



7-1998

SP511 Plant the Right Tree in the Right Place

The University of Tennessee Agricultural Extension Service

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Recommended Citation

"SP511 Plant the Right Tree in the Right Place," The University of Tennessee Agricultural Extension Service, SP 511-15M-7/98 R12-4910-11-001-99, http://trace.tennessee.edu/utk_agexfores/46

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Trees enhance the beauty and value of homes, streets and communities. However, trees planted in the wrong place can cause property damage and become a detriment rather than an asset. Planning the location and species of a tree will ensure that the tree will be an asset and not grow into a hazard or a nuisance.

“What tree should I plant?” is a question asked frequently by homeowners. The answer to the question depends on several factors:

1. Purpose for planting the tree.
2. Soil conditions.
3. Tree location, *the right place*.
4. Species growth and form, *the right tree*.
5. Undesirable species traits.

Purpose for Planting a Tree

Trees provide many benefits for the home landscape. Shade, color, vertical dimension, soundproofing, cooling, beauty, screening, windbreaks, boundary lines and wildlife habitat are just a few. Tree use is varied: framing the view of a house or landscape, screening out eyesores, dividing the landscape area, creating privacy and conserving energy. Landscape trees can be shade trees, flowering trees, framing trees, border trees, street trees, patio trees, fruit or nut trees and wildlife trees. Trees may also enhance property values.



Wayne Clatterbuck

Eastern White Pine interfering with overhead utility lines.

Once the purpose of the planted tree is determined, then other factors can be used to select the right tree.

Soil Conditions

Most trees grow best in a moist, deep, fertile, well-drained soil. Unfortunately, these soils do not occur frequently on developed property. Soil conditions are probably the most overlooked factor when selecting a tree. Soil contains the nutrients, air, water and organic matter required for tree growth. Both the physical and chemical properties of soils in developed areas have usually been altered, which affects fertility, aeration and drainage. Choosing trees that are best suited for the soil conditions on your property will govern how well they grow and prosper.

Soil fertility can easily be judged with a soil test. Soil tests will give indications of available nutrients (N, P and K), soil pH (acidity or alkalinity) and organic matter content. Soil pH of 5.5 to 6.5 is optimum for most trees; however, certain trees thrive at lower or higher values. Contact your county Extension office for soil testing information.

The physical aspects of the soil include its volume and texture (amount of sand, silt and clay). These soil properties influence aeration, internal drainage and water-holding capacity. Soils with large pore spaces (sand) will drain faster than those with small pore spaces (clay). However, clay soils will hold moisture longer than sandy soils. The optimum soil



Wayne Clatterbuck

Sidewalk uplifted by tree roots.

Size of Mature Trees*					
Small Trees (30' or less)		Medium Trees (30'-70')		Large Trees (70' or more)	
Dogwood	Smoketree	American Holly	Littleleaf Linden	American Beech	Shumard Oak
Fringetree	Sourwood	Golden Raintree	Red Maple	Baldcypress	Southern Magnolia
Hawthorn	Sumac	Green Ash	Sassafras	Black Cherry	Sugar Maple
Pawpaw	Sweetbay Magnolia	Hackberry	Silverbell	Black Walnut	Sycamore
Redbud	Witch Hazel	Honeylocust	Sweetgum	Cottonwood	White Oak
Serviceberry	Yellowwood	Kentucky Coffeetree	Willow Oak	Pines (most)	Yellow-Poplar

*Adapted from Tree City USA Bulletin No. 4, National Arbor Day Foundation, Nebraska City, NE.

for tree growth has a loamy texture (mixture of sand, silt and clay) with pore spaces containing 50 percent air and 50 percent water. Some tree species can better tolerate clay soils; others are more suited to sandy soils. Compaction of the soil decreases pore space and stresses the tree by reducing the amount of oxygen to the roots.

Tree Location, *The Right Place*

Growing space both above and below ground should be considered when selecting a tree to plant. Too often allowances are not made for the increased size of the tree when it matures.

Some of the problems that can be avoided by selecting the proper tree for the available planting space are:

1. Damage to houses through cracked foundations, leaves in gutters or abrasion of tree limbs hitting the house.
2. Cracked pavement of sidewalks, driveways, porches and patios.
3. Sewer lines or septic tanks clogged by roots.
4. Dangerous screening by obscuring traffic signs, pedestrians or vehicles.
5. Storm damage and electrical problems from trees or limbs affecting utility lines.
6. Blocking scenic views or windows.

