



# Frequently Asked Questions (FAQ) Laurel Wilt Disease

## **Where did the redbay ambrosia beetle and laurel wilt fungus come from?**

The redbay ambrosia beetle is native to Asia (including India, Japan, Myanmar and Taiwan). The fungus is believed to have arrived with the beetle and is probably Asian in origin as well.

## **How did they get here?**

Like many other non-native wood-boring beetles, the redbay ambrosia beetle likely arrived in solid wood packing material (SWPM), such as crates or pallets. SWPM is routinely used to ship goods internationally, but these materials can harbor unwanted wood-inhabiting pests if they are not properly treated before export.

## **Where has laurel wilt been found?**

Laurel wilt has been found at an increasing number of locations in the southeastern coastal plain of South Carolina, Georgia and Florida, and beyond. [See the Regional Distribution Map of laurel wilt disease.](#)

## **How long have this insect and disease been in the U. S.?**

The redbay ambrosia beetle was first detected in a survey trap at Port Wentworth, GA (near Savannah) in 2002. By 2003, unusual mortality of redbay trees was noticed in the vicinity of Savannah, GA and Hilton Head, SC, but laurel wilt was not recognized as the potential cause of this mortality until late 2004 and 2005.

## **What types of trees are affected?**

Thus far, only trees and shrubs in the family Lauraceae (Laurel family) are known to be affected by laurel wilt. Redbay (*Persea borbonia*) appears to be the most widely affected species. Other species that have developed the disease in the field include sassafras (*Sassafras albidum*), pondberry (*Lindera melissifolia*), pondspice (*Litsea aestivalis*), and avocado (*Persea americana*).

## **What are the symptoms?**

Trees diseased with laurel wilt initially exhibit drooping leaves with a reddish or purplish discoloration. On redbay, this discoloration may occur in a major portion the crown at first, but gradually the entire crown wilts. The leaves eventually turn brown and may remain on the branches for up to a year or more. Removal of bark from wilted trees reveals a dark, blackish discoloration on the surface of the sapwood that can also be seen in stem cross-section.

## **How can I tell if my tree was infected by the laurel wilt fungus?**

If the tree is a redbay or a related species in the Laurel family, is wilted in a large proportion of its crown, and has black discoloration in the sapwood, it is likely infected with the laurel wilt fungus. The sapwood discoloration is the most conclusive diagnostic feature in the field. Full confirmation of the disease requires taking samples of stained wood from the affected tree and isolating the laurel wilt fungus in the laboratory.

**What does the redbay ambrosia beetle look like?**

The redbay ambrosia beetle is a very small, elongated, cylindrical beetle about 2 mm (1/16th inch) in length. It is similar in appearance to several other ambrosia beetle species (both native and exotic) that are already found in the southeastern US. The combination of its black color, nearly smooth (glabrous) upper surface, and the shape of its wing covers (an abrupt apical declivity) helps to distinguish it from other species, but positive identification will require examination by a specialist.

**Are there other ambrosia beetles that attack redbay?**

Yes. Examination of redbay trees killed by laurel wilt has shown that several other species of ambrosia beetles colonize the stems. These other beetles do not contribute to the death of the tree, but rather come to reproduce and cultivate their own associated fungi (upon which they feed) in the dead wood. Like the redbay ambrosia beetle, these other ambrosia beetle species often produce toothpick-like tubes or piles of fine sawdust on the bark as they bore into the tree.

An ambrosia beetle called the black twig borer commonly bores into small diameter twigs and branches of redbay and other trees, causing a “flagging” effect in the crown (isolated death of small branches). The damage caused by laurel wilt is much more extensive (major branches or entire crown wilting) than that caused by the black twig borer alone.

**What is the life cycle of the redbay ambrosia beetle?**

The life cycle of an ambrosia beetle includes four stages: egg, larva, pupa, and adult. After boring into a tree, adult ambrosia beetles create tunnels (galleries) in the wood. They inoculate those tunnels with fungal spores that are carried on their bodies, and cultivate this fungus as food.

Females lay eggs in the galleries; these eggs hatch into larvae that feed on the fungus, eventually pupate, and change to the adult form. The cycle from egg to adult is called a generation.

The redbay ambrosia beetle probably has multiple generations per year, with the length of each generation varying with season and temperature. Only the female beetles fly and initiate attacks on new host trees. Unmated females lay eggs that hatch as males, with whom the parent female can mate. Mated females lay eggs that hatch as females, which in turn can mate with their sibling males. Thus only one female beetle is needed to establish a new local population of the insect.

**What is the laurel wilt disease cycle?**

Much is still unknown and unstudied about the laurel wilt disease cycle. Female redbay ambrosia beetles carry spores of the laurel wilt fungus at the base of their mouthparts. Trees become inoculated with the fungus when these beetles bore into the xylem (sapwood). There is evidence to suggest that initial inoculation of trees may happen in the crown, but early attacks may not be limited to this location. The fungus gradually colonizes sapwood throughout the stem, causing the tree to wilt and die in a matter of weeks or a few months.

As the tree wilts, it becomes suitable breeding material for the ambrosia beetles, which colonize the stem, reproduce in the sapwood, and cultivate the fungus on gallery walls as food. Emerging female redbay ambrosia beetles fly and initiate new infections on healthy trees or colonize dead/diseased trees.

**How does this insect and disease spread?**

The disease is not known to spread apart from the redbay ambrosia beetle transmitting the fungus. The beetle can disperse naturally through flight, or can spread through the transport of infested host material, such as firewood, logs, and infested plants.

**How big of a problem is this disease causing?**

Laurel wilt has been devastating to populations of mature redbays. In forest stands where the disease has been established for several years, nearly all of the mature redbays have been killed. Redbay seedling populations, however, appear much less affected by the disease, presumably because they are not as readily attacked by the redbay ambrosia beetle. The potential loss of redbay raises a number of ecological concerns related to its utilization as a food source by birds, insects, and other animals.

Extensive redbay mortality resulting from laurel wilt also has negative impacts in parks and residential neighborhoods. The dead trees decrease the aesthetic appeal of the landscape, and removal of large redbay trees along roads and in residential settings can be financially costly.

**What are the ecological concerns associated with this disease?**

Redbay produces annual crops of berry-like drupes that are eaten by songbirds, wild turkeys, quail, rodents, deer, and black bear. In addition to serving as winter browse for deer, leaves of *Persea* species are the primary larval food source for the palamedes swallowtail butterfly (*Papilio palamedes*). Concern exists that substantial losses of redbay may negatively impact these and other species.

**What can be done to stop or slow the spread and impact of this disease?**

Effective strategies for managing this beetle or disease have yet to be demonstrated. To help slow the spread of the disease into new areas, long-distance transport of wood from diseased and infested hosts should be avoided. Sanitation (cutting and destroying infested trees) might delay spread of the disease in an area if it is pursued very early and diligently, with a focus on new infection centers (as opposed to areas where a large percentage of hosts have already served as brood material and from which ambrosia beetles have already dispersed). Other management options, such as systemic fungicides and insecticides, are being evaluated.

**How can I get more information about the redbay ambrosia beetle and laurel wilt?**

For more information about laurel wilt, you may contact your state department of agriculture, state forestry agency, or the USDA Forest Service office in your area.

**Georgia Forestry Commission Web Link:**

<http://gatrees.org/forest-management/forest-health/laurel-wilt-disease/index.cfm>