Agronomic Spotlight

Seminis grow forward

Managing Piercing-Sucking Insects of Tomato

- Aphids, stink bugs, and thrips feed on tomatoes using piercing-sucking mouth parts.
- Puncture wounds and the removal of sap can affect plant growth and fruit quality.
- Integrating the use of cultural and chemical strategies can be used to manage these pests.

Aphids

Damage: Both the green peach aphid and potato aphid (Figure 1) feed on tomato leaves, blossoms, and fruit. Feeding can result in leaf distortion and reduced fruit set.[1] Aphids excrete honeydew, a thick, sugary liquid, that is difficult to remove from leaves and fruit. Honeydew also promotes the growth of sooty mold on leaves and fruit. Aphids also vector a number of viruses to tomato including Potato virus Y (PVY) and Tobacco etch virus (TEV).[2]

Figure 1. The pink biotype of the potato aphid.
Joseph Berger, Bugwood.org.

Scouting: Some scouting guides recommend monitoring plants for aphids starting at first bloom[3], while others recommend monitoring before plants start to flower.[1] Specific scouting recommendations vary by region, but the process usually involves inspecting leaves just below the highest open flower. Aphids typically feed on the undersides of leaves. Action thresholds range from "50% or more of the leaves are infested"[1] to "three to four aphids per plant" [3].

Management: There are differences in the susceptibility of tomato varieties to damage from aphid feeding not related to virus infection. Tomato varieties containing the MI gene for nematode resistance have been reported to be somewhat less susceptible to aphid damage than varieties without the MI gene.[3]

Reflective mulches can repel aphids from tomato plants, but the mulches are only effective until canopies cover the mulch.[3] The presence of natural enemies can keep aphid populations low, eliminating the need for treatment with insecticides. Avoid using broad-spectrum insecticides that can kill natural enemies.[1,4]

Stink Bugs

Damage: Several species of stink bugs feed on tomatoes, including the consperse stink bug, redshouldered stink bug, the say stink bug complex, southern green stink bug, bagrada bug, and the brown marmorated stink bug [BMSB] (Figure 2).[3] Stink bugs create puncture wounds on fruit when they feed. Yellow to light green discoloration often develops around the punctured area, and corky tissue forms under the surface in the area of feeding.[1,3]

Scouting: Stink bugs are problematic on tomatoes from initial fruit formation through harvest, with higher levels of damage generally seen later in the season.[5,6] To reduce losses from stink bug damage, it is important to detect the insects early and time treatments to maximize effectiveness.[6] Pheromone traps are available for some stink bug species, but not all. If traps are used, start evaluating leaves and fruit when adults are consistently found in the traps and when fruit are about one inch in diameter. Inspect the undersides of leaves for eggs and nymphs and the fruit for nymphs and adults. The adults like to hide, so detection can be difficult. Plants can be shaken over trays or tarps to dislodge the adults.[3,5,6] For fresh market tomatoes, consider insecticide treatments when stink bugs are present in the crop.

Management: Avoid planting tomatoes near wooded areas and remove or destroy overwintering habitat (woodpiles). Trap crops (cowpeas, beans, or crucifers) can be planted around the tomato crop to attract stink bugs. The trap crop can then be treated with an insecticide before the nymphs become adults.[1,3,5]

Insecticides also can be applied directly to tomato plants, but populations may rebound after an initial knockdown. Many insecticides are registered for stink bug control, but not all are effective against all species. In particular, many of the insecticides used to manage other stink bug species are not effective against BMSB. Be sure to choose insecticides specifically recommended for controlling BMSB.[3,5]

Figure 2. An adult brown marmorated stink bug.

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Thrips

Damage: Western flower thrips and onion thrips can cause problems on tomatoes. Adult thrips are mostly found in the flowers, while the larvae colonize flowers and fruit. Feeding damage can distort the growth of plants, deform flowers, and cause the formation of white-silvery patches on emerging leaves. Eggs laid in the fruit can cause discoloration (Figure 3) and produce dimples on the fruit. Larval feeding can cause flecking of the fruit. Thrips also transmit the Tomato spotted wilt virus.

Figure 3. Fruit discoloration caused by flower thrips feeding. David Riley, University of Georgia, Bugwood.org.

