



TREES FOR URBAN LANDSCAPES



All images: Downtown Parkersburg, WV
West Virginia Commerce

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CONSIDERATIONS - GENERAL

ROLE OF URBAN TREES IN MITIGATING THE EFFECTS OF CLIMATE CHANGE

Urban and community trees have an important role in mitigating climate change and helping cities adapt to higher temperatures and other impacts of climate change. Like forest trees, urban trees reduce greenhouse gases by sequestering carbon dioxide, and control soil erosion and runoff from heavier rain events. When placed properly, they can reduce the amount of energy needed to heat and cool buildings. These “ecosystem services” can be quantified at the individual tree, city or even state level.

Community trees also soften the harsh angles of urban landscapes and ameliorate noise, providing psychological relief in an increasingly urbanized world. They are a symbol of nature, creating recreational space as well as wildlife and plant diversity in urban environments. Their ecosystem services go far beyond that which is quantifiable.



Trees soften the urban landscape.
Parkersburg, WV. WV Commerce

PLANTING SITE DESIGN TIPS

- Incorporate trees into landscape design from the beginning. Consider purpose and use of plantings, above and below ground site conditions, ongoing maintenance requirements and appropriate species.
- Keep trees at least 40’ from intersections, road signs and traffic signals. Do not plant trees with a mature height >25’ near overhead utility lines.
- Make sure a planting site is large enough to accommodate the **mature** height and spread of the tree species/cultivar.
- Pick sites with ample soil moisture and good soil quality and volume. Tree root systems spread much farther than the branches.
- Planting strips (tree lawns) between the sidewalk and roadway should be at least 6’ wide. Sidewalk cutouts and planters are not ideal, but can be constructed to maximize tree rooting area (minimum 6’x6’ for small- to medium-sized maturing trees).



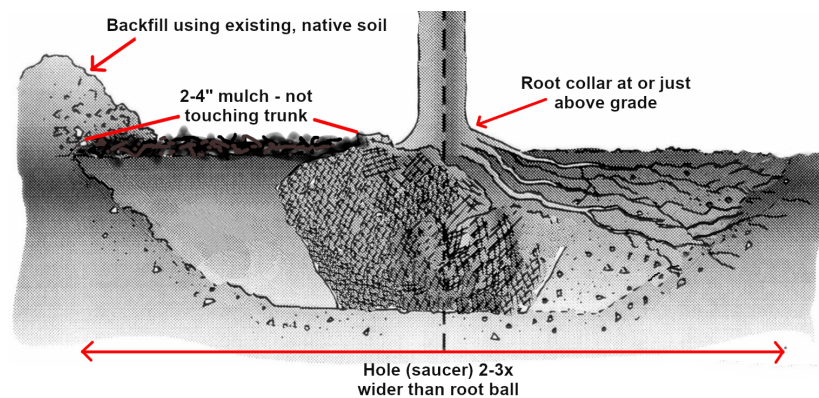
Dangers of inadequate soil volume.
J. O'Brien, USDA Forest Service, Bugwood.org.

UNSUITABLE PLANTING SITES

- Presence of overhead utility lines.
- Too close to pavement with high exposure to vehicle emissions, roadway salts and reflected heat.
- Infrastructure interference: within 40' of an intersection, road sign or traffic signal; within 20' of a building foundation, sidewalk or entryway.
- Highly compacted soils, underground utilities, or otherwise inadequate rooting space, such as a tree pit.

MAJOR PLANTING POINTS TO REMEMBER

- Select healthy, undamaged nursery stock; avoid trees with “V”-shaped branch attachment angles or circling/girdling roots;
- Remove any wrapping on stem and any burlap, twine or wire basket from the root ball;
- Plant root flare level with or slightly above soil line; do not bend/force roots into a hole that is too small;
- Do not pile mulch against trunk or wrap trunk; restrict pruning to 3Ds: dead, damaged or diseased branches;
- Only stake trees in high-traffic or windy areas, or on hillsides. Stake tree on opposite sides and tie Arbortie loosely around stem, allowing stem “wobble room”; remove any implements after one year;
- SLOWLY soak newly-planted tree roots; water weekly during first two growing seasons, and extra during drought.



The planting hole should be saucer-shaped to provide more friable soil for rapid initial root growth and establishment. The base of the saucer should be undisturbed or firmly packed soil, which prevents settling of root ball.
International Society of Arboriculture, Bugwood.org (with modifications)

CONSIDERATIONS - TREE SELECTION

- **Function:**
 - ⇒ Shade, screening, aesthetics or erosion control/prevention, etc.?
 - ⇒ Year-round interest: bark, crown shape, flowers, fruits and branching habit.
- **Shape:**
 - ⇒ Pyramidal? Spreading? Columnar?
Vase-shaped?
 - ⇒ Mature height and spread?
- **Source:**
 - ⇒ Select vigorous local nursery stock with one central leader and no visible signs of insect, disease or physical damage.
 - ⇒ Try to select native species.
- **Character:**
 - ⇒ What are advantages or disadvantages of the desired species? Messy? Weak wood? Wildlife benefit? Shallow roots? Dense canopy?
- **Maintenance:**
 - ⇒ Is the species easy to care for? How fast does it grow?
 - ⇒ Does the species produce messy fruit, shed branches and/or seed pods and/or bark?
- **Planting site factors:**
 - ⇒ Will the species of choice survive in the local hardiness zone?
 - ⇒ Are there any space restrictions above or below ground? **See the note on topping on the last page of this brochure.**
 - ⇒ Will the species of choice tolerate the site's soil pH, moisture and compaction? What about the site's sun exposure?
- **Neighborhood ecosystem:**
 - ⇒ Avoid planting trees that are overly common– strive for diversity and plant a variety of tree species from several different genera.
 - ⇒ Avoid planting species that are invasive, are susceptible to disease or have poor growth habits.

