

Planting a Tree for Prolonged Life

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It takes only a little more time and effort to plant a tree properly than it does to merely dig the proper size hole, plop in the tree and backfill. The few extra minutes it takes to properly select, locate and plant a tree will make a big difference in its ability to thrive and live to its optimum age. Proper selection, location, and planting reduce the likelihood that the tree will be affected by disease, extremes of moisture, inappropriate exposure to sunlight and physical damage. It means that the tree will most likely provide beauty, require less maintenance, add to your enjoyment, the value of your property, and save you money in the long run. Here are a few things to keep in mind when you think about planting a tree.



The Lifespan Trees

In ideal conditions, a tree that is naturally regenerated and that grows undisturbed in its native habitat receiving all the benefits of optimum light, water, and nutrients can have a lifespan of 50 to more than five thousand years depending on the species. In comparison, you can expect trees that are properly planted and cared for in your yard or in the terrace along your street to live between 20 and perhaps 300 years. Unfortunately, the actual lifespan of a tree planted in a residential urban setting is only 32 - 37 years and, it is less than 10 years for trees planted on downtown street. Urban park trees do slightly better at approximately 50 years. Even though the lifespan is longer for trees planted in an urban or suburban residential yard than on the downtown street terrace, many die well before their time.

Why the Difference in Lifespan?

Trees grown from seed or root shoots in their native habitat do well because they have adapted over long periods to their environment. Some of the environmental variables to which trees have adapted are soil conditions, the amounts and frequencies of moisture and nutrients available, the latitude and elevation, which affects the amount and intensity of sunlight through the seasons, and the interaction with wildlife, and insect and disease pests or allies. Over time, genetic changes allow trees to adapt making them robust and enabling them to be more competitive within an environment in which they can survive and thrive.

What Happens to Urban Trees?

Trees in urban settings are exposed to many kinds of environmental and mechanical hazards that are not present in most forests: road salt, mower or string trimmer damage to name a few. In addition, many tree species or varieties planted in the cities are not native to the site and therefore, may have difficulty coping with environmental threats to which they are not accustomed. When trees are planted in environments in which they are not suited, they decline, can become susceptible to disease

and usually die before their time.

The Right Tree in the Right Place

Professional arborists consider many things when selecting trees for urban settings. In general, they evaluate the aesthetic attributes of the tree and its planting site, determine the long-term maintenance implications, and weigh the ecological and environmental conditions before making a decision on what species of tree to plant. The following list provides more specific cues to consider:

Aesthetic

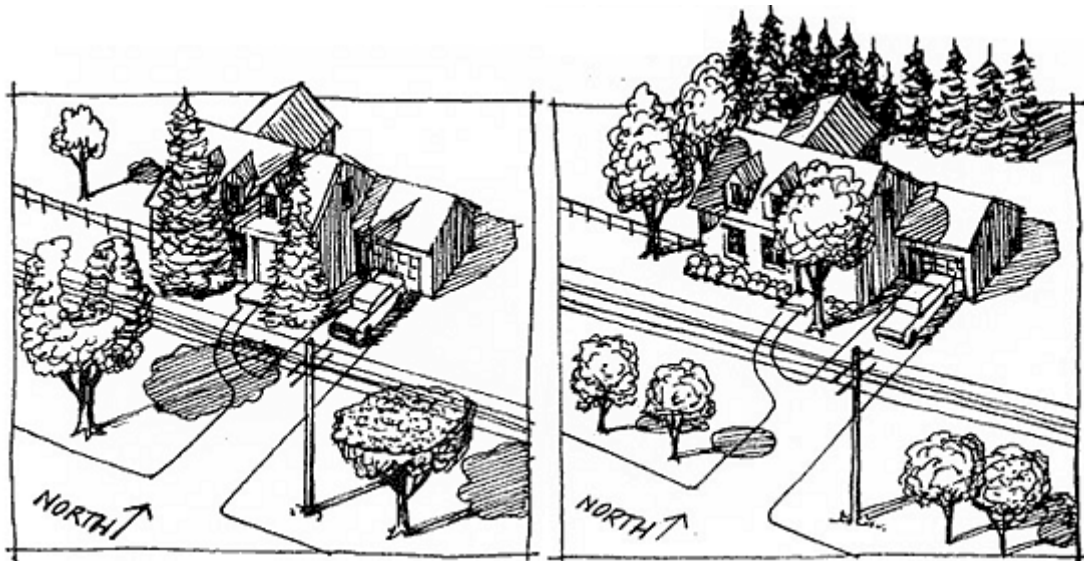
- Size
- Shape
- Density of shade
- Flowering or non-flowering
- Color of flowers and leaves in summer and fall

