UT Extension
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Bacterial Wetwood Disease of Trees

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Wetwood is a water-soaked condition of wood in the trunk and branches of trees. This condition has been attributed to bacterial infection in the inner sapwood and outer heartwood area of the tree. Infection is normally associated with wounding or environmental stress on the tree. The bacteria, *Enterobactor cloacae*, has been implicated as the cause of wetwood in elm, but numerous other bacteria have been associated with this condition in other trees such as cottonwood, willow, ash, maple, birch, hickory, beech, oak, sycamore, cherry and yellow-poplar. Bacteria alter wood cell walls, causing moisture content of the wood to increase. Infected wood may also have a high (basic) pH and a high concentration of microelements.

The most common evidence of wetwood is bleeding or "fluxing" of sap from the trunk or larger limbs of a tree. Often this fluxing is associated with a wound, but has also been observed where no obvious wound existed. Bacteria associated with wetwood are common in soil and water

Stain associated with bacterial wetwood disease on the trunk of pin oak.

Closeup of damage to bole (pruning scar) where flux of sap is exuding. Notice the bird peck hole where birds are either hunting for insects attracted by the flow of sap or actually feeding on the sap.

and probably enter trees through root wounds. The flux of sap may be the result of insects boring, animal rubbing or mechanical injuries to the tree, such as frost cracks or pruning. During extended drought periods, the condition has been noticed at the base of larger, older trees, especially oaks.

Bacterial fermentation of the sap during warm weather produces gases (often methane), causing pressure in the affected wood. The pressure forces the sap out of the tree by the path of least resistance. This is why the fluxing is usually found near wounds and openings in the bark. The exuding sap will run down the side of the tree, soaking a large area of bark. Once exposed to the air, the sap will become contaminated with other bacteria, yeasts and fungi, resulting in a foul-smelling, slimy, foamy substance. Fluxing of the sap is sometimes referred to as slime flux. The flux associated with wetwood should not be confused with the normal bleeding that may occur after pruning.

If slime flux runs down the tree for extended periods, it may cause the bark to decay and eventually may damage the cambium. The cambium is the regenerative layer of tissue between the bark and the wood that is responsible for the tree's diameter growth. The cambium produces new wood and bark each year and is directly related to tree vigor.

Fluxing of sap may also cause toxicity in the sap that is carried to the branches, thus resulting in wilting and defoliation of the leaves. Plants adjacent to the tree trunk may also be killed or damaged by toxic sap exuded from wetwood wounds. Wetwood alone rarely causes tree death, but may lead to secondary pathogens that combine for continued tree decline and eventual death.

Wood-infesting and other insects are attracted to the flux exudates. These insects may lay eggs and reproduce in the fluxing material. Wood-infesting insects are likely to invade the tree after being attracted to the slimy exudate.

There is no control for wetwood disease. Preventing damage and stress to tree roots and stem is probably the best way to avoid a wetwood problem. Drought conditions tend to increase wetwood problems, so it is important that the tree receives adequate water during the growing season.

Treatments for trees already infected with wetwood are generally only cosmetic and of no remedial value. Trees affected with wetwood will compartmentalize around the wetwood-affected area, and limit its spread to other parts of the tree. This is nature's way of protecting trees from infections.

A previously recommended practice of installing drain tubes in the wetwood-affected area to relieve sap pressure and remove lateral liquids has been challenged by researchers in recent years. Research has found that the benefits of tube installation are offset by the injury the installation causes. In fact, the spread of the infection to other tree parts may be increased by using drain tubes. Also, the removal of the internal liquids can create conditions favorable for invasion by wood-decay fungi.

For these same reasons, research has shown it is better not to scrape the wound and clean out the infected wetwood areas. Wetwood will cause only a small amount of injury for most healthy trees if they are allowed to compartmentalize the diseased area. It is far better for the tree to have a small section infected by wetwood than to be invaded by wood-decay fungi that could cause far more damage and structurally weaken the tree.

Use preventative measures to avoid wetwood disease. Follow good pruning techniques that result in minimum injury to the tree. Prune only as required for shaping the tree and removing the dead wood. Never cut behind the bark ridge when pruning a branch; i.e., do not make flush cuts. Protect trees, especially the roots, during construction projects. Fertilize and water as needed to avoid nutritional or moisture stress. Trees usually do not require watering unless prolonged drought occurs. Trees growing in lawns do not need additional fertilizer if the lawn grass is fertilized.

For trees with wetwood disease, wash the slime flux from the surface and apply insecticidal spray to protect the tree from insect infestations. Loose, dead bark or limbs should be removed. Cutting or scraping the fluxing area is not recommended. Increased applications of nitrogen fertilizer have increased the growth rate and recovery of some wetwood-affected trees.

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