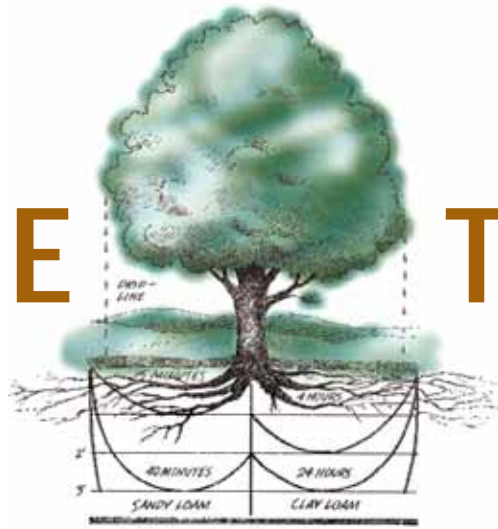
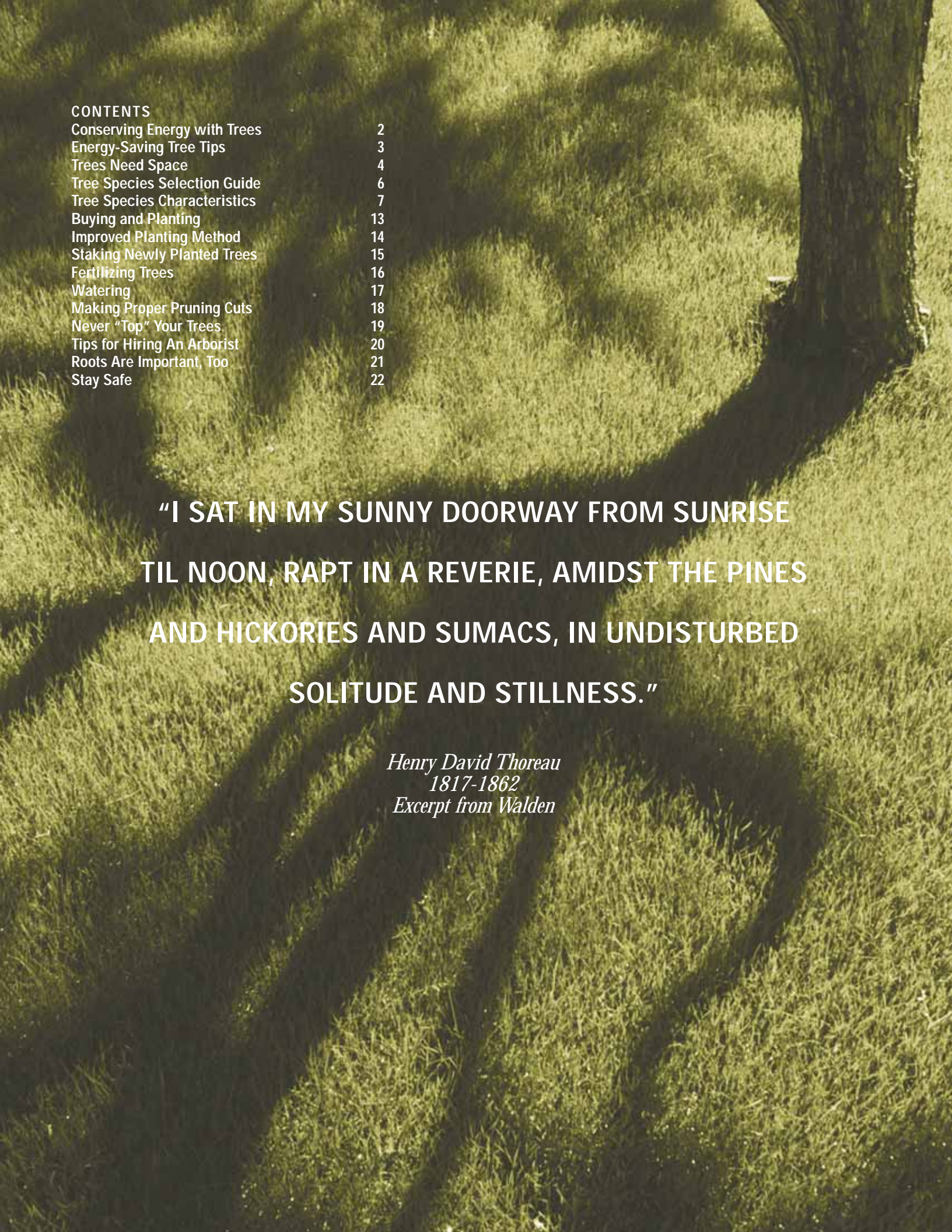


PUBLIC SERVICE COMPANY OF OKLAHOMA

TREE TIPS



A PLANNING GUIDE



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**"I SAT IN MY SUNNY DOORWAY FROM SUNRISE
TIL NOON, RAPT IN A REVERIE, AMIDST THE PINES
AND HICKORIES AND SUMACS, IN UNDISTURBED
SOLITUDE AND STILLNESS."**

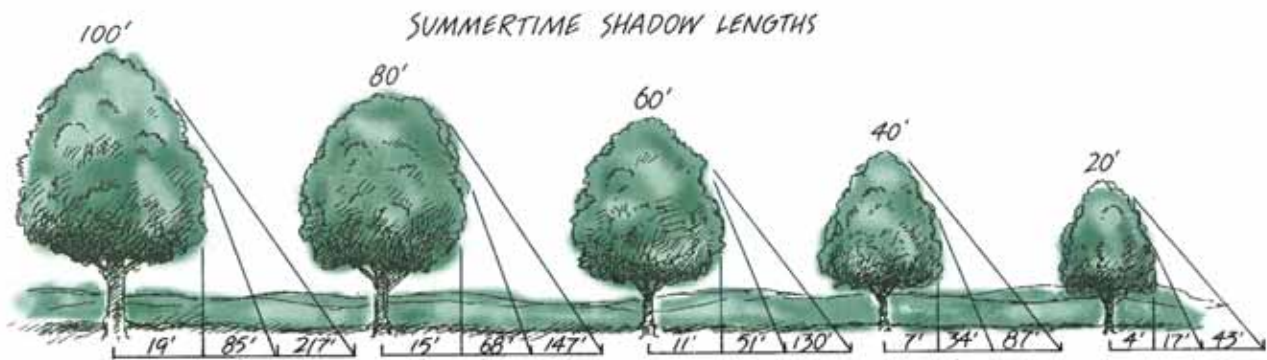
*Henry David Thoreau
1817-1862
Excerpt from Walden*

Trees are an important natural resource in the community we share. They add beauty to our surroundings. They clean the air and provide shelter and food for birds, small animals and insects. They protect us from harsh winter winds and provide shade on a hot summer's day. They can even lower utility bills when planted in the right spot. But when they're planted in the wrong spot, trees can threaten the dependability of your electric service and pose a safety hazard. ▲ **Our challenge at PSO is to balance respect for trees with our need to provide safe and reliable electric service.** ▲ Trees are the leading cause of electric power outages and contribute to “nuisance” problems, such as flickering lights and momentary outages. Just one tree limb in contact with a power line can disrupt electric service to dozens of families for blocks around.

▲ PSO's Forestry program is designed to reduce outages caused by trees through a program that combines line clearance work with public education on the importance of planting the right tree in the right place. ▲ Planned line clearance work is carried out by professional tree service contractors under the direction of PSO's staff arborists (degreed tree professionals). Following trimming standards set by the International Society of Arboriculture, these workers trim trees so limbs won't interfere with electric lines. These standards, coupled with proper trimming methods, preserve the tree's health while providing safe, reliable electric service. ▲ Sometimes it is necessary to remove a tree growing underneath the power lines rather than trim it. When we remove a tree, the PSO forester can help property owners select the proper tree to replant. Planting the right tree away from power lines will help replenish local urban forests with quality trees and eliminate tree/power line conflicts. ▲ PSO has drawn upon the knowledge of experts to assemble the information contained in “Tree Tips: A Planning Guide” to help you make good decisions about planting and caring for your trees. We hope you find it a useful information tool.

Happy tree planting!
Public Service Company of Oklahoma

Average shadow lengths for five different tree heights are shown for different times of day: the shortest distance is the shadow at noon, the middle distance is the shadow at 9 am and 3 pm, and the longest distance is the shadow at 8 am and 4 pm.