Two excellent tree species guides:

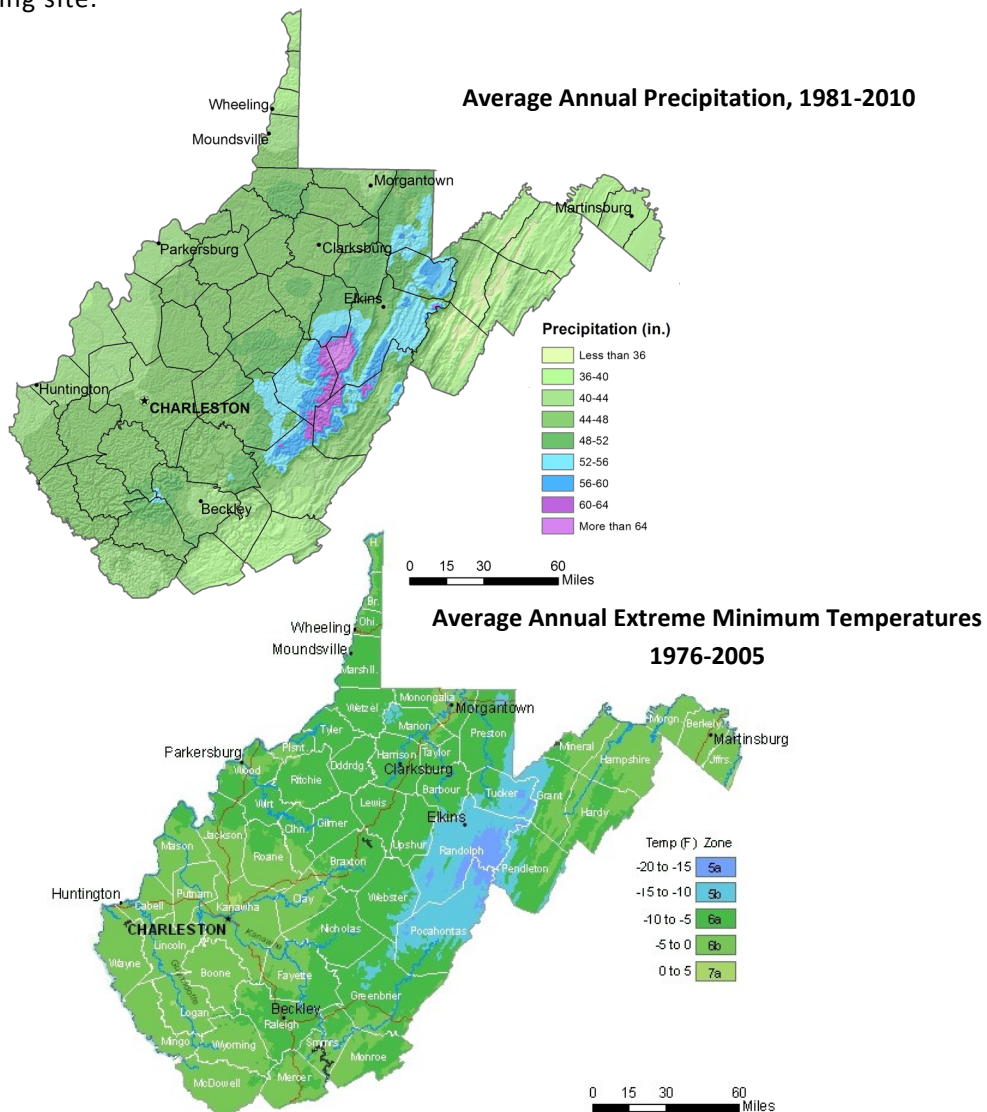
Hughes, M., E. Oaksford and M. Blakeslee. *Urban Tree Selection Guide: A Designer's List of Appropriate Trees for the Urban Mid-Atlantic*. 2015. Casey Trees.

Gerhold, Henry D., Norman L. Lacasse and Willet N. Wandell. Eds. 1992. *Street Tree Factsheets*. Penn State University, University Park, PA.

CONSIDERATIONS - MICROCLIMATES

WEST VIRGINIA MICROCLIMATES

Due to its mountainous topography, West Virginia has quite a few microclimates to consider. A southern- or western-facing slope may be considerably drier and hotter than one facing east or north. A tree planted in a low-lying area may succumb to a frost pocket. Even buildings in urban areas can create microclimates like rain shadows and wind tunnels. Consider these things when assessing a planting site.



Average annual precipitation 1981-2010 and USDA Plant Hardiness Zone Map with Average Annual Extreme Minimum Temperatures between 1976-2005 for the state of West Virginia
Maps by: Prism Climate Group, Oregon State University

CONSIDERATIONS - SITE

RIGHT TREE RIGHT PLACE

Tall-growing trees can interfere with overhead utility lines and create safety hazards, service interruptions, increased maintenance costs and difficulties with proper pruning, forcing utility companies to severely prune them to reduce their crowns so they “fit” under utility lines. Doing this removes a lot of live foliage, leaves large wounds on trees that may introduce decay, disrupts the natural structure of trees (adventitious water sprouts may grow taller than the original branches within years) and ultimately stresses trees, making them unsightly and prone to develop future hazards. Be sure any trees planted under utility lines will be less than 25-30’ in mature height!



The tree on the left has been severely pruned to accommodate utility lines. Trees <25-30’ in mature height are more suitable for planting beneath utility lines (right).

Stephen F. Austin State University (left); J. LaForest, University of Georgia (right), Bugwood.org

SPECIAL NOTE ABOUT ROOT CONFLICTS

Certain species of trees are not suited for planting next to hardscape like pavement or walkways, because they will heave it up and distort it with large surface roots. The following species and genera are notorious for having large surface roots.

katsura tree

American yellowwood

common hackberry

osage-orange

sweetgum

elms

maples

sycamore



Tree roots uplifting sections of sidewalk. Such infrastructure damage can be costly and dangerous, causing pedestrians to trip and fall.

