COMMON DISEASES

Not all diseases are destructive to trees. Nondestructive diseases are often called nuisance diseases, as they typically only impact the tree aesthetically. Below are some common examples. Please contact The Morton Arboretum's Plant Clinic (mortonarb.org/plantadvice) before considering treatment.

Apple Scab

Apple scab is caused by a fungus in spring as new leaf growth emerges. It can mostly be observed on leaves, blossoms, and fruit. Symptoms look like small velvety brown to olive green spots that enlarge and darken to become somewhat circular. Severely infected leaves and fruit fall prematurely. The fungus overwinters on fallen leaves. It is important to rake up leaves and dispose of them off the property.

Cedar-Apple Rust

Cedar-apple rust is caused by a fungus that needs two hosts: a juniper, such as eastern red-cedar, and, a deciduous host such as crabapple, hawthorn, or quince. On the apple tree, symptoms include leaf spots on the upper and lower side of the leaves and infections on fruits and branches. Symptoms of infection on the junipers are noticeable tan-brown galls that produce bright orange tendrils in the spring. Repeated infestations can destroy the ornamental value of healthy trees.

Sycamore Anthracnose

Anthracnose is caused by several species of fungi whose spores infect newly emerging leaves. The disease can become severe when cool, wet spring weather persists. The trees most likely to be affected are quite common, such as ash, elm, hickory, maple, oak, sycamore, and walnut. Most anthracnose symptoms are seen on the lower two-thirds of the tree's canopy, while the upper third looks unaffected. Sycamore anthracnose, unlike other anthracnose diseases, can also infect twigs and branches and kill buds, resulting in clusters of growth called witch's brooms. In bad years, sycamore anthracnose can cause trees to lose all their leaves by June. The trees grow new leaves in early July, but the production of new leaves can weaken them. Remove diseased leaves as soon as they drop off.

Phomopsis Blight

Phomopsis tip blight is a fungal disease that mostly affects evergreens, including junipers, arborvitae, and some pines. Symptoms are first noticeable in spring when new growth changes from light yellow green to red brown to ash gray as it dies. Small stems are usually girdled by these lesions, causing tip death. The blight is spread by splashing rain, wind, insects, or mechanical means such as pruners that have not been disinfected. Prune out diseased branch tips during dry summer weather and discard.



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NONTHREATENING INSECTS

Some insects will not typically cause trees to die, but tend to greatly affect tree aesthetics. Below are common, nonthreatening insects found in the Chicago region. Before considering treatment, please contact The Morton Arboretum's Plant Clinic (mortonarb.org/ plantadvice) for more information and complete descriptions of these insects.

Scales

There are many species of scale insects that feed on a wide range of host plants. Scale insects generally feed on plant sap and some species produce a sticky substance often called honeydew that drips onto branches and foliage below. Heavy infestations can cause branch dieback. Different scale insects require different treatments.

Japanese Beetles

Common in the Chicago region, Japanese beetles are 1/2 inch long, shiny, and metallic green with coppery-brown wing covers. As grubs, Japanese beetle larvae overwinter in the soil and can damage lawns by feeding on grass roots. Adult beetles emerge from the soil in late June and feed until mid-August on leaves of 300 different plant species. Feeding can skeletonize leaves so only the leaf veins remain. Several years of high beetle populations can drastically reduce the vigor of affected trees and plants.

Caterpillars

Two common pests of deciduous trees are the Eastern tent caterpillar (active in spring) and the fall webworm (active in summer and fall), whose gauzy tents deface trees on roadsides, home landscapes, and orchards. Tent caterpillars feed on leaves of ornamental trees during the day and return to their nests at night. They can defoliate a tree, but the tree may send out new leaves later in the season. Fall webworm stays in the nest all the time. Its damage is mostly a cosmetic problem. The tentlike structures from both caterpillars can be removed by hand.

Gall-forming Insects

Galls are abnormal growths that occur on leaves, twigs, roots, or flowers of many plants. While most galls are caused by irritation and/or stimulation of plant cells due to feeding or egg-laying by insects such as aphids, midges, wasps, or mites, some are the result of infections by bacteria, fungi, or nematodes. Most galls are nonthreatening, causing only unsightly distortion on affected plant tissue, though stem galls can do damage.

Pine Sawflies

There are more than 100 species of sawflies known in the United States. The pine sawfly gets its name from the sawlike apparatus at the tip of the adult's abdomen used for egg laying. Pine sawfly larvae feed in groups on white pine, mugo, and other pines. Due to their vigorous and lengthy feeding periods, large populations of sawflies can cause significant defoliation to host plants. Control requires constant vigilance and immediate action when populations are detected. Remove the larvae by hand or use a forceful spray of water to dislodge them.