Planting shade trees is one of the simplest, most cost-effective, energy-saving steps you can take. The objective of locating trees for shade is to shield your home's roof and walls from the hot sun as well as to cool sidewalks and driveways that reflect heat. Energy savings can result with as little as 20 percent of the roof shaded. With 50 percent of the roof shaded, you can cut your cooling costs in half. Shade from trees and shrubs can also improve your air conditioner's operating efficiency by 10 percent.

Some trees are compact and produce dense shade while other trees are more spreading with less-dense shade. You should consider less-dense shade if you desire a larger variety of landscape planting under and around the trees.

BY PROPERLY PLANTING TREES AROUND YOUR HOME, YOU CAN PROVIDE A BEAUTIFUL LANDSCAPE AND ADD VALUABLE ENERGY-SAVING BENEFITS YEAR-ROUND. SHADE TREES KEEP OUTSIDE TEMPERATURES COOL IN THE SUMMER WHILE TREES PLANTED AS WIND-BREAKS BLOCK THE CHILLING WINTER WIND.

Other factors you should consider when planting trees for shade include tree placement, mature height of the tree, and the sun's angle during the summer. These factors determine how much shade the tree will cast over a given area. The chart above illustrates summer shadow lengths produced by trees at various times of the day.

CONSIDER THESE POINTS WHEN SELECTING TREES AND THEIR PLANTING LOCATIONS TO HELP SAVE MONEY ON YOUR ENERGY BILLS:

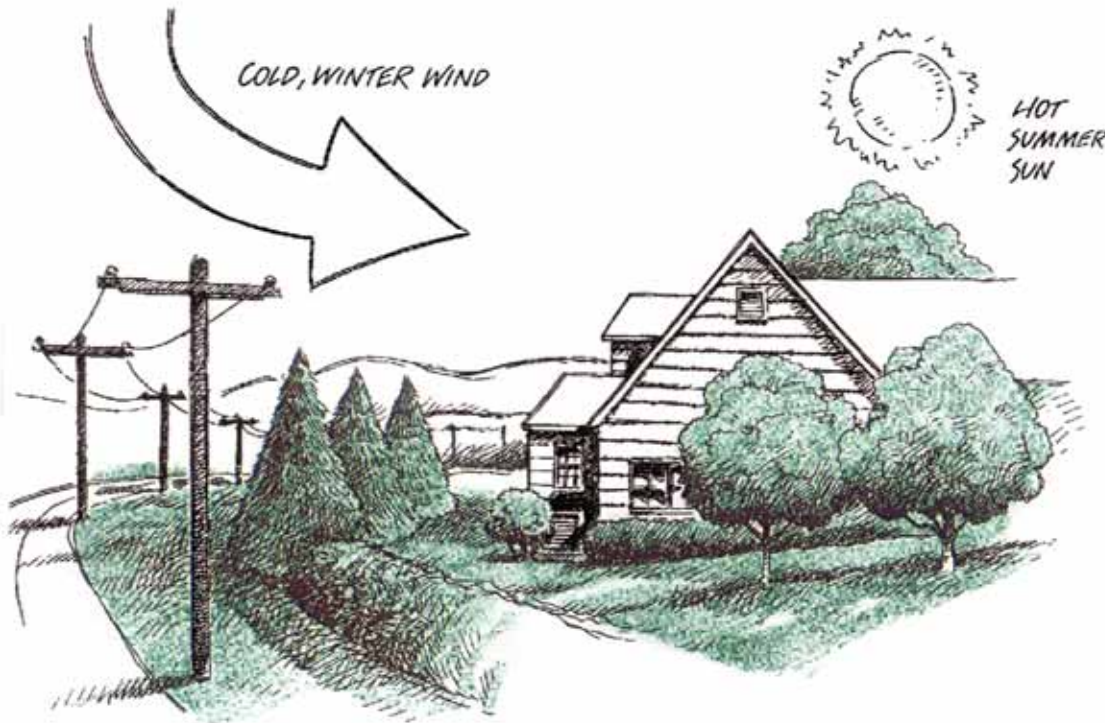
Windbreaks block the winter chill

While shade trees conserve energy in the summer, evergreen trees and shrubs planted to block the wind conserve energy in the winter. Planting pines and other evergreen trees to the north of your home can reduce winter wind velocities by 75 percent and possibly save up to 25 percent on heating costs.

It's important to know the direction of wintertime prevailing winds. The combination of evergreen trees and shrubs can be used as a barrier to redirect harsh winds away from your home. For best results, the windbreaks should be planted between 30 and 120 feet from your home or the area to be protected.

Shade trees block summer sun

- MEDIUM AND LARGE VARIETY TREES PROVIDE EXCELLENT COOLING BECAUSE THEY SHADE YOUR HOUSE AND YARD. THIS HELPS COOL BOTH OUTSIDE AND INSIDE TEMPERATURES. SELECT TREES WITH WIDE-SPREADING BRANCHES AND LESS-DENSE SHADE.
- CONSIDER THE SEASONAL SUN ANGLES WHEN PLANTING FOR SHADE. HOMES WITH LARGE SOUTH AND WEST EXPOSURES NEED SHADE IN MID TO LATE AFTERNOON SUN.
- WHEN PLANTING TO SHADE YOUR AIR CONDITIONING UNIT, BE CAREFUL NOT TO PLANT TOO CLOSE TO THE UNIT BLOCKING ITS AIR FLOW.
- IT TAKES TIME FOR TREES TO MATURE ENOUGH TO PRODUCE RESULTS, SO START PLANNING AS SOON AS POSSIBLE.



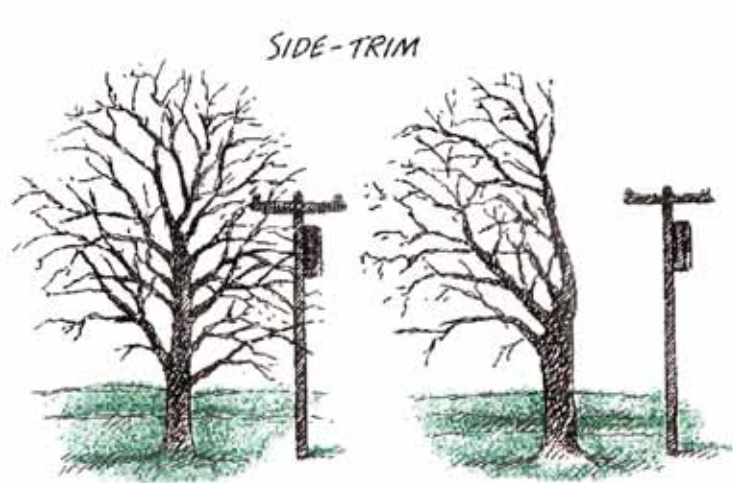
Plant shrubs under utility lines; small trees should be planted at least 15 feet away.

Plant evergreen varieties on the north and west side as a winter windbreak.

Evergreen shrubs can be planted at the edge of evergreen trees to help direct winter winds away from your house.

Shrubs and small trees can be planted to provide shade for air conditioners.

Plant medium to large deciduous trees on the east, south, and west side for shade and to block the hot summer winds.



Trees and shrubs add great beauty to the home landscape for little cost. However, many people are tempted to buy whatever tree is on sale and drop it into a hole without considering the site conditions or the type of tree. Our advice? Take time to plan. You'll be rewarded with beautiful results.

No single tree species is suitable for every site or for all landscaping purposes. Lack of planning can turn good intentions into serious problems. The wrong tree in the wrong location can result in clogged sewers, cracked foundations and sidewalks, and even power outages as trees grow into nearby electric lines.

Look before you leaf

Trees in contact with electric lines are the leading cause of power outages and quality of service problems, such as flickering lights and momentary loss of service.

Unfortunately, thousands of trees are growing too close to the power lines and must be trimmed or removed to prevent power outages and safety hazards. (The illustration above shows how trees growing too close to the power lines are trimmed to protect tree health while providing the necessary line clearance for reliability and safety.)

