Common Pests of Oaks in Virginia

Common Pests and Diseases of Oak Trees

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The oak resource in Virginia is a great natural treasure in our forests. Oaks are valued for their beauty, the food and habitat they provide wildlife, and the quality and strength of their wood products. Because of the importance of oaks to Virginia's ecosystems and economy, there are often questions about their health. This publication provides information about common pests and diseases that affect oak trees in Virginia.

Insects

Defoliators

Many defoliating insects feed on oak foliage. Different species feed at different times of the year, which may determine the severity of damage. Early season defoliators feed in spring around the time of bud break. In Virginia, common early season defoliators of oaks include fall cankerworm, a native species; and spongy moth, an introduced species from Europe. These caterpillars cause long-term damage after multiple consecutive years of defoliation since trees deplete stored carbohydrate reserves to produce a new flush of leaves after each defoliation. In contrast, late season defoliators feed at the end of summer right before trees normally drop their leaves. Feeding by late season defoliators can be unsightly but generally causes little long-term damage because the trees do not expend the energy to put out a new flush of leaves. Common caterpillars found on oaks in late summer are the variable oakleaf caterpillar and orange-striped oakworm.

Ambrosia Beetles

These small beetles are attracted to stressed, weak, or dying trees. They do not feed on the woody material of hosts, but rather on fungi that they carry with them and introduce to the trees they infest. Signs of ambrosia beetles include sawdust at the base of trees and "toothpicks" – tubes of frass and sawdust that are pushed out of the tree as a beetle bores in. It is important to note that there are many different species of ambrosia beetles but they generally act in the same manner. Most often, no control is warranted since the tree is usually in a state of decline already.

Poto credit: Albert (Bud) Mayfield, USDA Forest Service, Bugwood.org

Scales

Many species of scales feed on oaks, though most are aesthetic pests. These insects are stationary as adults; they settle on their host and feed on plant sap with specialized mouthparts. Scales are all relatively small, though their appearance varies by species. If scale attack is heavy, systemic insecticide application can be helpful for control. Horticultural oils and insecticidal soaps can be effective when timed correctly to control the mobile immature life stage. Often, natural enemies keep scale populations below damaging levels.

Poto credit: James Solomon, USDA Forest Service, Bugwood.org

Two-lined Chestnut Borer

This woodboring beetle attacks trees that have already been weakened by other stress factors. Oaks infested with the two-lined chestnut borer typically have wilted foliage, branch dieback, and crown decline. Beetle larvae bore into the bark and feed on plant tissue in the inner bark. Maintaining healthy trees is the best way to prevent attack from these beetles. Natural enemies also exist to help regulate borer populations.

Photo credit: Robert A. Haack, USDA Forest Service, Bugwood.org

Photo credit: Steven Katovich, Bugwood.org

Galls

Galls on oak leaves and twigs are often caused by small wasps or midges. These tiny insects live within plant tissue and trigger localized swelling of the host plant. Galls can be found on leaves, twigs, and branches, and they vary in size and appearance. Insects grow within galls and obtain nutrients from the tree. In most cases, galls do not cause significant damage to trees, so control is usually not warranted.

Photo credit: Steven Katovich, Bugwood.org

Red Oak Borer

This wood boring insect attacks species of red oaks (northern red, scarlet, and black). Larvae bore into bark and spend their first year in the phloem tissue and the second year within the xylem. Signs of red oak borers include frass and sawdust, wet discolored spots on bark, and exit holes. Damage to trees is minimal, but significant damage may cause a decrease in lumber grade. Typically, no control is necessary as natural enemies regulate populations.

