Laurel wilt of redbay and sassafras: Will avocados be next?

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Scientists with the USDA Forest Service Southern Research Station (SRS), Iowa State University, and the Florida Division of Forestry have provided the first description of a fungus responsible for the wilt of redbay trees along the coasts of South Carolina, Georgia, and Florida.

In the February issue of Plant Disease, SRS plant pathologist Stephen Fraedrich and fellow researchers provide results from their assessment of the fungus, the beetle that carries it, and their combined effect on redbay and other members of the laurel family, including sassafras, spicebush, and avocado.

Extensive mortality of redbay, an attractive evergreen tree common along the coasts of the southeastern United States, has been observed in South Carolina and Georgia since 2003. Though the wilt was at first attributed to drought, the cause was soon found to be a fungal pathogen and the exotic redbay ambrosia beetle, Xyleborus glabratus, a native to Southeast Asia that was first found in the area in 2002. Many ambrosia beetles carry species of fungi as food for their larvae; a previously undescribed fungus in the genus Raffaelea is a fungal symbiont of this ambrosia beetle.

To determine if the fungus was the cause of the wilt, Fraedrich and his colleagues inoculated redbay trees and containerized seedlings with the Raffaelea fungus; the plants died within 5 to 12 weeks. To connect fungus and beetle, they also exposed redbay seedlings to X. glabratus beetles; the ambrosia beetles tunneled into almost all of the plants,

causing 70 percent of them to die. The researchers found the fungus in 91 percent of the beetle-attacked plants.

“These experiments showed that the Raffaelea species we isolated from wilted trees and from the redbay ambrosia beetle is the cause of redbay wilt,” says Fraedrich. “The fungus, which is routinely isolated from the heads of X. glabratus ambrosia beetles, is apparently introduced into healthy redbay during beetle attacks on stems and branches.”

Redbays are common along Southeastern coast, and both residents and visitors are disturbed by the massive mortality. Deer browse on the evergreen foliage of the tree, and the fruit is eaten by songbirds, wild turkeys, and other animals. Redbay is also the primary host for the larvae of the palamedes swallowtail butterfly. But it’s not just the redbays that plant pathologists are worried about.

“The fungus we isolated has also been associated with the death of other trees in the laurel family, and the Raffaelea sp. has been isolated from wilted sassafras, pondberry and pondspice,” says Fraedrich. “Our inoculation studies have shown that the fungus is deadly to these species as well as to spicebush, and avocado, but not to red maple.”

The researchers concluded that there is reason to be concerned about the spread of the wilt to other members of the laurel family, which are common components in forests across the United States and other areas of the Americas. Recent studies have shown that California laurel, a West Coast species in the Lauraceae, is also susceptible to laurel wilt.

“We are also very concerned about avocado, a species indigenous to Central America which is grown commercially in Florida and California,” says Fraedrich. “Our evaluation of avocado indicates that it is also susceptible to laurel wilt, and the wilt has been found recently in avocado trees growing in a residential area of Jacksonville, Florida.”

Source: USDA Forest Service