A. Koeser, International Society of Arboriculture, Bugwood.org

TREE CHARACTERISTICS

GENERAL DISCLAIMER

The USDA's Plant Hardiness Zone Map divides the U.S. into 11 zones based on average minimal winter temperature. Trees in this guide thrive in zones 5a to 7a. Be sure to purchase trees grown within these zones to ensure their full tolerance of WV winter temperatures. This guide provides general species and cultivar growth habits and needs; consult a local nursery for more specific information. Not all species or cultivars listed may be available in an area.



W. Fountain, Univ. of Kentucky, Bugwood.org

Only certain species tolerate the root restrictions of sidewalk cutouts or pits.

GROWING CONDITIONS

Soil Conditions. Soil salt tolerance indicates whether a species will be harmed by road/sidewalk deicers. Unspecified soil pH means the species/cultivar has no preference. Unspecified soil water tolerance indicates that the species prefers moist, well-drained soils. Species designated for "wet" soils tolerate *periodically*, not continuously, wet soils. Species that tolerate "dry" soils or are "drought tolerant" can survive several weeks between deep waterings (after a 3-year establishment period). "Mod" indicates a moderate degree of drought tolerance. Extensive drought conditions will stress most species to some degree.

Light Conditions. Full Sun: direct sunlight for 6+ hours/day during the growing season. Partial Shade: approximately 3-6 hours of direct sunlight. Shade: <3 hours of sunlight. If no light needs are specified, the species/cultivar has no preference.

Tree Use Suitability. Table section indicating species best suited for...

- *Planters/boxes:* species that tolerate bonsai or above-ground planters
- *Sidewalk cutouts, pits, planting strips:* indicating limited rooting space and potential hardscape conflict
- *Parking lot islands or strips:* species more tolerant of heat, air pollution, soil salt and extremes of soil moisture
- *Windbreak/snow shield:* typically evergreen species
- *Privacy/noise screen:* typically evergreen species or species that can be trained as a hedge
- *Park or lawn:* for larger species or species less tolerant of urban stresses such as heat or drought

SPECIES/CULTIVAR CHARACTERISTICS

Species Benefits. Nativity, aesthetics, and tolerance of drought and disease. "Resistant to disease" refers to cultivars bred for resistance to specific pathogens that threaten the species (e.g., fire blight, Dutch elm disease or oak wilt) or species with no serious pathogen issues.

Species Issues. Thin bark, weak wood or branch attachment, excessive pest issues, or “fruit, nut or thorn conflicts,” which include issues with litter, pedestrian or property hazards, or unsightliness. Choose planting sites accordingly.



Sweetgum (left) “gumballs” can be a pedestrian hazard. Certain species like dawn redwood and American sycamore shed buckets of leaves each year, necessitating cleanup. Species with large fruit like black walnut (right) and osage-orange can dent vehicles in parking lots.

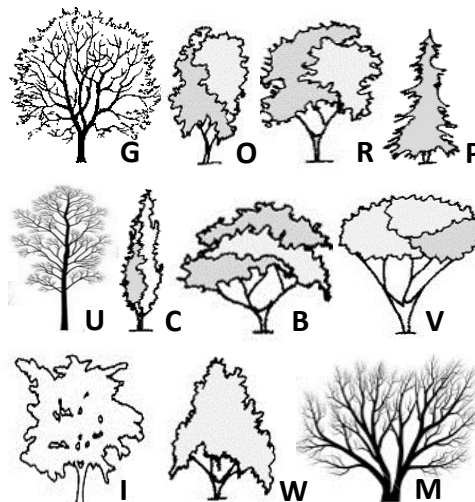
K. A. Rawlins, Univ. of Georgia, Bugwood.org

Growth Rate. How fast a species grows can give an idea of life span and maintenance requirements.

Pruning Needs. Clearance refers to removing lower branches for lines of sight, or to create space for vehicles or pedestrians. Form refers to corrective pruning needed to establish good tree structure.

Crown Shape. Different species have different growth habits, and some smaller tree species may naturally have a multi-stemmed growth form. The following tables indicate the general shape of species and various cultivars to help with placement of these species (e.g., using a species with columnar crown shape for tight spaces, or reserving spreading crown shapes for larger lawns). Crown shape also lends aesthetic balance to the landscape.

Crown shape	Symbol
Globose (spherical)	G
Oval	O
Rounded	R
Pyramidal	P
Upright	U
Columnar	C
Broad (spreading)	B
Vase	V
Irregular/variable	I
Weeping	W
Multi-stemmed	M



UNSUITABLE TREES

There are a variety of reasons why certain species should not be planted in an urban environment, especially as street trees. Here is a short list of some historically popular species among homeowners that should be carefully placed or avoided in general.

