



The Plant Doctor's LANDSCAPE TIPS

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

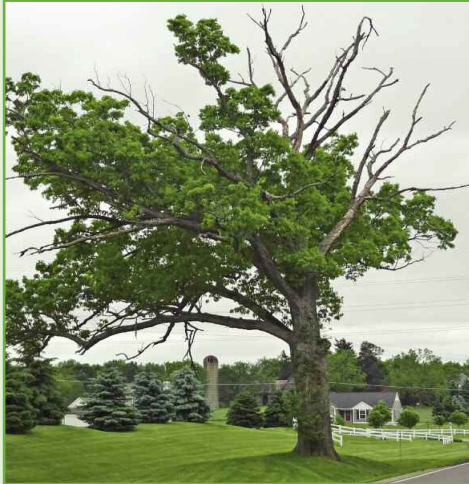


Photo 1: Big, old declining oak trees are common in the Michigan landscape. Determining the cause of decline can be a daunting task. A few simple procedures outlined in this article may help to delineate two of the more common and lethal issues.



Photo 2: With OW, common symptoms include wilted leaves and/or fallen leaves. The foliage on branches infested with the TLCB often wilts. Wilted leaves may also be observed with TLCB.



Photo 3: Epicenter patterns of problem spread is especially common with OW. With TLCB, a more diffuse epicenter effect may be observed.

DIFFERENTIATING TLCB AND OW

INTRODUCTION:

Due to ever increasing losses of tree species to exotic, introduced diseases and pests, (ex. Dutch Elm Disease and Emerald Ash Borer), our remaining tree species become more important for maintaining a diverse, healthy landscape. Oak species (*Quercus* sp.) represent increasingly important contributors/components to our landscapes and forests in Michigan. Oaks are susceptible to numerous diseases, pests and cultural/environmental problems (Photo 1). Two of the more common and lethal problems on oaks are Oak Wilt (OW), caused by a fungus (*Ceratocystis fagacearum*), and the Two-Lined Chestnut Borer (TLCB=*Agrilus bilineatus*), a flat-headed wood boring beetle and “cousin” to the introduced Emerald Ash Borer (EAB). While it may seem that discerning OW from TLCB is simple, I have found that it is often very difficult even for the professional arborist to differentiate between these two problems. Often, both of these problems or others are assigned under a catch-all term such as “oak decline.”

DIAGNOSING OW AND TLCB:

When diagnosing oak problems, it is vitally important to keep an open mind about all of the potential issues that may affect oaks. The decline and death of oak trees from OW and TLCB can be broadly summarized in Table 1.

TABLE 1	Red Oak Family	White Oak Family
Oak Wilt	Rapid Death	Slow Decline/Death
TLCB	Slow Decline/Death	Slow Decline/Death

Table 1. Relative speed of symptoms resulting from Oak Wilt and Two-Lined Chestnut Borer infections/infestations on the two major oak family groups.

Diagnostic Tips for OW: When considering whether OW is involved in the death or decline of a particular oak tree, I look for the following:

- 1) Rapid death of Red Oak Family members; Slow Decline of White Oak Family members (Photo 1).
- 2) Wilting and/or falling leaves in the spring and summer (Photo 2).
- 3) Recent injury, either from pruning or storm (sap beetle transmission).
- 4) Progressive tree death (root graft, epicenter effect-Photo 3).
- 5) Don't necessarily count on the reliability of lab tests to confirm the Oak Wilt fungus.

Diagnostic Tips for TLCB:

- 1) Rather slow decline of Red and White Oak Family members (Photo 1, 4).
- 2) Decline starts from the top on smaller branches, progressing downward.
- 3) Tunneling beneath the bark of affect branches and/or trunk (Photo 5).
- 4) D-shaped emergence holes first on the branches and later on the trunk (Photo 4 Insert).
- 5) Look for a diffuse epicenter of attacked trees, much like that of Emerald Ash Borer (Photo 3).

Sample Collection: One of the challenges of diagnosing OW and TLCB seems to be the collection of samples (Photo 1); it seems that there is a reluctance to commit resources for a climber or a bucket truck to collect samples from the upper limbs of a tree for analysis. In the case of TLCB, collection of a sample is vital to determine if TLCB is causing the decline in the tree; waiting until D-shaped holes appear on the trunk at eye level automatically implies the tree is dead or too advanced in decline to save.

MANAGING OW AND TLCB:

The TLCB is often considered a stress pest; in other words, trees that are under stress are most susceptible or attacked before healthy trees. However, both OW and TLCB (unlike many other borers) are alike in that they require live trees to complete their disease/life cycles. From this standpoint, they might both be considered “obligate parasites” (loosely used). It is highly possible that specific trees could be afflicted with both OW and TLCB, or perhaps even other problems. Big, old oak trees are likely to possess a multitude of problems.

Stress/Injury Management: TLCB tends to be attracted to stressed trees, but I have noted an epicenter effect whereby the insect may attack nearby younger, healthy trees from nearby infested trees. Minimizing identified or suspected stress factors should help. Increasing tree vigor with supplemental nutrition and water (not excess) may help minimize stress. Likewise, OW is often introduced into oak trees through fresh wounds. Avoiding wounding during the warm season and employing prompt storm injury repair procedures should prevent OW infections.

Preventative Management: For big old oak trees that are likely to attract the TLCB, an arborist could opt to apply preventative sprays or imidacloprid soil treatments much like we do for EAB management, particularly for valuable specimens in highly maintained landscape sites.. I do not recommend drilling trees for routine preventative treatments to control either the TLCB or OW. Oak trees, particularly large, old trees, tend to heal very slowly, and the drilling injury may introduce other problems.

Curative Management: Depending on the degree of decline, oak trees should respond to treatments aimed at “curing” infections/infestations of both OW and TLCB; this certainly applies to TLCB and most oak species. As we know, however, once a red oak becomes infected with OW, there is virtually no possibility of saving it with treatments; white oak family members affected with OW may respond favorably to curative treatments of propiconazole (Alamo), etc. for OW management. Again, I do not recommend drilling trees for injections unless a tree is advanced in decline or requires emergency treatment.

More details on OW and the TLCB can be found in the August, 2008 and April 2012 issues of *the Landsculptor*, respectively. The author or MGIA can provide electronic copies of these two articles upon request. 📄

For more information, please feel free to email David Roberts at robertsd@msu.edu or contact a professional plant health care provider. The author, MSU and MGIA do not endorse any particular products. If using pesticides, be sure to read and follow label directions.



Photo 4: Initially, I diagnosed the death/decline of this red oak near Glen Arbor, Michigan, as caused by the

OW fungus. Closer examination revealed D-shaped emergence holes (Insert), and wilted branches (on right, mid-way up the tree) typical of TLCB. Another clue is that some of the upper branches were bare of bark; OW-killed red oak trees do not lose their bark immediately.



Photo 5: When “windows” were created on the trunk by bark removal from the tree in Photo 4, larvae and tunneling were disclosed, typical of TLCB. In declining trees other borers and fungi will undoubtedly be found as well.

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