



TWO RIVERS STREET TREE PLANTING GUIDE



Revised October 2021

***We need trees in
Order to survive.
THINK ABOUT IT!***

- Trees supply the oxygen in the air we need to breathe.
- Trees keep our air supply fresh by absorbing carbon dioxide.
- Trees lower air temperatures by evaporating water in their leaves.
- Trees cut down noise pollution by acting as sound barriers.
- Trees provide shade and shelter, reducing yearly heating and cooling costs by 2.1 billion dollars.
- Tree roots stabilize the soil and prevent erosion.
- Trees provide food and shelter for wildlife.

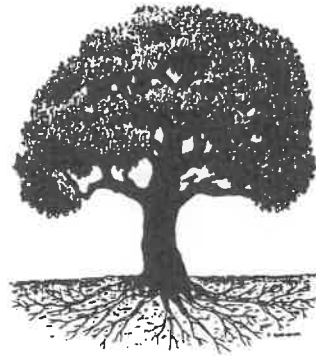
***Trees need our help
In order to survive.
THINK ABOUT IT!***

- Trees need pruning, feeding, spraying, and watering in order to thrive.
- A tree doesn't reach its most productive stage of carbon storage for about ten years, and many trees don't survive that long. The average tree in New York City survives only about 8 years!
- One million acres of forest are lost to city growth each year.
- Of every four city trees that die or are removed, only one is replaced.
- Any squirrel can plant a tree, but it takes a human to care for it in an urban area!

OUR FUTURE

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Introduction

The City of Two Rivers is responsible for all tree removals, maintenance, pruning, protection and planting of trees in all public areas and terrace areas of the City.

It is the purpose of this guide to provide information for Two Rivers property owners relative to recommended street tree species, soil conditions, principles and standards for tree planting and planting suggestions.

It is hoped that this guide will provide information to those who have already decided to plant trees and perhaps encourage others who may be reluctant to invest in this effort because of lack of information and guidance.

The Right Tree in the Right Location

Successful urban forestry planting plans match the individual tree species to the planting site. The right tree in the right location will result in:

- increased tree health, value and longevity
- decreased tree maintenance and removal costs
- elimination of sidewalk, curb, and gutter replacement caused by street tree roots
- a decrease in planting costs by reducing tree removals and replacements
- an increase in tree species diversity, therefore reducing future insect or disease loss (remember the over planting of American Elm trees and their loss through Dutch Elm Disease).
- a reduction in utility line tree clearance needs

The City of Two Rivers Park & Recreation Department has available, free of charge, a series of tree care brochures developed by the International Society of Arboriculture, a non-profit organization supporting tree care research around the world and dedicated to the care and preservation of shade and ornamental trees.

Three of these brochures deal directly with tree planting and go hand in hand with this guide. Tree planters are encouraged to acquire these brochures from the Park & Rec Department;

- *Buying High-Quality Trees*
- *Tree Selection*
- *New Tree Planting*



Principles For Street Tree Planting

The following general principles should be followed when selecting street trees:

- Plant several species per block or street.

A variety of tree species will help avoid monotony and ensure avoidance of an insect/disease epidemic. Tree species can be the same on some streets sides as long as species vary along the opposite side of the street.

- Plant species suited for the site.

Factors to consider:

- Winter hardiness
- Optimum height and spread at maturity. Fit the tree to the space available.
- Overhead utilities
- Tree terrace size
- Tolerance to pollutants and salt
- Soil type, alkalinity and available root zone

- Plant species with these characteristics:

- Easy to transplant and establish
- High resistance to damaging insects and disease
- Long lived and strong wood
- Minimal litter such as faded flowers, messy fruits or seed pods which may be a nuisance
- Roots that will not block sewers or heave pavements

- Consider planting site location:

- Plant smaller tree species at maturity under utility lines
- Tree terraces need to be a minimum width of 4 feet
- Stagger plantings on opposite sides of the street where it is impractical to provide sufficient trees on both sides.
- Consider the shade cast by surrounding street and landscape trees
- Be aware of pedestrian and motorist visibility at intersections



Standard for Street Tree Planting

Street tree planting exist to provide for public safety and healthy, long lived, low maintenance trees that will provide the many benefits of trees in the future years.