common name, Scientific name	Over-planted	Weak woody branch attachment	Large surface roots	Prone to decay	Significant pest problems	Invasive species	Severe fruit/seed or debris issues	Intolerant of urban conditions	Short life span	Prone to disease	Notes
American elm, <i>Ulmus Americana</i>	•	•								•	Hybrids resistant to Dutch elm disease available.
American sycamore, <i>Platanus occidentalis</i>			•			•					Extremely large tree; plant in open lawn and riparian areas.
ash, <i>Fraxinus</i> spp.	•			•							Host to invasive emerald ash borer. Be prepared to treat with chemical injections.
birch (except river birch), <i>Betula</i> spp. Except <i>B. nigra</i>		•	•				•	•			White birch may do well in higher elevations. Best for planting in riparian areas.
black locust, <i>Robinia pseudoacacia</i>		•			•	•				•	Aggressive, opportunistic growth; will colonize any disturbed area. Locust leaf miner severely defoliates every summer.
black walnut, <i>Juglans nigra</i>			•			•					Do not plant near pedestrian and parking areas. Chemically prevents growth of other plants within rooting zone. Not drought resistant; needs deep, moist soil.
boxelder, <i>Acer negundo</i>		•				•	•	•			Good for plantings in riparian areas.
callery pear, <i>Pyrus calleryana</i>	•	•				•	•	•			Weak branch attachment. Has escaped cultivation and become invasive in natural areas.
Chinese (Drake) elm, <i>Ulmus parvifolia</i>	•	•			•						Has escaped cultivation and become invasive in natural landscapes; prolific seeder.
Colorado blue spruce, <i>Picea pungens</i>							•	•			More suitable for higher elevations.
crapemyrtle, <i>Lagerstroemia indica</i>	•	•			•	•	•	•			Host to invasive crapemyrtle bark scale. Escapes cultivation by suckering and prolific seeding.
eastern hemlock, <i>Tsuga canadensis</i>				•			•				Host to invasive hemlock woolly adelgid. Be prepared to treat with chemicals. Best in riparian areas.
flowering dogwood, <i>Cornus florida</i>	•						•	•			Prone to anthracnose in harsh urban environment when subject to drought and heat.
Fruit tree varieties bred for production						•	•				Not suitable as street trees. Best planted in lawn settings in soil within acceptable limits for heavy metals.
gingko (female), <i>Ginkgo biloba</i>						•					Produces malodorous fruit.
golden raintree, <i>Koelreuteria paniculata</i>	•	•			•						Escapes cultivation; sensitive to cold winters and will die back.
Lombardy poplar, <i>Populus nigra</i>		•		•				•	•		Prone to root suckering.
mimosa (silk tree), <i>Albizia julibrissin</i>	•	•		•	•	•	•	•	•		Extremely invasive, prolific seeder. Prone to mimosa wilt and mimosa webworm which also targets native honeylocust.
Norway maple, <i>Acer platanoides</i>	•	•	•		•	•			•	•	Host for invasive Asian longhorned beetle; verticillium wilt.
Norway spruce, <i>Picea abies</i>	•		•								Plant at least 30 feet from any structure. Cytospora canker a problem.
paper mulberry, <i>Broussonetia papyrifera</i>	•	•	•	•		•	•				Extremely invasive and weak-wooded.
Russian olive (autumn olive), <i>Eleagnus angustifolia</i>					•						Aggressive and opportunistic growth; will colonize any disturbed area.
Siberian elm, <i>Ulmus pumila</i>		•	•			•					Aggressive growth. Best for use in reclamation or out-of-the-way locations.
silver maple, <i>Acer saccharinum</i>	•	•	•	•		•					Host to invasive Asian longhorned beetle. Best for plantings in riparian areas.
tree of heaven, <i>Ailanthus altissima</i>		•			•						Aggressive and opportunistic growth; will colonize any disturbed area. Host to invasive agricultural pest brown marmorated stink bug.
white mulberry, <i>Morus alba</i>		•			•	•					Extremely invasive and staining fruit.
willow, <i>Salix</i> spp.		•	•			•					Plant at least 30 feet from any structure, and keep away from water features.

SMALL TREES

Species <30' in mature height and <35' in mature width. Ideal for tree lawns >2' wide, cutouts at least 4'x4', and under utility lines.

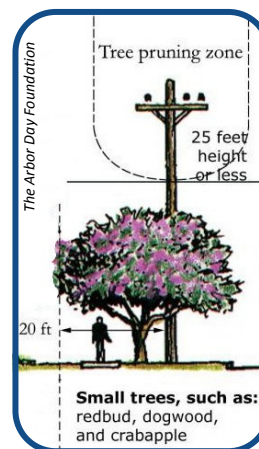


Kobus Magnolia
T. D. Sydnor, The Ohio State Univ.,
Bugwood.org

Name common name (Scientific name, 'cultivar')	Crown Shape	Soil salt tolerance			Soil water tolerance		Soil pH		Species benefits	
		Low, Medium, High	Wet	Dry	Acid	Alkaline	Resistance to disease	Showy flowers	Native	Drought tolerant
American hornbeam (<i>Carpinus caroliniana</i>)	O, M	L	•		•	•	•		•	Mod
blackhaw viburnum (<i>Viburnum prunifolium</i>)	O, R, V, M	L		•	•	•		•	•	•
common witch hazel (<i>Hamamelis virginiana</i>)	R, V, M	L			•	•	•		•	Mod
crabapples (<i>Malus</i> spp.)	R, U, V, M	L	•		•	•		•		Mod
x 'Adams'	G	L	•	•	•		•	•		Mod
x 'Adirondack'	O, V, U	M		•	•	•	•	•		•
x 'Centurion'	O, C, U, B	M		•	•	•	•	•		Mod
x 'Donald Wyman'	R, B, U	M	•	•	•	•	•	•		Mod
x 'Harvest Gold'	O, C, U	M	•	•	•	•	•	•		
x 'Prairiefire'	G, O, U	M	•	•	•	•	•	•		Mod
x 'Professor Sprenger'	O, U, B	L	•	•	•		•	•		
x 'Sentinel'	P, V, U	L	•	•	•		•	•		
x 'Snowdrift'	R, O, M	M	•	•	•		•	•		Mod
x 'Sugar Tyme'	O, U	M	•	•	•		•	•		
eastern redbud (<i>Cercis canadensis</i>)	G, B, I, M	L-M	•		•	•		•	•	•
hawthorns (<i>Crataegus</i> spp.)		M	•	•		•		•		•
crus-galli, 'Thornless cockspur'	G	L	•	•		•	•	•	•	Mod
laevigata, 'Crimson Cloud'	O, B, P	L	•	•	•	•	•	•		•
phaenopyrum, 'Washington'	R, P	L-M	•	•	•	•	•	•	•	•
viridis, 'Winter King'	R, V, B	L	•	•	•	•	•	•	•	•
crus-galli x phaenopyrum, 'Vaughn'	G, B	M			•	•		•		Mod
katsura tree (<i>Cercidiphyllum japonicum</i> , 'Pendula')	R, W	M			•	•	•			Mod
Kwanzan cherry (<i>Prunus serrulata</i> , 'Kwanzan')	U, V	L			•	•		•		Mod
magnolias (<i>Magnolia</i> spp.)		L			•			•		Mod
kobus var. stellata	O, B, M	L			•			•		Mod
x soulangeana, 'Saucer'	R	L			•			•		Mod
virginiana	C, V, M	L	•		•		•	•	•	?



