece of white paper. When present, thrips can be seen moving across the paper.

Thrips Control. Dr. Ray Cloyd of Kansas State University provides a detailed overview of thrips biology and management, including the use of natural enemies, in the publication *Western Flower Thrips: [Management on Greenhouse-Grown Crops](#)*. There are several natural enemies for thrips that can be used in biological control programs for both edible and ornamental crops. Predatory mites such as *Amblyseius cucumeris* and the predatory bug, *Orius* are two of several beneficial insects used to control WFT larvae and adults in the greenhouse.

Growers interested in implementing a biological control program for thrips need to plan accordingly and begin before populations get out of control and fruit damage occurs. This often requires a significant change in pest management mindset compared to traditional ornamental

production. Growers must thoroughly survey and inspect crops to monitor pest populations. Time is also needed to establish beneficial insect populations in order to effectively control the target pest(s).

There are a number of commercially available products that can be used to control thrips, though the list of labeled products for edible crops is much shorter than that for ornamental crops. *Remember, not all products labeled for control of thrips in ornamental greenhouse production are also labeled for use in edible crop production.* Read the label to ensure the chosen product can be applied to the intended crop in your state. The publication [Greenhouse Tomatoes: Pest Management in Mississippi](#) provides a nice overview of the pests encountered in greenhouse tomato production and lists the following products for use on thrips: azadirachtin, *Beauveria bassiana*, chlorfenapyr, malathion, paraffinic oil, potassium salts of fatty acids, pyrethrins, and spinosad.

Diligent scouting and implementing proper control measures as needed will prevent WFT from causing severe problems in your tomato production.

Bumblebee Hive Placement.

Bumblebees (*Bombus* sp.) are the primary pollinators for greenhouse tomatoes worldwide. Ensuring the health and vigor of the beehive(s) in the greenhouse is essential for adequate pollination and a robust crop. In their natural habitat, bumblebees build nests in or near the ground, generally in places that are shaded and relatively undisturbed. Providing a similar environment in the greenhouse can

Figure 3. Bumblebees are ideal pollinators for greenhouse tomato crops. Photo by Beth Scheckelhoff



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prolong the life of the hive and save growers the additional cost of replacing under-performing hives before scheduled. Placing hives within or below the plant canopy provides ample shade to keep the bees cool and protected (Figure 4). When hives are exposed to direct sunlight, bees spend time cooling the hive, not pollinating the flowers. Growers should check the location of hives to determine whether they should be moved or shaded.



Figure 4. The greenhouse tomato crop canopy provides a suitable environment for the bumblebee hive (far left). A hive in the open, direct sunlight will be warmer and less productive than the protected hive (below). Photos by Beth Scheckelhoff

