



# The Plant Doctor's LANDSCAPE TIPS

By David L. Roberts, Ph.D., *Senior Academic Specialist,  
College of Agriculture and Natural Resources, Michigan State University*

## OAK WILT PART 5: TREE UTILIZATION/DISPOSAL

### INTRODUCTION:

Oak Wilt (OW), caused by the fungus *Ceratocystis fagacearum*, is a serious and lethal disease of various species of the genus *Quercus* (Oak). Members of the red oak family (northern red, pin, scarlet, etc.) are particularly susceptible and often die within 1-2 months after becoming infected (Photo 1). The diagnosis, symptomatology, management and other aspects of OW have been covered in other articles: Oak Wilt Parts 1-4 (See the *Landsculptor*: Issues May 2015, October 2015, February 2016, May 2016 and September 2016).

One of the most common concerns expressed about OW is what to do with trees that have been killed by the disease. Should the tainted wood be destroyed to prevent infection of other oak trees, or can the wood be safely utilized for various purposes? Improper handling of OW-infected trees can spread OW and result in new outbreaks around Michigan. It is important to note that at the time of this writing, there are no ordinances or laws in Michigan regulating trees and wood materials infected by the OW fungus. Nevertheless, there are appropriate procedures to follow that can hopefully minimize further development of OW in Michigan. The safe disposal or utilization of oak-wilted trees is a rather complex issue.

### ASPECTS OF OAK WILT BIOLOGY:

To better understand the complex issue of dealing with trees killed by Oak Wilt, it is prudent to review a number of pertinent biological characteristics of the Oak Wilt fungus. These aspects help us make rational decisions regarding OW-infected trees and wood products.

1. The OW fungus is virtually an obligate pathogen (or parasite), meaning it does not survive well or long in nature without its living host plant (oak). In other words, the fungus does not generally survive



**Photo 1:** At this horse farm in northern Michigan, Oak Wilt progressed to nearby oaks via root graft transmission. If unchecked, the fungus will likely kill all oak trees in this landscape around the home. Although it is believed that most of the Oak Wilt transmission occurs through root grafts, all **new** outbreaks of Oak Wilt occurs every year from beetle transmission of the fungus from pressure pads to wounded oak trees.

very long in dead oak trees or products made from these trees.

2. The OW fungus reproduces by producing fungal mats (Photo 2) or pressure pads (analogous to a mushroom) beneath the bark of red oak family members (Photo 3). These pressure pads are especially important for infecting other oaks via overland spread by insects to wounded, live trees. As with aspect #1 (above), these pressure pads do not survive long after development due to decomposition/destruction by arthropod and other microbial activity. Pressure pads in oaks (red family members) can readily be transported in firewood and other wood products to new locations where new outbreaks of OW may occur.

*Continued on page 12*



**Photo 2:** A (dark) pressure pad (fungal mat) of the Oak Wilt fungus formed in the fall of 2015 from an Oak Wilt infection through pruning cuts made during the previous May.





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Continued from page 11

3. White oak family members (Photo 4: white, swamp white, bur, etc.) do not produce pressure pads and are of little concern in the overland dissemination of OW..., as might occur with transport of firewood or other oak products from infected red oak.
4. The OW pressure pads are typically produced during the spring following the year of infection but may occasionally be produced during the fall of the same year of infection and tree death.
5. Pressure pads typically form on trees that are standing: standing (declining, dead) trees still absorb sufficient soil moisture necessary for pressure pad development. Pressure pads may form in cut wood if the wood is damp.
6. It is estimated that 90% of OW spread each year occurs through underground root grafts (Photo 1). The first reaction of many people whose trees are afflicted with oak wilt is to promptly remove the diseased trees to try to stop the spread of the disease. In reality, the disease appears to spread more quickly via root grafts to nearby trees when affected trees are removed promptly. Hence it is advisable to implement remedial efforts such as trunk injections or root graft disruption before removing diseased trees; diseased trees can be removed after remediation efforts, usually later in the fall or winter following tree death.



**Photos 3 (top) & 4:** Pressure pads form only on red oak family members and are the principle source of new outbreaks every year from overland spread of the fungus by sap beetles. Red oaks are identified by their sharply pointed leaf lobes (Photo 3) while white oaks have rounded leaf lobes (Photo 4).