One objective for planting trees in a residential setting is to provide shade to cool homes during the summer months. For morning shade, plant trees on the southeast exposure of the house. For afternoon shade, trees should be planted on the southwest exposure. Deciduous trees (those that lose leaves during the winter) allow the sun to

warm the house during winter and shade it during the summer months. Evergreen trees planted on a northern exposure will screen or block cold winter winds.

Remember that trees will become larger with age. Your evaluation of the site before planting will allow you to choose the correct size of tree for the site, avoid crowding before it occurs and save time and money at some future date.

Species Growth and Form, *The Right Tree*

Once the soil and site (location) conditions for tree planting are determined and evaluated, then homeowners can factor in their personal preferences when choosing a species of tree. Characteristics such as tree shape, size, flowering, colors and texture should be considered. For trees to accomplish their intended purpose satisfactorily, and to continue to do so with future growth and development, they must be selected carefully. Properly selected trees will become an asset to your property and require less maintenance once established.

Hardiness. Select trees within geographic range zones 6 and 7 for planting in Tennessee (Figure 1). Trees native to more northern climates easily withstand winters in Tennessee, but are more subject to heat, scorch and sun-scald during the hotter summer months. Conversely, trees planted from more southern areas do well during the milder winters, but are affected by extreme winters where lower temperatures may kill the tree or accumulations of ice and snow may break branches and deform the tree. Also select trees that are more tolerant of or can adapt to adverse environmental conditions (air pollution, soil compaction and poor available moisture) frequently found in urban areas.

Tree Shape and Form. Different species of trees have different crown forms, such as round, oval, vasselike, weeping, pyramid, columnar or spreading. Selection of a proper form will satisfy your landscape objectives, enhance your property and decrease future maintenance costs. Trees with low-spreading branches are suitable for screens, but not for placement along driveways where visibility is essential. Columnar or upright trees are appropriate for medians and property boundaries, but not for providing shade for a house.

Tree Size, Growth and Longevity. Always plan for the growth and future size of a tree. The small trees planted today may be the large trees of tomorrow. Evaluate the mature height and spread of the tree, as well as its lifespan (see sidebars). Some trees grow and provide shade quickly within 30 years, then decline and eventually die. How will their decline and need for removal affect you? Yellow-poplar (tuliptree) is a prime example of a tree that can grow to a mature height of 100 feet or more, which makes it much too large for a yard tree or urban planting. However, the growth rate and size of the tree may be acceptable as a yard tree during its first 50 years for shade and enjoyment. Thus, consideration should be given to whether the tree is planted for posterity or to fulfill an immediate need that may have future consequences.

Sunlight. Some trees are more adapted to certain intensities and amounts of light than others. Shade tolerance is a term used to rate the capacity of a tree to develop and grow in the shade of other trees. Some species, such as pines, yellow-poplar and cottonwood require full sunlight and are considered shade-intolerant. Others, such as maple and beech prefer partial shade and are called shade-tolerant. Some species like white oak are somewhere in between and are referred to as intermediate in tolerance. Do not make a mistake of planting your tree where its requirement for light will not be met. Dogwood often fails as a transplant from the shade of the forest to the bright sunlight of an open yard. Cultivated dogwoods from nurseries are better suited for full-sun conditions. Transplanting trees from native stands to personal landscapes is not recommended.

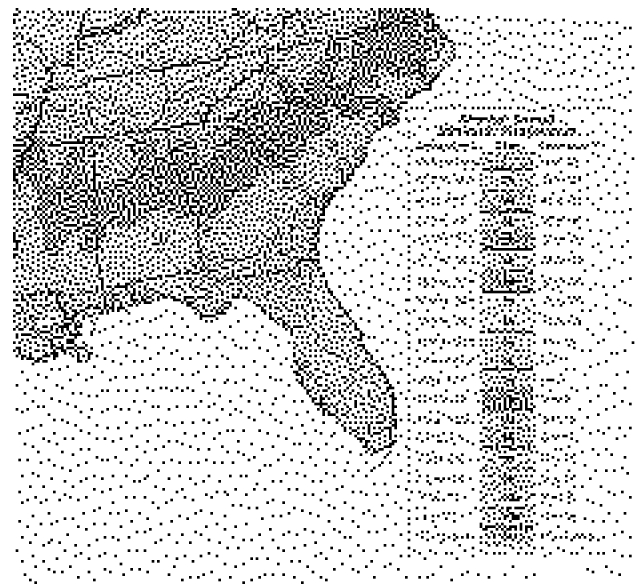


Figure 1. USDA hardiness zones for the southeastern United States.

