

# New Tomato Virus Identified in Arizona

By Susan McGinley  
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A new plant virus identified in fall 2006 in Arizona threatens not only home gardens, but also the commercial tomato industry in the state. Tomato yellow leaf curl virus, also known as TYLCV, was found in two home gardens in the Phoenix area.

Tomato plants infected by the TYLCV develop severely curled, yellowing leaves, shattered nodes and short stalks. The virus causes many of the flowers to abort, lowering fruit set and reducing yields. Symptoms are most apparent on the growing tips of plants, where the newest growth is taking place.

"You'll see very small, stunted plants that aren't going to be able to produce fruit—not good enough for shipping and storage," says Judith Brown, a virologist and whitefly vector biologist in the department of plant sciences at The University of Arizona.

"The virus stresses the plants beyond belief, and they simply stop growing"

Brown isolated DNA and identified the virus from plant samples submitted by Mary Ann Garewal, a UA-certified master gardener in Surprise, who observed symptoms and collected samples from her vegetable garden and those of another Phoenix gardener. At about the same time, Brown also identified a distinctly different isolate of the virus on infected commercial tomato plant samples from Sonora, Mexico, suggesting that the two isolates came from different sources.

The plant samples from both Arizona and Mexico were also infested with the "B" biotype of the sweet potato whitefly, *Bemisia tabaci*, which feeds on the leaves and can transmit the virus to other plants through its saliva.

TYLCV first infected tomatoes in the western hemisphere in the Caribbean and along the eastern coasts of both the United States and Mexico in the early 90s.

"It seemed to be contained in those areas until it was introduced in Texas last summer," Brown says. The source of that outbreak was traced to infected commercial transplants that were possibly infected by virus in plants brought in from out of state. TYLCV has also been tracked from the east coast states of Mexico to the Pacific coast production area in the state of Sinaloa, where the virus ravaged commercial tomato crops throughout the state during spring 2005 and again in fall and spring 2006, according to Brown.

"In the summer of 2006 we next found it in Sonora," she says. "Now it's becoming a giant epidemic across the Pacific coastal Mexican states, causing heavy yield losses in fresh-market tomatoes and peppers that are exported to the United States."

Brown notes that the TYLCV identified in Arizona did not come from Mexico. DNA testing matches it with isolates from Texas. When viruses pass through different hosts, particularly ornamentals or new hosts, they can mutate into different isolates and then be introduced back into a crop.

"It's a very prolific virus," Brown says. "If TYLCV infects a variety of tomato that is not resistant, you'll have a huge problem. I don't think any of the varieties grown hydroponically in greenhouses are resistant, although some of the field processing varieties are. None of the current home garden varieties are resistant."

TYLCV infects not only tomatoes, but also beans and peppers in home gardens, and some ornamentals.

Brown advises against spraying whiteflies to control the virus because by the time the symptoms appear it's too late to stop the disease. She adds that there are currently no chemical or biological controls for TYLCV.

"The best approach is to avoid introducing the virus in transplants. Virus-free seedlings are the way to go," she says. "You're safest if you buy virus-free plants or start your own from seed – although that still may not help if your garden or crop is near an infected field or a neighbor's garden that harbors the virus."