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INTRODUCTION ~ Armillaria root rot is a common disease of many trees in Florida. Although it is better known as a forest disease, it can also be found in urban landscape trees. It is often a secondary disease that takes hold after a tree is stressed or begins to decline. It is common to see trees in groups with this disease because it spreads by rhizomorphs, which are shoestring-like fungal growths that can spread underground from tree to tree, as well as through wind-borne spores and direct root-to-root contact.



Figure 1. Armillaria mushrooms near the base of the trunk. Photo credit: Orli Zimmerman.

HOSTS ~ Armillaria root rot affects a wide host range. Two of note in South Florida are the many ficus and oak species we commonly use in the landscape.

SYMPTOMS / IDENTIFICATION ~ Armillaria might not be particularly noticeable until the disease has significantly progressed. A general decline, wilting, or dieback may be the noticed first. This can be confused with or compounded by a number of other disorders. The disease is better identified by the presence of the shoestring-like rhizomorphs and tan or honey-colored mushrooms near the base of the tree. The rhizomorphs look like black shoestrings, and may even be confused with the root

system of the tree. Armillaria rhizomorphs are vegetative parts of the fungus; their function is to transport nutrients and increase the fungus' size. The rhizomorphs are easily confused with ficus trees' many aerial roots. Armillaria mushrooms may only persist for a few days. White mycelium may also be present under the bark; mycelia are another vegetative portion of the fungus. Their purpose is to absorb nutrients and decompose dead vegetative matter.

LIFE CYCLE of the DISEASE ~ In an urban landscape, Armillaria root rot is often a secondary condition that affects a stressed tree. Drought, disease, pest infestation, cold injury, over-pruning, and improper fertilization are some of the stresses that may initially affect trees. Armillaria can be spread by airborne spores that come from mushrooms at the base of the trunk, or by the rhizomorphs. Spores may enter a tree's canopy through open wounds and rhizomorphs affect the tree by contact with its roots. Spores may persist in dead tissues for well over ten years, should any part of an infected tree remain in the landscape.

LANDSCAPE MANAGEMENT ~ As with many landscape disorders, the most appropriate management technique is the avoidance of infection. Maintain healthy trees by ensuring that proper pruning, fertilization, irrigation, and pest management techniques are used. Commit to planting a more diverse landscape; diverse landscapes tend to better withstand pests, diseases, and even severe weather events.

Trees in the landscape affected by Armillaria should be removed in order to reduce the continued spread of this disease. There are no fungicidal cures for Armillaria, however there is some evidence the fungicidal treatments may reduce the level of infection. Fungicidal soil treatments can be used at planting to reduce the likelihood of infection in newly planting trees. As always, disinfect pruning tools between plants to reduce the possibility of transmitting diseases.



Figure 2. Short-lived Armillaria mushrooms near the base of the trunk. Photo credit: Orli Zimmerman.

References and Further Reading

Cox, K.D., Scherm, H., Beckman, T.G. *Armillaria root and crown rot*. Available at:

<http://www.ent.uga.edu/peach/peachhbk/fungal/armillariacr.pdf>

Florida forest diseases: *Armillaria Root Rot*. Available at: <http://www.sfrc.ufl.edu/4h/armillaria.html>

Williams, R.E, Shaw, C.G III, Wargo, P.M, & Sites, W.H. *Armillaria Root Disease*. Available at:

<http://na.fs.fed.us/spfo/pubs/fids/armillaria/armillaria.htm>.

Remember, the label is the law; be sure to use products only in a manner consistent with the manufacturer directions on the labels. Please use pesticides safely.

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