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THREATENING INSECTS

Below are the most common destructive insects in the Chicago region. If untreated, they can kill trees, though sometimes the insects are so harmful that treatment is futile. Before considering treatment, please contact The Morton Arboretum's Plant Clinic (mortonarb.org/plantadvice) for more information and complete descriptions of these insects.

Emerald Ash Borer

The emerald ash borer (EAB) is a major invasive species. Adults are metallic emerald green, bullet-shaped beetles that are smaller than a penny. Established across most of the United States, EAB causes significant mortality to native ash trees (*Fraxinus*) during its larval stage. The larvae feed on water-conducting tree tissue just under the bark, creating distinctive serpentine tunnels. As the larvae rapidly multiply, these tunnels girdle a tree in one to three years. Chemical injections can be used to protect trees from EAB larvae if applied before significant damage is done.

Two-Lined Chestnut Borer

Two-lined chestnut borer attacks many types of oaks. Trees that are stressed, injured, or weakened are most susceptible. The adult beetle is slender, greenish-black, and bullet-shaped with two yellow stripes along its back. The larvae feed under the bark and destroy the water-conducting tissues, causing branch dieback and eventually killing the tree. Prevention is the best defense. Healthy trees are less susceptible.

Zimmerman Pine Moth

The Zimmerman pine moth generally attacks Douglas-fir and Scots, Austrian and red pines. The pine moth's larval stage does the most damage. The larvae tunnel under the bark, girdling the trunk or large branches and cutting off the supply of water and nutrients. Masses of sap are apparent on the affected areas of the tree, usually near branch whorls. Adults are nocturnal gray-brown moths and are rarely seen.

Bronze Birch Borer

Similar to emerald ash borer in shape and size, this metallic bronze beetle affects stressed birches of several species. In the larval stage, the borer tunnels beneath the bark, cutting off the supply of water and nutrients. Some birch species are resistant to bronze birch borer.

National Invasive Species of Critical Concern.

Gypsy Moth

Gypsy moth is a major invasive species. Its caterpillars feed on more than 450 kinds of trees but favor oaks. Found throughout northeastern Illinois, the caterpillars hatch in spring from buff-colored egg masses and begin feeding in groups. The adult male moth is brown and the female is white with black markings. To help slow the spread of gypsy moth, check for for egg masses on outdoor surfaces during the winter and remove them.

Asian Longhorned Beetle

One of the most serious invasive pests, the Asian longhorned beetle (ALB) is black with several white spots on its back. It feeds on more than 14 tree species, especially maples. The beetle is most destructive in its larval stage. The larvae tunnel not only in the water- and nutrient-carrying tissues of a tree but also in the inner heartwood, undermining the tree's structure. Although eradicated in the Chicago region, ALB persists in large sections of the eastern United States.















THREATENING DISEASES

Below are the most common destructive tree diseases in the Chicago region. If untreated, they can kill trees, though sometimes the diseases are so harmful that treatment may be futile. Before considering treatment, please contact The Morton Arboretum's Plant Clinic (mortonarb.org/plantadvice) for more information and complete descriptions of these diseases.

Dutch Elm Disease (DED)

Caused by a fungus, this disease can spread readily in elm-rich areas due to the fungus' ability to move not only with the help of elm bark beetles, but also through grafted elm root tissue. The fungus spreads quickly throughout the tree. The most obvious sign is late summer "flagging," when leaves on upper branches curl and turn gray-green, then yellow, then brown. Brown streaks in the wood beneath the bark are further evidence, but only laboratory identification can confirm that the tree has DED.

Oak Wilt

All oaks are susceptible to oak wilt. However, the red oak subgenus is more susceptible than the white oak subgenus. The fungus invades the water-conducting tissues, preventing the normal flow of water. This causes the foliage to wilt and often kills the tree. Oak wilt can spread from infected trees to healthy ones through root grafts or when insects carry spores from one tree to another. The symptoms often start at the top of the tree and gradually spread downward. The leaves on infected branches curl and turn yellow or bronze in color. Red oaks may decline and die within weeks or months, while white oaks may show branch dieback for years before dying. In some cases, white and bur oaks recover after one year of infection.

Cankers

Cankers vary in size and shape. They appear as sunken or discolored lesions on the bark of trunks and branches or as injured areas on smaller twigs. The bark often splits between diseased and healthy tissue. New leaves on affected branches will become smaller, discolored, and curled. Cankers can take months or years to girdle twigs, branches, or trunks.

Thyronectria Canker is most often found on honey-locust trees. Botryosphaeria Canker is found on many trees including crabapple, elm, linden, pine, and sycamore. Cytospora Canker is found on spruce branches.

Thousand Canker Disease

A native fungal disease carried and transferred by a twig beetle, thousand canker disease is spreading across the United States, though it is not currently found in Illinois. Host species include walnut and butternut. Symptoms include flagging or wilting from the top of the tree downward and dead branches. Telltale cankers are present under the bark on infected branches.



