



The Plant Doctor's LANDSCAPE TIPS

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Photo 1. A typical scene of an Armillaria problem. The fungus used the stump on the left to gain sustenance, killing the small adjacent tree and has now advanced to the spruce tree on the right where its honey mushrooms have developed.



Photo 2. Diagnosis of Armillaria is aided by finding white mycelia (fungus body) fans beneath the bark of roots or lower trunk areas.



Photo 3. Armillaria produce rhizomorphs, which are specialized fungal structures that resemble roots. These rhizomorphs help the fungus to gather moisture and nutrients, as well as aid its advancement to other plants.



Photo 4. Under certain conditions, Armillaria may produce its "honey mushroom." In such cases, declining trees may eventually topple from butt rots and other auxiliary issues.

ARMILLARIA SHOESTRING ROOT ROT

INTRODUCTION:

Landscape plants may encounter a variety of problems relating to root issues, which may ultimately lead to plant decline and death. Many root issues may be site problems, such as a poor quality soils or poor drainage. Other root problems may be directly associated with various fungi that cause root rots. Armillaria is a genus of fungus commonly found in landscapes and natural forests; some Armillaria are aggressive pathogens while others are natural wood-rotting saprophytes. Two of the more common Armillaria species that attack landscape plants are *A. mellea* and *A. ostoyae*. Many hardwoods and softwoods, including conifers and deciduous trees and shrubs, and even some herbaceous plants, are susceptible to Armillaria species.

Armillaria has a few popular if unique connotations. First, scientists discovered that the fungus can grow in a clone (one body) for many, many years, leading to an ever-expanding mold beneath the soil. Over thousands of years, some of these clones have colonized many hectares of land, becoming the "humongous fungus," and also earning it the title of the world's largest living organism from some sources. Also, the fungus may glow in the dark if observed at the correct stage; advanced stages of decay in wood show the luminescence best.

DIAGNOSIS AND SYMPTOMS:

Plants affected by Armillaria root rot typically exhibit decline symptoms in the above-ground portions of the plant. Leaves may become stunted and off color (light green to yellow) or may exhibit an early fall color as a compromised root system gradually interferes with nutrient and moisture uptake. Along with the foliage, branches usually exhibit dieback or a gradual slowing of growth. Plants are often killed from attack by Armillaria (Photo 1). Plant death may be sudden or gradual, depending on the age of the plant, the aggressiveness of the particular strain of Armillaria and the stresses the plant is experiencing. Older trees may survive longer with the fungus, but may also contract a butt rot, sometimes leading to structural failure. Plant stress is known to be an important factor in Armillaria root rot disease.

There are three potentially distinguishing characteristics that may differentiate Armillaria from other root rotting disease or other root related problems. Usually, Armillaria produces white mycelia (fungus body) fans beneath the bark on roots or near the base of the stem/trunk of the plant (Photo 2). The fungus also produces specialized structures called rhizomorphs, similar in appearance to roots (Photo 3). These rhizomorphs help the fungus to extend itself and gather nutrients as it grows through the soil or along plant roots. The name "shoestring root rot" is derived from the appearance of these rhizomorphs. Third, the fungus may produce mushrooms (Photo 4). Typically produced in the fall, these mushrooms are a reason why the fungus is also known as the honey mushroom fungus.

MANAGEMENT:

Understanding the Armillaria fungus can help us manage its association with plants and subsequent disease development. First, Armillaria requires food to reproduce, to promote itself and to survive. Typical sustenance sources include stumps, decaying wood, and roots. Hence, where Armillaria was known to be a problem, remove stumps and as many roots as practical because replants may be killed by Armillaria fungus left behind. Or the fungus may grow along decaying roots to nearby healthy plants. Because Armillaria tends to attack stressed plants, avoid stress or injury to plants where practical. Stresses include soil disturbances around trees, changes in grade and terrain, excess/deficiency in moisture, excess/deficiency in plant nutrients, defoliating insects, improper planting techniques, soil compaction, etc. Vigorous plants better resist the fungus. Some plants are more resistant to the Armillaria fungus than others; consider recommendations on web sources and elsewhere for current information. ■

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