



AVRDC - The World Vegetable Center

Fact Sheet

Pepper Diseases

Tomato Spotted Wilt Virus

Thrips-Transmitted Potyvirus



Found worldwide

Symptoms

Plants infected while they are young display severe stunting, yellowing or chlorotic flecking of the whole plant, and very little yield.

Leaves infected later may show chlorotic line patterns or mosaic with necrotic spots. Necrotic streaks appear on stems extending to the terminal shoots.

Fruit of infected plants may show necrotic spots and streaks, mosaic, and ring patterns. On ripe fruit, yellow spots with concentric rings or necrotic streaks may be present.

Conditions for Disease Development

Thrips are the primary means of transmitting Tomato Spotted Wilt Virus (TSWV). Thrips are small, they multiply quickly, feed on a wide range of plants, and are constantly being blown into fields. Thrips feed on the juices of leaves, stems, fruits and flower parts. Feeding damage causes new growth to become misshapen and deformed. The wingless immature thrips acquire the virus and the more mobile adults later transmit the virus among plants.

The life cycle of thrips varies from 7 to 14 days at

How to Identify Tomato Spotted Wilt Virus



Leaves develop mosaic, chlorotic flecking, ringspots and deformations



Fruit show necrotic spots and streaks, mosaic and ring patterns, and distortions



fluctuating temperatures between 20–37°C. Consequently, there are multiple generations during the growing season. TSWV may persist from year to year in infected plants from which thrips can spread the disease to nearby crops.

Control

There are few, if any, resistant varieties available.

The presence of thrips in pepper fields can be monitored using yellow sticky cards. If the disease appears in a crop, infected plants should be removed and destroyed immediately either by burning or burying them. Rouging out symptomatic plants is not always effective as a control for secondary infections because TSWV has often spread before symptoms develop.

Maintain seedbeds away from cropped areas and from other susceptible plants. The virus has a very wide host range including tomato, pepper, pea, lettuce, potato, tobacco, and other members of the same family, as well as other broadleaf and grassy plants, including numerous weeds and ornamentals.

Remove volunteer plants and weeds from the production field and surrounding areas by maintaining a 10-m plant-free border. This may prevent or slow the spread of TSWV to susceptible pepper plants. Reduce cultivation within the field to avoid movement of thrips from infected sources.

Avoid sequential planting because thrips can continue to emerge from the soil for 2–3 weeks after crop residues are plowed and roto-tilled. Keep infected field areas fallow for 3–4 weeks to allow thrips to emerge from crop debris and disperse from the field.

If economical, soil can be fumigated with metham-sodium (Vapam) or 1,3-dichloropropene (Telone) to eliminate thrips associated with crop debris. Consider planting a non-susceptible crop if TSWV and thrip populations throughout the area are very high.

Eliminate all sources of thrips at the end of each crop to avoid harboring a small population ready to infest an incoming crop. During the first stage of plant production, use a nethouse structure or seedbed covered with a netting of 40-mesh or higher to exclude thrips from seedlings prior to transplanting. Use virus-free transplants.

Controlling thrips with chemicals can be difficult because they rapidly develop resistance. Several insecticide applications should be made at 5-day intervals to significantly reduce an 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) that will penetrate the protected areas of the plant harboring thrips and provide the most efficient use of insecticide if coverage is thorough. Rotate insecticides from different chemical classes as a way to delay insecticide resistance.

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