Trees Must be at least:

- 30' from any street corner
- 10' from a driveway
- 20' from a streetlight
- 10' from a fire hydrant
- 10' from a gas/water valve
- 20' from a utility pole

-Terrace trees shall be planted equal distance between sidewalk or proposed sidewalk and back of curb or proposed curb in coordination with underground utilities.

-All trees shall be planted in line with each other at a spacing between 30-50 feet depending upon species of tree. Larger crown tree requires more space.

-Trees may be allowed in terraces less than 4' with the City Foresters approval, but trees are prohibited in right of ways less than 50' wide.

-No planting of shrubbery, ground cover, or other plants within the terrace area.

-Terrace trees need to be sufficient size to absorb the abuse and conditions common to street trees. In most cases minimum specifications of 7' height and 1 1/4" diameter should be followed. When planting smaller tree species, a 5' height and 1" diameter is acceptable.

-The Two Rivers Parks and Recreation Department should be contacted for assistance prior to property owner street tree planting.

-Tree selections are continuously being improved upon with the development of new varieties and cultivars. The official City of Two Rivers Street tree species list is included at the end of this guide.

Planting Preparation

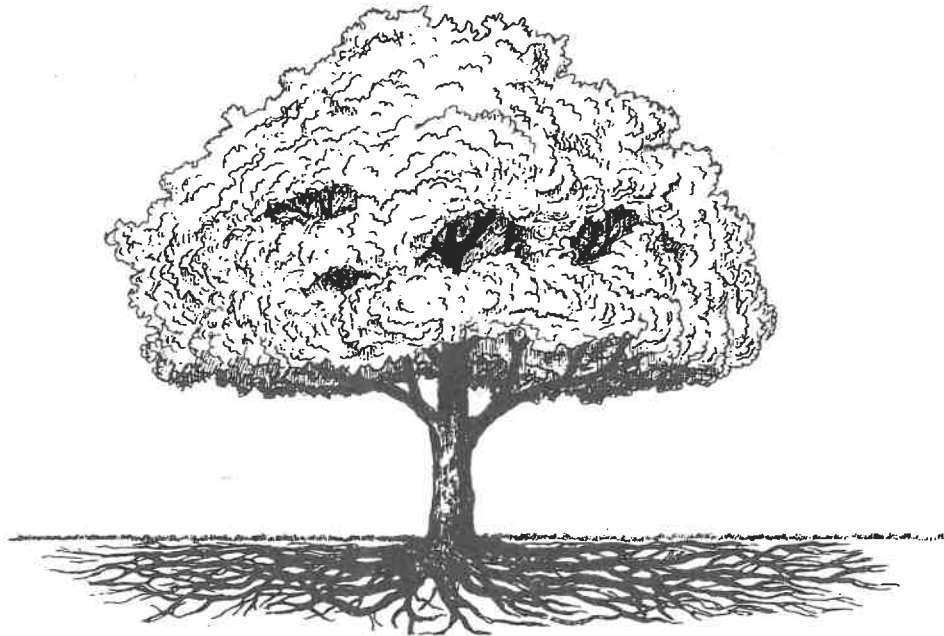
It is important that trees be planted as soon as possible after obtaining them. When trees cannot be planted soon after obtaining them they must be kept in a cool, shady location until they can be planted.

Proper planting techniques set the stage for a tree's overall health throughout its life. Most tree health problems are related to the condition of the root system. Planting too deep is a common mistake that predisposes a tree to an early death. Trunks were not meant to be buried with soil and/or mulch. When this occurs basal rot, girdling roots, and trunk cankers may develop. The base of the trunk is similar to your neck. It doesn't take much damage to that area to seriously affect the overall health of the tree.