Species issues				Pruning needs	Light needs	Growth rate	Good for					
Thin bark easily damaged	Fruit/Nut or thorn conflicts	Short life span (<40 years)	Wood susceptible to breakage	Clearance or form	Full sun ☀ Partial shade ☁	Slow, medium, fast	Planting/boxes	Sidewalk cutouts, pits, planting strips	Parking lot islands or strips	Windbreak/snow shield	Privacy/noise screen	Park or lawn
•				C, F ☹☹☹	S	•	•	•				•
				C, F ☹☹☹	S	•	•	•				•
•				C, F ☹☹☹	S	•		•				•
•	•	•		C ☹	M	•	•	•				•
•	•	•		C ☹	M	•	•	•				•
•	•	•		C ☹	S-M	•	•	•				•
•	•	•		C ☹	M	•	•	•				•
•	•	•		C ☹	M	•	•	•				•
•	•	•		C, F ☹	M	•	•	•				•
•	•	•		C ☹	M	•	•	•				•
•	•	•		C ☹	M	•	•	•				•
•	•	•		C ☹	M	•	•	•				•
•	•	•	•	C, F ☹☹☹	M		•	•				•
	•	•		F ☹☹☹	M		•	•				•
	•	•		F ☹☹☹	S		•	•				•
	•	•		C, F ☹☹☹	M		•	•				•
	•	•	•	C, F ☹	M	•	•	•				•
	•	•		C, F ☹	M	•	•	•				•
	•	•		C ☹☹☹	M	•	•					•
		•		C, F ☹☹☹	M			•		•		•
•		•		C, F ☹	M	•	•	•				•
				C, F ☹	S-M							•
•				C, F ☹☹☹	S	•						•
•	•			C, F ☹	M	•						•
•				F ☹☹☹	M			•				•



Thornless cockspur hawthorn
T. D. Sydnor, The Ohio State Univ., Bugwood.org

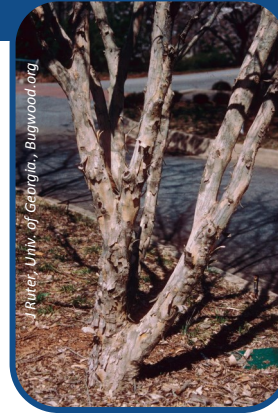
SMALL TREES

CONTINUED



R. Webb, Bugwood.org

Washington hawthorn



River, Univ. of Georgia, Bugwood.org

Trident maple

Name	Crown shape	Soil salt tolerance	Soil water tolerance	Soil pH	Species benefits
common name (Scientific name, 'cultivar')		Low, Medium, High	Wet Dry	Acid Alkaline	Resistance to disease Showy flowers Native Drought-tolerant
Trident maple (<i>Acer buergeranum</i>)	O, B, R, M	M		• •	• • • • • Mod
serviceberries (<i>Amelanchier</i> spp.)	U	M	•	•	• • • • • Mod
<i>canadensis</i> , 'Spring Glory'	U	M		•	• • • • • Mod
<i>laevis</i> , 'Cumulus'	C, V, U, M	M		•	• • • • • Mod
<i>laevis</i> , 'Majestic'	O, V, U, I, M	M		•	• • • • • Mod
<i>x grandiflora</i> , 'Autumn Brilliance'	O, U, V, M	M	•	•	• • • • • Mod
<i>x grandiflora</i> , 'Princess Diana'	O, B, U, I, M	M		•	• • • • • Mod
two-winged silverbell (<i>Halesia diptera</i>)	C, R, U, V, M	L	•	•	• • • • • Mod

EVERGREENS

American holly (<i>Ilex opaca</i> , 'Stewart's Silver Crown')	P	M	•	• •	• • • • •
arborvitae (<i>Thuja</i> spp.)	P	L-M	•	• •	• • • • • Mod
<i>occidentalis</i> , 'Emerald Green'	C, P	L-M	•	• •	• • • • • Mod
<i>occidentalis</i> , 'Nigra'	P	L	•	• •	• • • • • Mod
<i>occidentalis</i> , 'Hetz' Wintergreen'	P	M	•	• •	• • • • • Mod
Hicks yew (<i>Taxus x media</i> , 'Hicksii')	C, U	M	•	•	• • • • •
junipers (<i>Juniperus</i> spp.)	P	M		• •	• • • • •
<i>virginiana</i> , 'Elegantissima'	C, P	M		• •	• • • • •
<i>virginiana</i> , 'Burkii'	P	M-H	•	• •	• • • • •
<i>virginiana</i> , 'Keteleeri'	P	M		• •	• • • • •
'Glen St. Mary' southern magnolia (<i>Magnolia grandiflora</i> , 'Glen St. Mary')	O, P	M	•	• •	• • • • • Mod
'Hasse' southern magnolia (<i>Magnolia grandiflora</i> , 'Hasse')	O, P, U	M	•	• •	• • • • • Mod