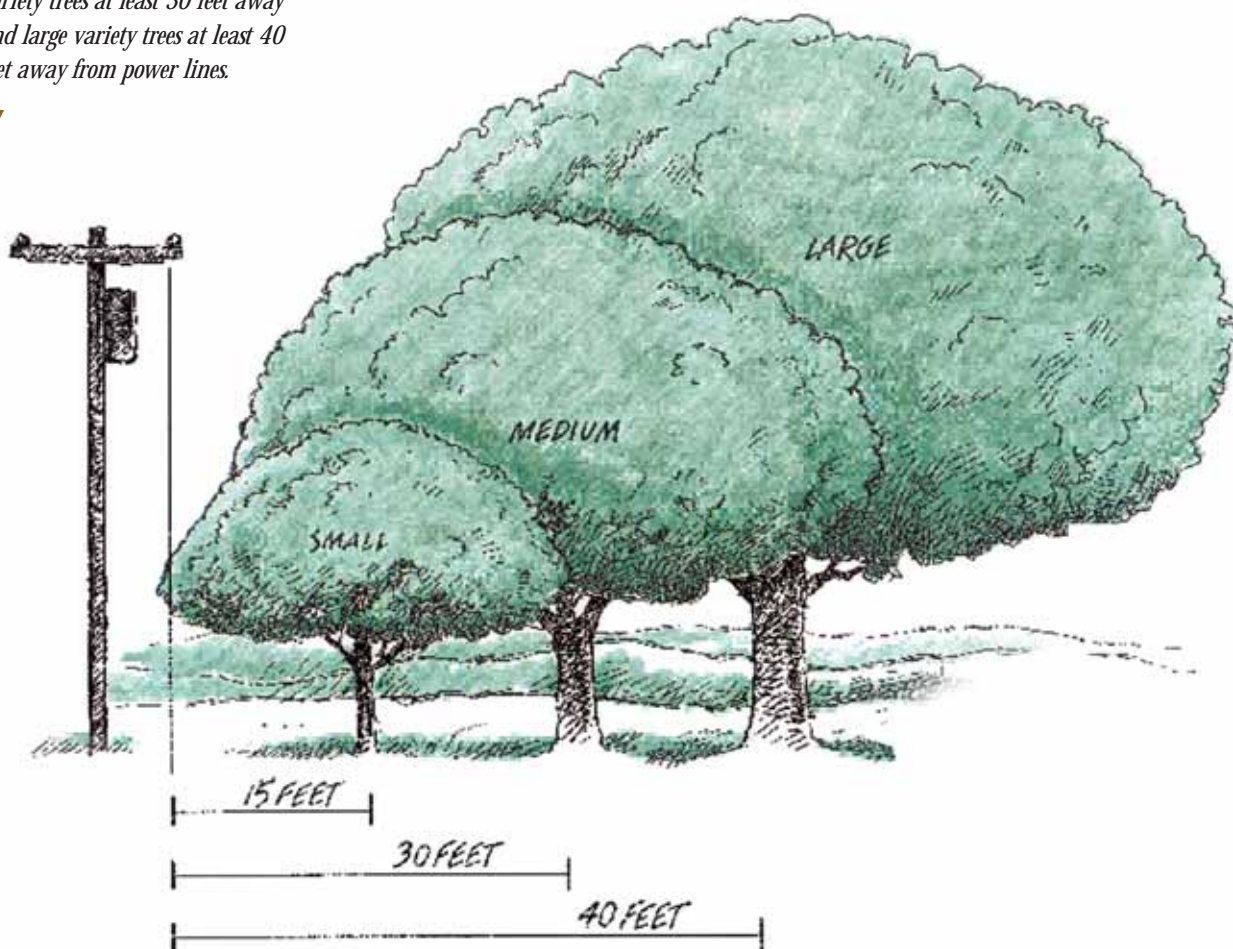
THE "LOOK BEFORE YOU LEAF" ILLUSTRATION (AT RIGHT) DEPICTS RECOMMENDED DISTANCES FOR PLANTING TREES AWAY FROM POWER LINES. THE DISTANCE IS MEASURED PERPENDICULAR TO THE POWER LINES. IF YOU FOLLOW THE SUGGESTED PLANTING DISTANCES, YOUR TREES MAY NEVER NEED UTILITY TREE TRIMMING.

ALSO, NEVER PLANT TREES OR SHRUBS WITHIN 10 FEET OF A TRANSFORMER MOUNTED ON THE GROUND OR ON A UTILITY POLE THAT MIGHT BE IN YOUR YARD. THIS ALLOWS FOR ACCESS TO PERFORM ROUTINE MAINTENANCE.

When you're ready to add a tree in your yard, PSO urges you to look up first before heading to the nursery to make sure you're not about to plant the wrong-size tree too close to the power lines.

The key is to plant small, medium or large trees the appropriate distance from the power lines so they are less likely to grow into the lines.

Never plant a tree underneath power lines. Only low-growing shrubs should be planted below power lines. Small variety trees need to be planted at least 15 feet away from power lines, medium variety trees at least 30 feet away and large variety trees at least 40 feet away from power lines.



Hundreds of tree species are available to purchase and plant: tall trees, short trees, ornamental and shade trees. Some trees can grow in full sun while others need some shade. By carefully selecting the right tree for the right place, your investment will pay off each year. ▲ Avoid buying the fastest growing or the cheapest tree you can find. It may be a costly mistake you'll pay for later. Fast-growers usually are weak-wooded trees that are damaged easily during storms. These trees are hazardous if located adjacent to dwellings or power lines and they will require repeated pruning. In addition, they are often prone to surface roots and insect and disease problems. Consider why you're planting the tree and then find a tree that fits those needs. **To ensure the tree you select meets your needs, answer the planning questions below.** ▲ The following chart lists many species of trees that grow well in Oklahoma. Take this guide with you when you visit your local nursery or greenhouse. Use it to discuss your landscaping needs with the nursery representative. Remember, this is only a guide to help you get started, not an all-inclusive list.
















PLAN, BEFORE YOU PLANT. THE FIRST STEP IS TO DRAW A PLANNING SKETCH OF YOUR YARD SHOWING ALL STRUCTURES, UTILITIES AND EXISTING PLANT MATERIAL. (REFER TO THE INSIDE BACK COVER.) LANDSCAPING SOFTWARE ALSO IS AVAILABLE FOR HOME COMPUTERS.

MARK THE AREAS WHERE YOU WANT TO PLANT, THEN ASK YOURSELF THESE QUESTIONS:







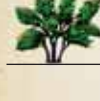


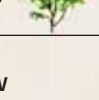
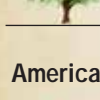

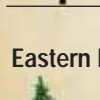
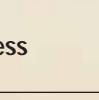

- What kind of space is available in the site selected for tree planting? Are there utility lines or other facilities above or below?
- Are there other structures such as storage sheds, sidewalks, pools, etc. that could be affected?
- Are there existing trees and shrubs in the area?
- What is the tree's purpose: accent, color, energy conservation, screening, etc.?

- Does the tree you want meet that purpose?
- How much maintenance does the tree require? For example, does it need annual pruning to remain attractive or just periodic pruning?
- Does it have leaves or seeds that may cause a bigger-than-usual litter problem?
- Is the tree adapted to your soil conditions? For example, is your soil shallow, rocky or clay?
- Does the tree need frequent watering or is it drought-tolerant? Can it withstand wind and ice?
- What kind of disease and insect problems are common to the tree?
- Are improved varieties of the tree available?