Photo credit: : Gerald J. Lenhard, Louisiana State University, Bugwood.org

Diseases

Bacterial Leaf Scorch

This systemic disease is caused by bacteria that invade the xylem of hardwood trees including the following species of oak: live, pin, scarlet, southern red, northern red, black, water, and willow. Xylem feeding insects, primarily leafhoppers and spittlebugs, can spread the disease when they feed on trees. Bacterial leaf scorch is chronic and causes mortality in oak trees. Leaf discoloration is the most noticeable symptom, starting from the outer edge moving inwards. There is usually a yellow "halo" between the brown, dead tissue and the healthy, green tissue. Premature leaf drop leads to reduced leaf area and branch dieback. There is no cure for this disease, but antibiotic treatments may prolong the life of an infected tree. Sanitation is also important as the bacteria can spread to other trees from pruning equipment that has not been properly cleaned.

Anthracnose

This is a group of fungal diseases that affect a variety of hardwood species including oak. Black spots develop on infected leaves in late fall and early spring, and spores are released, which can turn into secondary infections throughout the growing season. Anthracnose fungi flourish in wet weather. The most noticeable symptoms are irregular patches of brown, dead tissue and premature leaf drop. Rake and remove fallen leaves to prevent the fungus from spreading. When infections are severe, fungicides can be applied.

Photo credit: Joseph O'Brien, USDA Forest Service, Bugwood.org

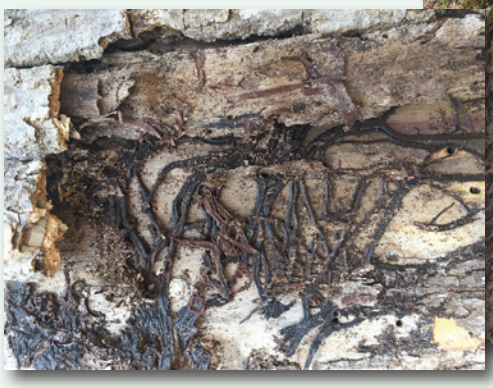
Phytophthora Root Rot

This condition is the general name for root diseases caused by species of water molds in the genus *Phytophthora*. It primarily impacts fine roots that absorb nutrients from the soil. Infected roots are soft, flaky, and discolored. Infection occurs during warm, wet weather. Phytophthora proliferates in saturated soils and can remain viable in the soil for many years. To prevent this root disease, avoid planting in areas where there is poor soil drainage, and remove and destroy impacted plants.

Photo credit: William M. Brown Jr., Bugwood.org

Armillaria Root Rot

Armillaria is an opportunistic pathogen that attacks trees that are already in a state of decline; it is a common contributing factor of oak decline. Trees that are infected with this root rot show signs of stress, such as crown dieback. Tan/orange "honey" mushrooms often grow on or around the base of impacted trees in late summer through October. Peeling back the bark around the lower stem and roots may reveal white spongy sheets of mycelia. Additionally, stringy, black rhizomorphs can also be found under bark. Maintaining healthy trees and minimizing tree injury is the best way to safeguard against Armillaria root rot.



Oak Leaf Blister

This condition is caused by a fungal pathogen causing circular, bulging areas that are scattered on the upper surface of leaves. All species of oak are susceptible to this condition, especially during cool, wet springs. Damage is most often purely aesthetic, but severe outbreaks cause trees to shed leaves prematurely. Long-term damage is minimal unless trees prematurely drop foliage for multiple, consecutive years. Management is typically not warranted for oak leaf blister, but fungicides are available when the condition is severe.

Photo credit: Larry Osborne, Bugwood.org

Tubakia Leaf Spot

This foliar disease occurs late season (July and August) and is common on all species of oak trees. Symptoms initially include small, brown/red spots on leaves. Severe infections may cause early leaf drop, but this causes little damage to trees since it occurs late in the season. Tubakia leaf spot is primarily a cosmetic disease, for which no control is recommended. Raking and destroying fallen, symptomatic leaves can prevent the spread of inoculum.