Katsura tree
T. D. Sydnor, The Ohio State Univ., Bugwood.org



Emerald green arborvitae
R. Webb, Bugwood.org



Two-winged silverbell flowers

N. Loewenstein, Auburn University, Bugwood.org

Species issues				Pruning needs	Light needs	Growth rate	Good for					
Thin bark easily damaged	Fruit/Nut or thorn conflicts	Short life span (<40 years)	Wood susceptible to breakage	Clearance or form	Full sun ☼ Partial shade ½☼	Slow, medium, fast	Planters/boxes	Sidewalk cutouts, pits, planting strips	Parking lot islands or strips	Windbreak/snow shield	Privacy/noise screen	Park or lawn
		•	C, F	☼ ½☼	M	•	•	•		•	•	
•			C	☼ ½☼	M	•	•	•		•	•	
•			C, F	☼ ½☼	M	•	•				•	•
•	•		C	☼ ½☼	M	•	•	•		•	•	
•	•		C, F	☼ ½☼	M	•	•	•		•	•	
•			C, F	☼ ½☼	S	•	•	•		•	•	
•			C	☼ ½☼	M	•	•	•		•	•	
•			C, F	☼ ½☼	M	•	•		•		•	



Apple serviceberry
R. Webb, Bugwood.org

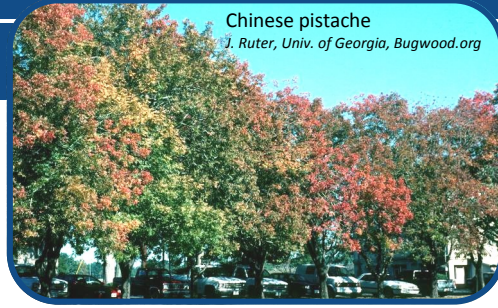
•			C	☼ ½☼	S	•	•	•	•	•	•	•
	•	•	C	☼ ½☼	S	•	•	•	•	•	•	•
	•	•	C	☼ ½☼	S	•	•	•	•	•	•	•
	•	•	C	☼ ½☼	S	•	•	•	•	•	•	•
	•	•	C	☼ ½☼	F	•	•	•	•	•	•	•
•			C	☼ ½☼	S-M	•		•	•	•	•	•
		•	C	☼ ½☼	F	•	•	•	•	•	•	•
		•	C	☼ ½☼	F	•	•	•	•	•	•	•
		•	C	☼ ½☼	F	•	•	•	•	•	•	•
•	•		C	☼ ½☼	S	•	•	•	•	•	•	•
•	•		C	☼ ½☼	S	•	•	•	•	•	•	•



Allegheny serviceberry
N. Loewenstein, Auburn Univ., Bugwood.org

MEDIUM TREES

Species 30-50' at mature height and <45' in mature width. Ideal for plantings at least 25' from buildings and utility lines and tree lawns >4' wide.



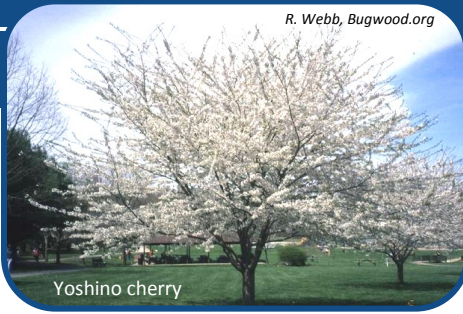
Chinese pistache
J. Ruter, Univ. of Georgia, Bugwood.org

Name common name (Scientific name, 'cultivar')	Crown shape	Soil salt tolerance			Soil water		Soil pH		Species benefits	
		Low, Medium, High	Wet	Dry	Acid	Alkaline	Resistance to disease	Showy flowers	Native	Drought tolerant
American hornbeam (<i>Carpinus caroliniana</i>)	O, M	L	•		•	•	•		•	Mod
Kentucky yellowwood (<i>Cladrastis kentukea</i>)	R, V	?	•	•	•	•	•	•	•	Mod
black gum (<i>Nyssa sylvatica</i>)	O, P	H	•		•				•	•
cherries (<i>Prunus</i> spp.)										Mod
<i>sargentii</i> , 'Columnaris'	C, U, V	M			•	•		•		•
<i>x yedoensis</i> , 'Yoshino'	R, V	L			•			•		Mod
Chinese pistache (<i>Pistacia chinensis</i>)	O, R, B, V	L			•	•		•		•
common hackberry (<i>Celtis occidentalis</i>)	R, V, I	H	•	•	•	•			•	•
common persimmon (<i>Diospyros virginiana</i>)	O, P	M-H	•	•	•	•			•	•
European mountain ash (<i>Sorbus aucuparia</i>)	O, U, R, M	L			•			•		Mod
osage orange (<i>Maclura pomifera</i>)	R, B	M	•		•	•	•		•	•
red maple (<i>Acer rubrum</i>)	O, R, U	L	•		•			•	•	Mod
'Armstrong'	C, U	L	•		•			•	•	Mod
'Autumn flame'	R	L	•		•			•	•	Mod
'Bowhall'	U	L	•		•			•	•	Mod
river birch (<i>Betula nigra</i> , 'Heritage')	O, P, U, M	M	•		•		•		•	Mod
sourwood (<i>Oxydendrum arboretum</i>)	O, P	L-M			•			•	•	Mod
sweetgum (<i>Liquidambar styraciflua</i> , 'Moraine')	O, P	M	•		•	•			•	Mod
Turkish filbert (<i>Corylus colurna</i>)	O, P	L	•	•	•	•	•			•

EVERGREENS

American holly (<i>Ilex opaca</i>)	P	M	•		•	•			•	•
eastern white pine (<i>Pinus strobus</i> , 'Fastigiata')	C	L			•				•	Mod
junipers (<i>Juniperus</i> spp.)	P	M		•	•	•			•	•
<i>virginiana</i> , 'Canaertii'	P	M			•	•			•	•
<i>virginiana</i> , 'Pendula'	C, P, W	M			•	•			•	•