TREE SPECIES CHARACTERISTICS

		SMALL / 8-30 FEET AT MATURITY	MEDIUM / 31-50 FEET AT MATURITY	LARGE / 51-80 FEET AT MATURITY	FAST, MODERATE - SLOW	FULL SUN, PARTIAL SHADE, SHADE	TOLERANT TO POOR SOILS	PREFERS MOIST, WELL-DRAINED SOILS	ORNAMENTAL, SHADE, WINDBREAK, BROADLEAF EVERGREEN, EVERGREEN	IMPROVED VARIETIES AVAILABLE	ATTRACTIVE, SPRING, SUMMER, FLOWERS, FALL & WINTER FRUIT	YELLOW, GOLD, ORANGE, RED, CRIMSON, FALL LEAF COLOR	
	Rusty Blackhaw	X			S	F/P	X	X	O		SP/F	O/R	Viburnum rufidulum
	Mexican Buckeye 	X			F	F/P	X	X	O		SP/F	Y	Ungnadia speciosa
	Carolina Buckthorn	X			M	F/P	X	X	O		F	Y	Rhamnus caroliniana
	Flowering Crabapple 	X			M	F			O	X	SP		Malus spp.
	Crapemyrtle	X			F	F	X	X	O	X	S	Y/O/R	Lagerstroemia indica
	Flowering Dogwood 	X			M/S	P/S		X	O	X	SP/F	O/R	Cornus florida
	Rough-Leaf Dogwood	X			F/M	F/P		X	O	X	SP		Cornus drummondii
	Eve's Necklace 	X			M	F/P	X	X	O		SP/F		Sophora affinis
	Washington Hawthorne	X			M/S	F/P	X	X	O		SP/F	O/R	Crataegus phaenopyrum
	Deciduous Holly 	X			M/S	F/P	X	X	O	X	F		Ilex decidua
	Yaupon Holly	X			F/M	F/P	X	X	O/B	X	F		Ilex vomitoria
	Saucer Magnolia 	X			M	F/P		X	O	X	SP		Magnolia soulangiana
	Amur Maple	X			F/M	F/P	X	X	O	X		Y/R	Acer ginnala
	Honey Mesquite 	X			S	F	X	X	O	X	F		Prosopis glandulosa
	Goldenrain Tree, Panicked	X			M	F	X		O/S		SP/F	Y	Koelreuteria paniculata
















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	Texas Persimmon (Chapote)	X			M/S F/P	X X		O		SP/F			Diospyros texana
	Mexican Plum (Big Tree Plum)	X			M F/P	X X		O X	X	SP/F	Y		Prunus mexicana
	Purple-Leaf Plum	X			M/S F/P			X O	X	S			Prunus cerasifera "atropurea"
	Eastern Redbud	X			F/M F/P	X X		O X		SP			Cercis canadensis
	Texas Redbud	X			M F	X X		O		SP			Cercis canadensis var. texensis
	Russian Olive	X			F/M F	X X	O/W	X					Elaeagnus angustifolia
	American Smoketree	X			M F	X X		O X	X	SP/F	Y/O/R		Cotinus obovatus
	Prairie Flameleaf Sumac	X			M F	X X		O X	X	F	R		Rhus lanceolata
	Vitex (Chaste or Lavender Tree)	X			F/M F	X X		O X	X	S			Vitex angus-castus
	Desert Willow (Flor de Mimbres)	X			F F	X X		O X	X	SP/S			Chilopsis linearis
	Corkscrew Willow	X			F/M F			X O					Salix matsudana
	American Holly	X	X		M/S F/P			X O/B	X	F			Ilex opaca
	Callery Pear	X	X		F/M F	X X		O X	X	SP	R		Pyrus calleryana
	Eastern Red Cedar		X		M/S F	X		W/E					Juniperus virginiana
	Arizona Cypress		X		F F	X		O/W/E					Cupressus arizonica

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	Lacebark Elm		X		M F/P	X X	O/S	X			Y		Ulmus parvifolia
	White Mulberry		X		F F	X X	O/S/W	X			Y		Morus alba
	Post Oak		X		S F	X X	O/S						Quercus stellata
	Osage Orange		X		F F	X	S/W	X			Y		Maclura pomifera
	Afghan Pine (Eldarica Pine)		X		F/M F	X X	O/W/E						Pinus eldarica
	Japanese Black Pine		X		F/M F		X	W/E					Pinus thunbergiana
	Chinese Pistache		X		M F	X	O/S		F	O/R			Pistacia chinensis
	Sassafras		X		F F/P		X	O/S			O/R		Sassafras albidum
	River Birch		X		F F/P		O/S				Y		Betula nigra
	Western Soapberry		X		F/M F	X	O/S		F	Y/O			sapindus drummondi
	Chinese Chestnut		X		M F		X	O/S	X	F	Y		Castanea mollissima
	Virginia Pine		X	X	M F	X		W/E					Pinus virginiana
	Red Maple			X	M F/P		X	O/S	X		R/C		Acer rubrum
	Green Ash			X	F F	X X	O/S	X			Y/O		Fraxinus pennsylvanica
	Baldcypress			X	F/M F	X X	O				O		Taxodium distichum

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	Blackgum			X	F/M	F/P		X	O/S			O/R	Nyssa sylvatica
	Cedar Elm			X	M	F	X	X	S			Y	Ulmus crassifolia
	Ginkgo (Male)			X	S	F	X	X	O/S	X		G	Ginkgo biloba
	Honeylocust			X	M/S	F	X		O/S/W	X	F	Y	Gleditsia triacanthos
	Kentucky Coffeetree			X	F/M	F/P	X	X	O/S			Y	Gymnocladus dioicus
	Bur Oak			X	M/S	F	X	X	O/S		F		Quercus macrocarpa
	Southern Magnolia			X	S	F/P		X	O/W/B	X	SP/S		Magnolia grandiflora
	Chinquapin Oak			X	M/S	F	X	X	S			O/C	Quercus muhlenbergii
	Shumard Oak			X	F/M	F	X	X	O/S			O/R	Quercus shumardii
	Water Oak			X	F	F/P		X	O/S			Y	Quercus nigra
	Pecan			X	M	F			S	X	F	Y	Carya illinoensis
	Austrian Pine			X	S	F	X		O/S W/E				Pinus nigra
	Loblolly Pine			X	F/M	F	X	X	O/E	X			Pinus taeda
	Sweetgum			X	F/M	F		X	O/S	X		O/R	Liquidambar styraciflua
	Tuliptree / Yellow Poplar			X	F	F		X	O/S		SP	Y	Liriodendron tulipifera

PROBLEMATIC TREES

Bradford Pear. Highly over-planted, fast-growing landscape tree. Prone to much storm and insect/disease damage.

Eastern Cottonwood. Fast-grower. Produces massive amount of cotton-like seeds that can cause allergy problems and clog air conditioners. Even the cotton-less variety produces a massive root system that can destroy sewers, walks, foundations, etc. The branches are susceptible to wind and ice damage.

Mimosa. Short-lived tree. Weak-wooded; susceptible to wind and ice damage. Has branch sucker problem under stress. Disease and insect problems likely as tree grows older.

Lombardy Poplar. Short-lived tree. May live only ten years before disease and wood bores destroy it. Weak wood susceptible to wind and ice damage.

White Poplar. Fast-grower. Susceptible to wind and ice damage. Has extensive root system that produces suckers or sprouts. May have insect problems.

Silver Maple. Widely over-planted species. Weak wood susceptible to wind and ice damage. Major surface root problems.

Chinese Tallow. Rapid growing hearty weed-type tree. Often forms thickets.

Alianthus (Tree of Heaven). Extensive root system. Root suckers or sprouts spring up along root system and eventually take over the landscape.

Salt Cedar. Fast-growing species considered a pest because it chokes small waterways and crowds out desirable vegetation.

IMPROVED VARIETIES

Flowering Crabapple.

CALLAWAY. Light pink buds with white blooms.

TOINIKO. Dark maroon buds with red-purple blooms.

MARGARET. Pink blooms in clusters.

JACKII. White blooms.

Flowering Dogwood.

CHEROKEE CHIEF. Dark Pink blooms.

CLOUD 9. White blooms.

WHITE CHEROKEE PRINCESS. White blooms in early spring.

FIRST LADY. Green-yellow variegated foliage.

Green Ash.

URBANITE. Good crown development, lustrous leaves and protective bark.

MARSHALL SEEDLESS. Drought-tolerant with dark green foliage and yellow fall color.

SUMMIT. Same as above but slower growing.

Red Maple.

DRUMMONDI. Medium green foliage with red-orange fall color.

OCTOBER GLORY. Glossy green foliage with scarlet to crimson fall color.

RED SUNSET. A fast grower with good foliage color and red fall color.

AUTUMN FLAME. Smaller leaves and early fall color.

CADD0. Drought-resistant. Native to southwestern Oklahoma.

Proper tree planting. In typical compact urban soils, the planting area needs to be at least 5 times the root ball diameter. The root ball must nest on solid, undisturbed soil. No soil amendments are necessary. Water thoroughly and add wood chips over the planting area.



When you're not sure what to look for, selecting trees at the nursery can be confusing. The best size for do-it-yourself projects ranges from seedlings up to about 2 inches in caliper. Caliper refers to the thickness of the trunk 6 inches above the root ball. Larger trees are heavy and should be planted by professional landscapers.

