

Arbor Day 2024 Tree Giveaway

The trees provided for today's giveaway were donated by Cargill through Living Lands & Waters as part of their [MillionTrees](#) initiative. Since 2007, more than 1.4 million trees have been distributed across the Midwest.

Summary of Key Tree Care Practices

- Oaks and pecans are excellent landscape trees in Minnesota but can attain large sizes at maturity.
- Consider the limitations of your landscape before planting.
- After picking up your tree keep the roots moist and avoid extreme temperature swings.
- Plant your tree as soon as you can.
- Dig a planting hole approximately 1-2' wide and only as deep as the root system is tall.
- Place your tree in the planting hole in a vertical position. The upper most roots should be at or slightly above ground level.
- Fill in and around the roots with the soil dug from the hole, gently tamping with your hand to remove air pockets.
- Once filled, confirm your tree is not planted too deep. Uppermost roots should be located at ground level.
- Create a ring of soil around the periphery of the planting hole.
- Water your tree until the entire planting hole is thoroughly saturated.

- Apply a 3-4" layer of mulch around the planting hole, making sure to leave a small gap between the mulch and the trunk of the tree.
- Thoroughly water your tree as needed, especially throughout the first year after planting.
- If animal damage is a concern, consider creating a cylinder of ¼" wire mesh to protect the trunk and branches.
- For details on these practices, see sections 1-3 (below).

Selecting, Siting, and Planting Your Tree:

When considering planting a tree it is important to **1)** recognize the attributes of the species you are interested in, **2)** understand the limitations of the site you wish to plant, and **3)** implement good planting practices.

1) Get to Know Your Tree

Familiarize yourself with the characteristics of the tree(s) you received. Think about how large these trees will become at maturity and envision the tree in your landscape. While pruning is an essential tool to maintaining healthy trees, it is generally not reasonable to assume pruning can be used to keep trees small if they will drastically outgrow the space.

Swamp white oak (*Quercus bicolor*) is a medium to large sized tree at maturity, forming a rounded crown, typically reaching heights of 65' with an equal or greater spread. Bark is flaky when young, maturing to appealing long, flat, longitudinal ridges. The growth rate is medium to fast and fall color is yellow to brown. In the wild, swamp white oak is usually found in low-lying, somewhat swampy areas along banks of streams. A native of Minnesota, this tree [grows throughout](#) the Midwest and Eastern United States. Swamp white oak is hardy throughout [USDA cold hardiness zones 4-8](#). An adaptable ornamental tree. Once established it tolerates periodic flooding and drought and has few serious pest and disease issues. This species prefers acidic soil conditions and should not be sited where soils have a high (> 7.5) pH (see section 2). This species

requires full sun.

Botanical fun fact: Mature swamp white oaks can be differentiated from many other oaks by the long (2-4") stalk-like structure from which acorns are attached. This structure is botanically referred to as a "peduncle."

Bur oak (*Quercus macrocarpa*) is a large tree at maturity, reaching approximate heights of 90' with an equal or greater crown spread. Hardy throughout zones 3-8, this long-lived, adaptable tree offers a stately branch structure and thick, deeply ridged bark that creates a rugged appearance. Fall color is yellow to bronze. A native of Minnesota, bur oaks have an extensive [native range](#) and can be found growing on a variety of sites in the wild ranging from wet bottomlands to dry uplands. While adaptable, bur oaks are slower growing than some other oak species and difficult to transplant in larger sizes. Once established, these trees are resilient and ornamental additions to a large landscape. This species is more tolerant of high pH and clay soils than other oaks. Bur oak is very tolerant of urban conditions. This species requires full sun.

Botanical fun fact: For most bur oaks, the acorn is mostly covered in a fringed cap. This cap differs in appearance between species and is botanically referred to as the "involucre."

