



TREE CITY USA BULLETIN

for the
Friends of Tree City USA

How to Prune Young Shade Trees

"As the twig is bent, so grows the tree." This insightful old bromide about children might just as well serve as the cardinal principle for pruning young shade trees. What you do to your tree in its first few years of life will affect its

shape, strength, and even its life span. In importance, early pruning must rank just after selecting the right tree for the site, and careful planting.

The sketch of the tree on the right represents what we like shade trees to look like 15 years or so after planting: a tall, straight trunk; and a full, healthy crown with strong, well-spaced branches... a tree that casts a broad expanse of sheltering shade, that resists damage by wind and ice, that is easy to maintain.

The sketch at the left also represents a 15-year-old tree. But it looks more like a big, rambling bush than a well-groomed shade tree. Its low-growing branches obscure streets, driveways, and walks, posing traffic hazards. Many branches have been damaged during storms, and weak, unsightly shoots sprout in abundance. Maintenance is badly needed and will now be expensive.

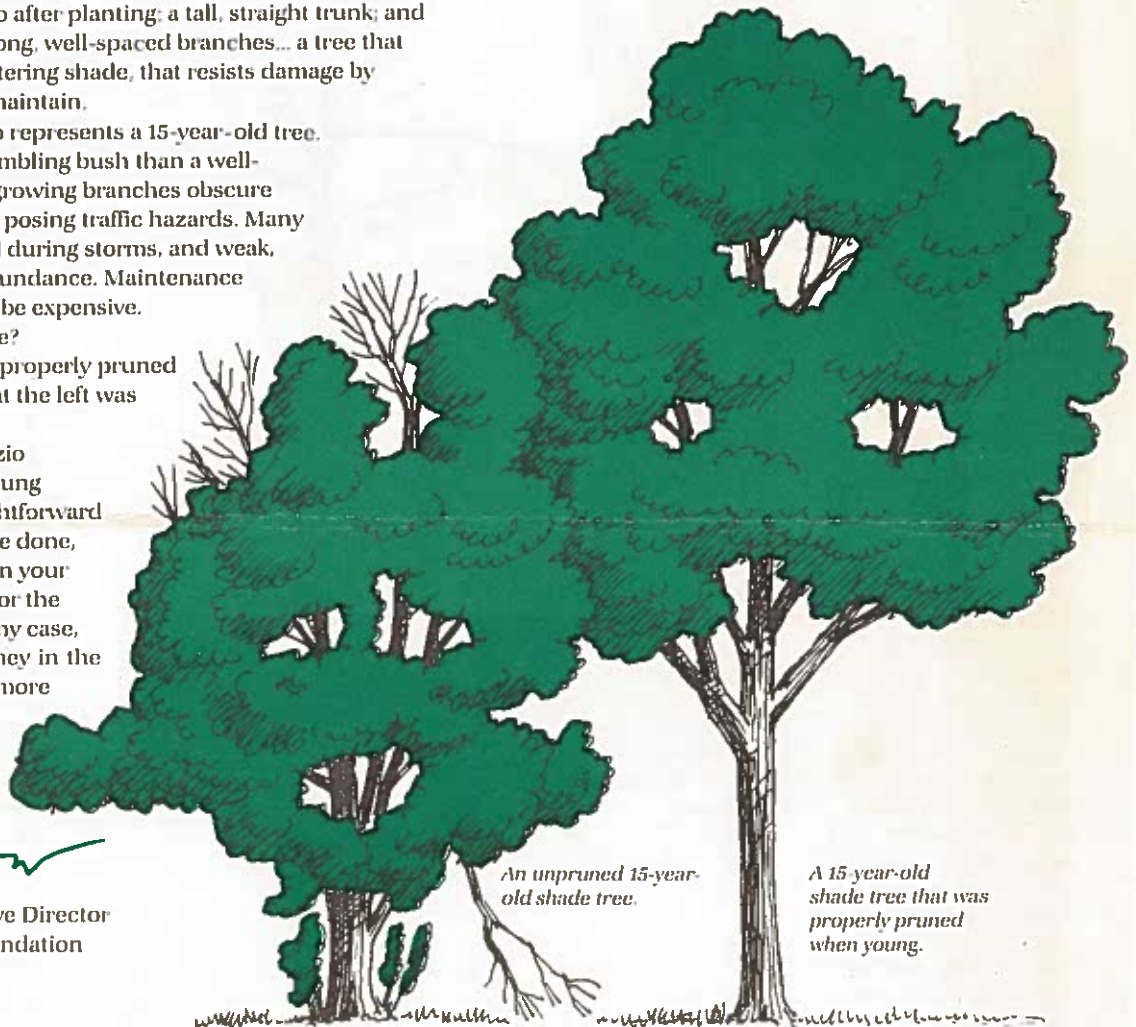
What made the difference?

The tree at the right was properly pruned when it was young. The tree at the left was neglected.

As Bulletin editor Jim Fazio skillfully explains, pruning young shade trees is a simple, straightforward task. It is a job that needs to be done, whether by you for the trees in your yard, or by your community for the trees on public property. In any case, proper pruning will save money in the long run, and give you safer, more beautiful, healthy, easy-to-maintain trees.