Once you have decided the size you want, look for the following:

- 1** A single, straight main trunk with no broken or dead branches, and smooth bark with no cracks, splits or sunken areas.
- 2** Check the twigs. You can tell if they are healthy by barely scratching the bark with your thumbnail. If you uncover bright green, the tree is healthy; however, if dull green or brown show, keep looking for a healthier tree.

- 3** Check the root ball. The tree's root ball should be tight and moist. If the root ball is dry or the tree seems loose in the root ball, avoid that tree.
- 4** Many nurseries grow trees and shrubs in pots. If roots are circled around the top of the pot or are growing heavily out of the bottom, avoid that tree.
- 5** Carry your tree by the root ball, not the trunk. Root damage can occur if the heavy root ball is left unsupported.
- 6** Plant the tree using the improved planting method as detailed on page 14.



THE SURVIVAL OF YOUR TREE DEPENDS ON SOIL CONDITIONS AND SPACE AVAILABLE FOR THE ROOTS TO GROW. BECAUSE THE SOIL AROUND MOST HOMES HAS BEEN COMPACTED DURING CONSTRUCTION AND ANNUAL LAWN MAINTENANCE, WE RECOMMEND THESE STEPS:

- First, be sure to call to have all underground utilities located before digging.
- Make sure the tree is planted away from overhead power lines. Refer to page 5.
- Mark out the planting area at least five times the root ball's diameter. See proper tree planting illustration on page 13.
- Loosen the soil in the planting area to a depth of about 12 inches, or so. Remove weeds and grass from the soil by turning the soil with a spade. If needed, dig a deeper hole in the middle of the area only as deep as the root ball, being sure the tree will sit on solid ground. The top of the root ball should not be below surrounding grade level.
- Set the tree upright in the shallow hole and cut any wire basket or twine used to secure the root ball. Remove the burlap, cord or wires from the root ball.
- If the tree is grown in a container, be sure to remove the container and gently spread out the roots that may be curled in the bottom.
- Shovel the original soil back around the root ball. Time-release fertilizer may be added to the soil, but other soil amendments are not recommended. Soil amendments like peat moss or potting soil, etc. will only hinder the growth of new roots into the surrounding soil.
- With a shovel (not your foot) pack the soil around the base of the root ball. This will help hold the tree upright without using stakes.
- Water the area thoroughly and add soil to any sunken areas. Then add 3 inches of wood chips or mulch, away from the trunk, over the planting area. The wood chips will help retain water and also help protect the young tree from lawn mower and trimmer damage.



STAKING MAY NOT BE NECESSARY, ESPECIALLY ON SMALLER TREES; HOWEVER, IF A TREE CONTINUES TO LEAN IN THE PLANTING HOLE, STAKING IS RECOMMENDED. IN MOST CASES, STAKING ONLY REQUIRES A SINGLE METAL FENCE POST OR LONG WOODEN STAKE.

- On the opposite side of the lean (usually the direction from which the prevailing wind blows) drive the stake into the ground two or three feet from the tree. Leave enough of the stake above ground so at least the top of the stake is even with the lowest branch.
- Use small rope or heavy twine to tie the tree to the stake. It is best not to use wire as it can damage the tree even if you use protective

hose over the wire. Remember, the rope and stake are designed to keep the tree from blowing over, not to keep it from moving. The movement of the tree helps to strengthen the trunk and roots.

- Don't leave the stake on a tree for more than one growing season. If the tree falls over after one season, there are other problems that need to be addressed, such as insect or disease problems or adverse soil conditions. It may be best to replace the tree with a new tree in a different location.
- Tree wrap is not recommended because it can cause rot to develop along the trunk underneath the wrap.

FERTILIZER APPLICATION RATES (IN POUNDS)

		TREE DIAMETER IN INCHES											
		*2	4	6	8	10	12	14	18	22	26	30	34
Nitrogen Percentage	12%	8	16½	25	33	41½	50	14	18	23	27	31	35
	14%	7	14	21	28½	35½	42½	12½	16	19½	23	26½	30
	16%	6	12½	18½	25	31	37½	11	14	17	20	23	26
	18%	5½	11	16½	22	27½	33	9½	12½	15	18	20½	23½
	20%	5	10	15	20	25	30	8½	11	13½	16	18½	21
	27%	3½	7	11	14½	18½	22	6	8	10	12	13½	15½
	33%	3	6	9	12	15	18	5	6½	8	9½	11	12½
	36%	2½	5½	8	11	13½	16½	4½	6	7½	9	10	11½

* Represents pounds of fertilizer needed.

Example: If you plan to use a 15 percent nitrogen fertilizer and your tree is 21 inches around. (Diameter equals 21 / 3 = 7") In the far left column the closest number to 15 is 16 percent. Along the top the closest diameter to 7 but not larger is 6. At the point where the two columns meet indicates you will need 18-1/2 lbs. of 15 percent fertilizer.

*Application rate for trees 2" to 12" is figured at 1 pound of actual nitrogen per 2" of tree diameter. For trees 14" and up the rate is 1/4 pound of actual nitrogen per 2" of diameter.

Fertilizing trees can be a confusing issue. There seem to be as many fertilizing methods as there are fertilizers. The most important thing to remember is that your trees are part of the bigger picture: your yard. What you do to your lawn and flowerbeds will have a direct impact on your trees and shrubs. If you have an annual lawn maintenance plan that includes fertilizing, you are also fertilizing your trees. Current research shows over 85 percent of a tree's root system is in the top 24 inches of the soil

Most soils have an ample supply of nutrients for good tree growth. The best thing to do before you fertilize is to have a soil sample tested. A complete soil test will indicate what nutrient deficiencies may exist in your soil. The test will also indicate soil pH.

Soil pH

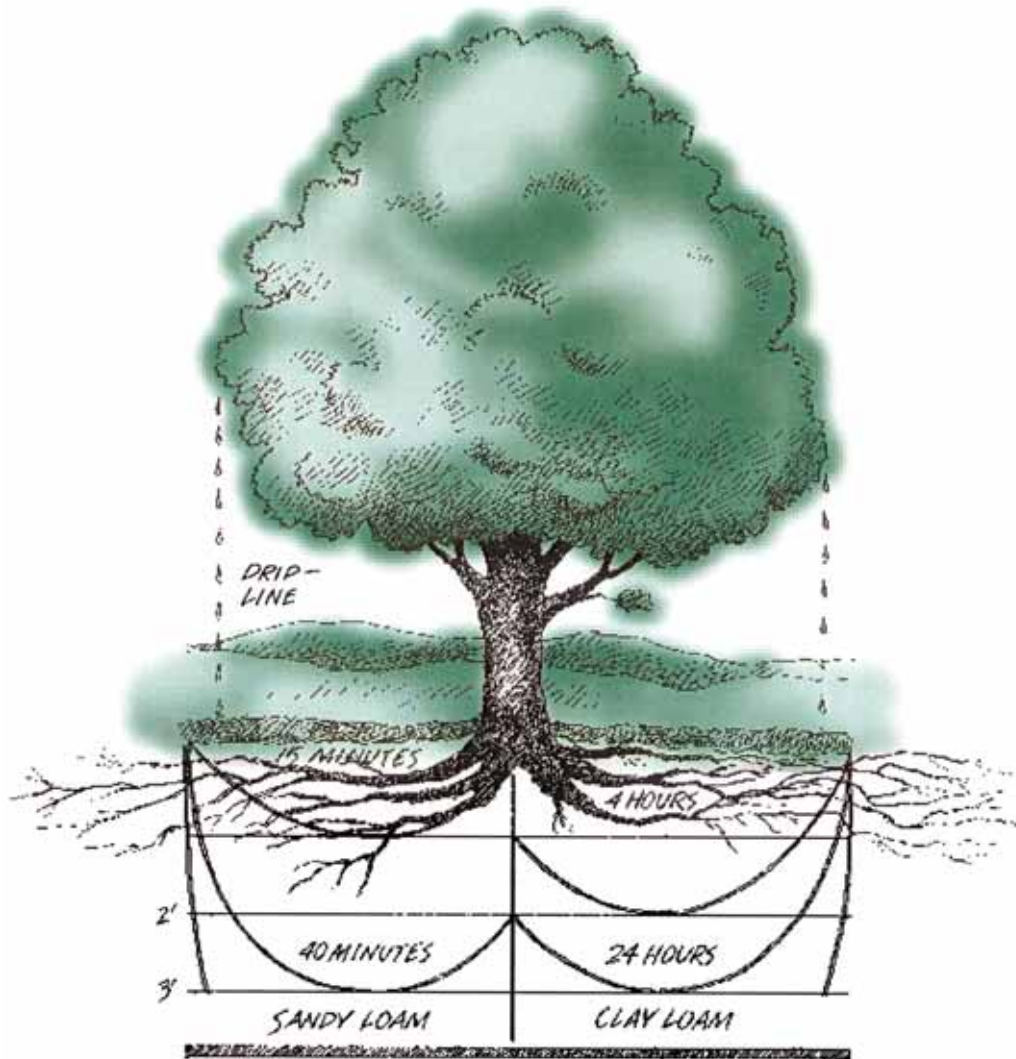
Soil pH is probably the single most limiting factor affecting plant growth. Generally, soils tend to become more acidic as fertilizers are used. A soil pH above 7 is alkaline and below 7 is acid. Most trees prefer a soil pH ranging between 6 to 7.5. If soils become too acid, or too alkaline, nutrients can become unavailable to tree roots and cause unhealthy trees. Several soil pH test kits are available on the market. However, to get a complete nutrient test you will need to take your soil sample to your Cooperative Extension Office.

