

Dutch Elm Disease and Tarrant County Trees

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Some plant diseases are kind of like the common cold. We've all seen them. Most of us have some close personal experience with them. And while plant diseases like Downy Mildew are about as attractive as Athlete's Foot, with a little less moisture and perhaps a little fungicide, both can be cured without serious risks to plant or personal health.

Other plant diseases are more like SARS or the West Nile Virus, capable of quickly killing a healthy person, unfamiliar, and even scary. The scariest of plant diseases can attack large healthy trees, seriously damaging our landscapes and natural areas. Dutch Elm Disease (DED) is one of these scary diseases. Oak Wilt is one of these scary diseases in our area and there are other scary diseases such as Sudden Oak Death that have yet to

reach Texas.

There is another human/plant health parallel that must be mentioned. Just as people are more likely to be killed by a common chronic disease such as heart disease, plants are most frequently killed by simple, not so scary, things like too little or too much water.

Ancient and Modern History

The history of Dutch Elm Disease is an interesting illustration of the movement of a pathogen across continents. Although the causal agent is believed to have originated in Asia, Dutch Elm Disease got its name way back in 1921 in Holland, when a female plant pathologist, Maria Beatrice Schwarz, isolated the fungus, *Ophiostoma ulmi*, from Elm trees that were mysteriously dying. Another of the mighty feminine Dutch phytopathologists, Christine Johanna Buisman, was the first person to recognize and identify the disease in the United States while visiting Ohio in 1930. The disease is believed to have been brought into the United States on elm logs from Europe imported by furniture manufacturers. The bark beetles that transmit DED can live on cut logs unless they are debarked. By sometime in the 1940s, the causal agent, *Ophiostoma ulmi*, had been replaced by a more virulent version, *Ophiostoma novo-ulmi*.



O. novo-ulmi has been crisscrossing the continents for the past sixty years. Dutch Elm Disease was first reported in North Carolina (on a winged elm, *Ulmus alata*) in 1962. By 1973, it had reached the West Coast. According to Dr. Dave Appel, professor of Plant Pathology and Microbiology Texas A&M University, small outbreaks have occurred in Texas in the Dallas/Fort Worth area, Lufkin and Waco over the past several decades.

Most of the recent Dutch Elm Disease action has been in the Denton County municipality of Flower Mound, just north of Grapevine. The Texas Plant Disease Diagnostic Laboratory confirmed two cases of DED in Flower Mound 2005 and one in 2008. In 2005, one of the trees killed in Flower Mound was a Cedar Elm. Jared Martin, Environmental Review Analyst for the City of Flower Mound, reports that since the 2005 outbreak

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approximately 75 American Elms and the previously mentioned Cedar Elm have died from what appears to be Dutch Elm Disease. In the spring of 2008 Dutch Elm Disease was also indentified on American Elms by a local arborist at a site in North Richland Hills.

Which Trees Can Catch this Disease?

American Elm, *Ulmus americana*, is widely regarded as the elm species most susceptible to Dutch Elm Disease. Unfortunately, all elms that are native to North America are at least somewhat susceptible. Most of the elms in North Texas



natural areas are Cedar Elm, *Ulmus crassifolia*. Cedar Elm is also widely used in Tarrant County landscapes. It is listed as intermediate in susceptibility to Dutch Elm Disease in the widely used reference *Diseases of Trees and Shrubs*, Sinclair, Lyon and Johnson (Cornell University Press.)

Our landscapes also have plantings of resistant Asian elm species. Lacebark Elm, *Ulmus parvifolia*, has attractive mottled bark and is included in the recommended trees for Fort Worth. Siberian—sometimes incorrectly called Chinese—Elm, *Ulmus pumila*, is not on anyone’s recommended tree list. All sorts of insects and diseases, pretty much everything except Dutch Elm Disease, will attack this tree. To add insult to injury, larger older specimens were often topped back in the days when this poor pruning practice was popular.

What Will Happen Here?

