



A1817

Caring for your established shade trees

E.R. Hasselkus

The loss of one mature shade tree can tarnish the appearance of the landscape around your home for the many years it takes a new tree to grow in its place. You can help to prevent this costly and marring loss by providing the necessary care at planting and with regular maintenance.

If you planted your trees in locations that will meet their needs, you have saved yourself and your trees from inevitable future problems. But, even if you did match your trees to the proper sites, the urban environment still poses problems for even the “sturdiest” of trees.

Gouges from lawn mowers, vandalism, soil compaction, and deicing salt are a few sources of injury a tree normally would not encounter in its natural setting. Of course, storms, insects, and diseases are not confined to the forest and can be just as damaging to trees planted in urban surroundings.

Trees growing in cities also lack many of the natural benefits that the forest provides. For example, decomposing leaves, recycled as nutrients in the forest, are raked from most lawns.

To substitute for nature, the tree owner must provide a program of care and take quick action when problems arise.

This publication outlines the steps you should take to maintain the established trees on your property. It describes how to prune and fertilize them, how to protect them against both winter damage and the stresses of the urban environment, and how to treat injuries once they occur.

Pruning

As a tree grows, its need for pruning will vary at each stage of development. When the tree is young, you should establish its basic structure by eliminating double leaders, weak crotches, and conflicting and inward growing branches.

Older established shade trees require less pruning. At this stage, you should prune only for corrective purposes—to avoid safety hazards and to improve the health and appearance of the tree.

Here are some situations that will require pruning the mature shade tree:

- Branches or limbs are dead or dying.
- Secondary branches are crossing other limbs. Crossing branches rub together and damage the bark, opening pathways for diseases and insects.
- Roots are damaged. The remaining healthy roots can no longer provide the necessary amount of water and nutrients for the existing crown.

- Branches form a narrow-angle crotch. These branches split easily and are vulnerable to storm damage.
- Sprouts are growing at or near the base of the tree trunk.

How to prune

Pruning a large tree is both a difficult and dangerous task. For work that requires removing large branches or climbing in tall trees, it's advisable to hire a commercial arborist to do the job.

If you are going to prune your trees, keep these points in mind:

- Always prune back to the main trunk, a side branch, or a good strong bud (figure 1).
- To remove branches that are 3 inches or larger in diameter, follow the 3-cut procedure illustrated in figure 2. Make an undercut at 1; cut off the limb from the top at 2. Then, make a smooth flush cut next to the trunk—from top to bottom. However, avoid cutting off the entire branch “collar,” which would needlessly increase the size of the pruning wound. Don't take any shortcuts because you risk tearing bark loose from below the cut.

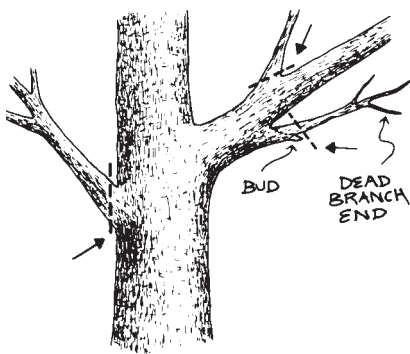


Figure 1. Removing the branch at the proper spot is a key part of pruning.

- If you are removing diseased branches, take great care to avoid spreading the disease. Disinfect pruning tools by spraying Lysol™ on them between each cut.
- When possible, do your pruning in late winter. Pruning wounds heal most quickly in spring.
- Avoid pruning oak trees from May through August because sap on exposed pruning wounds can attract disease-carrying insects.

Although pruning is necessary for the mature shade tree, it can also be a severe shock to the tree. Be sure you have a reason for every cut you make. Study the inherent characteristics of the tree to help you preserve its natural form. Starting at the top and working down, prune each limb individually and purposefully. Indiscriminate “topping” of mature trees is never justified.

When you are done pruning, fertilize and water, if needed, to give the tree a boost toward recovery.