Red oak (*Quercus rubra*), sometimes also referred to as the northern red oak, is a fast growing, medium to large sized tree. At maturity, red oaks develop a symmetrical, round-topped form and can reach approximately 70' in height with a similar spread. Red oaks are hardy throughout zones 3-9 and can be [found in the wild](#) from Nova Scotia to Minnesota and as far south as Louisiana. Bark is smooth when young, maturing to flat ridges with deep fissures. Red oaks perform best on well-drained, evenly moist sites, preferably with a sandy-loam soil. This species prefers acidic soils (see section 2). Healthy leaves are a lustrous-green during the growing season, turning a brilliant red in Autumn. When properly sited, red oak is a highly ornamental shade tree. This species requires full sun.

Botanical fun fact: The leaves of red oaks, and other species belonging to the "red oak" group, end in a bristle-tip. Oaks in the "white oak" group lack these bristle-tips and the lobes of their leaves are rounded.

Pecan (*Carya illinoensis*), this species is a large tree at maturity, reaching heights

between 70-130', with a spread between 40-75' in width. Pecan trees prefer full sun, are hardy throughout zones 5-9 and can grow between 2-4' per year. Pecan trees grow in moist woods, particularly along rivers or in bottomland flats and thus require large quantities of water during the growing season. This species prefers well draining, loamy and somewhat sandy soil with higher moisture levels, and can tolerate alkaline to slightly acidic soil levels, with a pH between 6.5 and 7. This species is well known for providing commercial nuts, as well as highly-prized grain for furniture and flooring. After 3-4 years of maturity, the tree will produce nuts, edible for both humans and animals. The fruits grow in clusters, maturing in the fall, accompanying a yellow foliage color. The bark appears gray-brown with platy scales, with green leaflets that grow up to 8" in length.

Botanical fun fact: Once established, the Pecan can live up to an average of 300 years old, with a trunk measuring 3-6' in diameter.

2) Understand the Limitations of the Planting Site

Is your tree capable of surviving and thriving under the conditions of your landscape? The best landscapes host species that are matched to the conditions of the site. Many factors play a role in determining the long-term success of planted trees, but the following should be given special attention:

Hardiness. In Minnesota, hardiness is usually considered in the context of a plant's ability to survive extreme cold winter temperatures. But no matter where within the United States you are thinking of planting, [USDA Cold Hardiness Zones Maps](#) can be used to determine where your tree can grow. Zones are determined using the average annual minimum winter temperatures over a 30-year period. Ensure the known cold hardiness tolerances of your tree are within the bounds of the location you intend to plant.

Light Levels. Be sure to match the light requirements of the tree to what is available in the landscape.

- Full Sun – six or more hours of direct sunlight exposure each day
- Partial Shade – between three to six hours of direct sunlight exposure each day
- Full Shade – less than three hours of direct sunlight exposure each day
- Dappled Shade – light filtering through a canopy above

- Deep Shade – almost no sunlight

Soil Conditions. The attributes of the soil in your landscape play a key role in tree health.

Soils not only provide nutrients and water that support plant growth, but also house microbes that benefit trees, and serve as a medium for tree anchorage. The physical and chemical aspects of soils determine how these factors influence tree health. Among the characteristics of soils to consider, the texture and drainage, fertility, and pH should be given priority.

Texture and Drainage. Texture and drainage are interrelated. Ideal soils consist of 50% solid matter (45-48% mineral particles, 2-5% organic matter), 25% air, and 25% water. The proportion of the mineral components that comprise a soil (sand, silt, and clay) determine a soil's texture, and this in turn affects its physical properties like drainage. Soils with a heavy sand component drain more freely because they have large pore spaces. Sandy soils have a low water-holding capacity and generate more dry conditions. Soils with a heavy clay component drain poorly because they have smaller pore spaces. Clay soils typically generate wet conditions. Drainage can be measured using a percolation test to determine the infiltration rate.

To measure the infiltration rate of a soil, dig a hole 12" wide and 12" deep. Completely fill the hole with water and allow it to completely drain; this establishes a state of saturation. Place a ruler vertically in the hole, then again fill the hole with water. Measure the depth of the water (starting point), then wait 15 minutes. After waiting, measure the depth of the water again and calculate the difference. Multiply this difference by four to determine the rate of infiltration in inches per hour.

