

VIS-Indicators of Structural Root Decay and Root Problems in Trees

Introduction-Indicators of Root Decay

Indicators of decay in structural roots are very important because roots are much less accessible. Root excavations may be needed to expose roots for decay testing in important situations. Whole tree failures from root decay can be catastrophic, so careful evaluation is critical.

Positive indicators of decay in roots

Positive indicators mean that some degree of structural root decay is present. The amount of decay may need to be verified with testing.



Conks or mushrooms on roots, or in soil and attached to roots.

A limited number of decay fungi fruit directly from roots. Conks or mushrooms attached to woody roots are a positive indicator of decay. Most of the root decay fungi fruit on the butt or on buttress roots. Note many fungi fruit under and near trees and many of these are beneficial (mycorrhizal) or saprophytes decaying on organic matter.



Conks on butt or buttress roots

Almost all the fungi that fruit on buttress roots or the butts (lower 3 feet) of trees also cause decay structural roots. Conks on the butt of a tree indicate structural root decay is present.



Basal Decay

This is a visual symptom of decay that is often observed on trees in urban areas that have been damaged by maintenance equipment or other wounding. The decay at the soil line indicates some degree of butt rot and structural root decay.

Potential indicators suggest that root decay might be present. The indicators presented in this first section are mostly a result of butt rot. Butt rot fungi usually also decay structural roots, therefore trees with these symptoms should also be evaluated for root rot. Some indicators are not specific to root disease and may be due to soil compaction, construction, soil drainage or other soil related problems.



Butt Flattening

This symptom develops on trees with root and butt rot. The butt of the tree flattens and suggests decay may be present.

Bottlebutt

This is a symptom of butt rot and structural root rot in trees. The outline of the base of the stem is “coke” bottle or elephant hoof print shaped.

Rhizomorphs (arrow)

Rhizomorphs are vegetative growth structures of the fungus *Armillaria* spp. Their presence is not proof that roots or butts of a tree are infected or decayed.



Previous Root/Butt Failures

Root disease fungi, especially *Armillaria* sp., often affect groups of trees particularly in forest situations.

Chlorosis/Poor Vigor

Chlorosis and poor vigor that is not soil nutrient related can be an indicator of root decay.

Branch Dieback/Decline

Branch dieback and decline are often symptoms of root or site related problems.



Grade Changes or Fill

Fill around trees cause bark death, soil girdling and eventually leads to decay and /or basal or root failures

Evidence of Root Cutting

Cutting of structural roots can directly cause tree failure or lead to root decay.

Evidence of Construction

Construction damage can lead to root death from soil compaction or grade changes.