Maintenance

- Need for and ease of pruning
- Amount of clean up of leaves and/or fruits

Ecological/Environmental/Cultural

- Condition of soil and nutrients available
- Amount of moisture available
- Climate/cold hardiness
- Amount of available light
- Competing plants
- Potential insect or disease problems
- Air quality (exposure to and levels of pollutants)
- Water quality (exposure to pollutants or road salts)



Wrong trees in wrong places

Better choices

Be sure to choose trees that are hardy in your area. Hardiness refers to the lowest average temperature that trees can tolerate. Wisconsin is divided into six zones, which range from 3a (-35 to -40 degrees F) to 5b (-10 to -15 degrees F). The hardiness zone for most of Dane County is 4b (-20 to -25 degrees F). For example, it would be unwise to plant a coconut palm in Wisconsin because it is not cold hardy to zone 4b.

Consider the above list carefully when selecting a tree for longevity and good health. Your choice will determine the time you invest in maintaining and caring for your tree(s). The right choice will provide years of enjoyment and save you time and expense.

The Planting Process

As important as it is to select the proper tree for the location and site, it is just as important to follow the proper steps in the planting to assure that your tree has the optimum chance for a long, vigorous life.

Purpose and Location Evaluation

The first step is to determine the purpose of your new tree. Do you want shade, privacy, a windbreak or is aesthetics your primary concern? Evergreens such as spruces, cedars, firs and pines make good privacy screen and windbreaks but might not meet your aesthetic needs. Next, evaluate the location. Check the space above and in all directions where the crown eventually will be. Are there wires or buildings that might interfere? If there are power lines overhead plant a tree whose height at maturity will not interfere with the lines. Also, check below ground to be sure there are no underground cables, pipes or other utilities -- always call DIGGERS HOTLINE or your local utility before digging. Assess the amount of light and water available. Is the site wet or dry? Is it higher or lower than the surrounding area where water might collect or quickly drain away? If the site is protected, next to a building that blocks direct sunlight for most of the day; don't plant a tree that requires full sun. A shade tolerant tree would be better adapted to this site. Do any other confining conditions exist? Don't choose a site that is too close to a driveway or building foundation where roots may cause damage or be damaged.

Understand the specific conditions of your planting site and select a tree whose requirements match those of the site. Things to consider are soil type (sandy, loamy, clayey), soil pH (alkaline or acidic), amount of moisture (dry, holds moisture, drains well), exposure to sun, wind, and pollution (direct sunlight, sunlight blocked by building(s), exposure to road salts, on an open hilltop with a windy northwest exposure).

Tree Species Selection Process

Walk through your neighborhood and see what's growing. Identifying nearby existing trees can help determine what's successful and what's native. It will also help you determine what to plant to add diversity to the neighborhood. Too many trees of the same species planted in close proximity can be a formula for disaster if a disease sweeps through your area, as Dutch elm disease did in the Midwest in the 50s and 60s.

Look for the functional and aesthetic design you desire but be careful -- trees die when design and aesthetics come before biology. You might be enamored by the shape and beauty of a flowering dogwood but finding a cultivar that will survive Wisconsin winters will be difficult. Don't plant something that doesn't have a chance to survive.

Selecting and Purchasing Your Tree

Almost any tree or shrub that you buy in at a lawn and garden store will survive for a period of time. However, if you want to improve the chances of your tree's longevity, don't cut corners; choose a reputable supplier. Wisconsin nurseries must be certified by state department of Agriculture, Trade, and Consumer Protection. Purchasing from certified nurseries assures that plants are inspected and free of major pests. Avoid trees with multiple, damaged, crooked or cut main trunks (or leaders), disfiguring knots, cuts on limbs over 3/4 inch that are not completely callused, prematurely opened buds, mold or insect damage on bark or foliage. Select trees that have been freshly dug, are well formed and symmetrical, are vigorous, healthy, free of disease, well-branched, have well-developed root systems and are densely foliated when in leaf.

