



The Plant Doctor's LANDSCAPE TIPS

By Dr. David L. Roberts, The Plant Doctor LLC a.k.a. The Tree Doctor

DISTINGUISHING OAK AFFLICTIONS

INTRODUCTION

Invasive diseases and pests have decreased the diversity of American woodlands and forests, often leading to the destruction of whole genera of trees/plants; examples of these imported problems include Dutch Elm Disease, Emerald Ash borer and Chestnut Blight. There are many other "imported" diseases that could spell disaster for our natural forests (i.e. White Pine Blister Rust), but we have learned how to manage some of them to reduce their impacts. The loss of so many species of plants makes those remaining even more important from forestry diversity and health standpoints. *Quercus sp.* (Oak), which has arguably risen to greater prominence, is affected by a lethal disease known as Oak Wilt (OW), which we consider "invasive". Compared to some of the other lethal, invasives maladies, Oak Wilt lacks a good vector to promote Overland transmission much more efficiently, ala Emerald Ash Borer and DED.

The prospect of Oak Wilt sends chills up our collective spines. Accurate diagnosis of OW is not always easy. Many issues have been mistaken for OW, and OW has been mistaken for other afflictions . . . sometimes with catastrophic impacts. Hence, it is vital that we be able to differentiate among Oak's various afflictions so that we can diagnose Oak Wilt and differentiate it from other oak problems accurately (Photo 1). Which also means we may implement the most effective measures . . . and not inappropriate

procedures. In 2019, I published an article in *the Landsculptor* entitled "Oak Wilt Part 7:Oak Wilt Look Alikes". I thought it might be useful to update/add to that publication because we have learned new information over the last several years. Plus, I have gotten a better appreciation for what matters are being confused with Oak Wilt and other maladies among the public. According to my experiences throughout Michigan in recent years, I think that diagnosing oak afflictions is more challenging than most of us would like to admit, which is a valid reason to again review some of these Oak Wilt-Mistaken Identities.

Oak Wilt: I have covered Oak Wilt extensively in various *Landsculptor* articles over many years. Oak Wilt is a disease against which all the other oak afflictions need to be compared and accurately evaluated. Briefly, Oak Wilt kills members of the red oak family rather quickly, often within a few months of infection. Initial and most obvious symptoms associated with OW is leaf drop. Leaf loss from trees is especially alarming to property owners during the summer season when we least expect it. Leaves that fall from infected trees may widely range in color and texture (Photo 2), which I find very useful in diagnosing Oak Wilt. Oak Wilt spread between trees via root graft is rather slow . . . but there are exceptions. Overland and Underground Spread characteristics of OW can be useful in helping us diagnose the disease. The article, "Oak Wilt's Rate of Underground Spread" was published in *the Landsculptor*, December 2024, Pages 15-17.

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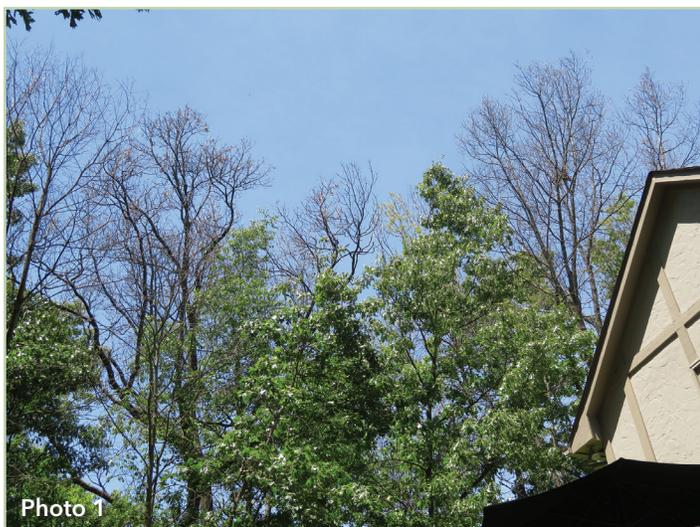


