

Fusarium Wilt of Mimosa (*Albizia julibrissin*)

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Fusarium wilt is a common and lethal disease of mimosa (*Albizia julibrissin*)¹, also commonly known as silk tree. In the United States this disease occurs in the east from New York southward and also in Louisiana, Arkansas and California. Fusarium wilt is caused by the fungus *Fusarium oxysporum* forma specialis *perniciosum*. This pathogen causes Fusarium wilt on *Albizia* species and also on tree-of-heaven (*Ailanthus altissima*). *Fusarium oxysporum* f. sp. *perniciosum* colonizes and clogs the tree's vascular (water-conducting) tissue, and interferes with the movement of plant sap. This results in relatively rapid tree death.

Symptoms

An early symptom of Fusarium wilt is a brown-streaking in the wood that is apparent when the bark of stems or roots is cut away; however, these symptoms typically go unnoticed (Figure 1).



Figure 1. Discolored wood in Fusarium wilt-diseased mimosa branch. (Image courtesy of

Clemson University-USDA Cooperative Extension Slide Series, Bugwood.org.)²

The first readily noticeable symptoms of mimosa wilt are yellowed, stunted, and wilted leaves on one or several branches in early to mid-summer. Later in the summer the affected branches may prematurely defoliate (Figure 2).

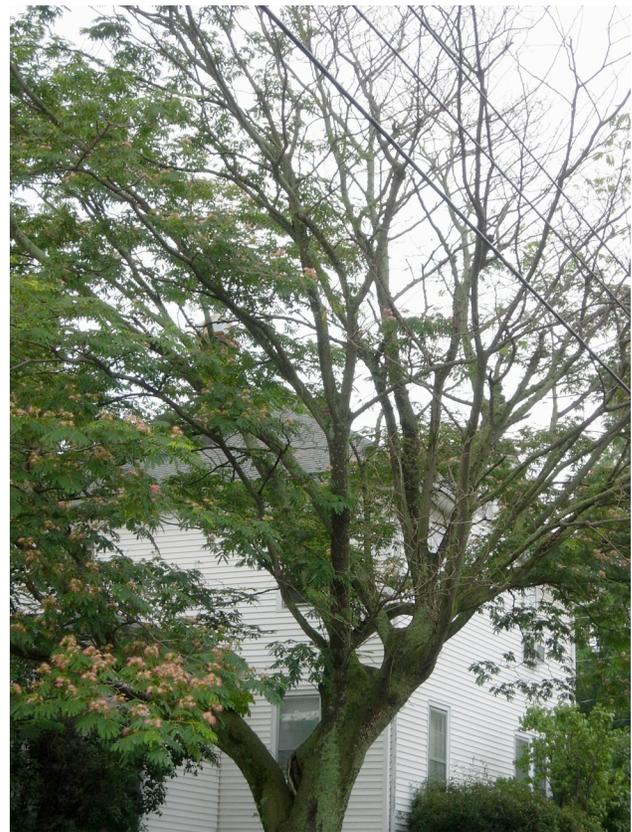


Figure 2. Defoliated branches in a section of a mimosa with Fusarium wilt disease. (Photo by E. Bush)

Yellowed and wilted leaves continue to appear on more branches throughout the summer and fall, although in some cases a tree may die within a month of initial symptom appearance. As the disease progresses, cracks begin to appear in the bark (Figure 3).



Figure 3. Cracked bark on a mimosa tree with Fusarium wilt disease. (Photo by E. Bush)

In some cases, gum or a white, frothy liquid with a fermented odor may exude from cracks. Sometimes a tree survives to the next growing season, but the new leaves will be stunted and yellowed and the tree will continue on a relatively rapid decline toward death (Figure 4).



Figure 4. Yellowed and wilted leaves on a mimosa during the second growing season after initial diagnosis of Fusarium wilt. (Photo by E. Bush)

After the aboveground portion of the tree dies, roots may still be alive and shoots may continue to sprout from the base of the trunk for some time (Figure 5).



Figure 5. Mimosa sprouts emerge near base of dead trunk of a mimosa during the second growing season after initial diagnosis of Fusarium wilt. (Photo by E. Bush)

Disease Cycle

Fusarium oxysporum f. sp. *perniciosum* is a soilborne fungus. The long-term survival of this fungus occurs by means of chlamydospores in the soil. Chlamydospores are thick-walled, darkly pigmented structures that allow fungi to remain inactive, but viable, for long periods. When roots of host trees grow close to chlamydospores, root exudates stimulate them to germinate and produce mycelium, the branching, thread-like structure of a fungus. The mycelium then penetrates and colonizes the mimosa roots, moving into the vascular tissue where the fungus begins to produce spores. The spores move upward with the tree's sap and become deposited in various locations throughout the vascular tissue. Thus, a systemic colonization of the plant's vascular system begins, which eventually results in a clogged and defective vascular system.

When the tree defoliates prematurely due to mimosa wilt, the fungal pathogen grows out from the vascular tissue into the bark and begins production of pink to orange spore masses. The fungus may continue to produce spores for a period of two years after tree death. The spores can be spread to new locations by air, water and insects; however, the primary means of spread occurs through water, which washes spores into the soil where spores germinate and produce chlamydospores. Chlamydospores can be spread to new locations through movement of infested soil or on contaminated equipment, tools, and shoes. The fungus may also persist in seed produced by diseased trees.

Control

Fusarium wilt is a lethal disease for which there are no controls. However, most tree species are not susceptible to *Fusarium oxysporum* f. sp. *perniciosum*, so replacing diseased mimosa with

a non-susceptible host tree (i.e. genera other than *Albizia* and *Ailanthus*) is the best option.

Currently, there are only a few mimosa cultivars ('Charlotte', 'Tryon' and 'Union') with resistance to Fusarium wilt. However, these cultivars do not appear to be widely available in the nursery trade and strains of the Fusarium wilt pathogen have been reported to overcome resistance in 'Charlotte' and 'Tryon'. Resistance to Fusarium wilt also appears to break down when root knot nematodes are present.

References:

Invasive Alien Plant Species of Virginia. 3 September 2008. Virginia Department of Conservation and Recreation. Accessed: 17 November 2008.

http://www.dcr.virginia.gov/natural_heritage/invspinfo.shtml

Miller, J. H. "Nonnative Invasive Plants of Southern Forests: A Field Guide for Identification and Control." Invasive Plants of the Eastern U. S. August 2003. Invasive.org. Accessed: 17 November 2008.

<http://www.invasive.org/eastern/srs/>

Plants Database. United States Department of Agriculture-Natural Resources Conservation Service. Accessed: 17 November 2008.

<http://plants.usda.gov/java/profile?symbol=ALJU>

Sinclair, W. A., and Lyon, H. H. 2005. Diseases of Trees and Shrubs, 2nd ed. Cornell University Press, Ithaca, NY.

Stipes, R. J. 1999. Fusarium wilt of trees. Pages 165-169 in: Shade Tree Wilt Diseases. C. L. Ash, ed. APS Press, St. Paul, MN.

¹Although mimosa has traditionally been used as an ornamental, it may be invasive in certain ecological situations. Before planting this species one should consider its invasive potential and alternative species for planting.

²Refer to the following url for license information: <http://creativecommons.org/licenses/by/3.0/us/>

Refer to the Plant Problem Image Gallery (http://www.ppws.vt.edu/ipm/image_gallery.html) for more plant problem images and information.