When you visit the nursery you'll find that trees are packaged in different ways. The three most common are balled and burlaped or B&B, containerized and bare root. B&B trees are unearthed from their growing site with a tree spade, which maintains a large ball of soil attached to the root system and trims the roots to create a compact package. The entire root ball including the soil is wrapped with burlap or similar material and tightly held together with a wire basket. The advantage is larger trees; the disadvantage is the weight of the ball, which makes planting heavy work.



There are two types of containerized trees: container grown or potted. Container grown trees are those that have been raised in large plastic or metal containers. They are generally smaller and lighter than B&B and thus easier to handle. Their primary disadvantage is the potential for girdling roots. Girdling roots are those that have begun to grow around the stem rather than in the preferred spoke-like or radial pattern. If girdling roots are not straightened or trimmed when the tree is planted, they will eventually grow large enough strangle the tree as the trunk expands. Potted trees are grown in the ground then uprooted and temporarily placed in plastic or metal containers for marketing. They are smaller and lighter than B&B stock and in many ways, they are similar to bare root stock. The soil is loosely attached to a smaller root ball and the plant is easier to handle during planting.



Bare root trees are just that, a tree with no container or soil and the roots are bare. They are the easiest to handle and plant but smaller in size than the previous three. Bare root trees must be planted within hours after they are purchased and the roots must be kept damp right up to the time of planting to prevent the fine root hairs from drying out. Inspect twigs, branches, and roots

looking for signs of moderate growth last year. Reject anything with numerous injuries or breaks to roots or branches.

Inspect the ball on B&B stock to make sure it is not dried out or broken apart. Grasp the trunk and gently wobble the tree to see if roots are too loose in the ball. Reject any tree if the soil appears excessively dry and has little contact with the roots. Look for girdling roots. Perform the wobble test a container grown trees, too. Look for girdling roots and determine if the potting medium and roots are dried out.

Handling the Tree

Handling the tree to avoid damaging the stem, its branches, or roots is a critical part of proper tree planting. To pick up the tree, lift it by the container or root ball, avoid using the stem or branches. The branches should be covered during transport (especially if foliated) to minimize desiccation by the wind across the surface of the leaves, and to reduce the chance of damaging branches. Soak B&B and container plants; keep the roots of bare root trees moist with damp towel, burlap, or mulch. If the trunk is wrapped, leave it in place until the tree is planted; it provides protection during transport and planting. However, do remove the wrap after planting since it can harbor moisture and insects which can invite disease.

Balled and Burlaped Trees (B&B)

There are specific steps to follow depending on whether your tree is B&B, container grown, potted, or bare root. B&B can be a little tricky because it's best to remove all the burlap covering and the entire wire basket but depending on the size of the ball and the amount of help you have it might not be possible. If you have plenty of help, remove the rope around the trunk, most or all of burlap covering and wire basket then carefully place the tree on the compacted soil in the hole disturbing the roots as little possible. Removing the wire basket and burlap prior to planting in the hole might not be possible. In that case remove the rope, peel back the burlap as far as possible, and place the tree in the hole. Using bolt cutters, snip the wire basket down as far as possible and remove.

Scrape away the excess soil from the trunk to reveal the root collar if you haven't already done so. Using clean, sharp hand pruners, snip off any adventitious root growing above the root collar. Gently straighten large structural roots away from the trunk to create a spoke-like pattern. This will help establish the roots more quickly, strengthening the tree's attachment to the earth and will reduce the risk of girdling roots. Plumb the tree and backfill with native soil.

Container Grown Trees

Be aware that container grown trees are more likely to be subject to girdling roots because of being grown in a confined space. Once you get the tree home, cut away the container and carefully set the tree in the hole. Scrape away the excess soil from the trunk to reveal the root collar and snip of any medium sized or larger roots that appear to be encircling the root system or that are growing back into the system. Use your judgment here – don't take too many roots or those that look to be structurally important to the root system. Trim off any adventitious roots

above the root collar, gently straighten large structural roots away from the trunk to create a spoke-like pattern, plumb the tree and backfill with native soil.

