South Carolina Forestry Commission

OAK WILT IN SOUTH CAROLINA

August 2017

Overview

Aiken, Barnwell, Lexington and Darlington counties are experiencing outbreaks of oak wilt. These outbreaks date back to 2014 in most cases and may be related to damage caused by the 2014 ice storm.

Oak wilt is a fungus that grows in the vascular tissue of oaks, blocking transmission of water and sugars and rapidly killing the tree. Although all oaks are susceptible, though to varying degrees, in South Carolina, the fungus has largely manifested itself in water oaks. The disease spreads to nearby trees through root grafts, connections between the roots of adjacent trees of the same species. Insect vectors can also spread it. We have repeatedly seen homeowners cut down a dead infected tree and dispose of it in vacant lots where all of the water oaks in the immediate vicinity die the following spring. This appears to be one of the most effective ways of spreading oak wilt.

Dieback from the leaf tips is a typical symptom of oak wilt, but this can also be caused by drought or anthracnose infections.

Although it is a devastating fungus, it is not very competitive. Trees killed by oak wilt are rapidly colonized by decaying fungi, including Hypoxylon fungus, which outcompete the oak wilt fungus.

Signs/symptoms

Symptoms of infected oaks can differ quite a bit between these two groups and between regions (South versus North). Infected oaks in the red oak group usually succumb more quickly than do oaks in the white oak group, which often have light symptoms and survive. In fact, this fungus has been used as a selective "herbicide" to remove oaks in the red group from land where they are unwanted. Infected oaks in the red oak group show foliage wilting and drop over the entire crown and no progressive branch dieback. Short-lived sprouts emerge but quickly dieback. Dark longitudinal streaks in the vascular tissue of the outer growth ring are often seen. The fungus multiplies in the tree's vascular system, shutting down water transport in the xylem tissue. This results in symptoms similar to those caused by drought. Symptoms often show up in the upper crown, changing color and wilting. Leaf tips begin to brown and progress inward, often leaving an abrupt border between dying tissue and green tissue. Mats of gray mycelium with raised black centers form on the surface of the wood and on the inner surface of the bark, especially in infected oaks of the red oak group. Formation of mats may be delayed until the following spring if the wilt begins in the summer. These fungal mats are rarely seen in South Carolina and may cause fissures in the bark. Fungal mats have a fruity odor and are very attractive to sap beetles.

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Disease cycle

Wounds caused by wind damage or mechanical damage associated with construction or pruning can be entry points for spores and beetles carrying the spores. The fungus most commonly spreads to neighboring trees through root grafts, resulting in a center of dead trees surrounded by wilting trees. Oak bark beetles (*Pseudopityophthorus minutissimus* and *P. pruinosus*) and sap beetles can also transmit fungal spores to healthy trees, but only if sporulating mats are produced, which is rare in South Carolina and other warmer regions. Spores are produced for only a brief period after a tree dies.

Timeline

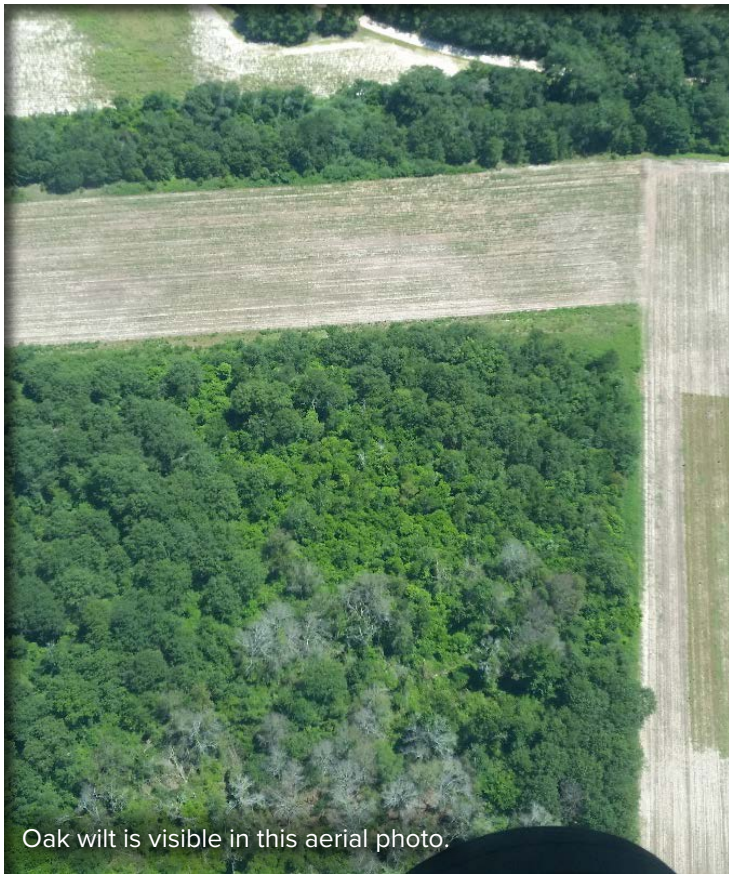
The fungus does not do well in high temperatures (>90° F), causing it to die in the smaller branches and stems of the tree in the summer. However, it does remain viable in the trunk and roots. The insect vectors are most active during the growing season.

Range

Historically, oak wilt has been limited to counties in the sandy belt around the middle of the state. This is likely because trees in sandy soils extend their roots out much further in search of moisture and are more likely to form root grafts.

Management

Avoid pruning oaks in the spring, as this leaves wounds where the fungus can enter, as well as attracting beetles which may vector the fungus. Infected trees can be girdled (as deeply as possible) to dry the tree out and reduce the growth of the fungus. If you can afford it, deep trenching (six feet deep) around infected and potentially infected trees will separate the roots of adjacent trees and stop transmission through root grafts. Trees that are cut down should not be moved as this is the most effective way of spreading the disease. If they must be cut down, they can be covered with a tarp to keep spores from spreading or burned. In South Carolina pockets of oak wilt typically diminish after a couple of years, but this is no consolation to landowners who have lost dozens of trees.


Oak wilt is visible in this aerial photo.

Contact

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