



AVRDC - The World Vegetable Center

Fact Sheet

Tomato Diseases

Tomato Spotted Wilt Virus (TSWV)



Found worldwide

Symptoms

Young leaves of slightly infected transplants turn bronze (purplish-brown) and later develop numerous small, dark spots. The bronzing of foliage may extend to large areas of the leaf surface. The bronzed areas may roll inward and the tissue often dies. Heavily infected transplants remain stunted.

Shiny, dark brown streaks appear on stems and petioles. Growing tips of plants may die back.

Affected fruit have spots about 1 cm in diameter with slightly raised, circular markings. Ripe fruit can be distorted and can have alternate red and yellow bands.

Sometimes infected plants are killed by severe necrosis. Host plants and symptoms vary among TSWV strains.

Conditions for Disease Development

TSWV is found in many plants, including solanaceous crops (tomato, pepper, potato and tobacco), pea, lettuce, numerous weeds and ornamentals. The virus is generally spread by thrips (*Thrips* spp.) Thrips are tiny, they multiply quickly, feed on a wide range of plants, and may be easily blown into fields.

How to Identify Tomato Spotted Wilt Virus



Look for bronzing of foliage with inward folding of leaves (left), shiny, dark brown lesions on stems and leaf petioles (center) and ripened fruit with large spotting or red and yellow bands (right).

Thrips feed on the leaf undersurface. They puncture plants and suck the juices that flow from the injury. They feed on leaves, stems, fruits and flower parts. Feeding damage causes new growth to become deformed.

Young (larval stage) thrips acquire TSWV when feeding from infected plants and then spread the virus as adults when they fly from plant to plant. The virus cannot be transmitted from one generation of thrip to another.

Infected weeds or ornamental plants are generally the source of the virus. The life cycle of a thrip varies from 7 to 14 days so there are multiple generations on weed hosts and during the growing cycle of crop plants.

Control

Some resistant varieties are available. Consult with your extension agent to determine which are the most suitable in your region.

The presence of thrips in tomato fields can be monitored using yellow sticky cards. Consider planting a non-susceptible crop if TSWV and thrip populations throughout the area are very high.

If the disease appears in a crop, infected plants should be removed and destroyed immediately. Unfortunately, rouging out symptomatic plants is not always effective because TSWV has often spread before symptoms develop.

Maintain seedbeds away from cropped areas and from other susceptible plants. Protect transplants with mesh netting (40-mesh or higher) to exclude thrips.

Maintain a 10-m plant-free border around the production fields to prevent the spread of TSWV. Tomato fields should be located as far away as possible from home gardens, and flower or grain fields.

Remove crop debris, weeds and other sources of thrips at the end of each crop. Plow and keep fields fallow for 3–4 weeks to allow thrips to emerge and disperse. Reduce cultivation within the field to avoid movement of thrips from infected plants. Soil can be fumigated with metam-sodium (Vapam) or 1,3-dichloropropene (Telone) to eliminate thrips associated with crop debris.

Controlling thrips with insecticides can be difficult because they rapidly develop resistance to the chemicals. Several insecticide applications should be made at 5-day intervals to significantly reduce a thrip infestation. More than one application is necessary. Five-day application intervals are more effective than 7-day intervals. Ideally, insecticides should be applied with equipment that produces very small spray particles (<100 microns) to maximize spray coverage on plants, including in crevices of plants. Rotate insecticides from different chemical classes as a way to delay insecticide resistance.

For more information on the production of tomato and other vegetables, go to <www.avrdc.org>.