



The Plant Doctor's LANDSCAPE TIPS

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OAK DECLINE IN MICHIGAN

INTRODUCTION

Oak trees (*Quercus sp.*) may contract a variety of problems. Some are lethal (i.e. Oak Wilt), while others (i.e. anthracnose) are less serious from a tree health standpoint. "Oak Decline" is a rather nebulous phrase assigned to oak maladies that are not readily diagnosed or understood. It may be described as a catch-all phrase for many species of tree problems. When we have trouble finding a causal factor for an oak problem, we might suggest that the malady is "Oak Decline". "Decline" is a rather confusing term in Plant Pathology that implies stress, dieback, and, perhaps, ultimately death (Photo 1). Decline is generally not attributable to one incitant but a multitude of factors working together.

When reviewing the literature on "Oak Decline", we often find the following criteria as factors contributing to decline: poor soil conditions, environmental stressors (drought, heat, cold, flooding, etc.), soil borne diseases and root rot (*Armillaria*, *Phytophthora*, *Innotus*, *Xylaria*, *Ganoderma*, etc.), various insect pests (Spongy Moth, Fall webworm, tent caterpillar, numerous borers, etc.), various foliar diseases and branch cankers (anthracnose, *Tubakia*



Photo 1

Bur Oak Blight, *Hypoxylon*, *Botryosphaeria*, etc.), urban landscape culture (herbicides, fertilizers, irrigation, etc.), among many other exhaustive contributors. In this article, I thought it might be useful to review a few factors contributing to several examples of oak decline and death.

EXAMPLES OF OAK DECLINE:

Example #1, Photos 2A-2C

Photo 2A was not snapped in the winter or dormant period but was taken in early to mid-summer. At a park near Ann Arbor, Michigan, Spongy Moth (formerly known as the Gypsy Moth) had voraciously denuded oak trees by early to mid-summer (Photo 2A). Depending on the time of foliage loss and depending on the incitant of foliage loss (disease or insect or environment), trees may try to re-foliate the same season or postpone re-foliation until the following year. At the time these photos were taken, the defoliating insect had performed a rather thorough number on these oak trees in the park. In fact, the large larval populations of the Spongy Moth had been killed by biological agents such as the *Entomophaga* fungus (Photo 2B); note numerous dead larvae hanging on the trunk bark. The incidence of expected Spongy Moth activity might be partly forecast during a given year by the number of overwintering beige egg masses on oak trees and other species. At an oak woodland on the opposite side of the state (Three Rivers, MI) from Ann Arbor, the initial concern by the property owner was Oak Wilt (Photo 2C). The extremely high population of Spongy Moths at this site (Photo 2c Inset) is enough to give an observer the "heebie jeebies", perhaps also clinically termed "Entomophobia". Several years of defoliation by the Spongy Moth will likely initiate Decline symptoms in oak trees, possibly leading to death of severely stressed trees, which have exhausted their resources as they try to re-leaf year after year.

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Photo 2A



Photo 2B



Photo 2C



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Example #2 (Photos 3A-3C):

Photo 3A shows a lakeside cabin shaded by a large red oak of approximately 3.5-4 feet dbh. Years before this photo was taken, a septic drain field was installed on one side of the tree under its dripline. In subsequent years, the tree developed a noticeable lean; fungal fructifications (reproductive structures=mushrooms) began developing every fall near the root collar region of the tree (Photo 3B). Then, one winter during an ice storm, the tree toppled, barely missing the cabin but striking the deck (Photo 3C). The decline-contributing fungus was *Armillaria*, the cause of root rot, which can be aggressive or less pathogenic depending on the species strain and local conditions.



Photo 3A



Photo 3B



Photo 3C

Example #3 (Photos 4A & 4B):

Photo 4A demonstrates classic "Decline" symptoms, in this example on red oak. An arborist and I were called into this site because the property owner of this 100+ acre woodland, where he had built his home, had assumed that Oak Wilt was the likely factor for tree death. He was very worried. Oak Wilt was detected in another section of this woodland. Oak Wilt is readily distinguished from Oak Decline and its associated contributors. Oak Wilt kills red oaks very quickly, usually within a couple months. Photo 4A shows a tree that had been in decline for several years; note abundant dead branches and reasonably healthy foliage on other branches, indicating a gradual dieback or decline. Two-Lined Chestnut Borer is a contributor to this tree's decline as evidenced by abundant D-shaped exit holes (Photo 4B).



Photo 4A



Photo 4B



Photo 5B



Photo 5C



Photo 5D

Example #4 (Photos 5A-5D):

Candi and Bob live on a farm in the country. They maintain and are proud of many oak trees along their country road; the oak trees represent “the longest continuous line of their size and age”. Photo 5A shows only a small portion of the trees lining the roadway. Bob is standing next to one of the larger oaks in Photo 5B. More than a decade ago, the county road commission had planned to remove all of these trees in the name of “progress”. Luckily for the trees, Candi and Bob were prepared to take matters as far as necessary to preserve these trees, even to litigation if necessary, largely because the trees were valuable to the community and because the road commission’s policy was inconsistent. The road commission agreed to redirect the road slightly to thwart the removal of these grand old oaks. Unfortunately, in 2023, one of the trees declined and died (Photo 5C). Others showed some significant stress including chlorosis (yellowing). Bob and Candi informed me that the trees had suffered catastrophic foliage loss from Spongy Moths in prior years (Photo 5D). Indeed, during my visit in mid-May 2024, early instar larvae were feeding on the emerging foliage, several weeks ahead of schedule, due to the unusually warm winter and spring. An arborist and I are addressing the needs of these magnificent trees to hopefully help Candi and Bob preserve them into the foreseeable future. 🌿



Photo 5A

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