IF THE SOIL TEST INDICATES THAT YOU NEED TO FERTILIZE, HERE ARE SOME HELPFUL HINTS:

- Fertilize every couple of years.
- Use a time-release fertilizer that has a moderate to low percentage of nitrogen (N), and a low percentage of phosphorous (P) and potassium (K).
- The best time to fertilize is mid-fall (September) and late spring (May). Distribute the fertilizer evenly under the branch spread and 10 feet or more beyond. When you fertilize trees or lawn, be sure to water thoroughly afterward.

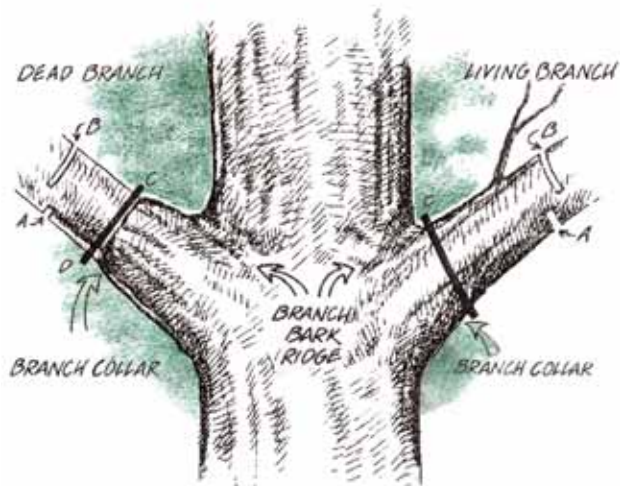
Refer to the fertilizer application chart above to help you determine how much is enough. Two things you will need to know to use the chart are fertilizer nitrogen percentage and tree diameter. Nitrogen percentage can be determined by finding the fertilizer numbers on the front of the bag. The first number in the three number series is the percent of nitrogen. For example, a 16-6-12 fertilizer has 16 percent nitrogen.

Tree diameter is determined simply by measuring the distance around the trunk 4-1/2 feet above the ground. Divide the distance in inches by 3 to figure the diameter.



A watering program is important to help establish newly planted trees. A slow, soaking watering once a week for the first three years is essential. Short, daily watering is harmful because it makes plants less drought-tolerant, and it pushes needed oxygen out of the soil.

Soil texture affects how long it takes water to soak into the root zone. The illustration above shows the time it takes water to soak into sandy or clay soil. Sandy soil requires more frequent watering because water passes through it more quickly.

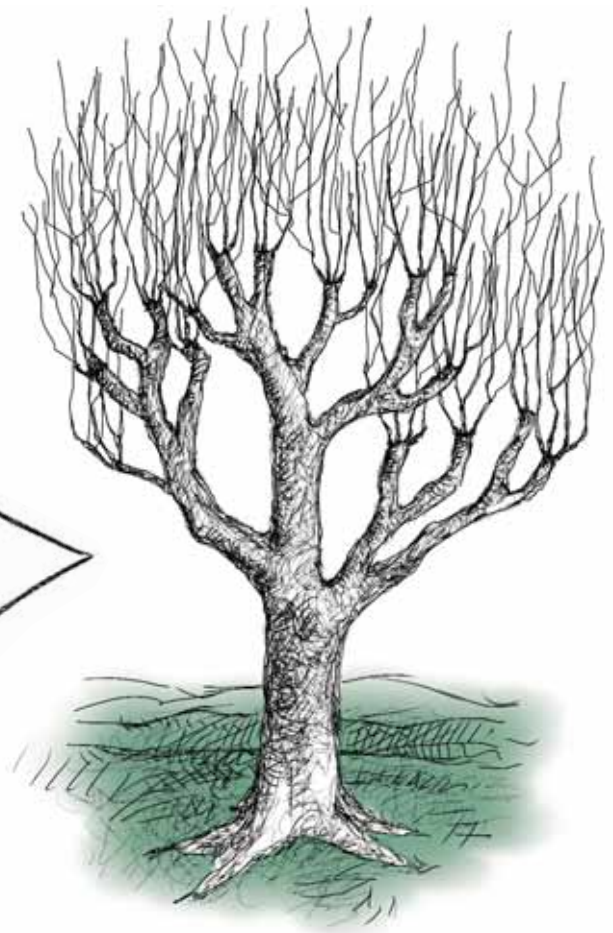
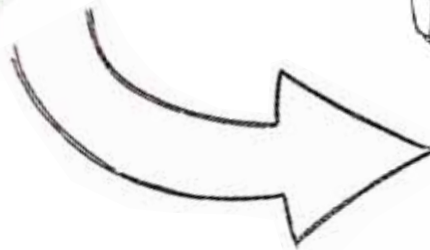


To remove larger branches, it's best to remove the bulk of the weight before making the collar-cut. As the illustration shows, make the first cut by sawing upward one-quarter of the way through the branch (A). Next, cut downward through the branch until it drops (B). Make the final collar-cut (C to D) without peeling the bark down the trunk. We don't recommend the use of pruning paint or any other type of dressing. These products may only inhibit the branch collar from growing new wood.

Next to planting your tree in the right place, correct pruning is the best way to prevent future problems. Merely taking a saw and cutting off an unwanted branch is not the right way to prune. Stubbed-off branches and branches cut flush with the trunk — common pruning mistakes — usually result in disease and insect problems for your tree.

Trees heal only by growing new wood over the wound; they cannot replace damaged tissue with new tissue. The faster the new wood grows over the area, the sooner the area is protected from disease or insects. Fortunately, nature has given trees something to help new wood grow faster: a branch collar.

The branch collar is a swollen area at the base of every branch fork. Pruning cuts should be made at the point where the branch meets the swollen collar (see pruning illustration). Pruning at the collar allows the tree to quickly grow new wood over the wound. Using this technique, you can prune at any time of the year. On the other hand, by cutting flush with the trunk, you remove the collar making it harder for the tree to cover the wound. By leaving stubs, the new wood is not able to grow over the wound.



“Topping” a tree harms its health and mars its natural appearance permanently. At first, a “topped” tree resembles a hat-rack; soon weak, odd-looking sprouts pop up. A “topped” tree will never again produce normal branches.

Healthy alternative to topping

AS AN ALTERNATIVE TO TOPPING/HAT-RACKING, “LATERAL-BRANCH TRIMMING” CAN BE USED TO REDUCE A TREE’S OVERALL SIZE. LATERAL-BRANCH TRIMMING RETAINS THE OVERALL SHAPE OF THE TREE AND INCORPORATES PROPER PRUNING CUTS. RATHER THAN ALL BRANCHES BEING LOPPED OFF LEAVING STUBS, SELECTED BRANCHES ARE PRUNED AT THE FORK USING THIS TECHNIQUE. REDUCING TREE SIZE CAN OFTEN BE ACCOMPLISHED WITHOUT HAVING TO CUT BRANCHES LARGER THAN SIX INCHES IN DIAMETER.