John Rosenow

John Rosenow, Executive Director
National Arbor Day Foundation



An unpruned 15-year-old shade tree.

A 15-year-old shade tree that was properly pruned when young.

A Tale of Two Trees

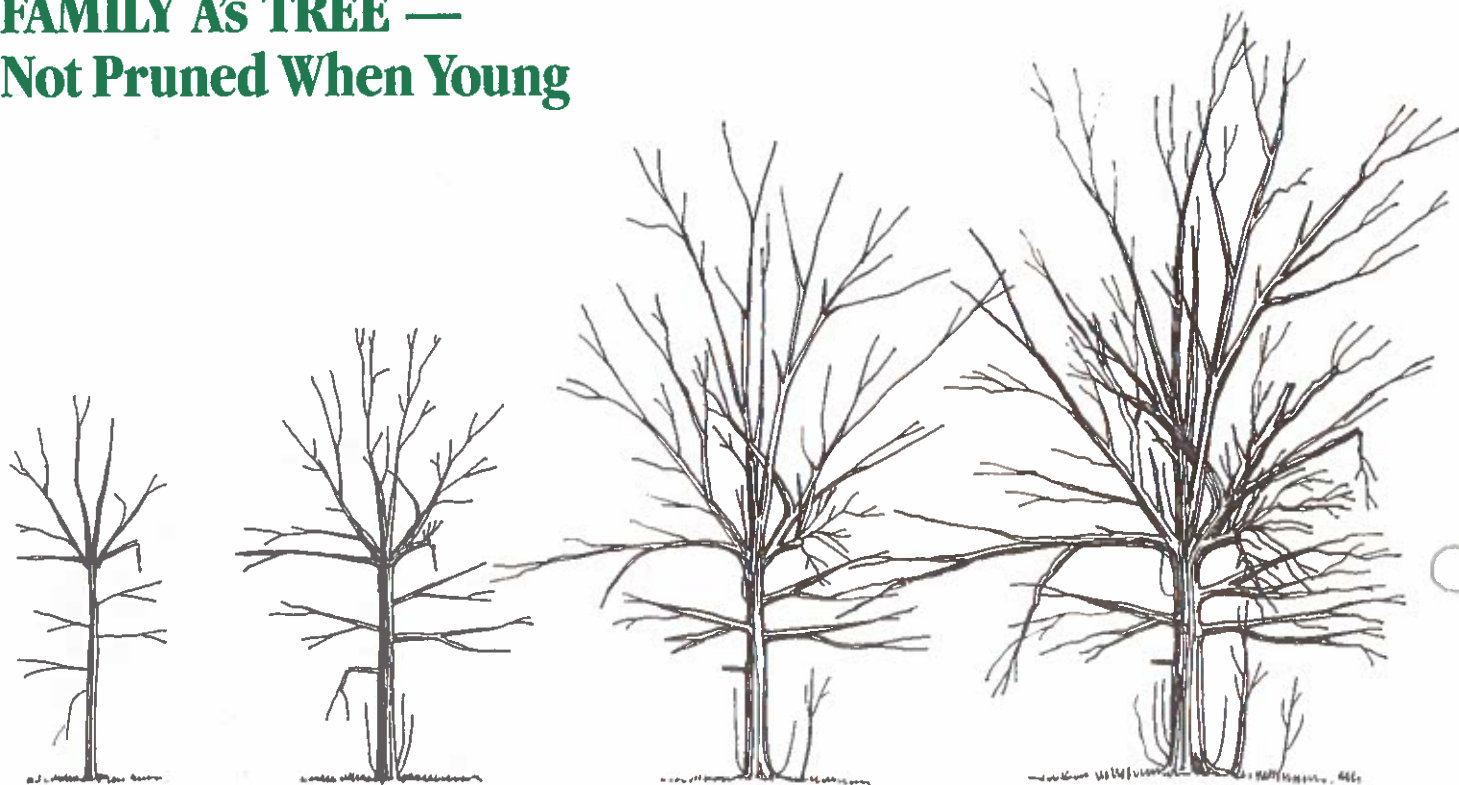
One happy day in May the all-American dream came true for two families. Brand new houses of their own in the suburbs. The good life for their kids. New friends and neighbors. More space and comfort. And good investments, too.

Now, it happened that both families loved trees, so they each promptly planted one to commemorate their new start

in life. Unknown to each other, both families planted trees that were the same species and the same age.

Looking ahead, we would expect the twin trees to eventually make a nice contribution to the neighborhood, each spreading its shade to grateful residents for generations to come. But, it was not to be. Unfortunately, Family A had the misguided belief that a tree should be left alone, just as it is in

FAMILY A's TREE — Not Pruned When Young



At Planting

Family A didn't ask for planting instructions. They knew how to plant a tree. When that was done, they believed their work was done.

Actually, they were partly correct. You may receive instructions to the contrary, but little should be done to the tree at this stage. In most cases, it is best to leave all the leaf surface possible to manufacture food that will build a larger root system. It has been found that both roots and top will be larger after one year if left unpruned.

