

LOUISIANA PLANT PATHOLOGY

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Tomato Yellow Leaf Curl

Tomato Yellow Leaf Curl Bigeminivirus

Tomato yellow leaf curl (TYLC) is a relatively new whitefly-transmitted virus disease of tomatoes in the United States. It was first observed in south Florida in 1997 and has since spread throughout much of the Southeast, including Louisiana where it was first observed in 2000. Since then, it has been observed sporadically around the state and has been found in both field and greenhouse plantings.

Symptoms on the leaves include yellowing of the tissues between the veins, upward curling of the leaf margins and an overall reduction in their size. When plants are infected at an early age, the entire plant will be stunted, but when they are infected at a later age, only the new growth will be affected. Flowering and fruit production generally stop once the plants are infected, but fruit already on the plant will generally mature normally. However, flowering and fruit set may be a function of the type of tomato (determinate vs. indeterminate) as greenhouse-grown Trust tomatoes (an indeterminate variety) showing severe symptoms were observed to continue flowering and setting some fruit.

Tomato yellow leaf curl virus is a Gemini virus that is transmitted by the silverleaf (poinsettia or sweet potato) whitefly, *Bemisia argentifolii* (or *B. tabaci* Biotype B). Once a whitefly begins to feed on an infected plant, it can acquire the virus within 15-30 minutes and then can transmit it for 10-12 days. Because of this, a single whitefly that has acquired the virus can spread it quite extensively within a planting. The virus does not multiply within the whitefly and is not passed from one generation to the next. However, whitefly nymphs feeding on an infected plant that acquire the virus will retain it as they go through successive molts.

The host range of the virus is restricted to plants in the Fabaceae, Solanaceae, Asteraceae and Malvaceae. Susceptible hosts that show symptoms



Fig. 1. TYLC on field-grown tomatoes. Note downward curling of leaf margins generally associated with newer infections.



Fig. 2. TYLC on greenhouse-grown tomatoes. Note upward curling of leaf margins generally associated with older infections.

include bean (*Phaseolus vulgaris*), jimsonweed (*Datura stramonium*), tobacco (*Nicotiana* spp.) and common or annual sowthistle (*Sonchus oleraceus*), whereas cheeseweed (*Malva parviflora*) and pepper (*Capsicum annuum*) are susceptible but remain symptomless. Most of the information on susceptible weed hosts was generated in the Mediterranean region and the identity of weeds capable of serving as alternate hosts and sources of inoculum in the Southeastern U.S. is still unknown.

Management of TYLC relies on the use of virus-free transplants, roguing (pulling out and disposing of) infected plants as soon as they are detected early in the season and the control of whiteflies. Weed control is also important because weeds can serve both as a source of whiteflies and a potential

source of virus. The use of reflective mulches also may aid in reducing spread of the virus. Control of whiteflies is accomplished by the use of neonicotinoid insecticides in the transplant water or applied via drip irrigation immediately after transplanting. Once whiteflies are detected, they should be controlled with a combination of a pyrethroid and another type of insecticide, but do not use neonicotinoids if they were used at transplant. Insect growth regulators also may be used when populations of whitefly nymphs are high.

TYLC resistant varieties, such as Tygress, are available and more are being developed and introduced every year. Since TYLCV occurs rather sporadically in Louisiana, however, the use of resistant varieties may not be justified at this time.

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