



Oak Wilt in Texas

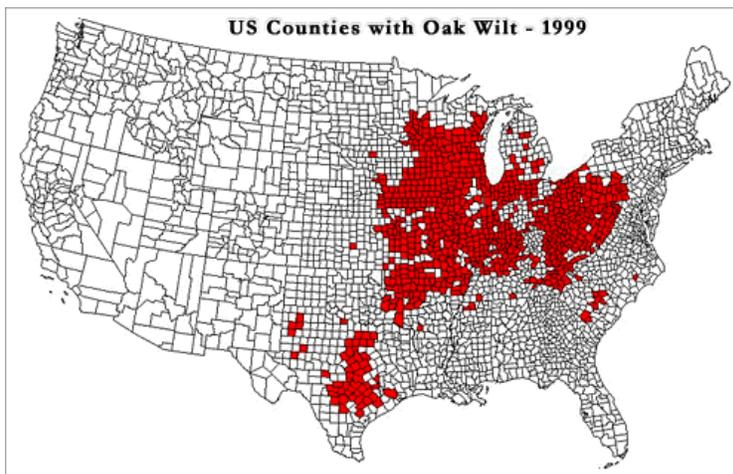
Oak Wilt is a fungal pathogen that is quite lethal to at least 20 species of oak. Chinese chestnut has also been reported as a host for the disease. Susceptibility varies among oak species, but generally the species in the red oak group are most sensitive. Oak wilt is caused by the fungus *Ceratocystis fagacearum*. This pathogen grows in the vascular system, where it inhibits water and nutrient flow from the roots to the crown of the tree. This disease can be found in certain areas of the Midwest, Texas and the eastern United States as displayed in the distribution map.

SYMPTOMS & SIGNS

Symptoms of this disease vary greatly among species and location. Trees in the red oak group frequently die within a year of infection. Leaves generally turn dull green or tan along the margins and display an abrupt change from healthy to dying tissue. Discoloration, chlorosis and necrosis along the leaf veins can accompany these symptoms.

Leaves will wilt and drop from the trees as these symptoms begin to appear, but some leaves may drop when they are still green. Brown streaks may develop in the sapwood of infected trees as a result of the plugging and death of the vascular system cells. White oaks display a much less dramatic series of these same symptoms. In the south, most white oaks can survive for several years after infection, and display slow dieback of limbs and twigs. Leaves typically the discoloration of the leaf veins and necrosis of leaf tips. However, it has been shown that bur oak, a white oak, is susceptible and may die more rapidly than others within this group.

Infected red oaks may develop a gray fungal mat with black centers on the surface of the wood and against the dead trunk. This mat formation, never seen on live oaks, will cause the bark to crack and expose the fungus to insects that are attracted to the fermented, fruity odor.



Foliar symptoms of Live Oak

Two common species of insects that transmit this disease are the oak bark beetles and sap beetles. These beetles are attracted to trees damaged by disease, wounds or pruning cuts. They pick up the fungus and distribute it to other trees in the area. Adults emerging from eggs laid in infected trees are infected and transmit the disease with them as well. Once a tree in a localized area is infected, spread of the fungus via root grafts becomes a major factor. The adjoining trees will usually wilt within 1-6 years after infection of the original tree.

Confirmation of the disease is performed by isolating the fungus from infected tissue in a laboratory. Samples submitted for confirmation should display some characteristics that will make diagnosis and isolation more successful. Collected samples should be in the process of wilting and have ample moisture in the sapwood. It may be necessary to remove the bark and longitudinally section wood to detect vascular discoloration, but this color change should be observed in samples before submission. Additionally, samples should be kept cool during sampling, storage and shipping.



Leaf scorch, vascular discoloration and sporulating fungal mat

MANAGEMENT

Inspection of susceptible trees is the cornerstone of oak wilt management. Fungicide injections are available to provide preventative and therapeutic treatments for the disease. Trenching between the root system of healthy and infected trees can prevent spread through root grafts. Immediate removal of infected red oaks should be performed and the wood should be burned or buried to prevent further spread of the fungus. White oaks can be left, as they may recover or survive, but in either case, fungicide injections should be performed to nearby hosts. Pruning may be required to remove dead branches and prolong tree health. Fertilization should be considered based on soil analysis to alleviate nutrient stress.



Typical Dieback of Oak Canopy