After 3-4 Years

By the time many transplants are in their new home for 2 to 4 growing seasons, sprouts and suckers may appear. The root suckers protruding near the base sap strength from the tree. The sprouts are disproportionately vigorous and weakly attached to the tree. And look at the broken limb. By now, it has sprouted numerous branches just below the break — too many, in fact.

After 5-7 Years

The baby is quickly becoming an adult. The results of not making corrections early in life are now quite visible, although some are still not obvious to the untrained eye. To the more careful observer, the form of the future crown is apparent.

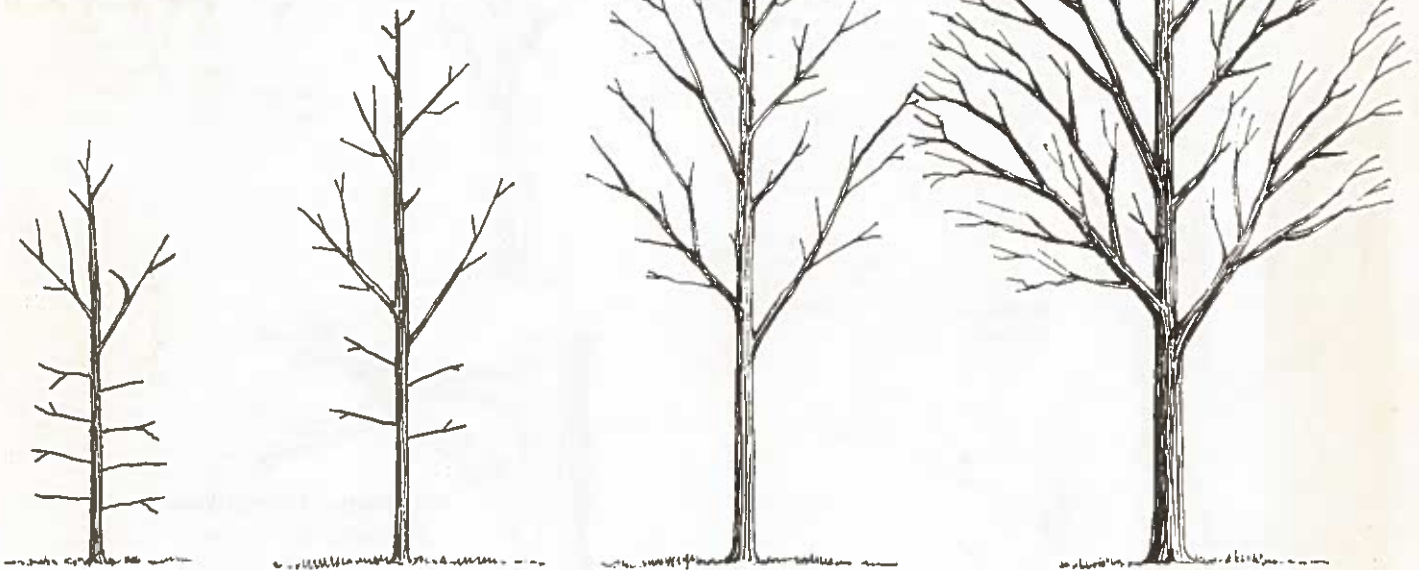
15 Years After Planting

Family A's tree is now not only unattractive, but dangerous, especially when the wind is blowing. Lopsided and dense, the tree in full leaf catches the wind like a sail. Also, the narrow branch angles and multiple leaders have resulted in a weak top. The broken branch not only attracted insects, but may soon break off under the weight of too many sprouts. Decay has entered the trunk where the little bent branch tore off many years ago and a jagged stub protrudes just above it. The tree is an accident waiting to happen. It is becoming more of a liability than an asset for the property.

the forest. Family B knew better: They realized that a tree in the yard or along a street is not growing there because ecological sorting matched its needs to the site. It is there because it was planted there; Nature's method was circumvented. The new transplant is probably on poor soil that is then subjected to the trampling of hundreds of

footsteps. It most likely is not enjoying the optimum conditions of sunlight or shade, and it certainly does not have the advantage of forest neighbors to shield it from wind, prune its lower branches, and form the outline of its crown. In short, it needs help.

FAMILY B's TREE — Pruned When Young



At Planting

Family B also planted their tree correctly, but they also noticed a broken branch and a branch that was competing with the leader. Both were pruned close to the trunk. Another, swollen from the sting of an insect laying eggs (a gall), was snipped off. Otherwise, all branches were left intact to provide maximum leaf surface to manufacture food during the first year of life in its new home.

After 3-4 Years

By now root growth should be well on its way to anchoring the transplant and expanding to the size necessary to nourish the growing branches. Family B decides to cut off the root suckers and sprouts in the crown. Other excessive branches are thinned to reduce competition for light, water and nutrients, and a co-dominant leader is removed. A few of the lowest limbs are also removed, but others are temporarily left to help the trunk develop more taper and strength.

Growth is far enough along to reveal problems developing such as branches that rub or are growing in an undesirable direction. Narrow angles are also eliminated for reasons explained on page 4.

