HORTICULTURE FACT SHEET

Management of *Ceratocystis fagacearum* in Oak Trees

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Oak Tree Death

Across the Big Country region, oak tree species are dying as a result of the continued spread of the oak wilt fungal pathogen known as *Ceratocystis fagacearum.*

Oak wilt was first discovered in Wisconsin in 1944 and first diagnosed in the Abilene area in the mid-1990's. The disease and loss of trees continues to spread primarily as a result of improper pruning practices and non-removal of infection centers.

An oak wilt "center" results when a diseased tree causes the spread of the pathogen to nearby uninfected trees. No oak tree species is immune from infection by the oak wilt fungal pathogen. However, some oak species such as white oaks show higher resistance to infection and mortality than other oak species.

There is no known cure for the pathogen. The only way to control its spread to healthy trees is through prevention.

Fungicide Treatment of Oak Wilt

Although there is no cure for the oak wilt pathogen, there are fungicides available that can suppress spore development, and these fungicides must be injected at the root flare into the tree's water-conducting tissues. Other types of applications such as foliar sprays and soil drenches have not shown any affect on the suppression of the disease pathogen.

Alamo® is the only fungicide that has been tested through research by Texas A & M University to have shown any affect in treatment of infected oak trees. According to the Texas Forestry Service, other similar formulations with the active ingredient propoconizole, at 14.3% concentration, which are labeled to be used in oak wilt control could be effective, but are not supported by research and therefore, are not recommended by this agency.

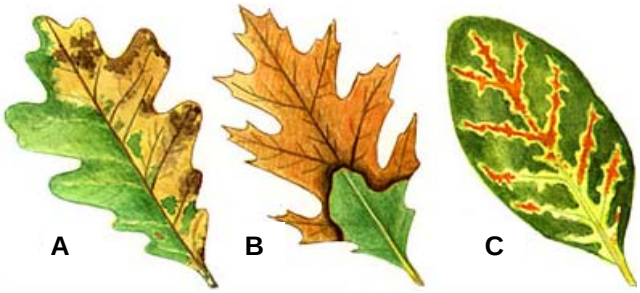

Figure 1. Foliar symptoms of the oak wilt pathogen (above) in oak species: A-white oak; B-red oak; and C-Texas live oak. Source: U.S. Forest Service.

Diagnosing & Treating Oak Wilt

Although trees infected with the oak wilt pathogen often display foliar symptoms and patterns of tree mortality, diagnosis should be confirmed and conducted by a trained expert. Pathology sampling may be necessary to confirm the presence of the fungus.

Treatment options will vary based on the specific oak species and can be preventative or therapeutic in nature. Red oaks that are symptom-free and located within 100 feet of an oak wilt center should be treated; however, treatment may not be successful. White and live oaks can be treated successfully in a preventative and therapeutic approach; however, the success will vary if the tree is

Figure 2. Macro-infusion injection of Alamo® fungicide at root flare of an infected oak tree.
Source: http://plantpathology.tamu.edu/Texlab/oakwilt.html

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Management of the Disease Cycle

The disease cycle can be slowed and prevented with proper pruning and management of oak trees in the landscape. The oak wilt fungus can be spread by:

- **Roots of oak trees adjacent to one another tend to graft together and can form one large connective root system, and the fungus can spread through the root system.**
- **Spores from infected trees can be spread by small sap-feeding insects as they move to open wounds on uninfected trees.**
- **Harvesting and movement of infected trees sold for firewood, especially red oaks, can introduce the disease to other geographical regions.**
- **Improper pruning and not sanitizing pruning equipment will spread the pathogen. Equipment should be sanitized with a 10% bleach solution before and after pruning an oak tree, and before pruning other plants. Pruning cuts should be sealed with a wound paint. Pruning should be done during winter months when the tree is dormant.**
- **Early detection is key. Look for foliar symptoms and the presence of fungal spore mats.**
- **Dead or dying trees should be promptly removed and destroyed. If the wood is to be harvested for firewood, it should remain on the property site and be tarped under clear plastic for one year as detailed in Figure 3.**
- **Treatment may include removal of the diseased tree; trenching to sever connected root systems; and/or, macro-infusion of a fungicide on symptomatic and asymptomatic trees. Prevention and good sanitation practices are key to preventing the spread of the oak wilt fungal pathogen.**

