

FOREST HEALTH ALERT

From the Missouri Department of Conservation

Armillaria Root Rot



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Sara Lalk, Missouri Dept. of Conservation

Trees suffering from Armillaria root rot often have thin canopies and branch dieback. Armillaria mushrooms were later found at the base of this tree.

Tree species affected: Over 200 species of hardwoods and conifers. Oaks, elms, and maples are highly susceptible.

Concerns: Stunted leaves, wilted foliage, reduced growth, branch dieback, and ultimately tree death. Infected trees experience structural wood decay, root rot, and butt rot, resulting in significant windthrown hazards.

Description: Armillaria root rot is a common root disease of trees and other woody plants, caused by several closely-related *Armillaria* species. These fungi can be parasitic on living trees or simply live on dead and decaying woody material. In Missouri, Armillaria root rot typically infects trees that are weakened or stressed by drought, root damage, defoliation, or other causes. Armillaria root rot is often referred to as a “disease of the site”, because once established the fungi can live for years on the roots and stump of a tree that has been killed, eventually spreading to the roots of nearby living trees. In urban or yard settings, Armillaria root rot can result in hazardous trees and difficulty establishing new trees.

Symptoms and Signs: Initial symptoms of Armillaria root rot often includes stunted leaves, reduced tree vigor, and canopy thinning (Figure 1). As the disease progresses, significant branch dieback becomes noticeable and root and heart rot weakens the structural integrity of trees. In late summer and fall, clusters of honey-colored Armillaria mushrooms may grow at the base of infected trees (Figure 2). As the fungi absorb nutrients from the heartwood of trees a white rot results, characterized by soft, stringy wood. When Armillaria infection is suspected, removing the bark from the lower trunk and roots may reveal white, fan-like mats of fungal tissue (Figure 3). **Continued →**

2



D. Powell, USDA Forest Service, Bugwood.org

Honey-colored Armillaria mushrooms grow in clusters from the roots of an infected tree.

3



S. Katovich, USDA Forest Service, Bugwood.org

Armillaria mycelial fans growing under the bark of a dead American elm.

Symptoms and Signs (continued): During the later stages of infection or after trees have died, dark brown, string-like structures called rhizomorphs may also be found beneath the bark on the lower trunk and roots (Figure 4). In forested settings, pockets of dead and dying trees can occur as Armillaria spreads from infection centers to neighboring trees.

Recommendations: There are few effective treatments for Armillaria outside of prevention-based measures. Trees with extensive Armillaria colonization can be structurally unsound (Figure 5) and should be assessed by a certified arborist for hazard status. Find ISA certified arborists in your area by visiting www.treesaregood.org.

Prevention: Maintaining tree vigor and reducing stress is important for reducing susceptibility to infection. In urban settings, water trees during dry periods, use mulch, and avoid wounding. In forest settings, practice good forest management and avoid damaging standing trees during construction and logging activities. If trees with Armillaria have been removed from a site, eliminating root and stump material can reduce the amount of Armillaria present to cause new infections. It may be difficult to establish new trees in areas where Armillaria is present. Good tree care and selection of Armillaria-resistant species can improve the chance of success.

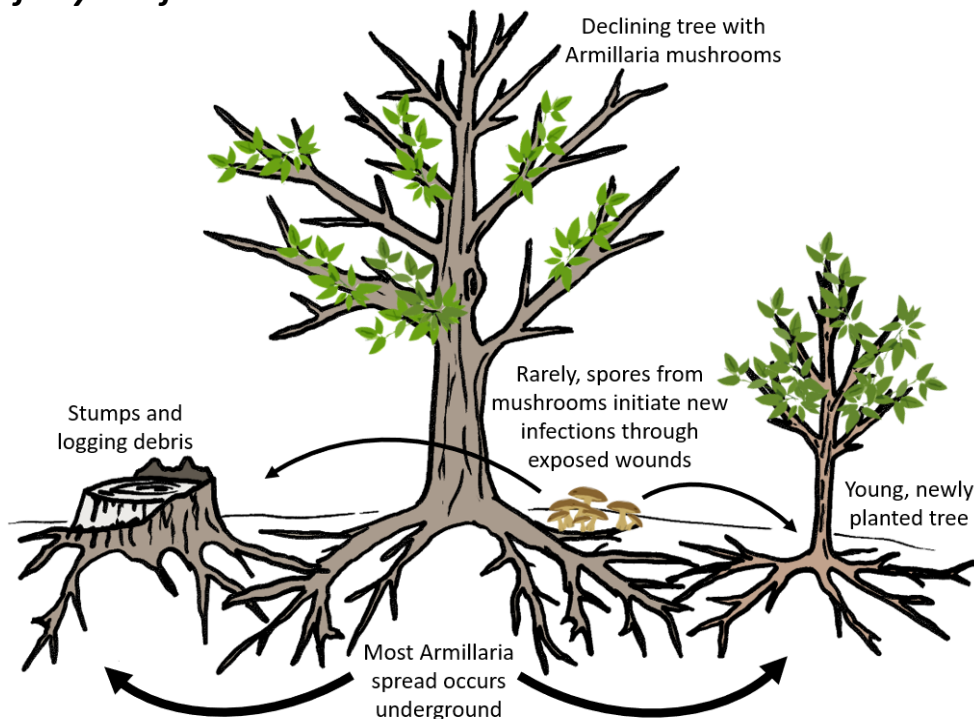


Black, string-like Armillaria rhizomorphs grow under the bark of infected trees.



Armillaria causes root and butt rot, creating hazardous trees that are easily windthrown.

Life Cycle of Armillaria Root Rot



Native tree species resistant to Armillaria root rot:

- American sweet gum
- Bald cypress
- Black cherry
- Cucumber magnolia
- Hackberry
- Kentucky coffee tree
- Pawpaw
- Pecan
- Sycamore
- Thornless honeylocust
- Tulip tree (yellow poplar)