After 5-7 Years

Now is the time to make a good tree even better. Lower limbs are pruned off to "raise" the bottom of the crown well out of the way of human heads. The lowest limbs are now the permanent lowest limbs. *An important fact is recognized here. Branches do not move upward as a tree grows taller. The center of a branch at 5 feet will always be at 5 feet.*

Higher up, a few overzealous branches are cut back so they do not protrude beyond the graceful outline of the crown. A branch here and there is removed for more even spacing — but basically the job of sculpturing the tree is now complete.

15 Years After Planting

Family B was amazed to see their tree survive a major wind storm one summer day. While many other trees in the neighborhood suffered split tops and broken limbs, their's stood strong and firm. Proper pruning gave strength to the branches and allowed the wind to pass harmlessly through the thinned crown. Early each spring, the tree gets scrutinized and dead or damaged limbs are cut off using proper pruning methods. Otherwise, Family B has only to enjoy the beauty and shade of their tree. And what do you know? Just before they moved recently, the real estate agent told them it was the trees in their yard that helped sell the property so quickly.

Pruning for Strength

The first guide to pruning a young shade tree is to have a clear understanding about what pruning can do for the tree — and you.

For example, we know to prune modestly — if at all — when transplanting a new tree. An immediate objective must be to strengthen and expand the root system which is usually reduced by 80-90 percent during transplanting. To meet this objective, as much as possible of the leaf surface (the tree's

food factories) is left intact. Only damaged or dead limbs should be removed.

After the first year, pruning should begin in earnest. Pruning with strength as the objective is the best way to avoid weak branches later on, and to prevent expensive corrections that will otherwise become necessary.

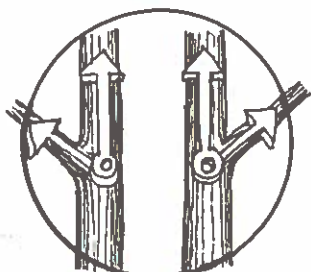
What to look for:



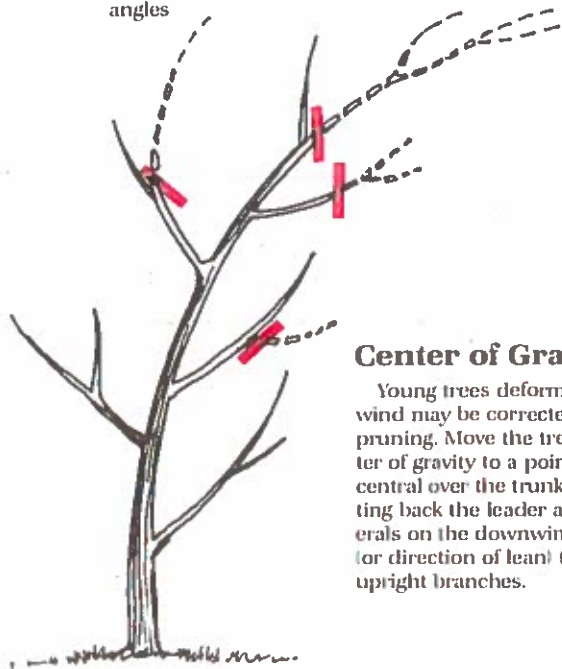
Branch Angles and Size

Narrow angles signal a point of future weakness, whether in the trunk or crown. The reason is that as the two branches grow, neither has sufficient space to add the wood needed for strength. Instead, they grow against each other. The effect is similar to hammering in a wedge. To prevent this and the expensive problems that are sure to follow, simply remove one of the two branches. For strength, the ideal branching angle approximates 10 or 2 o'clock.

Lateral branches should be no more than $\frac{1}{2}$ to $\frac{3}{4}$ the diameter of the trunk. As the trunk grows it will strengthen the joint by adding wood around the branch — like a dowel in a chair leg.



Ideal angles



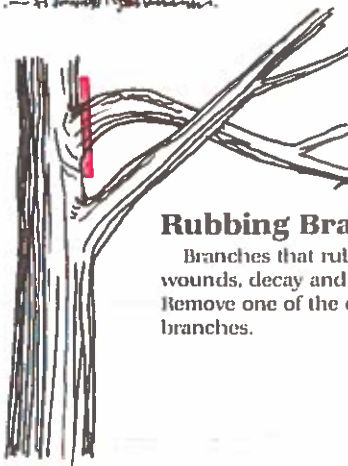
Center of Gravity

Young trees deformed by wind may be corrected by pruning. Move the tree's center of gravity to a point more central over the trunk by cutting back the leader and laterals on the downwind side (or direction of lean) to more upright branches.



Watersprouts and Suckers

These "parasite" sprouts can occur at the base or inside the crown. They are rapidly growing, weakly attached, and upright. Usually they use more energy than they return to the tree. It is best to remove them as soon as possible when it is obvious they are vigorous sprouts.