- < 4 inches/hour = poor drainage
- 4-8 inches/hour = moderate drainage
- > 8 inches/hour = excessive drainage

Fertility. Evaluation of soil fertility is an important step in site evaluation. This information can determine if any nutrient application needs to take place and/or support a decision on how to amend a soil before planting. Most soils in Minnesota provide adequate nutrient levels to support tree growth and most exceptions relate to soil pH (below). To determine if fertilizers need to be applied during tree establishment, consider [collecting](#) and submitting a

soil sample to the [University of Minnesota Soil Testing Laboratory](#) to receive a professional recommendation.

Soil pH. The pH is a measure of the acidity or alkalinity of a soil. Soil pH is measured on a scale of 1-14, where 7 is neutral, 1-6 is acidic (with 1 being most acidic), and 8-14 is basic (with 14 being most basic). This factor is important for tree health because nutrient availability changes at different points on this scale. Most plants perform well at a pH of 6.5, with some known to be tolerant of more acidic or alkaline conditions. However, for many trees, adverse effects begin once the pH reaches 7.5 or higher. Plants sensitive to high pH may display interveinal chlorosis (yellowing between the veins of the leaf), symptoms associated with a nutrient deficiency (iron, manganese, etc.). Urban soils tend to have a higher pH due to calcium carbonate leaching from concrete.

To determine the pH of your soil, [collect](#) and submit a soil sample to the [University of Minnesota Soil Testing Laboratory](#). Use the results to determine if your site is suited to your tree species of interest.

One way of estimating if the pH of your soil is appropriate is based on the performance of other plants in the landscape that typically suffer when soil pH is too high. River birch and red maples are two common landscape trees that exhibit interveinal chlorosis when soil pH is high. If this is a common occurrence in your landscape, consider planting bur oak. While a soil test is the only way to determine precisely where your planting site falls on the pH scale, if trees close to your planting site have struggled, favor bur oak and avoid planting swamp white oak or red oak.



*Interveinal chlorosis on a red maple (*Acer rubrum*) associated with manganese deficiency. Symptoms are the result of high soil pH that limits availability of manganese in the soil.*

3) Good Planting Practices Make for Healthy Trees

Set your tree up for success. Implementing proper handling and planting practices help your tree to establish and ensures your tree lives a long, healthy life. The tree(s) you received are bare-root, meaning most or all the soil has been removed from the roots. This method makes transporting your tree easier but also leaves the roots vulnerable to drying out. Be sure not to let the roots dry out! Keep the roots moist and protected from the sun and wind. Plan to plant your tree as soon as possible!

Preparing the Planting Site. Once you have identified the proper space in your landscape for your tree, the next step is to start digging the planting hole.

- The hole should be 2-3 times wider than the root system of the tree.
- Do not dig deeper than the length of the root system. The root collar or root flare, where the uppermost surface roots occur on the tree, will be located at ground level or even slightly above. Measure the depth of the root system and match the depth of the planting hole.
 - If the hole was dug too deep, backfill with soil to the appropriate depth, then gently firm the base of the planting hole using your hand. Do not overly compact the base of the planting hole. The goal is to create a firm base without major air pockets to

prevent sinking and shifting of the tree after planting.

- During digging, the back of the shovel can compact the sides of the planting hole. This may be especially true of clayey soils. Compacted sides create a barrier to root growth as your tree establishes. Use a shovel to score or roughen the sides of the planting hole.
- The soil removed from the planting hole will be returned once the tree is placed in a process called backfilling. If the site is known to be compacted or is very clayey, now is the time to amend with organic material to improve the physical properties of the soil.
 - Do not backfill entirely with an organic amendment alone. Instead, thoroughly mix the amendment with the backfill soil.
 - If amending backfill soil, mix in between 25-33 percent organic amendment by volume for moderately compacted sites or up to 50% by volume for highly compacted clay soils.
 - Do not use peat in poorly drained, clay soils. This can draw excessive water into the planting hole.
 - Mature compost is an excellent organic amendment!
- Do not add rocks or other materials to the base of the planting hole for drainage. Note, however, that those digging in soils on urban sites may encounter buried debris. Remove debris safely and within reason.