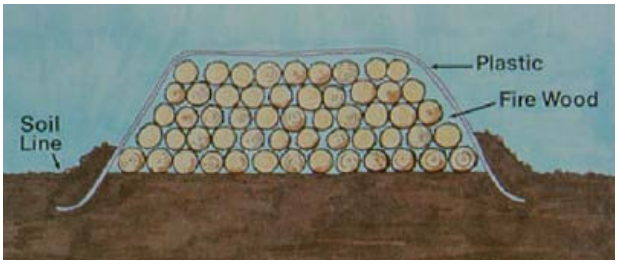


Figure 3. Proper management such as tarping cut wood is necessary to control the spread of the fungus. Source: Texas Forest Service, http://www.texasoakwilt.org

Recommended Landscape Trees

RESISTANT WHITE OAK TREE SPECIES

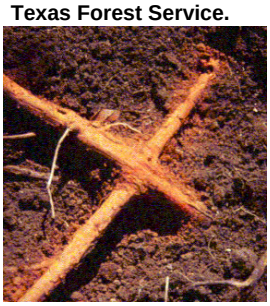
Post oak (*Q. stellata*)
Bur oak (*Q. macrocarpa*)
Mexican white oak (*Q. polymorpha*)
White shin oak (*Q. sinuata var. breviloba*)
Lacey oak (*Q. laceyi*)
Chinkapin oak (*Q. muehlenbergii*)

In lieu of planting oak trees, other tree varieties might serve your needs and ensure a sustainable landscape.

Ash, Texas (D, S)
Bald Cypress (D, S/PS)
Buckeye, Mexican (D, S/PS)
Chinese Pistache (D, S)
Crape Myrtle (D, S)
Desert Willow (D, S)
Elm, Cedar (D, S)
Holly, Yaupon (E, S/Sh)
Lilac, Texas or Vitex (D, S)
Maple, Shantung (D, S/PS)
Mountain Laurel, Texas (E, S/PS)
Oak species, Oak, Live (E, S)
Pine species (E, S) - Pinyon, Italian Stone & Jap. Black
Plum, Mexican (D, S/PS)
Pomegranate (D, S/PS)
Redbud, Texas & Mexican (D, S/PS)
Smoke Tree, American (D, S/PS)
Soapberry, Western (D, S/PS)
Sumac, Evergreen (E, S/Sh)

Figure 4. Image of fungal mat (right) which typically develops on red oak species the year following the initial infection. Source: USDA Forest Service.

Figure 5. Image of root graft (below). Source: Texas Forest Service.



For more information, contact Melissa Clifton Sturdivant, Extension Horticulturist with Texas AgriLife Extension Service in Taylor County or a local certified arborist, your local garden center or an urban forester with the Texas Forestry Service.

Resources: Harris, R.W., J.R. Clark and N.P. Matheny. (2004) *Arboriculture: integrated management of landscape trees, shrubs, and vines. 4th Ed.* Prentice Hall: New Jersey.

USDA Forestry Service Webpage. Forest insect and disease leaflet 29. (1983). http://www.na.fs.fed.us/SPFO/pubs/fidls/oakwilt/oakwilt.htm

Eight-step Program to Oak Wilt Management. Texas AgriLife Extension Service Plant Pathology Webpage. http://plantpathology.tamu.edu/Texlab/oakwilt.html

USDA Forestry Service Webpage. http://www.na.fs.fed.us/spfo/pubs/howtos/ht_oakwilt/toc.htm

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