Photo 1

Photo 1: The decline and death of these oak trees could easily be attributed to Oak Wilt, as several arborists and property owner surmised. However, these trees are not affected by the lethal disease Oak Wilt; they are affected by Imazapyr herbicide applied by a homeowner (refer to "Herbicides" and Photo 10, below). Unknowingly, we as professionals may be blamed for tree death without understanding all the factors associated with a landscape like this one. The homeowner who made the application of Imazapyr had no clue that he and not his arborist, caused the problem.



Photo 2

Photo 2: One of the major distinguishing factors of leaf loss from Oak Wilt is the variety of colors and textures of fallen leaves associated with the disease. Note that shed leaves may appear normal green in color, tan, olive green and everything in between. Leaf diseases other than Oak Wilt will exhibit symptoms that with close examination are usually different from symptoms on Oak Wilt-impacted foliage.



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Defoliators: Because one of the primary symptoms of OW is defoliation, we need to consider that there are innumerable pests, diseases and environmental aspects that may cause defoliation much like OW does. Cynipid Wasp Gall, an insect pest, is an example of a defoliator that may be mistaken for Oak Wilt (Photo 3). Anthracnose and Tubakia, for example, are two infectious fungal leaf diseases that cause leaf-drop in oak trees (Photo 4).



Photo 3



Photo 4

Photos 3 & 4: Many diseases and pests can cause leaf-loss in oaks. Note leaves on the lawn (lower right) in Photo 3 caused by the cynipid wasp gall (Inset). Typical foliar infectious diseases that attack oak and lead to defoliation include Anthracnose (*Gnomonia*-pictured) and *Tubakia*. We often mistake some of these foliar problems for Oak Wilt because these and other issues cause the primary symptom (defoliation) we associate with Oak Wilt infections. They can generally be easily distinguished from Oak Wilt infections by closely examining symptoms on the leaves (compare with Photo 2).

There are others but these are two of the more common ones we see in Michigan. We can generally differentiate among the foliar problems by examining the symptoms very carefully (Photos 2, 3, 4).

Physiological and Environmental Scorch: One of the reactions of heat and drought stress on trees is leaf-drop, not unlike that associated with diseases and pests. Oak species are no different. Over the years I have encountered quite a few examples of heat stress on oak that resulted in leaf drop and that had sometimes been erroneously attributed to OW (Photos 3 and 5). Misdiagnosis of heat stress is not that unusual even for many experienced scientists, arborists, and landscapers. When heat stress occurs, accompanied by leaf loss, homeowners sometimes become hysterical in the middle of summer when they often believe their trees are dying. Perhaps a major diagnostic feature of leaf loss from environmental stress and Oak Wilt is the symptomatology on the leaves; environmental stress causes interveinal leaf necrosis, with leaf veins remaining green (Photo 5, compare with Photo 2 for OW). We also encounter "physiological scorch" on red oaks fairly often (Photo 6); this disorder, characterized by necrotic spots between leaf veins, is distinctive but is often mistaken for anthracnose, bacterial leaf scorch and/or OW. Environmental

stress may occur on the same trees/same branches, year after year, without serious consequences to the health of trees.

Oak Borers: There are hundreds of gall-forming pests on oaks; most are harmless. Two common borers that are perhaps the more serious that gall formers are Two-Lined Chestnut Borer (TLCB) and perhaps the more serious pests are the Two-Lined Chestnut Borer (TLCB) and the Twig Pruner. The TLCB attacks most oak species, but compared to Oak Wilt on red oaks, the TLCB causes a decline in trees, usually beginning at the top (Photo 7). Twig Pruners and Twig Girdlers can injure branches, possibly leading to branch/limb breakage. Although not proven, I have noted an association between Twig Pruners and the Overland Spread of Oak Wilt. Twig Pruners typically chew from the inside out, causing structural integrity problems (Photo 8). When twigs and branches break due to internal structural degradation, they expose (torn) vascular tissue (Photo 8 Inset) that can attract sap beetles, a primary vector of Oak Wilt. So not only can twig infesting insects cause limb problems (decline, death) but they might lead to Oak Wilt infections; in many situations where I have witnessed twig pruners associated Oak Wilt, there is no evidence of Underground Spread nor of other injuries that might attract sap beetles.