Balled and burlapped (B+B) planting stock is recommended for street tree plantings. B+B trees allow for a stronger and larger tree to be installed over a greater time frame. Most street tree plantings should be 1 ½ - 2" diameter.

Before you begin planting a tree be sure you have had all underground utilities located prior to digging.

**DIGGERS HOTLINE
1-800-242-8511**



Planting Instructions

Be aware that a tree's root system has been reduced 90-95% of its original size during transplanting. The trauma caused by the digging process will cause trees to exhibit what is known as transplant shock. This is indicated by slow growth and reduced vigor following transplanting. Proper site preparation and planting techniques will allow the tree to quickly establish in its new location.

1. Dig a shallow, broad planting hole. Make the hole as much as three times the diameter of the root ball but only as deep as the ball.
2. Identify the root collar or trunk flare. This is where the roots spread at the base of the tree. This is the proper planting depth of the tree and it should be partially visible after planting.
3. Place the tree at the proper height. It is better to plant the tree a little higher (1-2") than to plant too deep. Always lift the tree by the root ball and never by the trunk.
4. Straighten the tree in the hole. View the tree from several directions.
5. Fill the hole, gently but firmly with the existing soil. Fill the hole about $\frac{1}{3}$ full and gently but firmly pack the soil around the base of the root ball. Cut and remove the string, wire and burlap from around the ball as much as possible (at least top $\frac{1}{2}$) without disturbing the root ball. Be careful not to damage the trunk or roots.

Fill the remainder of the hole and settle the soil with water. It is not recommended to apply fertilizer at the time of planting.

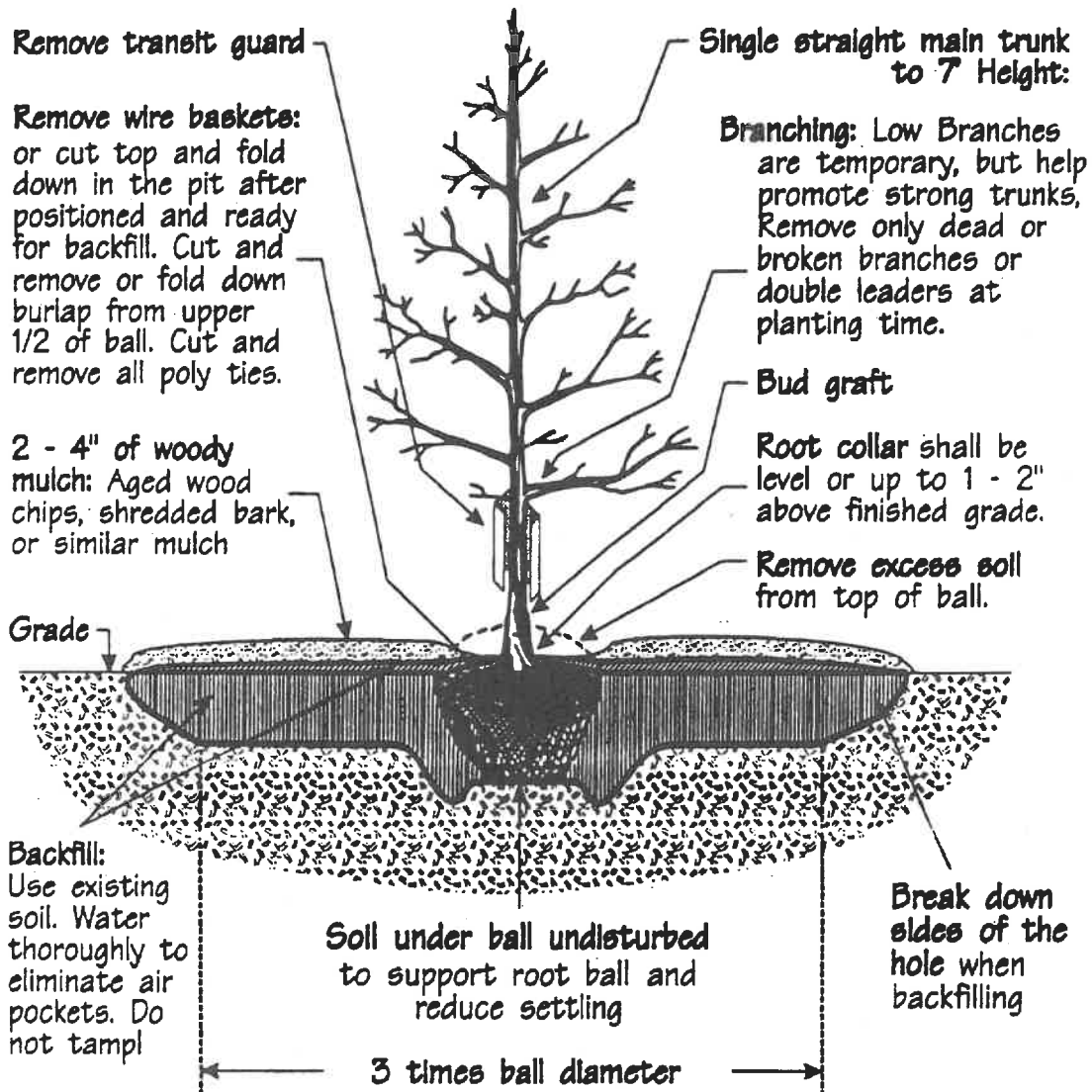
6. Stake the tree only if necessary. Research shows that trees will establish more quickly and develop stronger trunk and root systems if they are not staked at planting time. Bare root stock may require staking to stay upright. If staking is necessary for support, two stakes used in conjunction with a wide flexible tie material (canvas or lawn chair webbing will work) will hold the tree upright, provide flexibility and minimize injury to the trunk (see diagram).