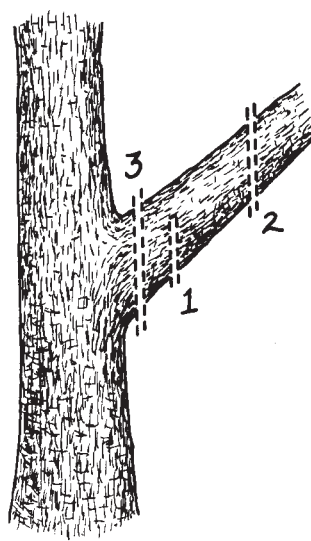


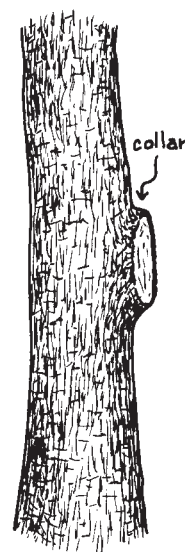
Figure 2. Use the 3-cut procedure to avoid damaging the bark when pruning larger branches. Make your final cut smooth and close without cutting into the collar.

Treating wounds

A wound is a break in the bark that exposes injured wood. Lawn mowers, bikes chained to young trees, pruning, construction work, vandalism, and frost cracks are common causes of trunk wounds. Untreated, trunk wounds pose a serious threat to the health of the tree.

To treat a fresh wound, remove any loose bark with a sharp knife. Make a clean cut back to intact bark and wood. If practical, cover the wound with plastic film for several weeks to keep the exposed cambium from drying out.

Except for oaks, the application of dressings is no longer recommended. On oak trees, prompt application of a wound dressing is necessary during spring and summer to help keep out insects that transmit oak wilt fungus. For other trees, thickly applied dressings may actually enhance wood decay by trapping moisture. A very thin coating of a tree wound dressing may be applied for cosmetic purposes.



Fertilization

In the forest, the cycle of growth and decay is virtually uninterrupted. Decaying vegetation is broken down into nutrients in the soil where they are taken up by growing plants. In cities, where leaves and grass clippings are raked from lawns, nutrients are not readily available to trees. Fertilization is a necessary substitute for nature.

Signs to look for

The mature shade tree is usually fertilized less often than the young tree. Here are some signs that indicate the need for fertilization:

- Sparse foliage.
- Small and poorly colored leaves.
- Short annual twig growth.
- A large amount of dead wood.
- Dieback at the ends of branches.

When to fertilize

You can fertilize your shade tree in early spring when the buds begin to swell, or in fall when the leaves start to change color and drop. Don't apply fertilizer during the summer. Summer fertilization can stimulate heavy growth late in the growing season, making it prone to winter damage.

How to fertilize

A shade tree's feeder roots are mainly located within the top 12 inches of the soil. This network of feeder roots extends from an imaginary circle around the trunk—located at a distance of about twice the trunk diameter away from the trunk itself—to another imaginary circle just beyond the spread of the outermost branches.

The two imaginary circles will be the starting and finishing points when you fertilize. From the starting circle near the trunk, picture a series of concentric circles—2 feet apart—spreading out to the circle just beyond the spread of the branches.

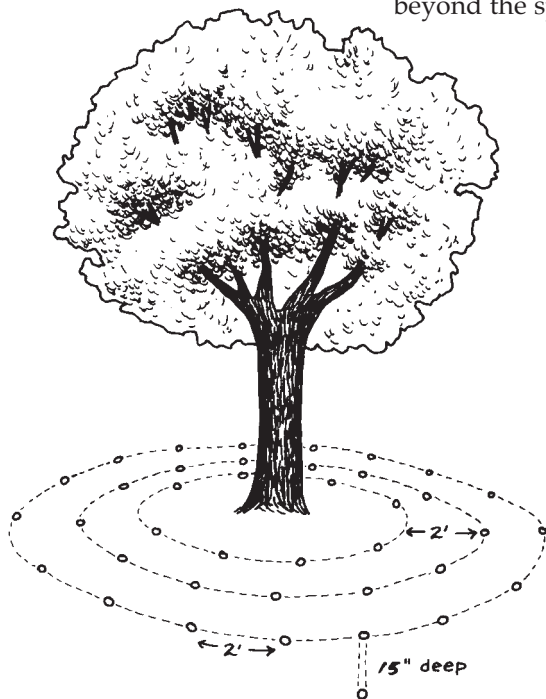


Figure 3. Mapping out a series of concentric circles will help you distribute fertilizer equally over the tree's root zone.