R. Webb, Bugwood.org

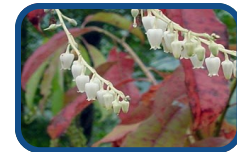


Yoshino cherry

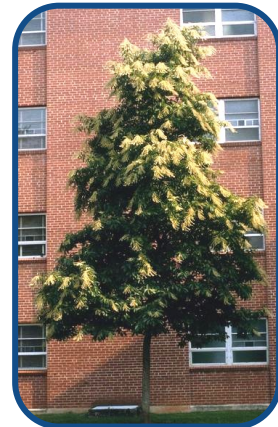


Flowers of Kentucky yellowwood

				Species issues	Pruning needs	Light needs	Growth rate	Good for				
Thin bark easily damaged	Fruit/flower or thorn conflicts	Pest issues	Wood susceptible to breakage	Clearance or form	Full sun ☐ Partial shade K☐	Slow, medium, fast	Planters/boxes	Sidewalk cutouts, pits, planting strips	Parking lot islands or strips	Windbreak/snow shield	Privacy/noise screen	Park or lawn
•			C	☐☐☐	S	•	•	•				•
•		•	F	☐☐☐	M				•			•
	•		C	☐☐☐	S		•	•				•
•		•	F	☐	M		•	•				•
•	•		C,F	☐	M		•	•				•
	•		C,F	☐☐☐	M		•	•				•
•	•	•	F	☐☐☐	F		•	•				•
	•	•	C	☐	M		•	•				•
	•	•	C,F	☐	M		•	•				•
	•		C,F	☐	F							•
•		•	C,F	☐☐☐	F		•					•
•	•	•	F	☐☐☐	F		•					•
•	•	•	☐☐☐	M			•					•
•	•	•	F	☐☐☐	F		•					•
			C,F	☐☐☐	F		•	•		•		•
			C	☐☐☐	S			•				•
•			C	☐☐☐	M		•	•				•
	•		F	☐☐☐	S		•	•				•
•			C	☐☐☐	S			•	•	•		•
•	•	•		☐☐☐	M	•			•	•		•
			C	☐☐☐	F	•	•	•	•	•		•
			☐☐☐	F	•	•	•	•	•	•		•
			C,F	☐☐☐	F	•	•	•	•	•		•



W. VanDyk Evans, Bugwood.org



Sourwood (top: close-up of flowers)

J. Ruter, Univ. of Georgia, Bugwood.org



Common hackberry

S. Katovich, Bugwood.org

LARGE TREES

Species >50' at mature height with ≤90' mature width. Ideal for parks, open lawns, green spaces, tree lawns ≥8' wide and sites with no utility lines.



Dawn redwood

Name	Crown Shape	Salt Tolerance	Soil water		Soil pH		Species Benefits			
common name (Scientific name, 'cultivar')		Low, Medium, High	Wet	Dry	Acid	Alkaline	Resistance to disease	Showy flowers	Native	Drought-tolerant
American elm* (<i>Ulmus americana</i>)	U, V	H	•	•	•	•			•	•
'Valley Forge'	U, V	H	•	•	•	•	•		•	•
'New Harmony'	U, V	H	•	•	•	•	•		•	•
Baldcypress (<i>Taxodium distichum</i>)	C, P, U	M	•		•	•			•	•
'Monarch of Illinois'	P	M	•	•	•	•			•	•
'Pendens'	P	M	•	•	•	•			•	•
chinkapin oak (<i>Quercus muehlenbergii</i>)	B, R	L	•		•	•	•		•	•
Cucumbertree (<i>Magnolia acuminata</i>)	P, U	?	•		•	•	•		•	Mod
Dawn redwood (<i>Metasequoia glyptostroboides</i>)	O, P	L	•		•					Mod
Ginkgo** (<i>Ginkgo biloba</i>)	P, R	M	•		•	•	•			•
Littleleaf linden (<i>Tilia cordata</i>)	O, P	L	•		•	•		•		Mod
'Glenleven'	O, P	L	•		•	•		•		Mod
'Greenspire'	P	L	•		•	•		•		Mod
Kentucky coffeetree** (<i>Gymnocladus dioica</i>)	O, I	L		•	•	•	•		•	•
London planetree (<i>Platanus x acerifolia</i> , 'Bloodgood')	B, R, P	M	•		•	•				•
northern red oak (<i>Quercus rubra</i>)	R	H			•	•			•	•
Nuttall oak (<i>Quercus nuttallii</i>)	R	?	•		•		•		•	Mod
pin oak (<i>Quercus palustris</i>)	P	L	•		•		•		•	•
Shumard oak (<i>Quercus shumardii</i>)	O, R	H	•		•	•			•	•



cucumber-tree

J. Ruter, Univ. of Georgia, Bugwood.org



bald cypress

S. Winterton, Aquarium and Pond Plants of the World, Ed. 3, USDA APHIS PPQ, Bugwood.org



London planetree

T. D. Sydnor, The Ohio State Univ., Bugwood.org

				Species issues	Pruning needs	Light needs	Growth rate	Good for							
Thin bark easily damaged	Fruit/Nut or thorn conflicts	Pest issues	Wood susceptible to breakage	Clearance or form	Full sun ☀ Partial shade ☀☀	Slow, medium, fast	Planters/bowes	Sidewalk cutouts, pits, planting strips	Parking lot islands or strips	Windbreak/snow shield	Privacy/noise screen	Park or lawn			
•	•	•	F	☀ ½ ☀	F		•	•					•		
•	•	•	F	☀ ½ ☀	F		•	•					•		
•	•	•	F	☀ ½ ☀	F		•	•					•		
			C	☀	F		•	•		•	•				
			C	☀	F		•	•		•	•				
			C	☀	F		•	•		•	•				
•			c	☀	F			•							•
•			C	☀ ½ ☀	F										•
			C	☀	F		•	•		•	•				
•			C	☀ ½ ☀	S		•	•							•
	•		C, F	☀ ½ ☀	M	•	•	•			•	•			
	•		C	☀ ½ ☀	F	•	•	•			•	•			
	•		C	☀ ½ ☀	M	•	•	•			•	•			
•			C	☀	M			•							•
•	•		C	☀	F	•	•	•							•
•	•	•		☀	F			•							•
•			C	☀	M		•	•							•
•	•	•	C	☀	M		•	•			•	•			
•			F	☀	F			•							•