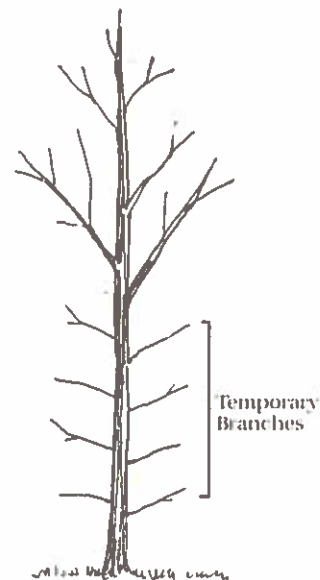


Rubbing Branches

Branches that rub result in wounds, decay and notches. Remove one of the offending branches.

Temporary Branches

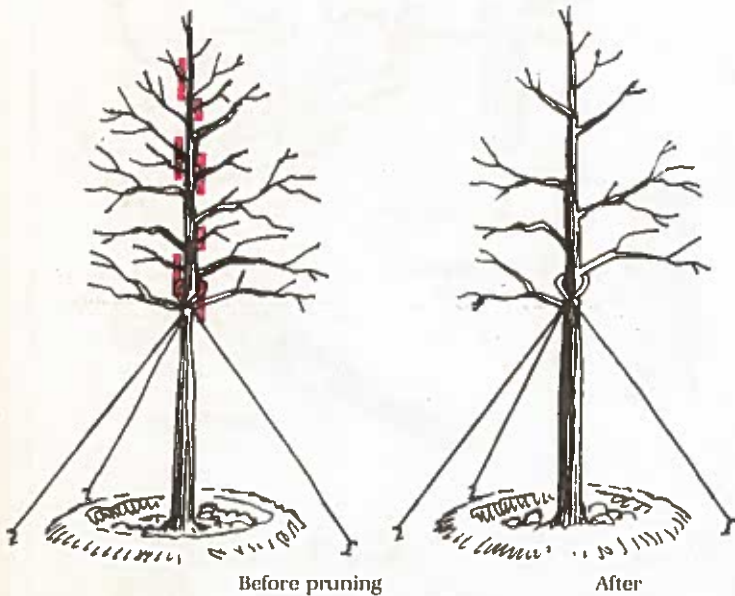
Branches below the lowest permanent branch can protect young bark from injury from the sun and add taper and strength to the trunk. Particularly in lawn plantings where lower limbs do not block passage or tempt vandals, the limbs may be left for 3-4 years after planting. Then remove over the next 2-3 years, beginning with the larger temporaries. Don't let the temporary branches become large and vigorous. Shorten the larger temporary branches, or remove vigorous temporaries if less vigorous ones can be selected.



Caution: When pruning diseased trees, dip your shears in household bleach before storing or moving to the next tree. Be sure to rinse and wipe dry before storage.

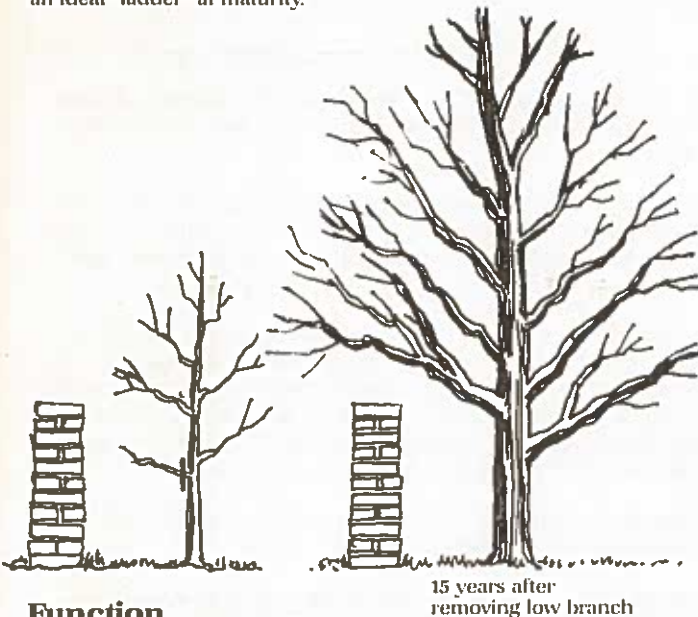
Pruning for Form

The objective in pruning for form is to help shape a tree that is aesthetically pleasing and serves well in the space it is to occupy. After pruning with strength in mind, look for ways to help shape the most desirable tree.



