Tomato Spotted Wilt Virus in Tomato

Steve Bost, Professor
Entomology and Plant Pathology

Tomato spotted wilt virus (TSWV) has been found in Tennessee crops each year since 1986. The primary crops affected are tobacco, tomato, peppers, and certain greenhouse ornamentals.

Symptoms
The distribution of infected plants in a field is typically scattered, with relatively few plants affected. However, extensive losses can occur, since spread can continue on tomatoes throughout the summer. Symptoms vary, but usually begin with a blighting of young (upper) leaves, beginning with purple or brown spots on the leaves (Figures 1 and 2). Its appearance in the upper part of the plant distinguishes TSWV from fungal leaf blights, which often begin on the lower leaves. Purple to bronze streaks and rings may appear on stems (Figure 2). In older infections, stem surfaces exhibit tan to brown, corky areas (Figure 3) and tip dieback. Plants infected when small are stunted and pale (Figure 4), and leaves are rolled, exhibiting purple veins on the undersides. Infected, ripe fruit show noticeable yellow rings. Some fruit have a dark, rough, “alligator” skin.

Spread
TSWV is spread by tiny insects called thrips, which pick up the virus by feeding on infected plants. TSWV has a wide host range, including many perennial weeds that can host the virus over the winter. Thus, there is a readily available source of the virus each year.

Figure 1. TSWV usually begins on young leaves.
Figure 2. Leaf and stem symptoms caused by TSWV.
Figure 3. Brown, corky areas on stems, in an advanced case of TSWV.
Figure 4. Young plant affected with TSWV.
If the virus and the thrips are present, the severity of the disease depends on the weather. Dry spring weather is usually followed by problems with spotted wilt during the growing season, and preventive methods (below) for the summer crop would be warranted. Hot, dry weather during the summer reduces spread.

Control

Reflective mulches help to control spotted wilt by causing fewer thrips to land on the tomato plants. Extensive research has shown the benefits of reflective mulches in reducing the incidence of the disease. Metalized mulches are sold for this purpose. Gardeners can produce reflective mulches by spraying black plastic with aluminum paint or by placing aluminum foil, shiny side up, on the ground around the plants.

Varieties with resistance to spotted wilt have recently become available, primarily for commercial growers (a determinate saladette variety, "Health Kick," is provided by Park Seed Co. for the home garden market). The level of resistance in all varieties with spotted wilt resistance is only intermediate, and other methods of control may be needed. Following are determinate, slicing varieties: Amelia, Bella Rosa, BHN 602, BHN 640, Camel, Crista, Finishline, Fletcher, Mountain Glory, Nico, Primo Red, Quincy, Red Bounty, Red Defender, and Talladega. Determinate, saladette varieties include: BHN 685, Health Kick, Monticello, Muriel, Patria, Plum Regal, Picus, and Tachi. Indeterminate saladette varieties are Reposado, Super Cromo, and UG 7901. BHN 1010 is a grape type. Many of these varieties have not yet been evaluated extensively and there is little information on their performance under our conditions.

Many authorities suggest that infected plants not be removed, as doing so may cause more movement of the thrips than would occur otherwise. Furthermore, TSWV-infected tomato plants sometimes grow out of the condition and produce normal fruit.

Insecticides with thrips activity have been shown to provide slight suppression of spotted wilt if applied early and frequently. Commercial growers who wish to follow such a program should apply Admire at planting and continue with foliar applications of dimethoate, Venom, Lannate, Monitor, Rimon, or Radiant. Home gardeners are more limited in their choices, but spinosad products such as Conserve (Southern Ag) and Ferti-lome Borer, Bagworm, Tent Caterpillar, and Leafminer Spray would be the most effective.