“Topping” your tree (trimming the tree to resemble a “hat-rack”) is the worst thing that can be done to harm the health of a tree. Trees are often hat-racked because the owner becomes worried that the tree is growing too large, or the owner believes topping is “good” for the tree because of the new foliage that results. Regardless of what reason is given, the fact is science clearly shows that topping/hat-racking only produces negative results, such as the following:

- Damage to the tree’s health. As the protective crown is removed, the trunk is exposed to possible scalding by the sun.
- Disease and insect infestation on the stubbed branches resulting in accelerated wood decay and spread of diseases.
- Excessive re-growth. The new weakly attached sprouts grow with narrow v-shaped forks, making them more susceptible to wind and ice damage.

ARBORISTS ARE TREE PROFESSIONALS AND ARE THE MOST KNOWLEDGEABLE PERSONS TO CONSULT ABOUT YOUR TREES. ARBORISTS MAY HAVE A DEGREE IN FORESTRY OR HORTICULTURE (OR OTHER FIELD OF STUDY) OR THEY MAY POSSESS CERTIFICATION BY THE INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA). SOME ARBORISTS HAVE BOTH A DEGREE AND ISA CERTIFICATION.

When to hire an arborist

There are times when a property owner would benefit from hiring an arborist for consultation services, but it's not always easy to determine when this should be done. Here's a suggestion for how to make that determination:

TAKE A CLOSE LOOK AT YOUR TREES AND ASK YOURSELF THESE QUESTIONS:

- Are there cracks in the trunk or splits in the bark?
- Are there storm-damaged branches or other branches that need to be pruned?
- Are branches dying?

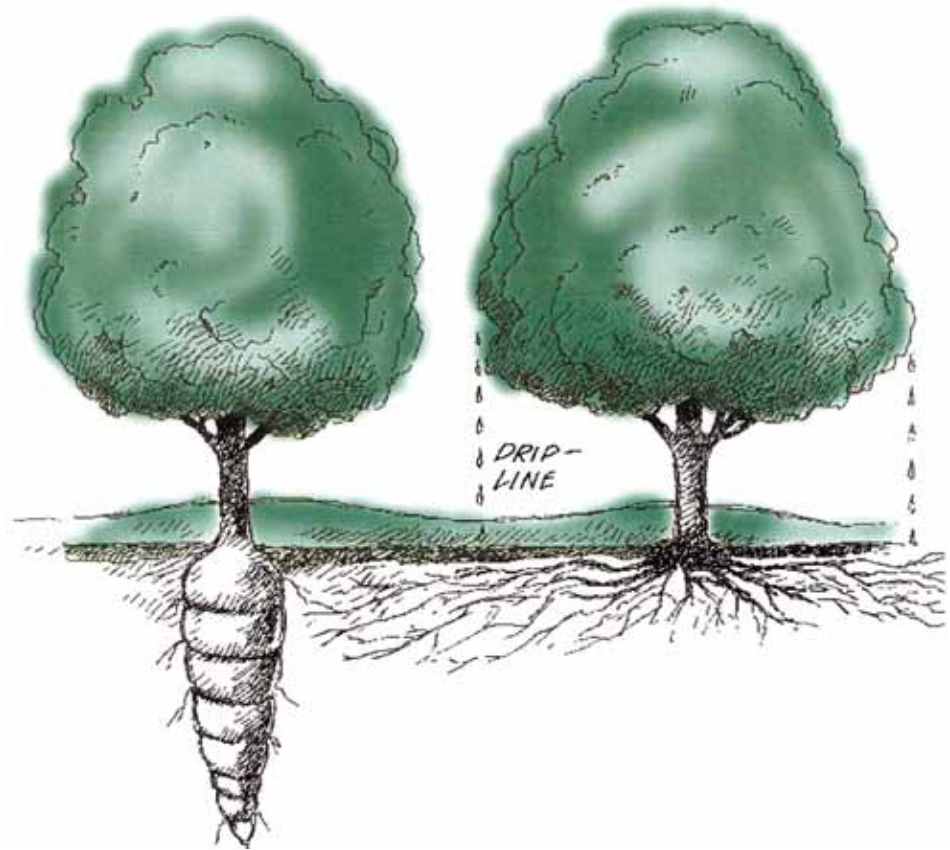
If the answer is "yes" to any of these, you should consult an arborist.

How to hire an arborist

HERE ARE SOME TIPS FOR SELECTING THE RIGHT ARBORIST FOR THE JOB:

- Look in the phone book's yellow pages for tree companies that list their educational credentials, such as a degree in Forestry or Horticulture, and/or certification by the International Society of Arboriculture (ISA).
- Ask your friends and neighbors if they can recommend a tree company with which they've had a good experience.
- Ask to see liability and worker's compensation insurance certificates. Call the insurance company to see if the policy is current. If damage occurs to your property or to a neighbor's or someone is injured, you are responsible if they don't have insurance.
- Ask for local references and verify the quality of work. Have more than one company look at your job. It's best to get at least three opinions.
- Ask about the company's pruning techniques. If they say they "flush cut" or suggest "topping" or "hat-racking" your tree, don't hire them.
- Be wary of anyone going door-to-door offering to do tree work. Most reputable tree companies have plenty of work without knocking on doors.
- Don't be rushed by bargains; never hire someone who insists on being paid before the work is complete.

Tree roots don't grow like carrots. Eighty-five percent or more of a tree's roots exist in the top 24 inches of the soil. Roots can spread twice the height of the tree in good soil. In poor soil, they may only spread slightly past the branch drip-line. ►



Heavy construction equipment, vehicle traffic, lawn maintenance, and foot traffic can threaten the health of your tree. Why? Because they trample and compact the soil, starving and suffocating the tree's roots.

Tree roots need oxygen and water to survive and grow. Compacted soil around the roots reduces the amount of oxygen and water available to the tree roots. Eventually soil compaction can suffocate the roots causing the tree to decline and die.

Keeping root damage to a minimum

When a building or remodeling project requires heavy machinery on your property, be sure to tell the contractor, the foreman on site and anyone else involved in the project that you want your trees protected from damage during the work.

- Make sure protective barricades are erected around trees. Protect as much area around a tree as possible, but at least out as far as the branches "spread" (also called the tree's "drip-line"). Roots can

spread up to twice the height of a tree in good soil. In clay soil, tree roots may only grow a few feet past the drip-line.

- Make sure utility contractors trench outside the protective barricades around your tree. If that's not possible, insist they bore or tunnel rather than trench.
- Use bricks, flagstone, gravel, etc. rather than continuous cement walks under trees.
- Use a turf aerator on an annual basis to aerate the soil under and around trees.

Here are some tips for protecting trees from damage by mowers and trimmers:

- Use mulch around young trees. This also will help conserve water.
- Plant perennial ground cover under older trees. Use your creativity to design a ground cover bed as part of your overall landscape design.
- Place a section of corrugated PVC pipe around the base of the tree during the first few years of establishment.

PSO IS CONCERNED ABOUT YOUR SAFETY. HERE ARE SOME SAFETY TIPS TO KEEP IN MIND WHEN LANDSCAPING AND DOING TREE WORK AROUND YOUR PROPERTY:

Underground lines — call before you dig

Before you dig, remember to call your local underground locating service at least 48 hours in advance. The call is free. Touching an underground power line — with anything — could result in a serious or fatal injury. Protect yourself at home and at work. Call for help in locating these lines before you dig.

In Oklahoma call 1-800-522-6543, a minimum of 48 hours before digging.

Overhead power lines

Never attempt to trim or remove trees near any power line. Serious life-altering injuries and fatalities have occurred when untrained or

improperly trained individuals attempted to do such work.

Remember: Electricity moves at the speed of light. Only tree contractors who are certified to work near power lines by the Occupational Safety and Health Administration should be used.

If trees have grown into the power line running from the pole to your house, PSO will be happy to disconnect and lower the service line temporarily. This will enable you to perform the tree work safely. We will then return and reconnect the line after the trimming is done. There is no extra charge to you for this service.

Please call PSO's customer service number to request this service: 1-888-216-3523. Customers are asked to make this request at least two business days in advance of the date they plan to clear their service line of vegetation.