#### RED OAK-WILTED WOOD UTILIZATION AND DISPOSAL OPTIONS:

There are a variety of procedures that can be implemented to utilize or dispose of trees killed by OW. The following procedures need only apply to red oak or red oak family members, which typically produce pressure pads. Members of the white oak family are not known to produce pressure pads and hence, there is little concern about transmission of OW in White Oak wood products.

**Debarking:** Removing the bark from trees affected by OW will prevent the formation of pressure pads..., which in turn should reduce the likelihood of overland transmission. Debarking is a tedious, labor intensive process unless one has the proper equipment.

**Chipping:** Chipping trees not only prevents pressure pad development but will ensure the destruction of any pressure pads that may have already formed.



**Photo 5:** Oak Wilt infected trees that are chipped into mulch destroys the capability of the fungus to survive and spread. This mulch is fine for landscaping and other uses.

Chips (mulch) from OW trees are fine for landscapes and elsewhere (Photo 5).

**Immediate Destruction:** Other than chipping into mulch, trees killed by OW can be destroyed by burying or burning. These actions will eliminate the possibility of overland spread of OW from pressure pad formation.

**Lumber:** Trees killed by OW are fine for milling into lumber; the lumber quality is generally not reduced by OW infections. As with any logging considerations, the quality of wood may be reduced if trees are left standing or logs are left unattended too long; borers and other microbes begin attacking dead standing trees and unutilized logs. If logs are debarked, pressure pads will not form. If logs cannot be debarked, they should be sealed in plastic in a similar manner as for firewood (below) until milled.

**Firewood:** Trees killed by OW can safely be used as a fuel source. It is appropriate and ethical to follow some simple guidelines to prevent the spread of Oak Wilt in firewood.


1. **Prompt Utilization:** If trees that are killed by OW can be utilized for fuel within a few months of tree death





**Photo 6:** To prevent potential further spread of Oak Wilt via overland transmission of the fungus, the property owner in Photo 1 plans to burn all Oak Wilt-infected wood in this outdoor wood burner during the winter following death of his oaks.

(example: the following winter), no precautions usually need to be taken (Photo 6).

2. **Plastic Sealing:** If OW-tainted firewood is not to be utilized promptly and/or if air drying and “seasoning” are desired, it should be covered and sealed in plastic to reduce the potential of visitations by insects, which can subsequently transfer the deadly fungus to nearby healthy but injured oaks. Because pressure pads do not remain viable for very long, the firewood only needs to be sealed during the spring and summer when pressure pads are likely to be present (usually the spring and summer of the year following tree death). Firewood can be sealed in plastic by digging a shallow trench around the stack of firewood and/or by placing heavy objects or soil on the plastic edges. Use of clear plastic may trap heat within the firewood stack and hasten pressure pad decomposition. After the first spring and summer following OW-tree death (with accompanying pressure pad decomposition), the firewood is no longer contaminated and can be utilized, transported or stored for years without concern (Photo 7).
3. **Drying Firewood:** OW-afflicted trees that are cut into small firewood-sized pieces and subsequently dried rapidly (under shelters, etc.) will usually not produce pressure pads. As an example, if a red oak is cut into firewood pieces in July or August of the same year of tree death from OW, it is likely the firewood will dry quickly enough to preclude development of pressure pads, which require moisture to form.
4. **DON'T MOVE FIREWOOD!?!?:** It is not prudent to move OW-tainted wood from an OW site unless the above precautions and a firm understanding of the disease and wood handling is understood. For example, it would not be smart to take OW-tainted wood to a state park, campground or cottage up north; such actions could result in new OW epicenters and destruction of our (your) forests and landscapes (Photo 8). 



**Photo 7:** If trees killed by Oak Wilt are to be used for firewood, the firewood should be sealed in plastic the spring and summer following the death of oaks the year before. This effort should reduce the potential for overland spread of the OW fungus from pressure pads on the firewood. Because the OW fungus does not survive long in firewood, the plastic can be removed after the spring/summer sealing period.



**Photo 8:** Oak Wilt is spreading through the oaks at this campground in northern Michigan. The original source of the Oak Wilt was probably contaminated firewood brought by a camper.

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