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Construction injures trees

By John Hartman



Figure 1. Mushrooms of the Armillaria fungus, cause of oak root rot, growing at the base of an infected tree.



Figure 2. Hypoxylon canker disease of oak is seen as tan to dark brown patches of fungal stroma on the infected limb.

Why trees decline in the landscape is an inquiry received regularly in the field and the plant disease diagnostic laboratory. Declining trees often are infected by an opportunistic fungal pathogen such as Armillaria (Figure 1) or Camillea a.k.a. Hypoxylon (Figure 2), but these organisms may not have started the decline. Construction activities can often be found as the initial cause of the problem, often many years before symptoms of decline are evident.

Tree owners are often very concerned about the potential loss of their trees for a variety of reasons. Trees add to property values by improving aesthetics. Trees have ecological benefits by reducing carbon dioxide production through lowering fuel consumption for heating and cooling, sequestering carbon dioxide as carbon, and by providing wildlife food and shelter. In some locations, trees have been shown to reduce crime rates. Trees may also have emotional value. I have seen tree owners place signs along the street indicating their concern over loss of trees due to utility construction, for example. So how can construction activity affect tree health?

Construction harms existing trees by cutting roots. Whether it is a building foundation, utility trench, or curb installation, nearby construction severs tree roots. Cutting most of the roots on

one side of the tree removes needed anchorage and could cause the tree to topple in a storm. Even construction so minor as sidewalk repair can cause major problems for the tree. Backhoes, often used to excavate utility trenches, rip interfering tree roots apart leaving exposed, wounded roots (Figure 3). In some cases, while being mindful of the trees, utility trenches are run down the middle of the street, but the property owner chooses to locate lateral lines to the home too close to the roots of the street-side tree.

Construction harms existing trees by compacting soils. Good soil should contain 50% pore space for aeration and moisture retention. Tree roots need oxygen to function. Heavy equipment compacts soil, reducing oxygen and inhibiting root penetration (Figure 4). Even piling soil and construction debris or parking workers' vehicles over the root zone squeezes air out of pore spaces. The effect is worsened if the soil is wet.

Construction harms existing trees by burying roots and trunk. Roots normally grow in the top foot of soil. Piling soil or increasing the grade smothers the roots (Figure 5). It takes only a few inches of added soil to kill a sensitive tree.

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injuries may close easily; larger wounds may lead to internal decay. Split and broken branches resulting from heavy equipment operation will cause decay and hazard problems later.

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Construction harms existing trees by exposing trees to the elements. Trees formerly growing in woods and protecting each other from wind and sun are exposed after construction. Thinning out

groups of trees to showcase individual trees on a wooded lot can lead to tree decline.

In most cases, homeowners, builders, and developers are wary of causing too much injury to exposed parts of trees such as the trunk, limbs, and branches. However, tree roots seem to be the most vulnerable to construction activity because their location is poorly understood and they are out of sight. Most tree roots grow in the upper 6 – 12 inches of soil, so even a shallow trench will cause great harm. In addition, if unobstructed, tree roots extend out in all directions the height of the tree or more. This becomes a large area to protect from cutting, compaction, and grade changes. Where construction is being considered on wooded lots or near any existing trees, builders and homeowners are urged to consult with a certified arborist during the design of the building before any construction is begun.



Figure 3. Backhoes digging utility trenches rip tree roots apart, exposing injured roots to infection by decay fungi.



Figure 4. Heavy construction equipment compacts soil in the tree root zone.



5. Soil and debris piled on the construction site can smother roots.



Figure 6. Basal injury to tree following construction activity.

Figure 7. (right) The fungus Ganoderma, cause of root and butt rot, entered the tree through injured roots of trunk following construction and is fruiting at the base of the tree.