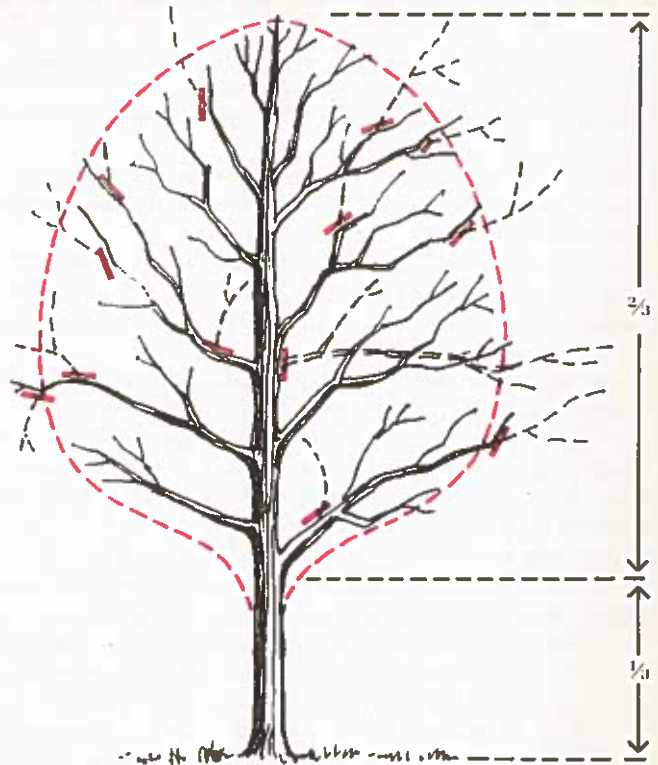
Thinning and Spacing

Most trees benefit from thinning — removing a portion of the limbs that compete for space and light. Evenly spaced laterals, 8-12 inches apart in the young tree, is a good rule of thumb to help assure an ideal "ladder" at maturity.



Function

Try to imagine what the tree will look like when it is larger. If a limb is headed toward trouble (the house, walkway, sign, etc.), remove as early as possible in the life of the tree. Closure of the wound will be more complete when the limb is small, and it is less trouble and expense. Remember limbs do not move upward as a tree grows in height.



Ingrowers Protruders and Crown Ratio

When a crown is dense, look for limbs that turn inward, and those that extend beyond the "natural" outline of the crown. Prune at the trunk or down to an appropriate lateral branch. Over-pruning can damage or even kill your tree. Always maintain at least $\frac{2}{3}$ of the tree as the live crown.



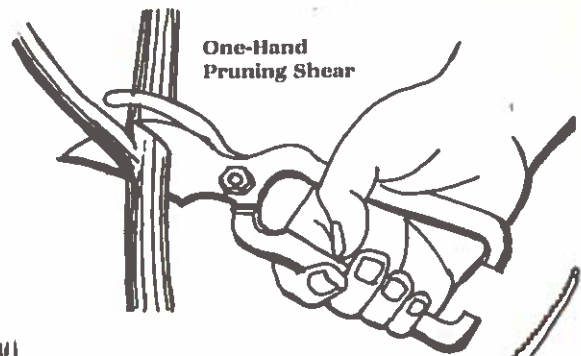
Double Leaders

Protect the leader from competition. In trees with co-dominant leaders, remove the one with a crook or other defects, or that creates a lop-sided appearance.

Caution: Do not prune too high too quickly. To "lift" (raise) the crown, remove lower limbs over several years. No more than $\frac{1}{3}$ of the live crown should ever be removed in a single cutting.

Keys To Good Pruning

1. Prune early in life of the tree so pruning wounds are small and so growth goes where you want it.
2. Begin your visual inspection at the top of the tree and work downward.
3. Identify the best leader and lateral branches (scaffold limbs) before you begin pruning and remove defective parts before pruning for form.
4. Don't worry about protecting pruning cuts. For aesthetics, you may feel better painting larger wounds with a neutral-color tree paint, but the evidence is that it does not prevent or reduce decay.
5. Keep your tools sharp. One-hand pruning shears with curved blades (secateurs) work best on young trees.
6. Make safety a number one priority. For high branches use a pole pruner. Some, like the one pictured, have both a saw and shears on the same tool. A major job on a big tree should be done by a professional arborist.
7. When you prune back to the trunk or a larger limb, branches too small to have formed a collar (swollen area at base) should be cut close. (Notice in the drawing of the pruning shears that the cutting blade is cutting upward for less effort and a close cut.) Otherwise, follow the rules of good pruning of larger limbs by cutting just outside the branch ridge and collar and at a slight down-and-outward angle (so as not to injure the collar). Do not leave a protruding stub.
8. When simply shortening a small branch, make the cut at a lateral bud or another lateral branch (referred to as "head" or "headback pruning"). Favor a bud that will produce a branch that will grow in a desired direction (usually outward). The cut should be sharp and clean, and made at a slight angle about 1/4 inch beyond the bud.



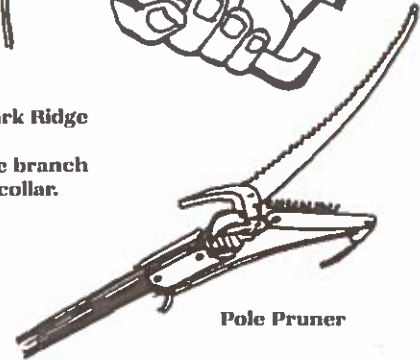
One-Hand Pruning Shear



Branch Bark Ridge

Cut outside branch ridge and collar.