The Planting Process. After digging the planting hole and amending backfill soil if needed, it is time to plant your tree.

- Inspect the tree for damage or poor root architecture. Prune away any damaged or unhealthy roots and branches. Evaluate the root system and look for roots that seem to be wrapped around the stem. These roots can become “girdling roots” later in the life of your tree and it is best to correct them at the time of planting. Tease these apart if loosely bound or crossed. If any major roots are already tightly wrapped around the tree and appear to be constricting the stem, prune them out.
- Place the tree in the planting hole so that the uppermost roots (root flare) are slightly above ground level (1”). Position the tree as desired and ensure the central branch (central leader) is upright.
- Spread out and straighten the roots away from the trunk so they do not crisscross once

backfill soil is placed.

- Begin backfilling around the base of the roots. Carefully fill around and throughout the root zone to prevent the formation of air pockets.
- Once halfway filled, use the handle of the shovel to gently prod the backfill soil to collapse air pockets and promote settling.
- Ensure the plant is still positioned vertically and that the root flare has not sunk well below ground level. Reposition as needed, gently tamp the soil with your hand.
- Continue this process of filling, tamping, and positioning until the planting hole is filled to ground level. At this time, the root flare should be positioned just at or slightly above ground level.
- Create a slight ridge of soil around the periphery of the planting hole to direct water to the root zone and create a boundary.
- Without washing away the soil, begin gently watering-in the tree. Thoroughly water, ensuring the water is penetrating the entire soil profile of the planting hole. This will require approximately 5-7 gallons of water.

Aftercare. You've planted your tree. Now what? There are some simple aftercare techniques that can help your tree become established and ensure your tree grows for many years to come.

Water. Routinely water your new tree throughout the first year after planting and periodically supplement watering in year two and year three, especially when rainwater is inadequate. Providing supplemental water to your tree as it establishes is key to success in this process!

- The amount of water and frequency of applications will depend on weather and site conditions. Inspect the soil 4-8" deep and determine if it is wet, dry, or somewhere in-between. If the soil feels dry or only slightly damp, it is time to water.
- Water until the soil is thoroughly soaked. One of the best ways to do this is to place a hose at the base of the tree and allow it to slowly trickle into the soil over a period of several hours.
- Well drained soils will likely need to be watered more frequently than those that do not drain as quickly.

Mulch. Adding mulch around the base of the plant is an important step in establishing your tree. A good mulch will help limit weed growth, insulate tree roots, buffer soil

temperatures, aid in water infiltration, and helps maintain soil moisture. In addition, a mulched area around the base of the tree can help discourage damage from yard and lawn equipment like mowers.

- Wood and bark chips are great materials for mulching.
- Spread a layer 3-4" thick under the tree while not directly piling the mulch up against the trunk. Pull mulch away from the tree leaving a couple of inches of space between wood/bark chips and the trunk.
- It is best to have at least the area under the dripline mulched. Periodically expanding the mulched area as the tree grows is advised.
- Too much mulch, more than 4" thick" can have adverse effects on the health of your tree.
- Do not place a weed mat or garden fabric on the ground before mulching.

Pruning and Staking. Pruning of newly planted trees is not advised unless removing damaged or diseased branches. Corrective [pruning](#) following proper techniques should take place once the tree has established. Trees should only be staked if needed. Usually, small, healthy, bare-root plants do not require staking and will anchor themselves as they establish.

- Note for future management of your tree: avoid pruning oaks between spring and fall. [Oak wilt](#), a disease spread by a fungal pathogen, is a major concern in the midwestern United States. Oak wilt is most easily spread by sap beetles, which are attracted to pruning wounds during the growing season. Only prune oaks between November and March when risk of spread is reduced.

Animal Damage. The best way to address damage to trunks and stems from rodents feeding or large animals rubbing is to preventatively create a barrier. A cylinder of ¼" wire mesh anchored at ground level is advised, especially when trees are young. The mesh cylinder should be at least 1-2' taller than the potential snow level in the winter to prevent rabbits from reaching low-lying branches.

Questions or comments?

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