In each of these circles, make holes with a crowbar, soil auger, or probe. These holes should be 2 feet apart and 12 to 15 inches deep (figure 3).

Evenly divide the recommended amount of fertilizer among the holes and cap the holes with peat moss, sand, or soil.

If you own young trees that cast little shade over your lawn, you can use a different fertilization method. Simply apply a double rate of recommended slow release lawn fertilizer over the feeder root area when you are fertilizing your lawn.

If the root zone of your tree is covered with a mulch, you also have an alternative to the hole procedure. Broadcast the fertilizer over the mulched area where the feeder roots are located. Water well to move the fertilizer into the root zone.

How much fertilizer

A complete tree fertilizer contains the three major tree nutrients—nitrogen, phosphorous, and potassium.

Different fertilizers contain different amounts of the major nutrients and are numbered accordingly. For example, a 100-pound bag of typical fertilizer, 10-8-6, consists of 10 percent nitrogen (N), 8 percent phosphorous (P_2O_5) and 6 percent potassium (K_2O). If you bought a 50-pound bag of the same fertilizer, the amount of each nutrient would be cut in half.

The best way to determine the nutrient needs of your tree is to have your soil tested. Analysts can tell you the exact proportions of the major nutrients you should apply, and secondary testing can tell you if other nutrients are in short supply in your soil.

In general, however, commercial fertilizers with a high nitrogen content, such as 12-6-4, 16-8-8, and 20-10-5, are usually best. For shade trees, use 1 to 2 pounds (1 to 2 pints) of fertilizer per inch of trunk diameter. Limit flowering trees to 1 pound per inch of trunk diameter. Distribute the total amount of fertilizer evenly over the feeder root area according to the method fertilization used.

Your tree will provide you with signals if you have overfertilized. If the leaves are dark green and twig growth is excessive, reduce or delay application for a year or two.

The frequency of application will also depend upon the tree species and the growth response you desire. A slow-growing tree species, such as a ginkgo, may need fertilization about every three or four years. However, you may want to speed up the growth rate of young trees by applying fertilizer annually.

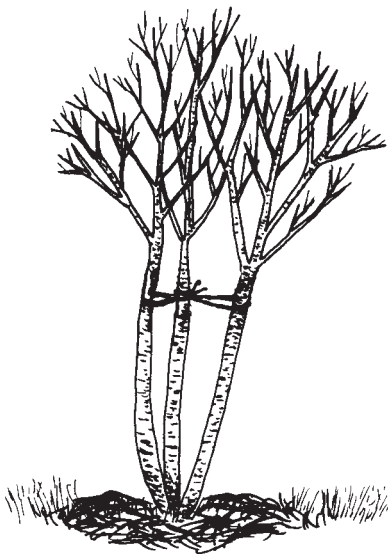


Figure 4. Protect the tender bark of young trees from winter sun scald by wrapping the trunks.

Seasonal and urban stresses

The extremes of the weather, damage from animals, salt spread on icy pavement, and soil compaction can take a heavy toll. It is important to recognize the potential sources of injury and to take steps to reduce the chances for tree damage.

Sources of winter injury

Ice and snow

The accumulation of ice or wet snow may cause malformation, splitting, or breaking of trees. Multi-trunked trees, such as birch, may be protected from damage by tying leaders together with soft twine, strips of cloth webbing or nylons. Tie the leaders about two-thirds of the way above the crotch (figure 4). This method will reduce the exposed surface area of the tree and make it less prone to damage from loads of ice and heavy snow.

To provide more lasting protection for trees with large, spreading branches or large multi-stemmed trees, support the branches with cables installed by a commercial arborist.

Salt

Salt spread on icy pavement presents a double threat to trees. Spray from traffic and salt draining into the soil pose different but equally serious problems.

Trees planted within 30 to 50 feet of highways often suffer from salt-spray damage. Salt spray causes bud death and twig dieback. As a result, new growth is concentrated at the bases of branches, creating clusters of twigs known as witches' brooms.

