

PLANT HEALTH CARE REPORT



Northern Red Oak

Northern red oak (*Quercus rubra*) is a moderately fast-growing, large-maturing shade tree that has a pleasing oval form. Leaves are lobed and, during the summer, glossy dark green. Fall color is highly variable, ranging from bright red to yellow-brown.

Northern red oak can be found naturally growing over a wide range of geographic areas from northeastern Canada south to Georgia and as far west as Minnesota and Iowa. It can be planted across the USDA cold hardiness zones 5 to 8. Variability is often found in red oaks; most are propagated by acorns and cross pollination among other red oak group species.

Growth is best in areas of full sun, but moderate shade is tolerated. Northern red oak will grow in most types of acidic soils with a pH range from 4 to 7. Optimum growth is obtained on moist, well-drained, loamy soils. Northern red oak is drought tolerant; after established, irrigation is usually only needed during periods of extreme drought.

One of the most common problems with this species is chlorosis that develops when micronutrient availability for iron and manganese is limited by high soil pH. Deficiencies can result in yellowing or browning between the leaf veins and eventual decline of the tree. This problem may be



Continued on page 2

corrected either by amending the soil or injecting micronutrients into the root flare at the appropriate time.

Oak wilt is the most destructive disease of oaks, especially those in the red oak group. It is caused by the fungus *Bretziella fagacearum*. The fungus is introduced by sap beetles (nitidulids) or through underground root grafts. Mature landscape trees can be protected from oak wilt with preventive injection treatments. It is important to avoid pruning during the time of year when sap beetles are most active.

Other diseases that cause dieback and decline include bacterial leaf scorch, cankers and root rot. Several sucking insects in the leafhopper group transmit the bacterium (*Xylella fastidiosa*), which causes bacterial leaf scorch. Symptoms start as marginal browning of the leaves, sometimes with a yellow halo between the brown and healthy leaf tissue. The scorching symptom progresses in a random pattern in the crown and will eventually result in branch dieback and death of the tree. Numerous canker fungi attack twigs, branches, and the stem of trees that are stressed by the lack of water, root damage, or nutrient deficiency. Root rot and bleeding cankers caused by *Phytophthora* species are difficult to detect in early stages but can lead to tree death during hot, dry periods in the summer. Leaf spot, anthracnose, and leaf blister disease may cause premature defoliation. Successive years of foliar disease can result in chronic damage and decline.

Many insects feed on northern red oak. It is a preferred host for the spongy moth caterpillar (*Lymantria dispar*), which can completely defoliate a tree in a growing season.

Monitoring and Treatment Considerations for Northern Red Oak

Winter to early spring

Apply treatment to suppress foliar disease if needed. Monitor for scale, cankers, spongy moth egg masses, and twig galls; treat as needed. Reduce or remove branches to promote appropriate structure. Remove dead, dying, diseased, and broken branches. Expose and inspect root collar for problems; add mulch as needed. Sample soil for nutrient and pH levels. Fertilize and amend soil according to soil analysis.

*Inject flare roots to treat micronutrient deficiency or adjust soil pH as needed on a 3-year schedule.

Mid-spring

Apply treatment to prevent anthracnose and leaf spot disease if needed. At full leaf expansion, inject flare roots to suppress bacterial leaf scorch if needed. Inject flare roots to protect trees from oak wilt if needed. Apply bark treatment to prevent ambrosia/bark beetles if needed.

Late spring

Apply treatment to prevent anthracnose and leaf spot disease if needed. Monitor for leaf-feeding pests; treat as needed. Apply bark treatment to prevent ambrosia/bark beetles if needed. Take soil and foliar nutrient sample if micronutrient deficiency is suspected.

complete defoliation by this insect can seriously weaken the tree to attack by other pests. Multiple years of defoliation or defoliation of a previously weakened tree may kill it outright. Other caterpillars that are occasional problems include orange-striped oakworm, cankerworms, and oak leaf skeletonizers. Obscure scale (*Melanapsis obscura*) is a small armored scale insect that feeds on twigs and branches. From under its bark-colored cover, it removes sap produced by the leaves. Lecanium scales are a type of soft scale that can quickly reproduce in stressed red oaks. Heavy infestations lead to copious amounts of honeydew and sooty mold as well as a general decline of the tree.

Ambrosia and bark beetles are attracted to stressed trees. These beetles bore into the tree where they lay eggs in the vascular tissue. Maturing beetles girdle the xylem, phloem, cambium, or a combination of these tissues. Many will introduce a fungal symbiont that can cause cankers or wilt disease. Similarly, two-lined chestnut borer (*Agrilus bilineatus*) often bores into the wood killing the cambial tissues making the tree susceptible to decay. Decay organisms that successfully invade oaks can degrade structural fibers in wood increasing the likelihood of failure.

Since northern red oak is typically one of the tallest trees in the landscape and has coarse bark that holds rainwater, it is susceptible to lightning strikes. Depending on the severity of the strike, the tree may die within a few weeks, decline for years as decay moves in, or not be seriously damaged. Lightning damage can be prevented with the installation of a lightning protection system.

Early summer

Monitor for leaf-feeding pests; treat as needed. Adjust soil pH as needed.

Midsummer

Monitor for leaf-feeding insects and obscure scale crawlers; treat as needed. Apply bark treatment to prevent ambrosia/bark beetles if needed. Sample for bacterial leaf scorch, if needed. Monitor irrigation and soil moisture to minimize water stress, especially if bacterial leaf scorch is confirmed.

Fall

If sucking insects were problematic this past growing season, consider treating with an appropriately timed systemic product. *Inject flare roots to treat micronutrient deficiency or adjust soil pH as needed on a 3-year schedule.

*Systemic injections are available to treat iron/manganese deficiency. This treatment can be applied at any time except when the tree is frozen, during drought, or on trees with severe root damage. Fall treatment rates are higher than spring. Treatment should not be repeated more than once every three years.