Potted and Bare Trees

Potted and bare root trees can be treated the alike when planting. Since potted trees are grown in the earth then placed in containers temporarily for transport or sale, the soil in the container is generally loose and much of it falls away when the container is removed. Generally, the hole for these trees does not need to be as deep as B&B and container grown. Inspect the roots and trim away any that are damaged or broken, also trim adventitious or any that may become girdling roots. Place in the hole and spread the roots out radially. Sometimes it is easier and just as effective to dig a shallow hole and merely peel back the turf, spread the roots and, turning the turf so the grass side is down, put it back into place over the roots.

Site Preparation and Planting the Tree

You've already chosen your site so the next step is site preparation. Determine size of the hole by measuring depth of root system from the root collar to bottom of the root ball or the longest downward pointing root. The root collar is the swelling where the stem transitions into the root zone – look for change in bark color and texture. Be careful not to confuse it with the root graft which looks more like an overgrown wound. It's important at this time to scrape away any soil at the base of the tree until you uncover the collar.

Dig a hole that is slightly shallower than the depth of the root system and three times as wide in circumference. Leave the bottom of the hole on which the root ball or root system will rest untouched and compacted. Taper the sides of the hole to create a shallow bowl or dish shape and roughen the exposed walls if glazed, especially in clayey soil. Use a rototiller, shovel, spading fork, or stump grinder to loosen the soil around the hole at least five times the diameter of the root system and at least 8 inches deep, deeper if soil is compacted. This allows the roots to grow more rapidly.

The next step is very important. Set the tree in the hole with the root collar even with the soil surface or a little above it. Do not plant it at same depth that it was growing in the nursery since root collars are often covered with soil in nurseries during weed cultivating operations. Trees planted at this depth will be too deep and will likely die within five years.

Things to Remember

Always plant the root collar even with or a couple of inches above the natural level of the soil surface. It is better to plant the tree too shallow than too deep.

It is best to use the soil removed from the hole for backfilling since new soil may disrupt the movement of water and nutrient unless that it is too clayey or rocky. In that case, mix in a soil mixture appropriate to the kind of soil that is in place. Always break up clumps and remove rocks and debris from the backfill. Do not tamp the soil down. A thorough watering will pack the soil down naturally to remove air spaces. A good rule of thumb is 10-15 gallons for each inch of diameter measured 12 inches above the root collar. A tree with a 2" caliper would

receive 20-30 gallons of water at planting. It is not necessary to fertilize the tree at this time. It is best to let it get established for at least one year; even then fertilizer is not necessary unless an analysis determines that there is a nutrient shortage.

Mulch is important. Apply at least 4-6 inches of mulch over the entire area of loosened soil. Do not allow the mulch to directly contact the trunk. Leave a gap or depression directly around the root crown to allow the exchange of gases. Mulch reduces the competition with turf grasses and other plants for moisture and nutrients. It also holds moisture in the soil longer during dry spells, and it protects the trunk from lawn mower and string trimmer damage.

Avoid staking the tree if possible but it is especially necessary if planting in a windy location. The correct materials if staking is necessary are wide bands of carpet, inner tube, or nylon or cotton strapping. They are best for supporting the trunk. One band and stake is preferred but up to four may be necessary depending on the size and location of your tree. Allow enough slack in the bands so that the tree moves some with the wind, this allows the tree to develop the strength necessary in its stem to support itself once the roots are established. The staking should be removed within one year of planting. Avoid using wire or rope of any kind directly on the tree. Even wire protected by a piece of garden hose will cause serious damage at the point of attachment.

Maintenance – Pruning, Watering and Fertilizing

Transplanting causes enough stress; pruning can place additional unnecessary stress. Avoid pruning but remove any dead, broken, or damaged branches. Inspect the tree each year after planting and train prune to correct structural problems. Begin to establish scaffold branches or remove any dead or damaged branches on a regular cycle. Consult a tree pruning text or your local county extension office for information on proper pruning timing and techniques. Watering should only be necessary during periods of extended dry spells. Fertilizing should not be necessary unless there appears to be a problem and an analysis of a sample of the foliage reveals a nutrient deficiency.

Conclusion

The best planting times for the upper Midwest are spring to early summer and fall (in southern Wisconsin that is April 1 through the first week of June and late October to late November). Make your planting plans now and visit your nursery in the early spring to order or purchase your trees. Choose appropriate and healthy stock and follow this planting method to improve your chances of growing a tree that will last more than a lifetime and provide a living legacy for you and your family.

Image Credits

The Arbor Day Foundation. 2010. <http://www.arborday.org/>

Resources

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