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THREATENING DISEASES



Bur Oak Blight

Bur oak blight is a fungal leaf disease that has been found in southern Minnesota, lowa, and northern Illinois. There are two stages of infection: tissue death of the leaf and spore-producing pustules found where the leaf attaches to the twig. Infected leaves generally remain attached to the twigs over the winter and symptoms appear to move up the tree from the lowest branches. Over time, the tree slowly declines.

Fire Blight

Fire blight is a bacterial disease that affects trees and shrubs in the rose family, including apples, crabapples, and hawthorns. In early spring, flowers can be infected with the bacterium, resulting in blossom blight. New leaf growth can suddenly wilt and turn black or brown, giving the appearance of having been scorched by fire. Cankers can occur on twigs, branches, and stems.

Diplodia Tip Blight

Diplodia tip blight is a fungal disease of stressed conifers, especially pines. Austrian pine is the most susceptible host. When the new needles at the branch tips, or candles, are expanding in spring, they become stunted and turn tan or brown. Typically, all needles on the current season's shoot are killed. Symptoms often start in the lower half of the tree and progress upward. As lateral shoots are killed, whole branches may die back to the trunk, disfiguring the tree.

Verticillium Wilt

Verticillium wilt is a serious soil-borne fungal disease that can affect hundreds of plant species. Most afflicted plants are infected through their roots. The fungus spreads into the branches and stems through the tissues that carry water, cutting off the water supply to the leaves and causing them to wilt. Leaves may turn yellow and branches may die back, sometimes in only part of the tree.









PLANTING TREES

Plant a tree the right way so it has the best chance to thrive and will provide greater benefits throughout its life. Follow these tips to give your tree a good start. For more information and help selecting the right kind of tree, see mortonarb.org/plantadvice.

Trees are measured by the caliper inch, meaning the diameter of the trunk in inches.

Arboretun

A wide hole, not too deep

A tree needs a wide, shallow planting hole so it can spread out new roots. Trees that are balled and burlapped lose between 70 and 90 percent of their root mass when they are dug up for transplanting.

Ways to buy trees

Bare root

Trees from nurseries come one of three ways: bare root, balled and burlapped (B&B), or potted (containerized).





Bare root trees have exposed roots without any soil on them. The roots must be kept moist and covered because they can dry out quickly. Bare root trees are usually small—less than 2-inch caliper and should be planted when dormant (late fall or early spring).

Balled and burlapped trees are dug up with some roots in a ball of soil that is then wrapped in burlap. The soil helps keep the roots moist.

Potted trees are becoming widely available. They can become rootbound, so remove the pot and carefully unwrap or even cut back circling roots when planting.



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MULCHING

A layer of mulch over its roots helps any tree grow and thrive. It is especially important for newly planted trees, but mulch is good for established trees, too. For more information, see mortonarb.org/plantadvice.

Mulch helps keep tree roots cool in the summer and holds moisture in the soil. It keeps lawn mowers and string trimmers safely away so they do not damage the tree's bark. Mulch also deters weeds and improves the soil as it breaks down.

Mulch should be made of plant material that will decompose over time.

The best material is chipped or shredded wood, although leaves and grass clippings can be used. Compost also makes a fine mulch. Do not use gravel or stone.

Spread mulch in a wide saucer shape around the tree's trunk.

Mulching imitates the way trees grow in nature. In the wild, the forest floor is covered with a layer of twigs, decomposing leaves, branches, and other dead plant matter.

In urban areas, trees do not have this natural mulch layer and often have to compete with turfgrass for nutrients and water. Replacing grass with mulch protects trees and helps them grow.

Maintaining a mulch layer over a tree's root zone is one of the most important and effective ways to help trees live long, healthy lives.

The right way to mulch

- Spread as wide as possible
- 3 to 4 inches deep
- Saucer shape
- Keep clear of tree's bark



Spread mulch 3 to 4 inches deep in a wide circle around the tree trunk. Ideally, mulch should cover the whole area under the tree's branches. For newly planted trees, make the circle at least 4 to 6 feet across.

Form the mulch into a low saucer shape a little higher at the outer edge. This will contain rainwater so it can soak down to tree roots.

Make sure the mulch does not touch the tree's bark.

If there is a lawn under the tree, spread mulch right on top of it rather than digging out the grass. The grass beneath the mulch will die, which is better for the tree. A young tree that is mulched may grow twice as fast because it is better able to develop roots.

Avoid these mistakes

- Don't mound mulch against trunk
- Don't let mulch touch bark
- Don't use synthetic materials, gravel, or stone



Never pile mulch against the trunk of a tree. It can trap moisture and cause the bark to rot, making the tree vulnerable to disease and insect problems.

Synthetic materials, gravel, and stone are not good insulators and do not break down to improve the soil.

> Most tree roots are just below the soil surface. Typically, 90 percent are no deeper than 18 inches.



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