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LAUREL WILT IN TEXAS: IMPACT, BIOLOGY, AND CONTROL

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I. INTRODUCTION AND CAUSE OF LAUREL WILT

The fungus causing the tree disease laurel wilt, *Raffaelea lauricola*, was originally discovered in the United States (U.S.) in 2004 in Georgia. The fungus subsequently spread across the Gulf Coast States to be found in Texas in 2013. The disease occurs in 14 East Texas counties. Laurel wilt is a significant disease of both forest and shade trees in residential neighborhoods and urban landscapes. Most recently, the disease has been found killing dozens of valuable shade trees in north Harris County, and many more will likely die due to the explosive nature of pathogen spread.

II. HOSTS AND AFFECTED TREES

In Texas, laurel wilt has been found killing redbay (*Persea borbonia*) and sassafras (*Sassafras albidum*) trees. These two trees are in the family Lauraceae, as are many other tree species known to be susceptible to *R. lauricola*. For example, swamp bay (*P. palustris*), spicebush (*Lindera benzoin*), and California laurel (*Umbellularia californica*) are additional trees found in Texas that may eventually be hosts to the pathogen. In Florida, commercial avocado (*P. americana*) trees are known to be affected as well.

Red bay, the primary tree affected by laurel wilt, serves as a prized shade tree in urban communities in East Texas. Seeds of the redbay serve as a source of mast for wildlife, and aromatic leaves were used for tea by early settlers and medicines by Native Americans.

III. BIOLOGY AND SPREAD OF THE PATHOGEN

One reason for the rapid spread of *R. lauricola* is the existence of an insect that carries the pathogen from diseased to healthy trees, sometimes over considerable distances. They are known as redbay ambrosia beetles (*Xyleborus glabratus*) (Fig. 1) and were introduced simultaneously with the pathogen. Ambrosia beetles are uniquely suited to acquire the fungus from dead trees and transmit it to healthy ones. Female beetles carrying the fungus will bore tunnels into healthy trees and lay eggs. As the eggs hatch, the juveniles feed on *R. lauricola* growing in the original tunnels and emerge as adults to visit new trees and spread the pathogen. The fungus increasingly spreads through the sapwood of the diseased tree, disrupting the flow of water in the vascular system and resulting in typical symptoms. The process starts with the attack by very low numbers of beetles, but eventually, they will be attracted in huge numbers to overwhelm tree defenses and lead to its death.

Figure 1. Southeast Asian Ambrosia Beetle (*Xyleborus glabratus*)
Image by Rachel Osborn, USDA APHIS PPQ, Bugwood.org

IV. SIGNS AND SYMPTOMS OF LAUREL WILT

The initial symptoms of an infected tree are yellowing and wilting of leaves in random branches (Fig. 2). The symptoms will spread to larger limbs so that increasingly more of the tree canopy will be affected, displaying splotchy patterns of yellow and brown leaves throughout the crown. Internally, the tree will also be symptomatic with distinct streaking in the sapwood that is revealed by removing the bark from the trunk or larger limbs (Fig. 3). The ambrosia beetles cause small holes on the bark surface (Fig. 4). The holes extend beneath the bark into the sapwood. Externally, the beetles cause tiny "sticks" comprised of compacted wood dust protruding from the bark. An abundance of the sawdust-like

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substance also accumulates in the bark furrows and around the base of the tree (Fig. 4).

If further evidence is needed to diagnose a potential case of laurel wilt, then samples from diseased trees may be submitted to a plant diagnostic clinic such as the Texas Plant Disease Diagnostic Laboratory with the Texas A&M AgriLife Extension Service in College Station, Texas (*https://plantclinic.tamu.edu*). Submission involves collecting the appropriate sample, in this case, a branch or trunk sample consisting of symptomatic sapwood from infected trees. Further instructions will depend on the diagnostic protocol being used by the clinic running the samples and should be obtained prior to submission.

V. MANAGEMENT

Proper diagnosis of laurel wilt is always the first step in planning an effective management program (see *Section IV: Signs and symptoms of laurel wilt*). The second step is to prevent the pathogen from spreading to new, healthy trees. All precautions should be taken to prevent the wood from diseased trees being transported into areas where the pathogen is not known to occur. If the pathogen is introduced into an area, then diseased and dead trees should be promptly identified and removed to eliminate breeding and reduce the beetle populations. The wood should be destroyed, buried, or otherwise treated appropriately to eliminate the threat of spreading contaminated beetles. Wounds, including pruning cuts, on uninfected trees should be treated with a pruning paint because they attract beetles. Weakened or stressed trees also attract beetles, so susceptible hosts should be kept healthy and free of stresses that might compromise the health of the tree.

Another form of protection may be afforded by intravascular injection of trees with a fungicide. Propiconazole, sold as products with the trade names Alamo® and Propizol®, have been shown to have some temporary benefit in protecting trees when properly applied. There are a variety of injection methods, types of equipment, and properly trained commercial arborists in Texas that should be consulted for such specialized procedures. However, further research is needed to improve the likelihood of saving trees with intravascular injection, so expectations for complete control with injection at the time of this publication are not warranted.

Figure 2. A row of diseased redbay trees infected by *R. lauricola*.

Figure 3. Internal streaking of the sapwood of a diseased red bay caused by colonization by *R. lauricola*.

Figure 4. Holes (blue arrows) created by ambrosia beetles when they bore into trees and the dust (green arrows) and tubes (yellow arrows) of compacted wood dust resulting from mass attack.

REFERENCES

Olatinwo, R. O., Fraedrich, S. W., and A. E. Mayfield. (2021). Laurel wilt: current and potential impacts and possibilities for prevention and management. *Forests*, 12, 181. *https://doi.org/10.3390/f12020181*

Hughes, M. A., Smith, J. A., and D. R. Coyle. (2016). Biology, ecology, and management of laurel wilt and the redbay ambrosia beetle. *Southern Regional Extension Forestry*, SREF-FH-006.