Sources for this publication

A Field Guide to Trees and Shrubs

America's Garden Book

Know It and Grow It II

Manual of Woody Landscape Plants

Planting New Life in the City

*Urban and Community Forestry,
a Guide for the Interior Western United States*

Tree City USA Bulletins

Taylor's Guide to Trees

Handbook of Landscape Cultivars

Organizations

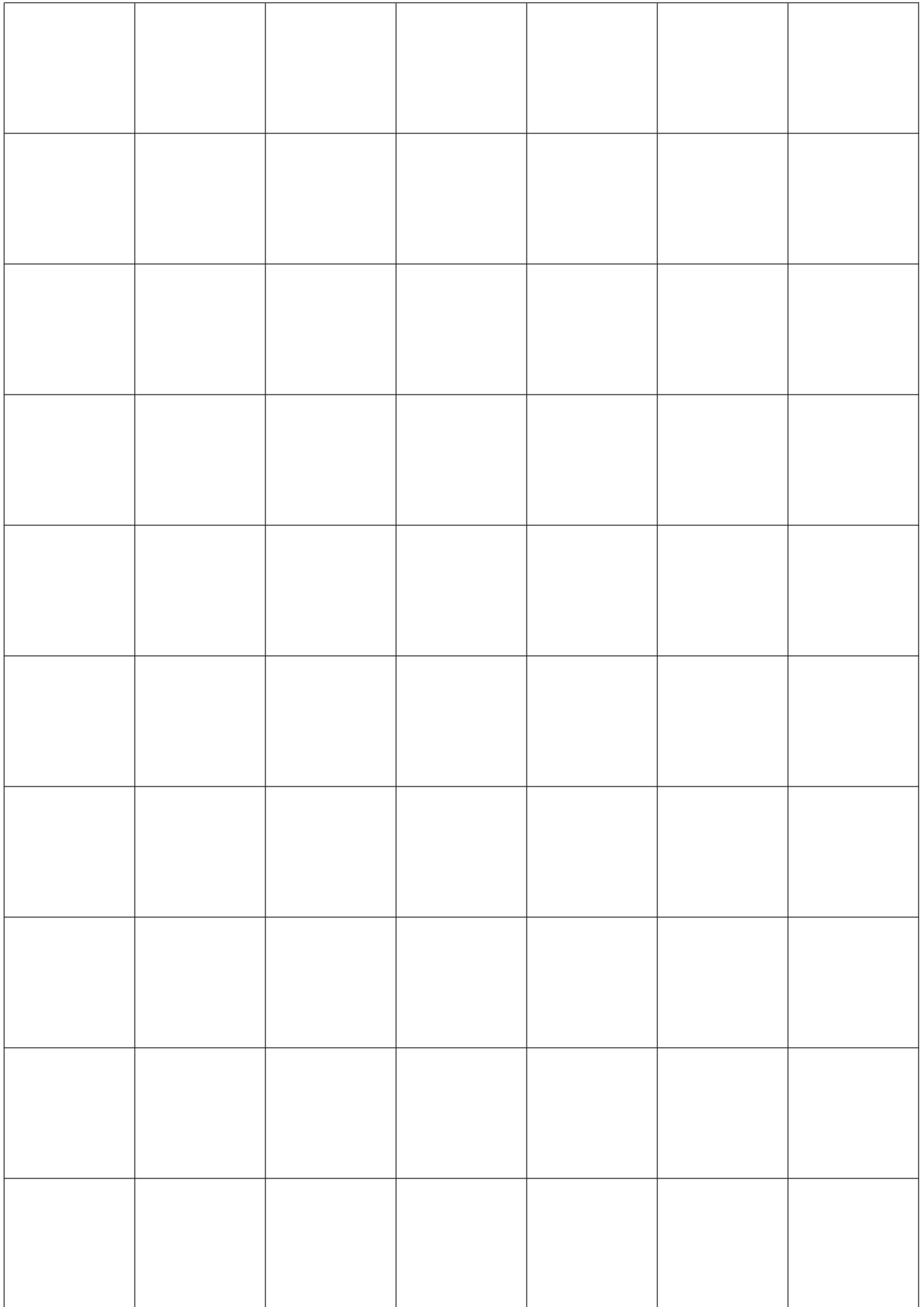
American Forestry Association

National Arbor Day Foundation

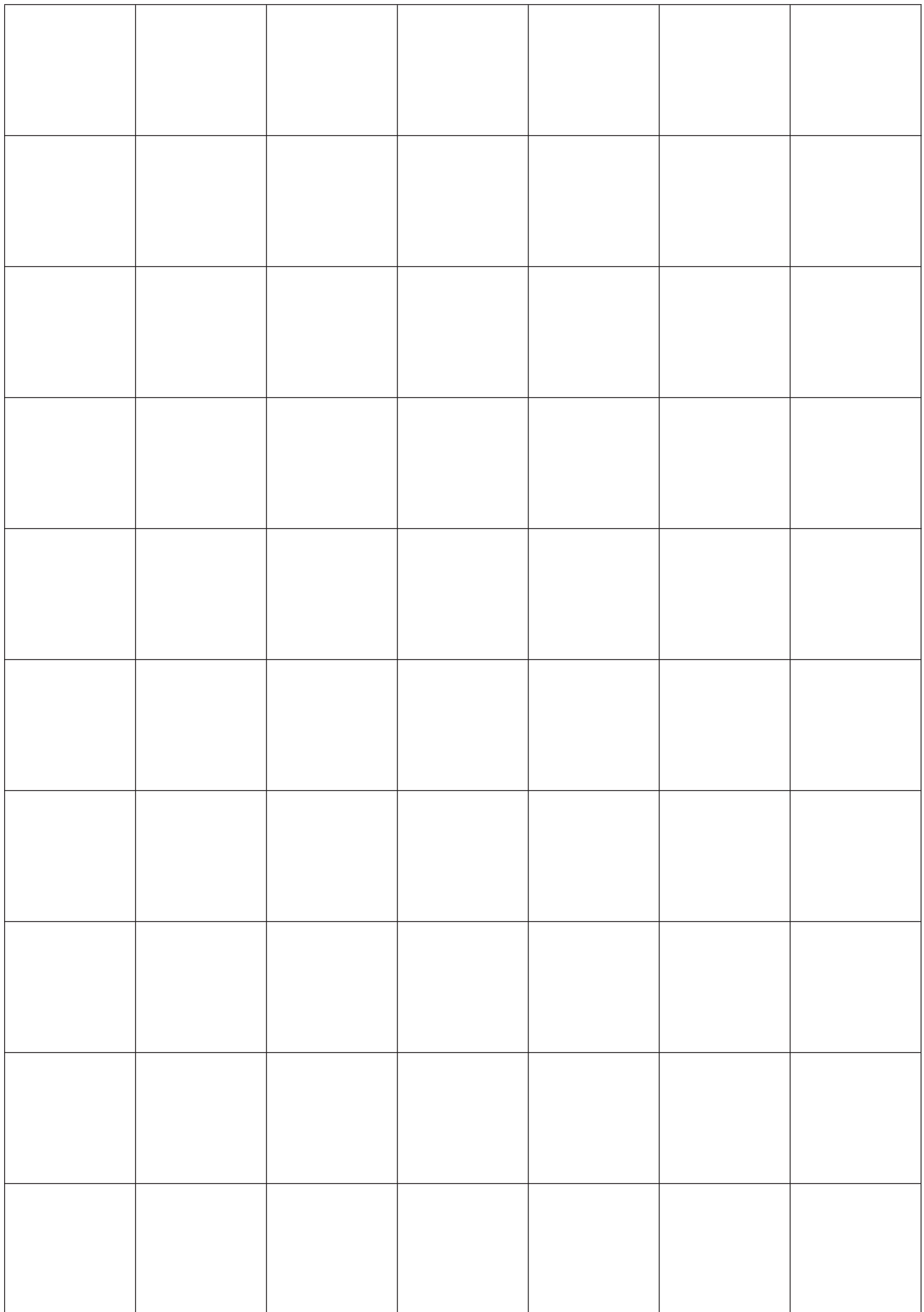
International Society of Arboriculture

National Arborists Association

Use this grid to draw a planning sketch of your yard. (Refer to "Before you plant, plan" on Page 6.)



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FOR MORE INFORMATION

Landscaping and tree care practices are not as simple as they first seem. The more information you have, the better you will be able to make a quality decision. A number of knowledgeable people around the state can answer your tree care questions.

Contact your local nursery/garden center operator, extension agent or local forester. You can take your sketch as outlined on the inside back cover to one of these sources and ask for assistance in selecting trees and shrubs.

To request additional copies of "Tree Tips" please call:
1-800-305-6742



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