

Managing Tomato Spotted Wilt in Tomato in Georgia

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Tomato spotted wilt (TSW) (pictured above) is a disease in tomato in Georgia that has the potential to cause serious yield loss. TSW is caused by a virus that is transmitted primarily by tobacco thrips and western flower thrips (pictured below) in Georgia. Management of TSW in the crop can be complex but comes down to two basic approaches: (1) use host plants that are resistant to the virus and (2) prevent the thrips carrying the virus from settling and/or feeding on the crop. The commercially available TSW-resistant tomato varieties have a single gene, Sw-5, that confers resistance although some strains of the virus can overcome resistance. Preventing virus transmission by controlling thrips is difficult since thrips can transmit the virus within minutes of active feeding. Thus, insecticides might not act quickly enough to prevent the transmission unless they interfere with or prevent thrips feeding. For example, the systemic neonicotinoid insecticide imidacloprid interferes with feeding by tobacco thrips, but not western flower thrips. It is important to understand your risk of TSW before choosing a management method.

How to Determine Your Risk?

Since thrips and the TSW virus occur in numerous weed hosts, this problem can persist from year to year in a given area. If you have a history of problems with TSW on your farm, you are more likely to have disease pressure due to the presence of infected weeds in the landscape. The intensity of this disease pressure can vary based on annual weather conditions (e.g., warm, dry conditions in the spring can lead to earlier and more severe problems with TSW than cool, wet springs). This is primarily due to what is happening with the thrips population in the farmscape. Thrips reproduce faster under warmer conditions, while rainfall can reduce the survival of immature thrips. Using temperature to predict when a specific, damaging generation of thrips is set to emerge from the pre-adult stage is an effective way to estimate your short-term risk (in weeks) of thrips transmitting TSW virus to the crop. Risk of TSW virus spread by early season thrips populations can be reduced by implementing measures such as insecticides that interfere with thrips feeding or reflective mulch that repels thrips.



Tobacco thrips



Western flower thrips



There are also Roma or plum-type tomato lines with resistance to TSW, including Picus (Seminis), Rubia (Sakata), Muriel, BHN 685 (Siegers), Hedvig, Galilea, and Shanty (Hazera). If you plant a TSW-susceptible cultivar, it is still possible to induce a certain level of resistance using a plant activator like acibenzolar-S-methyl (Actigard - Syngenta) applied just prior to infection by thrips carrying the TSW virus. However, results in Georgia suggest that TSW-resistant cultivars are much more effective than the use of Actigard.

Controlling Thrips

Since thrips are the only vectors of the virus that causes TSW, it stands to reason that if you can stop the thrips from reaching or feeding on the tomato crop then you could prevent the disease. Unfortunately, this is easier said than done. To screen out thrips, you would need a super fine mesh (<0.2 mm dia. hole), which is cost prohibitive. In the field, imidacloprid has been used to effectively reduce tobacco thrips feeding on young plants. Other more efficacious insecticides have been used to control multiple thrips species on the tomato plant foliage in an early-season preventative treatment program. Perhaps the best non-chemical approach for reducing thrips in the tomato field has been achieved with the use of metallic-reflective mulch (pictured below). However, reflective mulches can reduce soil temperature and delay tomato plant growth early in the season.



Metallic reflective mulch compared to black mulch

Managing TSW in Tomato

TSW can cause damage by stunting plants, drastically reducing yields and causing irregular ripened fruit (pictured above). The primary tactic for preventing a problem with this disease is to use TSW-resistant tomato varieties. Round-type tomato cultivars that have confirmed resistance to TSW in Georgia include:

Cultivar	Plant Source
Quincy	Seminis
BHN 640	BHN/Siegers
Crista	Harris Moran/Clifton
Bella Rosa	Sakata/Siegers
Amelia	Harris Moran/Clifton
Talladega	Syngenta
Red Defender	Harris Moran
BHN 444	BHN/Siegers
Redline	Syngenta
BHN 602	BHN/Siegers
Top Gun	Twilley
Inbar	Hazera
Tycoon	Hazera
Carson	Hazera
Tribeca	Vilmorin
Mountain Glory	Siegers
Fletcher	Reimer Seeds
Finishline	Syngenta
Tous 91	Hazera
Nico	Harris Moran
Tribute	Sakata