Collar



Pole Pruner

Correct Pruning Cut



Too Close



Too Long

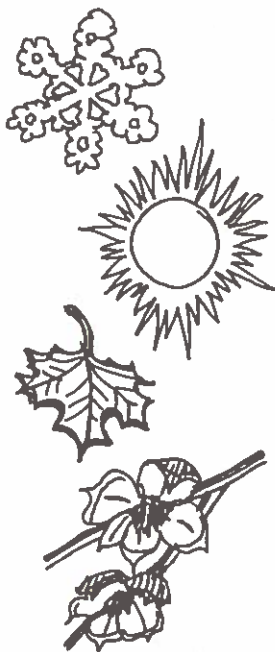


Too Slanted



When To Prune

depends to a large extent on why you prune. Light pruning and the removal of dead wood can be done anytime. Otherwise, here are some guidelines, but recognizing that individual species may differ:



Winter Pruning during dormancy is the most common practice. It results in a vigorous burst of new growth in the spring and should be used if that is the desired effect. It is usually best to wait until the coldest part of winter has passed. Some species, such as maples, walnuts and birches, may "bleed" when the sap begins to flow. This is not harmful and will cease when the tree leafs out.

Summer To direct the growth by slowing the branches you don't want; or to slow or "dwarf" the development of a tree or branch, pruning should be done soon after seasonal growth is complete. The reason for the slowing effect is that you reduce the total leaf surface, thereby reducing the amount of food manufactured and sent to the roots for their development and next year's growth of the crown.

Another reason to prune in the summer is for corrective purposes. Defective limbs can be seen more easily, or limbs that hang down too far under the weight of leaves.

Fall Because decay fungi spread their spores profusely in the fall and healing of wounds seems to be slower on fall cuts, this is a good time to leave your pruning tools in storage.

Flowering Trees If your purpose for pruning is to enhance flowering: 1. For trees or shrubs that bloom in summer or fall on current year's growth (e.g., crape myrtle), prune in winter; 2. For trees that bloom in spring from buds on one-year-old wood (e.g., dogwood and flowering fruit trees), prune when their flowers fade.

Caution: In some areas of the country, diseases or insect occurrence may be affected by the time of pruning. Check with your county extension agent or city forester; or an arborist or nursery operator to see if there are any local problems.



TREE CITY USA

Pruning Is A Vital Part Of Any Urban Forestry Program

A survey conducted by the American Forestry Association (AFA) showed that many of the nation's urban forests are in serious trouble. To stem the decline of shade trees, more and more communities are engaging in vigorous planting programs. The magnitude of this effort may vary from a few dozen park trees in small towns to the annual planting of thousands of trees in large cities. In all cases, the investment is significant. AFA's Gary Moll suggested that 20 percent of an urban forestry budget should be directed at planting and early care.

It follows that the early care of new trees is one of a community's best ways to maximize its investment in planting. Systematic pruning of trees during the first several years of growth should be an integral part of the program.

A basic mission of the Tree City USA program is to encourage ongoing shade tree care. Early pruning is part of the care necessary for strong, healthy, beautiful trees. Of the four standards shown on the back page of this bulletin, time spent pruning young trees would contribute to Standard 3 as a portion of the comprehensive community

forestry program. In every way, your community will gain from making early pruning a part of the urban forestry program.

Within a tree maintenance program, urban foresters and arborists have suggested that the following steps be included:

1. Minimum pruning immediately after transplanting; within 3 years, pruning for strength and form; and every 3 years thereafter pruning to "lift" the canopy of street trees (usually to 8 feet above sidewalks and 14 feet above residential streets).
2. Providing initial training and annual refresher training for crews doing the pruning. *Caution: Crews that regularly prune older trees tend to overprune young trees.*
3. Stressing tool sharpness and, if necessary, disinfective methods.
4. Developing an inventory which is kept up to date with all maintenance operations including pruning, with future needs being noted.
5. Monitoring on an annual basis.

For The Best Start, Start in the Nursery

A good tree management program begins with selecting good trees. When choosing trees for city plantings along streets and in parks and other public

places, you will want trees with a fairly substantial caliper even if they are initially more expensive. Some things to look for:

Bare root tree:

Abundant root growth, fibrous and numerous small roots. Good color moist.

Balled & Burlapped tree:

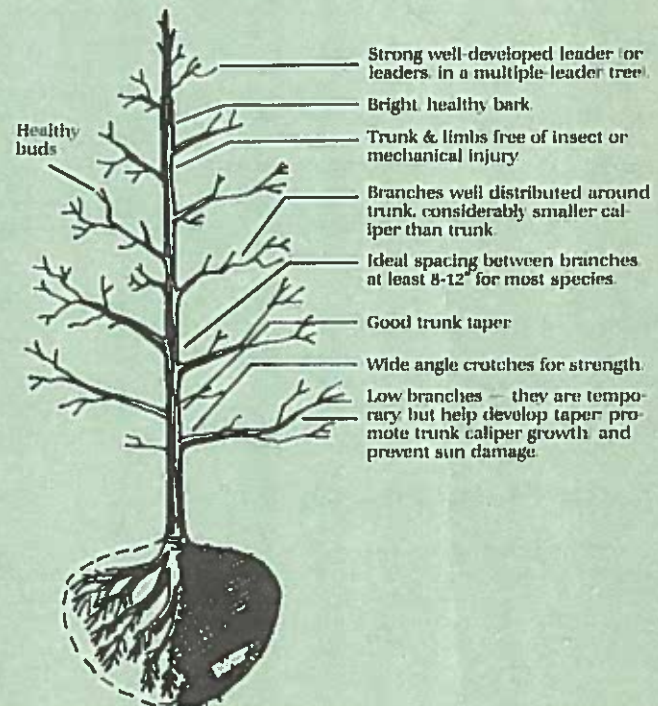
Firm soil ball with trunk securely tied. Do not accept a plant with a broken "ball." Do not accept a tree with a circling root at the base of the trunk. Always carry B&B plants by the soil ball, not by the trunk, stems or branches.