Photo 5



Photo 6

Photos 5 & 6: Environmental Scorch (heat and drought stress) typically result in "scorch" symptoms denoted by interveinal necrosis and green veins; affected trees usually are not seriously harmed. Physiological Scorch is quite common on red oaks and is characterized by necrotic spots between leaf veins; Photo 6 exhibits a combination of Physiological Scorch and Environmental Scorch. Again, Physiological Scorch is rarely serious and occurs year after year on the same branches of the same trees. Either "Scorch" has often been mistaken for Oak Wilt.



Photo 7

Photos 7 & 8: Various borers attack Oak trees. The Two-Lined Chestnut Borer may attack and cause decline in both the red and white oak families. Compared to Oak Wilt on Red Oak, TLCB on red oak (and white oak) causes dieback symptoms to occur rather slowly (Photo 7). Twig girdler activity may result in branch death and structural failure (Photo 8) due to weakening of internal wood by borer tunneling. Limb breakage initiated by the Twig Girdler will result in jagged edges of live cambium tissue (Photo 8 Inset), which the author believes may attract sap beetles, the vectors of Oak Wilt.



Photo 8

Herbicide: Phytotoxicity on trees and other plants from herbicide applications either through drift or root uptake is very common in Michigan. All areas can be impacted: urban, suburban and rural. Herbicides impact plants differently depending on their mode of action. For example, growth regulator herbicides (2,4-D, Triclopyr, Dicamba) affect the normal growth of trees and their foliage (Photo 9). The nontarget impacts of growth regulator herbicides are generally not lethal nor long lasting. Other herbicides are far more dangerous to trees and landscape plants.



Photo 9

Photo 9: Herbicide toxicity is quite common on landscape and nursery plants. Note distorted, cupped oak leaves typically of exposure to a growth regulator-type herbicide. Even though 2,4-D was confirmed in this situation and affected about every tree species on the property, there will be recovery and no long-term damage to trees by the herbicide.

One of the most common herbicide phytotoxicities and frequently mistaken for OW is Imazapyr (Photo 1 and Photo 10). This mistaken identity of Oak Wilt

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for Imazapyr phytotoxicity has occurred all over Michigan (and beyond) by professionals and homeowners alike. As we might imagine, if Imazapyr toxicity is mistaken for Oak Wilt, the ensuing destruction of even more healthy trees by the implementation of some entities' OW remediation measures could be economically and environmentally devastating. Property owners largely do not understand the impacts of various herbicides upon their property. Sometimes, even we professionals have made similar mistakes.

There are many other maladies such as Oak Decline and various Root Rots that may be mistaken for Oak Wilt or difficult to discern, but space limitations forbid me to address those issues at this time. 🌱

The Plant Doctor will be speaking on "Oak Wilt: Best (and Worst) Management Practices" and "Understanding Herbicide Impacts on Trees & Landscapes" on Wednesday, March 5th at the MGIA 38th Annual Trade Show & Convention at the Suburban Collection Showplace in Novi, Michigan.

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Photo 10

Photo 10: This meticulously maintained landscape was treated with Ortho GroundClear (Inset), which contains the lethal tree chemical, Imazapyr; symptoms of herbicide damage did not appear during the year of application. The following year, disaster struck many of the oak trees in the same landscape (Photo 1). The property owner believed the problem was Oak Wilt and was not aware of the threat that Imazapyr poses to the health of large trees, especially Oak trees.