

Tomato Spotted Wilt Virus on Cool Season Pot Crops

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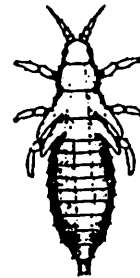
Tomato spotted wilt virus (TSWV) has a wide host range. Nearly all greenhouse-grown crops except roses are susceptible to the virus. Over 550 species in 62 different plant families, including many weed species, are confirmed hosts of TSWV.



TSWV causes spotting of tomato leaves and fruit. The strain of TSWV that affects tomato is known as the lettuce (L) strain. It is most often found in dahlias and chrysanthemums in the greenhouse.

A relatively new strain of TSWV has been isolated from New Guinea impatiens and is now known as impatiens spotted necrotic virus (ISNV) or the impatiens (I) strain of TSWV. In Pennsylvania, a recent survey reported that over 90% of the bedding plants, pot crops and perennials that showed TSWV symptoms were infected with the I strain of TSWV.

The primary vector of TSWV is the western flower thrips (WFT), *Frankliniella occidentalis*. In Massachusetts, a 1991 survey reported that WFT was the dominant thrips species in greenhouses and has displaced the eastern flower thrips. The incidence of TSWV has increased as the difficult-to-control vector (WFT) has spread throughout the greenhouse industry.



General symptoms of TSWV include spotting of the leaves, necrotic areas, mottling and mosaic patterns. Less commonly observed symptoms include distortion, stunt-

ing and ringspots. Infected plants may show a wide range of symptoms. Expression of symptoms depends upon the time of year, temperature, stage of host plant development and the particular host plant or cultivar. Symptoms may remain latent and not be seen until the end of the crop production cycle. Some plants, such as garden impatiens, may be weakened but will eventually outgrow the virus. Other plants, such as New Guinea impatiens, may be killed. Visual expression of symptoms may also be easily confused with nutritional problems or fungal or bacterial diseases. (To confirm TSWV, growers may send samples to Agdia, Inc. 30380 County Road 6, Elkhart, IN 46514; Phone (219) 264-2014.)

Many cool season pot crops such as cineraria, calceolaria, Thanksgiving cactus and gloxinia are susceptible to TSWV-I. If infected, cool season crops may serve as a reservoir source of the virus for thrips to spread TSWV to bedding plants and perennials.

Cineraria

When streak and mosaic of cineraria was first observed in the 1930s, it was reported that the virus was transmitted in the seed and by the onion thrips, *Thrips tabaci*. However, a later study found only one percent infection of cineraria by seed transmission. Some characteristic symptoms of TSWV include black streaks on the petioles, pale blotching on the leaves and leaf mottling with raised dark green areas in light green tissue. Yellow ringspots are less frequently seen. Wilt-ing may occur just before and during blooming. In Pennsylvania, 22% of the cineraria tested showing TSWV symptoms were tested positive for the impatiens strain.

Calceolaria

Some characteristic TSWV symptoms include necrotic areas on the leaves, stunting of the foliage and flowers, dark or light green leaf mottling, and distortion. Ringspots are much less commonly seen but may be present on the flowers.

Cyclamen

TSWV was first reported on cyclamen in Ontario greenhouses in 1985 and 1986. Some TSWV symptoms include necrotic spots or lines that are randomly located on the leaf. Later, lesions may enlarge into necrotic spots or concentric rings that look like "thumbprints" against a chlorotic background. Collapse of older leaves may occur as the leaf peti-

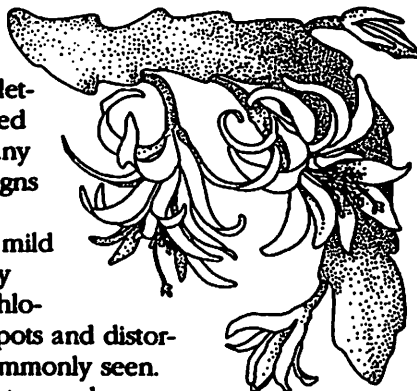
oles become necrotic and collapse. When cyclamen is grown at cooler temperatures (13°C or 55.4°F), symptoms may take from three to four months to develop. However, symptom expression is suppressed at higher temperatures (22°C or 72°F). During this latent period, production continues and serious losses may occur.

Gloxinia

Symptoms in gloxinia will vary depending upon the age of the host plant. When young gloxinia plants are infected, plants may turn brown and collapse. Symptoms may be confused with a fungus crown rot caused by *Phytophthora parasitica*. When older gloxinia plants are infected, yellow or brown leaf spotting, or brown oak-leaf patterns may occur on the leaves.

Thanksgiving Cactus

Both strains of TSWV have been isolated from Thanksgiving cactus. The lettuce strain has been isolated from plants not showing any viral symptoms and any signs of thrips feeding or injury. However, often only very mild symptoms of infection may occur, including sunken chlorotic lesions, dark green spots and distortion. Ringspots are less commonly seen. Young vegetable transplants may be particularly vulnerable. Both pepper and tomato transplants were reported to become infected with the I strain of TSWV.



Become familiar with TSWV symptoms on your cool season pot crops. Crop loss can then be minimized, when roguing of diseased plants and strict thrips control is practiced. Avoid carrying over thanksgiving cactus and cyclamen that may not show any obvious symptoms of TSWV infection or thrips feeding damage.

References

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