Remove staking after 1 - 2 years.

7. Mulch the base of the tree. A 2-4 inch layer of wood chips, shredded bark or similar material is ideal. The actual trunk should have no more than 1 inch of mulch against it. Proper mulching can nearly double tree growth in the first few years after planting.
8. Follow-up care. Keep soil moist but not soaked. When the soil is dry below the mulch it is time to water. This will vary depending upon weather conditions and time of year.

Prune only damaged or dead branches at planting time and wait to begin training pruning after 1 full year of growth. Follow the pruning diagram for all pruning cuts on all trees.

Proper Tree Planting Diagram

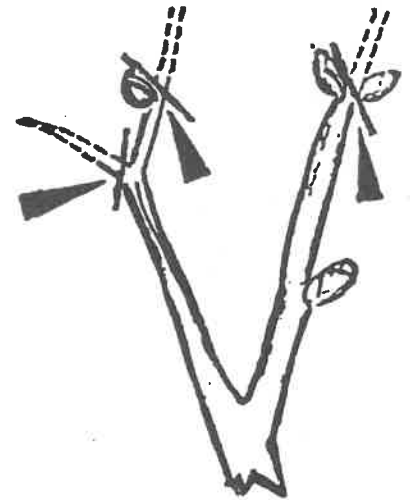
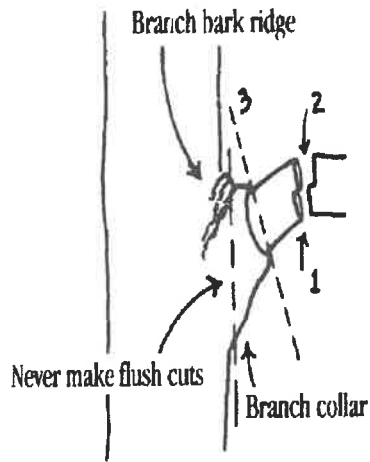