Scouting: It is important to identify adult thrips species, because not all the thrips that may be present cause damage to tomato. Scout fields weekly and examine the flowers and small fruit on randomly selected plants. Treatments may be warranted if an average of more than one adult per flower or more than two larvae per small fruit are detected.[1,5]

Management: Do not grow bedding plants in tunnels or greenhouses prior to growing tomatoes. Avoid planting tomatoes next to onions, garlic, and cereal crops, which are hosts of western flower thrips and onion thrips. Avoid planting tomatoes in fields near greenhouses where ornamental plants are grown. Ultraviolet and reflective mulches can repel thrips early in the season. Do not over fertilize the tomato plants, as this can increase colonization by thrips.[1,3,6]

If insecticide treatments are warranted, ensure that sprays cover all plant parts, including the undersides of leaves. Some insecticides list thrips (in general) on their labels, but they may not be effective against western flower thrips.[1,3,4] Populations of western flower thrips have been documented to be resistant to some insecticide classes, including pyrethroids, carbamates, and organophosphates. The spinosyn class of insecticides has been the most effective for western flower thrips, but resistance to this class of insecticides has been documented in some parts of Florida.[7]

Using Insecticides

Insecticide treatments should be applied at times when they will be most effective, based on the important insect stages and locations. If possible, use pheromone traps and scouting to determine when target insects are present and active before applying insecticides. If insects primarily reside on the undersides of leaves or at the stem ends of fruit, then it is important to make sure that sprays cover those areas.

For many insect pests, the method of application can affect treatment outcomes. Ground applications are usually more effective than aerial applications because they provide better coverage of plant surfaces. The use of hollow-cone nozzles or air-assist sprayers, higher spray pressures, higher application volumes, and lower application speeds will also improve coverage.[3,5]

It is important to protect beneficial insects, including natural enemies and pollinators. In some cases, as with aphids and thrips, the use of a broad-spectrum insecticide can increase the problem because the natural enemies of these pests are killed.[5]

Do not apply insecticides to blossoms during the pollination period to protect pollinators. Also avoid applying insecticides during the times of the day when pollinators are active, and protect any hives in the area from spray drift. When possible, select products that are safe for bees and other pollinators.

Several insecticide products are available for many of the insect pests of tomato. Consult regional production or pest management guides for recommendations on the most effective products for specific pests in your area. Accurately identify the insect pests and select the products that have been shown to be effective for those specific pests. Be aware of problems with insecticide resistance and implement resistance management strategies. Rotate the use of insecticides with different modes of action (different insecticide classes). Always refer to the most current product labels, and follow the instructions and restrictions listed on those labels.

Sources:

[1] Webb, S., Stansly, P., Schuster, D., Funderburk, J., and Smith, H. 2017. Insect management for tomatoes, peppers, and eggplant. UF-IFAS publication ENY-461. [2] Jones, J., Zitter, T., Momol, T., and Miller, S. 2014. Compendium of tomato diseases and pests, second edition. American Phytopathological Society, St. Paul, MN. [3] Miyao G, Goodell P., Davis, R., Hembree, K., Natwick, E., Ploeg, A., Aegerter, B., Lanini, W., Stapleton, J., Stoddard, C., Subbarao, K., Trumble, J., Zalom, F. Revised continuously. UC IPM Pest Management Guidelines: Tomato. UC ANR Publication 3470. [4] Egel, D., Foster, R., Maynard, E., Weller, S., Babadoost, M., Nair, A., Rivard, C., Kennelly, M., Hausbedk, M., Szendra, Z., Hutchinson, B., Eaton, T., Welty, C., and Miller, S. 2019. Midwest vegetable production guide for commercial growers 2019. [5] Reiners, S., Wallace, J., Curtis, P., Helms, M., McGrath, M., Nault, B., and Seaman, A. 2019. Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production. Cornell Cooperative Extension. [6] Weinzierl, R. 2014. Insect management in tomatoes. ISCAOC presentation. January 14,2019. [7] Funderburk, J., Reitz, S., Stansly, P., Freeman, J., Miller, C., McAvoy, G., Whidden, A., Demirozer, O., Nuessly, G., and Leppla, N. 2018. Managing thrips in pepper and eggplant. UF-IFAS publication ENY-658.

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