Why hasn’t Dutch Elm Disease already wiped out every native elm tree in the metroplex? There are many possible explanations. The most susceptible species, the American Elm, hasn’t been planted as extensively here as in the cities of the Midwest and Northeast. Most of our native elms are the less susceptible Cedar Elm. Elms of all kinds aren’t quite as prevalent in our native areas or our urban landscapes as other tree species, especially Oaks. However, if the oak is #1, the elm is #2. For example, in the City of Arlington, the *Ulmus* genera made up 17% of the

trees surveyed in 2000 and 19% in 2003. Our hot summer weather may be unfavorable for the bark beetles that spread the disease or the fungus that causes it or both. On the other hand, it is possible that we just haven’t seen the worst of it yet.

As elms leaf out this spring, we can all be on the lookout for signs of Dutch Elm Disease. The first step is to correctly identify the tree species. DED is most commonly found on American Elms. If a tree is infected with DED, individual limbs will rapidly wilt and die.



Branch tips will droop down or “flag.” The next key to diagnosis is discoloration in the vascular system of infected branches. Finally, look for elm bark beetle galleries just under the bark. There are two species of elm bark beetles that spread the disease, one native and one introduced. Both are likely to be present around elm trees, even if the fungus isn’t.



The Texas Plant Disease Diagnostic Laboratory can confirm diagnosis by isolating the pathogen. Forms and instructions for sample submission are available at <http://plantclinic.tamu.edu>.



Dutch Elm Disease could be confused with another up and coming tree problem, Bacterial Leaf Scorch (BLS). Bacterial Leaf Scorch is not new to us, but according to Dr.

Kevin Ong, Director of the Texas Plant Disease Diagnostic Laboratory, it is being diagnosed on more tree species and with greater frequency in Texas. Bacterial Leaf Scorch is caused by the pathogen *Xylella fastidiosa*. Some key differences between the two diseases include:

DED affects individual branches. BLS may be

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first observed on individual branches, but spreads through the entire crown, affecting the oldest leaves first.

DED will cause the leaves to wilt and turn yellow, then brown. BLS causes leaves to turn brown along their margins, sometimes with a yellow halo.

DED symptoms are often observed in the early summer, but can occur anytime in the growing season. BLS is usually observed when temperatures peak in the late summer.

DED will result in brown streaking in the vascular system, BLS won't.

Managing Dutch Elm Disease is a lot like managing Oak Wilt (OW)—regular monitoring is a must, removal of infected trees will reduce inoculum production, insecticides can be used to kill the beetle vectors, root grafts can be eliminated to reduce spread, and valuable trees at risk of infection can be treated with injections of fungicides. There are some important differences in management techniques based upon significant differences in these two vascular wilt pathogens.

OW is only transmitted by insects when fungal mats are present, usually February through June. DED can be transmitted by insects at anytime.

The nitidulid beetles that transmit OW require fresh wounds made by someone else to transmit the disease. The elm bark beetles that transmit DED make their own wounds.



Only infected red oaks, not live oaks, are a source of inoculum for insect transmission of OW. Every infected elm is a source of inoculum for insect transmission of DED.

How can we avoid the catastrophic loss of trees that can occur with scary diseases like Dutch Elm Disease and Oak Wilt? One of the keys is landscape diversity. It is really easy to overplant a species or genera, especially one that is well adapted to our area. Most municipalities strive to diversify so that no one genera, such as *Ulmus* or *Quercus* (the Oak genus) exceeds 20% of the trees in that city. Providing adequate distance between trees of the same genus can

also prevent root graft transmission of vascular diseases. A distance of at least 60 feet is commonly recommended.

Another tool to minimize the impact of these diseases is choosing species and cultivars that are disease resistant. Asian Elm species such as Lacebark Elm are resistant to Dutch Elm Disease. Cedar Elms are less susceptible than American Elms. Even among American Elms there are resistant cultivars such as 'Princeton,' 'Valley Forge,' and 'New Freedom.' White Oaks such as Bur Oak and Chinquapin Oak are resistant to Oak Wilt.

Finally, a strong, healthy plant is less likely to get sick and die than a weak, stressed one. Take good care of your trees and they'll probably be around for many years.