PROPER CUT

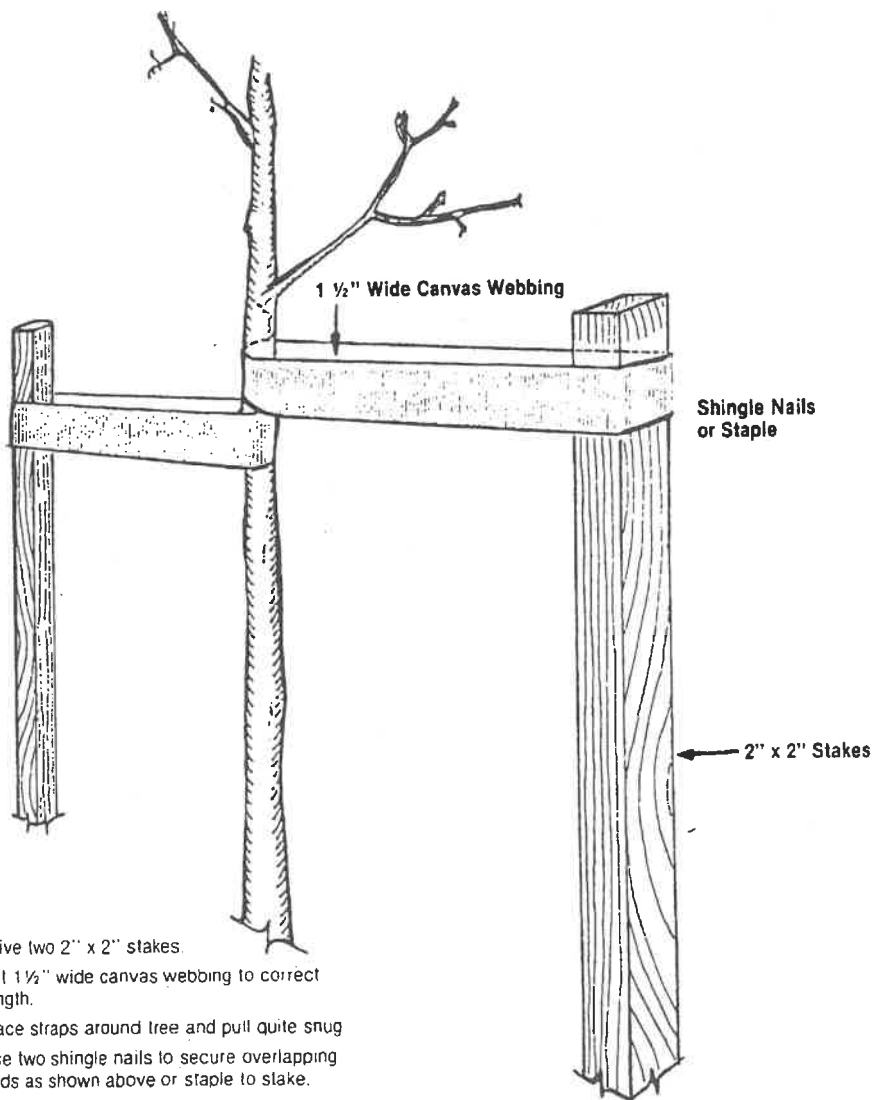
Cut 1 is made to prevent tearing of bark.

Cut 2 is made to remove weight of branch.

Cut 3 finishes proper pruning.



When pruning smaller branches, cut back to bud. If buds are opposite, cut through the bud not wanted. A new branch will develop in direction the bud points.



- 1 Drive two 2" x 2" stakes
- 2 Cut 1 1/2" wide canvas webbing to correct length.
- 3 Place straps around tree and pull quite snug
- 4 Use two shingle nails to secure overlapping ends as shown above or staple to stake.

RECOMMENDED STREET TREES - CITY OF TWO RIVERS

Large trees for use in wide areas (7' + root area) and no overhead utilities.