Most soil salt injury also occurs within 30 to 50 feet of pavement where salt is spread. Salt in the soil can kill roots directly or prevent the roots from taking up water. These injuries may not become evident for several years. Symptoms include an initial blue-green cast to the foliage, marginal leaf burn, reduction in leaf, flower and fruit size, early fall coloration and leaf loss, stunting, and a general lack of vigor.

The best way to prevent salt damage is to cut down on the use of deicing salt. Although you can't control how much salt is used on city streets, here are some things to keep in mind when you spread salt on your pavement:

- Never apply pure salt. Mix it with an abrasive, such as sand, cinders, or ash.
- Limit applications to high-risk locations, such as hills, steps, and walkways.
- Apply salt carefully. Spread it after shoveling or plowing and after the threat of snow has passed.
- Protect plants from salt spray by putting a protective barrier in front of them. Plastic, burlap, plywood, or window screen are commonly used.

For a listing of trees that are tolerant of salt, see Extension publication *Salt Injury to Landscape Plants* (A2970).

Rodent damage

During winter, rodents and rabbits may feed on and damage the tender bark and twigs of landscape plants. This damage may permanently disfigure the tree, or, if it is completely girdled, the tree will die. Young and thin-barked trees are most vulnerable to animal damage.

For protection against rodents such as mice and rabbits, place a cylinder of $\frac{1}{4}$ -inch mesh hardware cloth around the trunk. The cylinder should extend from 2 to 3 inches below the soil line, to defend against burrowing rodents, and to 18 to 24 inches above the anticipated snow line, to protect against rabbits (figure 5).

You can leave the hardware cloth on year-round but it should be larger than the trunk to allow for growth.

For small trees, spiral plastic tree guards, available at most garden centers, provide effective protection.

If you have many trees, using hardware cloth or tree guards may be too expensive. In this case, repellents may be the best solution to animal problems. Repellents are not poisons; they simply make the plant undesirable through taste or smell.

For rodents, the most effective repellents are those containing thiram. You can either paint or spray the repellent on the tree trunk but repeated application may be necessary after heavy snow or rain.

Deer damage

Deer damage trees in two ways. They feed on and damage tops and side branches of small trees, and male deer rub their antlers on the trunks of small trees during the autumn rutting season. During rutting, bark and branches are rubbed from the tree.

Applications of repellents, also containing thiram, can help keep deer damage in check. Cloth bags containing human hair have also proved to be an effective deer repellent. Hang the bags around September 1 and remove them in the spring.

Small hotel-sized bars of soap can also be effective repellents. Leave the wrapper on the bar and poke a hole through the soap. Hang the soap on the tree with a short piece of wire.

Another defense is to enclose the area around the tree with a fence. To be effective, the fence must be high and built with posts and heavy wire mesh.

Drought

While newly planted trees require regular watering for the first three years after planting, mature trees are better equipped to withstand dry weather. However, extended periods of drought can be stressful to the mature tree and make it vulnerable to disease and insect injury, particularly borers.

During a drought, an occasional, thorough watering is much more beneficial to the tree than frequent, light waterings. You can use a soaker hose and let it run slowly for several days. Another option is to use a water lance which allows you to inject water into the soil near the feeder roots.

Soil compaction

The tree's roots are made up of living cells that require oxygen to survive. When the soil is compacted above the roots, the amount of available oxygen is reduced. This lack of oxygen can result in root injury or death.

Heavy pedestrian traffic or construction machinery can pack down the soil. If this happens, you can avoid root damage by aerating the soil. You can do this by making a series of holes with a soil auger throughout the root zone. (See the section on how to fertilize for a description of the root zone.) Backfill the holes with sand, gravel, or peat moss to permit air to reach the roots.

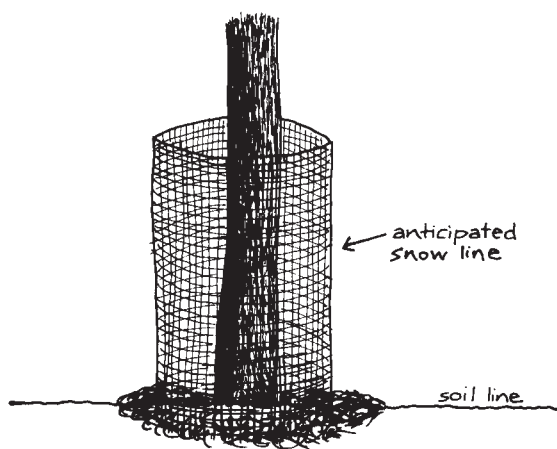


Figure 5. Prevent damage from rabbits and rodents by placing a cylinder of hardware cloth around the trunk.

