



Bio Control Measures of Tomato Spotted Wilt Virus and their Biological Impact

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DESCRIPTION

Tomato Spotted Wilt Virus (TSWV) is one of the plant viruses transmitted by thrips and causes serious economic losses to many crops. From 2008 to 2011, to identify the natural host species of TSWV in Korea, weeds and plants were collected from five regions (Seosan, Yesan, Yeonggwang, Naju, and Suncheon) where TSWV was present and identified. Identified as 1,104 samples belonging to TSWV up to 144 species of 40 families. According to reverse transcription polymerase chain reaction, TSWV was detected in 73 samples from 23 plant species, of which 5 samples belonged to the Solanaceae family. Additionally, 42 weed species have been confirmed as natural hosts of TSWV with three different life cycles, suggesting that these weed species may play an important role as virus reservoirs during non-crop periods.

This study provides comprehensive and up-to-date information on the natural hosts of TSWV in Korea. Tomato Spotted Wilt (TSW) has seriously challenged traditional pest management practices in tomatoes and peppers because it is severe and unpredictable. Effective and sustainable TSW management is complex and requires multiple approaches to achieve maximum effectiveness; Management of TSWV must be carried out in a manner that reflects the epidemiology of TSW. The virus that causes TSW, Tomato Spotted Wilt Virus (TSWV), is capable of infecting hundreds of plant species. As a result, throughout the southeastern United States, TSWV-infected trees are widespread.

TSWV is only spread by thrips. In the southeastern United States, two species of tobacco thrips (*Frankliniella fusca*) and the Western flower thrips (*F. occidentalis*) are the main spreading agents.

In addition to spreading TSWV, both thrips species themselves are significant pests due to damage caused by their feeding. Cultural practices to reduce TSWV infection include garden sanitation, weed control, and reflective mulch. Sanitation measures begin with purchasing tomato plants that are free of thrips. These tiny insects have elongated bodies and are very active. After planting, weeding around the garden will remove alternative host plants for thrips and viruses. Control weeds around the garden, especially dandelions, annual thistles, bluegrass, ranunculus and plantains. These are some of the most important alternative hosts for TSWV and thrips.

Tomatoes can be grown in silver reflective mulch to repel thrips. However, silver mulch will slow down the maturation process of the first planting. If reflective coating is not available locally or in garden supply catalogs, black plastic can be spray painted silver. Pirate beetles (*Orius insidiosus*) and big-eyed beetles (*Geocoris punctipes*) are very effective hunters of thrips. These predatory insects are available for purchase in many different varieties. Do not use organophosphate or pyrethroid insecticides, as they will kill beneficial insects, such as those that naturally control thrips.

CONCLUSION

There are no effective pesticides available to home gardeners that can control Western flower thrips (the vector) regularly enough to prevent viral infections. However, spraying tomato plants early in the season can help control thrips to some extent. Many neem-based products, botanical pesticides that protect against thrips, are now available to home gardeners. Summer oil or insecticidal soap can also be used. Before using pesticides in vegetable garden, carefully read and follow the instructions on the label.

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