<u>Scientific Name</u>	<u>Common Name</u>
Acer x freemanii	Autumn Blaze Maple
**Acer platanoides	Norway Maple
Celtis occidentalis	Hackberry
**Fraxinus americana	White Ash
**Fraxinus pennsylvanica	Green Ash
Gingko biloba	Gingko
**Gleditsia triacanthos inermis	Honeylocust
*Gymnocladus dioicus	Kentucky Coffeetree
Phellodendron amurense	Amur Corktree
*Quercus alba	*White Oak
*Quercus macrocarpa	*Burr Oak
*Quercus robur	*English Oak
*Quercus rubra	*Red Oak
**Tilia cordata	Little Leaf Linden
Tilia americana cv 'Redmond'	Redmond Linden
**Ulmus americana cv	American Elm (Disease Resistant)

*Trees may not be suitable for high traffic areas due to nut and fruit litter.

** Many cultivars exist for these species. Cultivars are used for variety among species and improved performance through characteristics: i.e. shapes, structure, growth habit, insect/disease resistance, absence/persistence of fruit, and color.

cv - abbreviation for cultivar

RECOMMENDED STREET TREES – CITY OF TWO RIVERS

Small trees for use in wide areas (4-6') or areas with overhead utilities.

<u>Scientific Name</u>	<u>Common Name</u>
Acer Tataricum	Tatarian Maple
**Amelanchier spp. ^	Serviceberry
Caripinus spp.	Hornbean, Musclewood
**Crataegus spp.	Hawthorn
**Mauls spp.	Crabapple
Ostrya virgiiana ^	Ironwood, Hop Hornbean
**Prunus sp. ^	Ornamental Cherry and Plum
**Pyrus calleryana	Callery Pear
Syringa reticulata	Japanese Tree Lilac

** Many cultivars exist for these species. Cultivars are used for variety among species and improved performance through characteristics: i.e. shapes, structure, growth, growth habit, insect/disease resistance, absence/persistence of fruit, and color.

Spp. -abbreviation for species

^ -messy tree with berries

What Cultivars Can Do

Cultivars have been developed for many reasons. Traditionally, these have been to make fruit production more profitable or to create something novel for the landscape market. Cultivars can also help solve problems related to planting sites. It is this use that has tremendous potential in urban and community forestry — along streets, in parks and around public buildings. By selecting a cultivar with a trait that can solve a problem, it is possible to:

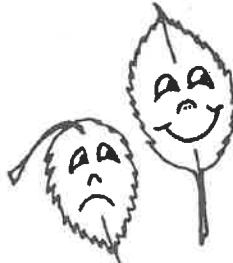
- reduce the need for chemical pesticides, saving money, reducing environmental impacts, and preventing citizen complaints.
- reduce maintenance hours, freeing crews to do more productive things like systematic pruning.
- improve tree health, thereby reducing dead limbs and other public safety risks.
- predict crown size and root space needs, helping to best match trees to specific sites.
- enhance aesthetics through more diversity of flowers, foliage and form.
- eliminate the nuisance of fruit dropping.
- reduce removal costs by extending tree life.

Unfortunately, in almost all cases there are tradeoffs. Although there are cultivars available that offer all the advantages shown on these pages, each also has limitations. It is important to learn all the characteristics of a cultivar and avoid selections where the limitations outweigh the advantages. Otherwise, cultivars offer a wonderful menu of traits ready to serve those who take the time to study the planting site and match it with the best possible tree.

▼ Resists disease

Example: 'Sapporo Autumn Gold' Hybrid Elm

Introduced by the Wisconsin Alumni Foundation in 1975; resistant to Dutch elm disease and verticillium wilt.



▼ Resists insects

Example: 'Regent' Scholartree

Introduced in 1964; resistant to leafhoppers.

▼ Tolerates heat and compacted soil

Example: 'Summit' Green Ash

Developed in Minnesota, this tough cultivar not only tolerates urban heat and compacted soil, its thicker bark makes it more resistant to borers and mechanical injury as well.