References to products in this publication are for your convenience and are not an endorsement of one product over other similar products. You are responsible for using chemicals according to the manufacturer's current label directions. Follow directions exactly to protect the environment and people from chemical exposure. Failure to do so violates the law.

Benefits of mulching

A layer of mulch placed over the root zone of young and small trees can help them in several ways. Mulch reduces evaporation, controls weeds, and moderates the extremes of soil temperature in both winter and summer. It also reduces the chance for trunk damage from lawn mowers and may help to prevent soil compaction by discouraging pedestrian traffic.

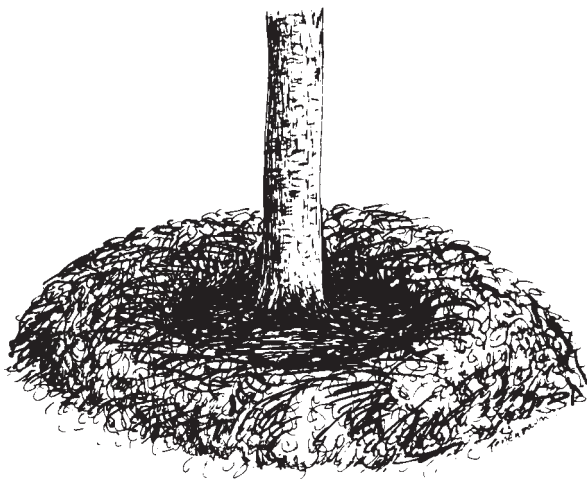


Figure 6. When mulching, leave a saucer-shaped area around the trunk to make watering easier.

Wood chips, shredded bark, ground corn cobs, or similar materials make good mulches. Place a 2- to 3-inch-deep layer of one of these materials over the root zone, but not in contact with the trunk. Leave a shallow dish-shaped area around the trunk to allow for easy watering.

As organic mulches decompose, they utilize nitrogen. To compensate, an annual application of high nitrogen fertilizer is recommended.

Additional information

For more information on tree selection and care, consult the following University of Wisconsin-Extension publications.

- A Guide to Selecting Landscape Plants for Wisconsin* (A2865)
- Caring for Deciduous Shrubs* (A1771)
- Controlling Deer Damage in Wisconsin* (G3083)
- Evergreens—Planting and Care* (A1730)
- Landscape Plants that Attract Birds* (G1609)
- Plants Not Favored by Deer* (A3727)
- Preserving Trees During Construction* (A3072)
- Protecting Gardens and Landscape Plantings from Rabbits* (G1654)
- Salt Injury to Landscape Plants* (A2970)
- Selecting, Planting, and Caring for Your Shade Trees* (A3067)
- Tree and Shrub Fertilization* (A2308)

UW
Extension

Copyright © 1993 by the Board of Regents of the University of Wisconsin System doing business as the division of Cooperative Extension of the University of Wisconsin-Extension. Send inquiries about copyright permission to: Manager, Cooperative Extension Publishing, 432 N. Lake St., Rm. 103, Madison, WI 53706.

Author: E.R. Hasselkus is professor emeritus of horticulture, College of Agricultural and Life Sciences, University of Wisconsin-Madison and University of Wisconsin-Extension, Cooperative Extension. Produced by Cooperative Extension Publishing.

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress; and provides equal opportunities and affirmative action in employment and programming. If you need this material in an alternative format, contact the Office of Equal Opportunity and Diversity Programs or call Cooperative Extension Publishing at 608-262-2655.

This publication is available from your Wisconsin county Extension office or from Cooperative Extension Publishing. To order, call toll-free number: 877-WIS-PUBS (947-7827) or visit our web site at learningstore.uwex.edu.