Undesirable Species Traits

Most trees will have some undesirable traits that may be considered obnoxious by some and tolerated by others. Most of the unfavorable traits are associated with insects and disease, production of fruits and seeds and tree maintenance.

Insects and Disease. Trees are susceptible to many insects and diseases. Some trees are more vulnerable than others. Most of these problems are species-specific and should be considered when selecting a tree to plant. Examples of insect and disease concerns prominent in Tennessee are Dutch elm disease, southern pine beetle, Japanese beetle, white pine weevil, anthracnose, powdery mildew, phytophthora root rot, verticillium wilt, gypsy moth,

Estimated Longevity of Selected Trees

Short (up to 50 years)		Medium (50 to 100 years)		Long (100 or more years)	
Bradford Pear	Norway Maple	American Holly	Littleleaf Linden	American Beech	Southern Magnolia
Cottonwood	Silver Maple	Dogwood	Pines (most)	American Elm	Sugar Maple
Crabapple	Redbud	Golden Raintree	Red Maple	Baldcypress	White Oak
Fringetree	Serviceberry	Green Ash	Sycamore	Black Walnut	Yellow-Poplar
Hornbeam	Witch Hazel	Hackberry		Hickories	



Mark Halcomb

A variety of landscape materials in an attractive residential setting.



Don Williams

Insect galls (maple bladder gall mite) on silver maple leaves.

eastern tent caterpillar, various aphids, mites, scale and borers. Consult with your local garden center, nursery, tree care professional, county Extension office or forester to discuss if a tree being selected is prone or sensitive to local diseases or insects.

Fruits and Seeds. Some fruits and seeds are nuisances to property owners, but may be valued by others. If the homeowner is interested in providing food for wildlife, fruits and seeds will attract many birds and animals. However, some seed can annoy landowners. The fruit of crabapple, blackgum and hackberry are messy when shed. Though beneficial to wildlife, acorns, walnuts and hickory nuts are an irritation when mowing lawns. Seed produced by yellow-poplar, maples and redbud easily sprout in flower beds and lawns, becoming a weed problem. Sweetgum and sycamore balls are unsightly to some homeowners and are difficult to rake. Some of these traits are tolerable, while others are not, depending on the perspective of the property owner.

Maintenance. Tree maintenance is an unavoidable task that homeowners should include in their evaluation of a tree. Most fast-growing trees will require more frequent maintenance than species with moderate to slow growth. The


weak wood of many fast-growing trees requires heavy clean-up of limbs and debris after storms and may disrupt utility service and highway traffic. Will the species selected need major pruning to obtain the desired shape or to eliminate weak crotches and other sources of structural weakness? Is the tree planted in a location such as next to a house or a driveway where pruning is necessary? Is the species subject to insects and disease that will require treatment? How resistant is the tree to ice and snow breakage? Will the tree need frequent watering during dry weather? These are a few of the maintenance questions that should be considered when selecting a tree. Once the tree is selected, purchased and planted, considerable costs have already been incurred. If the tree is not suited for the growing space or location, it may not survive, resulting in a loss of time and money. If the tree survives, but was poorly selected, the homeowner or community will have considerable expenses for its care. The right tree in the right place will provide benefits for many years with minimum costs.

No one tree will fulfill all objectives within space and time. Although tradeoffs will occur, homeowners should integrate the various factors (purpose, soil, placement and species) to make the best informed decision on *planting the right tree in the right place*.

Appreciation is expressed to Robin Young for design of this publication.

SP 511-15M-7/98

R12-4910-11-001-99

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Printing for this publication was funded by the USDA Forest Service through a grant with the Tennessee Department of Agriculture, Division of Forestry. The *Trees for Tennessee Landscapes* series is sponsored by the Tennessee Urban Forestry Council.