Photo credit: Paul Bachi, University of Kentucky Research and Education Center, Bugwood.org

Bacterial Wetwood

This is a bacterial condition in which water and gas build up within the tree and are eventually released to the surface. Sap flows out and eventually darkens and ferments, causing a sour smell. Bacteria may colonize the fluid, and the sap ooze is attractive to insects and other secondary fungi. This is typically seen in spring and summer when sap movement is at its highest. No control is available other than to avoid wounding trees and to correctly prune trees so the tree can seal itself properly.

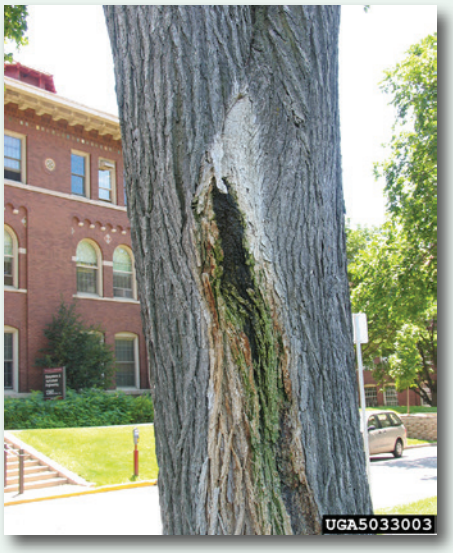


Photo credit: Joseph OBrien, USDA Forest Service, Bugwood.org

Biscogniauxia Canker

Formerly known as hypoxylon canker, this fungus attacks trees that are very stressed and close to death. Large fungal mats beneath the bark are the most noticeable symptom. Fungal mats start out brown/tan and turn gray or black as they age and the tree further declines. Spores are present on trees year-round but symptoms do not develop until the tree is weakened. There is no control for Biscogniauxia canker.

Oak Wilt

This disease is very aggressive and attacks both red and white oaks, but is especially devastating to those in the red oak group. Leaves on infected trees wilt and turn brown as tissue dies. This progression starts at the top of the tree and moves downward. Vascular staining in the outer xylem is noticeable on twigs and trunk, and fungal mats may form beneath the bark of trees. Oak wilt spreads primarily through root grafts and sap feeding beetles. There is no cure for this disease. Oak wilt was first confirmed in 1951 on scattered oak trees in western Virginia, but has not been detected in Virginia since surveys in the 1970s. A test from live tissue sent to a forest pathologist is the only way to officially confirm this disease.

Photo credit: Paul A. Mistretta, USDA Forest Service, Bugwood.org

Sudden Oak Death

This is an introduced pathogen from Europe. It is caused by *Phytophthora ramorum*, which is different from the Phytophthora root rot described above. This pathogen is aggressive and causes mortality within a few months to years. It attacks foliage of mountain laurel, camellia, rhododendron, and viburnum plants, and can then colonize the bark of oak trees. *P. ramorum* causes cankers on the trunk which eventually girdle and kill the tree. To date, sudden oak death has NOT been detected on oak trees in Virginia. It is presently found in oaks in California and Oregon.

Photo credit: Joseph OBrien, USDA Forest Service, Bugwood.org

Decline Complexes

Oak Decline

The decline complex is the gradual decline of a tree due to the interactions of three groups of stress factors: predisposing, inciting, and contributing. Predisposing factors weaken trees over time and are often abiotic or related to site condition, such as poor soil, topography, stocking density, old age, and prolonged drought. Inciting factors are events that rarely kill a tree outright but do cause significant stress. These include attack from defoliating insects or short-term weather events such as frost. Inciting factors lead to reduced vigor and annual growth, and make the tree more susceptible to other pests and pathogens. The final group, contributing factors, are the secondary insects and pathogens that ultimately cause tree mortality. Biscogniauxia canker, armillaria root rot, and two-lined chestnut borer are common contributing factors. They are often blamed for the death of the tree, but contributing factors are simply taking advantage of a very weak tree that is already in an advanced state of decline. Oak decline is not caused by one single causal agent, but is the interaction between all three groups of factors.

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