Littleleaf linden flowers
J. Obrien, USDA Forest Service, Bugwood.org



Kentucky coffeetree flowers
T. D. Sydnor, The Ohio State Univ., Bugwood.org

LARGE TREES

CONTINUED



Tulip poplar flower



Eastern white pine

Name	Crown Shape	Soil salt Tolerance		Soil water		Soil pH		Species Benefits		
common name (Scientific name, 'cultivar')		Low, Medium, High	Wet	Dry	Acid	Alkaline	Resistance to disease	Shiny flowers	Native	Drought-tolerant
sweetgum (<i>Liquidambar styraciflua</i>)	O, P	M	•		•	•			•	Mod
'Burgundy'	O, P	M	•		•	•			•	Mod
'Rotundiloba'	O, P	M	•		•	•			•	Mod
sugar maple (<i>Acer saccharum</i>)	O, R	L			•	•			•	Mod
tulip poplar (<i>Liriodendron tulipifera</i>)	O	L	•		•		•	•		Mod
shagbark hickory (<i>Carya ovata</i>)	O	M	•	•	•	•	•		•	Mod
shingle oak (<i>Quercus imbricaria</i>)	O, R, P	H	•		•	•			•	•
silver linden (<i>Tilia tomentosa</i>)	O, R, P	M			•	•		•		Mod
sycamore (<i>Platanus occidentalis</i>)	R, B, P	M	•		•	•			•	•
white oak (<i>Quercus alba</i>)	R, P	H	•		•				•	Mod
willow oak (<i>Quercus phellos</i>)	R, P	H	•		•		•		•	•
EVERGREENS										
eastern white pine (<i>Pinus strobus</i>)	O, P	L			•				•	Mod
'Glauca'	O, P	L			•				•	Mod
southern magnolia (<i>Magnolia grandiflora</i>)	O, P	M	•		•	•		•	•	Mod



willow oak

L. Morris, Univ. of Georgia, Bugwood.org



ginkgo

J. Ruter, Univ. of Georgia, Bugwood.org



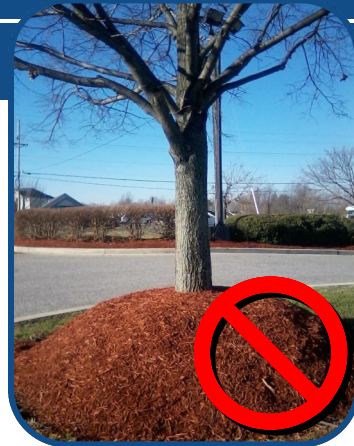
Kentucky coffeetree

V. Wilkins, Indiana Univ., Bugwood.org

				Species issues	Pruning needs	Light needs	Growth rate	Good for				
Thin bark easily damaged	Fruit/Nut or thorn conflicts	Pest issues	Wood susceptible to breakage	Clearance or form	Full/sun ☼ Partial/shade ½☼	Slow, medium, fast	Planters/boxes	Sidewalk cutouts, pits, planting strips	Parking lot islands or strips	Windbreak/snow shield	Privacy/noise screen	Park or lawn
•			C	☼ ½☼	M		•	•				•
•			C	☼ ½☼	M			•				•
			C	☼ ½☼	M			•	•			•
			C	☼ ½☼	M		•			•		•
•	•			☼	M			•				•
•	•			☼ ½☼	S							•
•			C	☼	F			•				•
	•		C, F	☼ ½☼	F			•		•		•
•	•			☼	F		•	•		•		•
•			C	☼ ½☼	S			•				•
•	•		C, F	☼	F		•	•				•
•	•	•	C	☼ ½☼	F	•		•	•	•	•	•
•	•	•	C	☼ ½☼	M	•		•	•	•	•	•
•	•		C	☼ ½☼	M		•	•	•	•	•	•

IN SUMMARY

- Urban forests help reduce stress, noise, heating and cooling costs, pollution and runoff.
- Select healthy nursery stock and plant the right tree in the right place.
- Diversity in urban forests is crucial to maintaining a healthy ecosystem.
- “Topping” trees leads to decay, poor form and future hazards.
- Planting a tree too deep or “volcano” mulching leads to stem decay and girdling roots. Root flare should be slightly above soil level.
- Make sure to water new trees weekly during the growing season, and give them a good, slow soaking.



“Volcano” mulching wastes mulch and damages stem tissue by holding moisture against it.

E. Moss, West Virginia State University Extension Service, Bugwood.org

WHY TOPPING HURTS TREES

Sometimes large-maturing trees get too big for a site and there is a desire to reduce their height. Topping is not the way to accomplish this. Branches cut back to a stub develop many weakly-attached, fast-growing sprouts. These sprouts will ultimately make the tree taller in a short amount of time, necessitating even more pruning. Topping also removes too much live foliage and destroys a tree’s natural form, weakening it and introducing many wounds where decay organisms can enter live tissues.



Topping severely stresses a tree, leaving many wounds and causing it to send out adventitious sprouts to regain lost foliage.

J. O'Brien, USDA Forest Service, Bugwood.org

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