▼ Provides shade without messy fruit/seeds

Example: 'Skyward' Green Ash

Introduced by Willet Wandell in 1988, *Fraxinus pennsylvanica* 'Wandell' goes by the trade name, Skyward, and is a seedless cultivar. This means less clean up and fewer clogged drains.



▼ Transplants easier

Example: 'Schwedler' Norway Maple

A very old cultivar from Europe; is said to transplant better than other Norway maples.



▼ Has a crown form that fits the space

Example: 'Armstrong' Red Maple

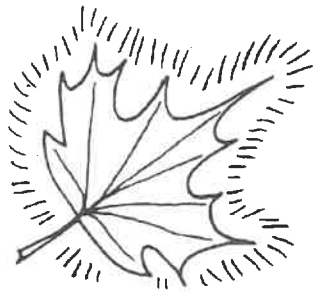
Cultivars may be selected from a wide range of crown forms as shown on page 3. 'Armstrong' red maple is a columnar tree with upright branching, making it suitable for narrow spaces.



▼ Tolerates salt

Example: 'Vaughn' Hawthorn

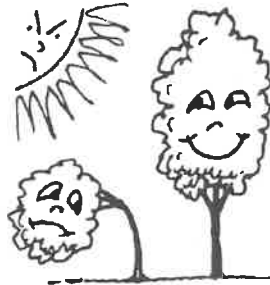
A medium-size tree that tolerates a wide range of urban conditions, including deicing salt in the soil and the air.



▼ Displays unusual leaf colors

Example: 'Crimson King' Norway Maple

This one can be selected when an extended display of fall color is desired.



▼ Tolerates drought

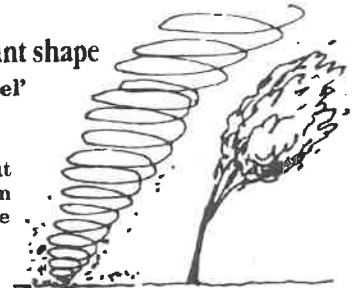
Example: 'Greencolumn' Black Maple

From the midwest, this slow-growing cultivar has a narrow crown and tolerates heat and drought better than its close relative, sugar maple.

▼ Exhibits storm resistant shape

Example: 'Scarlet Sentinel' Hybrid Maple

Where the vigor of silver maple is desired, but without undue susceptibility to storm damage, this cultivar may be the answer.



▼ Grows rapidly

Example: 'Siouxland' Cottonwood

Introduced by South Dakota State University, this is a good choice for quick shade where space allows.



SPECIAL ACKNOWLEDGEMENT to Kris Irwin, Assistant Community Forester for the Nebraska Forest Service, University of Nebraska, for suggesting the topic for this issue and contributing to its content.

Crown Shapes

To help communicate accurately about cultivar characteristics, an attempt is made to standardize terms for foliage color, size categories and other traits. Here are standardized crown categories used in the Directory of Landscape Tree Cultivars Project.



Broadly Globe



Moderately Globe



Broadly Columnar



Moderately Columnar



Narrowly Columnar



Broadly Weeping



Moderately Weeping



Broadly Ovate



Moderately Ovate



Broadly Pyramidal



Moderately Pyramidal



Narrowly Pyramidal



Broadly Vase



Moderately Vase

Selected Cultivar Listing City of Two Rivers

<u>Scientific Name</u>	<u>Common Name</u>
Acer x freemanii	
`Autumn Blaze`	Freeman Maple Autumn Blaze
`Armstrong`	Armstrong Freeman Maple
Acer platanoides	
`Columnare`	Columnar Norway Maple
`Crimson King`	Crimson King Norway Maple
`Deborah`	Deborah Norway Maple
`Emerald Queen`	Emerald Queen Norway Maple
`Royal Red`	Royal Red Norway Maple
`Schwedleri`	Schwedler Norway Maple
Amelanchier	
laevis	Allegheny Serviceberry
x grandiflora	Autumn Brilliance Serviceberry
Crataegus	
crus-galli var. inermis	Thornless Cockspur Hawthorn
phaenopyrum	Washington Hawthorn
`Vaughn`	Vaughn Hawthorn
Fraxinus americana	
`Autumn Applause`	Autumn Applause White Ash
`Autumn Purple`	Autumn Purple White Ash
Fraxinus pennsylvanica	
`Marshall seedless`	Marshall Seedless Green Ash
`Patmore`	Patmore Green Ash
`Summit`	Summit Green Ash
Gleditsia triacanthos inermis	
`Imperial`	Imperial Honeylocust
`Shademaster`	Shade master Honeylocust
`Skyline`	Skyline Honeylocust

