



Tomato spotted wilt virus of agronomic, vegetable, and ornamental crops

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Introduction

In 1919, tomato spotted wilt virus (TSWV) was first described in tomatoes in Australia. By 1920, TSWV was found in all Australian territories and since that time TSWV has spread to many areas of the world. By 1926, TSWV was found in Hawaii in pineapple. By 1935, TSWV became epidemic in California. In 1938, TSWV was found in greenhouse-produced tomatoes in Cleveland, Ohio. Since the late 1960s, TSWV has caused significant damage to tomatoes in Hawaii and in the 1980s TSWV has severely affected lettuce and pepper production there. In 1971, TSWV was found in peanuts in Texas. In 1985 and 1986, some peanut fields in Texas were destroyed by TSWV. However, the incidence of TSWV in Texas-produced peanuts was significantly less from 1987 to 1989. In 1990, the incidence in some peanut fields was again over 50%.

In Louisiana, TSWV was first found with certainty in 1972. By 1988, incidences of TSWV in solanaceous crops ranged from 25% to 75% in Louisiana.

In Georgia, TSWV was identified in 1970 once, but it could not be found in a field survey in 1983. By 1989, however, TSWV became a serious problem in tobacco, peanuts, and tomatoes in south Georgia, where incidences exceeded 50% in some fields. In 1990, some tobacco fields were plowed down because of TSWV.

In Florida, some evidence suggests that TSWV occurred in tomatoes in 1974. TSWV was first identified in tomatoes and peanuts in the panhandle area in May and June 1986, respectively. Since 1986, TSWV has been found also in tobacco, peppers, impatiens, gloxinia, and gladiolus (maybe in 1985 also) in Florida. By 1990 incidences of TSWV in tobacco have increased to 7%. For peanuts, the incidence in most fields has been between trace amounts to 3%, but in some peanut plantings, the incidence

has been over 10%. In 1988, TSWV was identified in tomatoes in Dade County. Meanwhile, higher populations of western flowers thrips have been found in central and south Florida. Thus, TSWV and its vectors are considered to be well established throughout the state of Florida. TSWV is a major threat for the production of many crops with incidences in tomato being more than 50% by the fall of 1990 in the south Georgia and north Florida area.

The case histories mentioned above clearly demonstrate how TSWV can appear in some area and over time increase to devastating proportions. In contrast, some areas of the United States have had serious problems with TSWV in some production systems but over time TSWV became a minor problem for unknown reasons. Much remains to be learned about this enigmatic virus.

Host range

TSWV infects many plant species. Some of the common crops that are susceptible to TSWV are listed in Table 1. A major source of virus can be weeds, but in practical terms it may not be possible to eradicate the weed sources because they are numerous and, very likely, are not even adjacent to commercial crop fields. Also, at this time we do not know what weeds function as hosts and sources for TSWV in Florida. In other areas of the United States and the world, many weeds have been identified as potential hosts for TSWV. Certainly, weed control in and around production fields and greenhouses is encouraged.

Methods of spread

The primary movement of TSWV from one plant to another is by the feeding of thrips (singular or plural). Thrips are extremely small insects 0.5 to 5 mm (Figure 1) that inhabit flowers, leaves, and the

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