

Tomato Spotted Wilt Virus

Tomato and chile pepper growers should be on the lookout for a potentially significant viral disease called Tomato Spotted Wilt Virus (TSWV). This virus was recently identified in the NMSU Plant Diagnostic Clinic on chile pepper samples from across the state. This virus is commonly identified in New Mexico. It has a wide host range that includes vegetable crops, ornamentals and weeds and it is transmitted by thrips which is a common insect pest. TSWV is an important disease of many different crops grown in temperate and subtropical regions of the world. It is a unique virus in a virus class by itself. The virus has a wide host range, but some of the more common hosts for New Mexico are tomatoes, peppers, potatoes, eggplant, peanuts, lettuce, cucurbits, many legumes, many ornamentals, and weeds such as field bindweed, nightshade, and curly dock. This disease is especially damaging in the ornamental and vegetable greenhouse industry.

Symptoms - Symptoms of TSWV are numerous and varied. However, there are two fairly common symptoms for which this disease was named. First, the young leaves turn bronze and subsequently develop numerous small, dark spots. Second, the leaves often droop on the plant, creating a wilt-like appearance, although the plant is not actually wilted (Figs. 1 and 2).



Figure 1. Tomato infected with TSWV (Photo: N. Goldberg, NMSU-PDC).



Figure 2. Tomato leaf with necrotic spots caused by TSWV (Photo: J. French, NMSU-PDC)

Other symptoms include die-back of the growing tips (Fig. 3), stunting, mottling (Fig. 4) and dark streaking on the stems (Fig 5). Leaves may also develop dark green spots surrounded by yellow tissue or concentric ringspots (Fig. 6). Affected plants may develop a one-sided growth habit or may be stunted completely. Plants that are affected early in the growing season often do not produce any fruit, while those infected after fruit-set produce fruit with striking symptoms, including chlorotic concentric ringspots, raised bumps, uneven ripening, and deformity (Fig 7). Infected plants produce poor quality fruit and have reduced yield. In some cases, particularly with peppers, foliage symptoms may be very subtle or nonexistent, but fruit symptoms may be very pronounced.



Figure 3. Terminal necrosis on chile pepper caused by TSWV (Photo: N. Goldberg, NMSU-PDC).



Figure 4. Mottling caused by TSWV (Photo: J. French, NMSU-PDC).

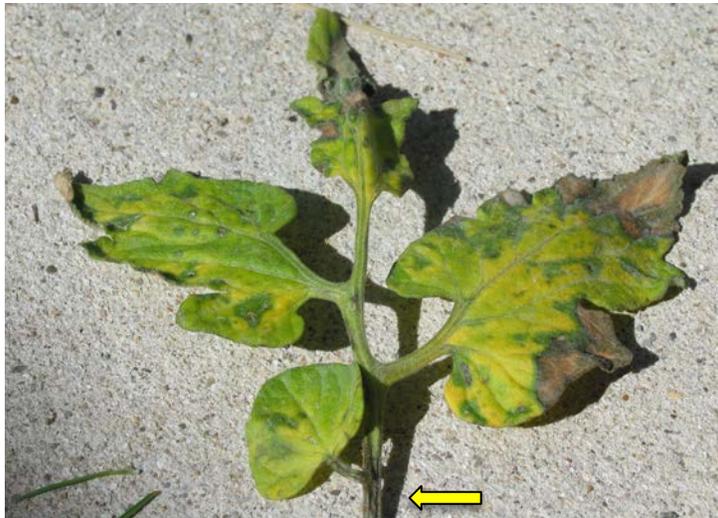


Figure 5. Necrotic stem lesion (designed by the arrow) caused by TSWV (Photo: R. Flynn, NMSU).



Figure 6. Concentric ringspots caused by TSWV (Photo: J. French, NMSU-PDC).



Figure 7. Fruit symptoms on tomato and chile pepper (Photo: NMSU - PDC).

Virus Transmission - TSWV is transmitted from infected plants to healthy plants by at least ten species of thrips. Thrips are tiny (approximately 1/16th of an inch) winged insects that feed on plants through sucking mouthparts (Fig. 8). Thrips transmit the virus in a persistent propagative manner, which means that once the insect has picked up the virus, the virus replicates within the insect and it is able to transmit the virus for the remainder of its life. The virus is not passed on from adult to egg; however, progeny that develop on infected plants will quickly pick up the virus and be an effective disease vector.



Figure 8. Onion thrips (left) and western flower thrips (right), two important vectors of TSWV in NM (Left photo: Whitney Cranshaw, Colorado State University; Right photo: Jack T. Reed, Mississippi State University).

Management – Once a plant is infected with a virus, there is no cure. Infected plants are a source for new infections and should, therefore, be removed to reduce the spread of the disease.

For more information, contact: Natalie Goldberg, Extension Plant Pathologist (ngoldber@nmsu.edu), or Jason French, Plant Diagnostician (jfrench@nmsu.edu)