Scientific Name**Common Name**

Malus

`Adams'	Adams Crabapple
`Centurion'	Centurion Crabapple
`Hargozam'	Harvest Gold Crabapple
`Prairifire'	Prairifire Crabapple
`Sentinel'	Sentinel Crabapple
`Snowdrift'	Snowdrift Crabapple
`Spring snow'	Spring Snow Crabapple
zumi `Calocarpa'	Redbud Crabapple

Pyrus

`Aristocrat'	Aristocrat Callery Pear
`Bradford'	Bradford Callery Pear
`Chanticleer'	Chanticleer Callery Pear
`Select'	Select Callery Pear

Tilia americana

`Redmond'	Redmond Linden
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Tilia cordata

`Chancole'	Chancellor Littleleaf Linden
`Corzam'	Corinthion Linden
`Greenspire'	Greenspire Littleleaf Linden
`Olympic'	Olympic Littleleaf Linden

Tilia x flavescens

`Glenleven'	Glenleven Linden
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Ulmus americana

`Liberty'	Liberty Elm
`New Harmony'	New Harmony Elm
`Princeton'	Princeton Elm
`Valley Forge'	Valley Forge Elm
`Washington'	Washington Elm

This is a small listing of commonly used cultivars as street trees. These trees have been chosen for their growth forms, insect and disease resistance, fruit persistence or absence, colors and ability to be thornless. Additional cultivars become available periodically and should be researched before purchasing plant stock.

Trees Not Recommended For Street Tree Planting

Red Maple (*Acer rubrum*) - requires acidic soil, Iron chlorosis problems. Needs sandy soil.

Sugar Maple (*Acer saccharum*) - salt intolerant

Silver Maple (*Acer saccharinum*) - weak wood, large buttress roots

Box Elder (*Acer negundo*) - weak wood, sprawling crown

Black Walnut, Butter nut (*Juglans spp.*) - large nuts create litter problem

Cottonwood and other Poplar species (*Populus spp.*) - weak wood, cottony seed problem

Black Willow, Weeping Willow (*Salix spp.*) - weak wood, drooping habit

Catalpa (*Catalpa speciosa*) - flower, fruit, and leaf litter problem, large root flare

Spruce, Pine (*Picea spp.*, *Pinus spp.*) - dense crown creates visual obstacle

American Elm (*Ulmus americana*) - subject to Dutch Elm Disease (Disease resistant American Elms now available)

Siberian Elm (*Ulmus pumila*) - weak wood, large buttress roots

Paper Birch (*Betula papyrifera*) - insect problems, weak wood, drought intolerant

Black Locust (*Robinia psuedoacacia*) - weak wood due to borer problems

Horsechestnut, Buckeye (*Aesculus spp.*) - large nuts create a litter problem

Russian Olive (*Elaeagnus angustifolia*) - subject to phomopsis blight, sprawling crown

Nut and Fruit Bearing Trees - potential for litter problem

Sources

International Society of Arboriculture. P.O. Box GG, Savoy, IL 61874-9902, USA

Street Trees for Wisconsin, College of Agriculture, University of Wisconsin College of Agriculture. Circular 129.

Tree City USA Bulletin. The National Arbor Day Foundation. 100 Arbor Avenue. Nebraska City, NE 68410.

Wisconsin Department of Natural Resources. Bureau of Forestry. Urban and Community Forestry.

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