Container grown tree:

Avoid trees that are "root-bound" in the can. Roots that circle around the edge of the container may become circling roots. Because of this, B&B trees are generally preferred. Always remove can, basket or pot when planting. (Cut any circling roots when planting.)

For some street plantings, such as next to narrow sidewalks, it may be necessary to plant trees that immediately have high crowns. In this case, the height of the lowest limbs should be specified when ordering from the nursery. However, whether raising the crown during the years after planting, or as the trees are grown in the nursery, it is generally important to maintain a ratio of $\frac{1}{4}$ green top to $\frac{1}{4}$ pruned trunk.

Tree boards should be wary buyers. Carefully write specifications and be sure an expert inspects the trees before accepting delivery on behalf of the city. After a good start with good nursery stock, remember — a program of pruning young trees is a wise, long-term investment.



Other sources of Information or Help

Tree City USA Bulletin will inform readers of helpful, up-to-date publications which provide more depth or that are readily available for community distribution. The editor welcomes sample copies to consider for inclusion in future revisions.

On the subject of pruning young shade trees, material is scattered throughout texts and literature of a more encompassing nature. In most states, the Cooperative Extension Service and state forestry offices have leaflets on pruning, although most focus on the care of mature trees. Greater detail is available in the scores of excellent books available on general tree care. As a starting point, we recommend three of the standards that should be on the shelf of all urban foresters and other individuals interested in urban forests:

GENERAL TEXTS:

- *Arboriculture — Care of Trees, Shrubs, and Vines in the Landscape*
Richard W. Harris, 1983,
Prentice-Hall, Inc.,
Englewood Cliffs, NJ (688 pp.)
- *Urban Forestry — Planning and Managing Urban Greenspaces*
Robert W. Miller: 1988
Prentice-Hall, Inc.,
Englewood Cliffs, NJ (404 pp.)
- *Urban Forestry*
Gene W. Grey and Frederick J. Deneke, 1986,
John Wiley & Sons, NY (299 pp.)

PRUNING BOOKS:

- *All about Pruning (96 pp.)*
Ortho Information Services
Chevron Chemical Company
P.O. Box 5047
San Ramon, CA 94583-0947
- *Pruning Handbook (96 pp.)*
Sunset Publishing
Menlo Park, CA 94025
- *Tree Pruning—A Worldwide Photo Guide (192 pp.)*
Alex L. Shigo
Shigo and Tree Associates
4 Denbow Road
Durham, NH 03824

LEAFLETS:

- For public distribution, consider this leaflet:
Homeowner's Guide for Beautiful, Safe and Healthy Trees
USDA Forest Service
Northeastern Forest Experiment Station Publications
359 Main Road
Delaware, Ohio 43015
- For assistance in writing pruning contract specifications, request the *Pruning Standards for Shade Trees* flyer from the National Arborist Association, P.O. Box 1094, Amherst, NH 03031. Include a stamped self-addressed envelope.

TRAINING:

The Arbor Day Institute, the continuing education and training arm of The National Arbor Day Foundation, offers workshops throughout the year on pruning and other tree care topics. Write to: The Arbor Day Institute, P.O. Box 81415, Lincoln, NE 68501-1415 or phone 402/474-5655 and ask about the Technical Arborist Workshop, Modern Arboriculture Workshop or Home Study in Arboriculture. Arrangements may also be made for local, co-sponsored workshops.



Homeowners can obtain advice on pruning young shade trees from their county extension agent, local arborist, or city forester. Communities can obtain assistance in designing pruning and other community forestry programs from their state forester's office.



TREE CITY USA

The Tree City USA program is sponsored by The National Arbor Day Foundation in cooperation with the USDA Forest Service and National Association of State Foresters. To be named as a Tree City USA, a town or city must meet four standards:

- Standard 1: A Tree Board or Department
- Standard 2: A City Tree Ordinance
- Standard 3: An Annual Community Forestry Program
- Standard 4: An Arbor Day Observance and Proclamation

Each winning community receives a Tree City USA flag, plaque, and community entrance signs. Towns and cities of every size can qualify. Tree City USA application forms are available from your state forester or The National Arbor Day Foundation.

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To order additional copies... Friends of Tree City USA members may obtain a single copy of any *Tree City USA Bulletin* free of cost. Quantities of any issue are available at 25 for \$6.25 or 500 for \$100. To order, specify the issue number and quantity; and make your check payable to: The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410.

To join the Friends of Tree City USA... to receive a subscription to the *Tree City USA Bulletin*... and to become more involved in the urban forestry movement in your town and throughout America, send a \$10 dues-donation to Friends of Tree City USA, National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410. Make your check payable to National Arbor Day Foundation.

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