Growing Healthy Trees

Special thanks to the Colorado Tree Coalition for partially funding the printing of this booklet.

WESTMINSTER

Colorado Tree Coalition

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Dear Citizens of Westminster:

As you may know, urban trees provide many benefits to our community. Whether you are interested in growing trees for their environmental, economic or social benefits, the keys to success lie in proper selection, planting and long term care. The goal of this booklet is to provide a reference point that will help residents plant and nurture healthy trees.

The City of Westminster is naturally a desert plains environment that is conducive to only a few select tree species. Growing trees in our City can be a very challenging and frustrating task. We believe the information within these pages will provide the frame work needed to improve your arboricultural skills.

All of you are integral parts of Westminster's urban forest, and with your help we can grow our City into the best it can be. Use the information within this booklet to make the best tree care decisions possible, and pass along your knowledge to friends and neighbors.

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TREE CITY USA®

CONSIDERATIONS BEFORE PLANTING

Several important details must be considered before selecting and planting a tree. These include the amount of growing space available for the tree, water availability and drainage, soil pH, light levels, and weather.

Amount of growing space available for tree

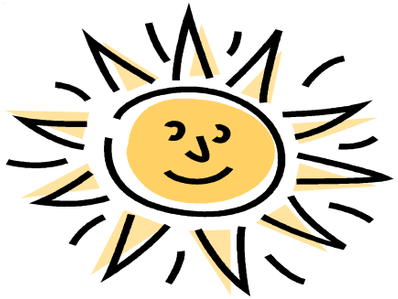
The area above and below ground must be large enough to accommodate the tree's mature height, spread, and root growth. Overhead and underground utilities can lead to unwanted problems if not considered before planting. Always call for utility locations before digging and make sure the mature tree will not interfere with overhead utilities. Be aware that the tree you're planting can be a potentially invaluable asset or a devastating liability depending on its location.

Water availability and drainage

Westminster's climate is classified as semi-arid based on average annual moisture. This sparse amount of moisture combined with the typical heavy clay soil found in the City helps explain why this area was previously prairie and not forest. Thus, supplemental moisture through a sprinkler system or hand held hose is critical, as well as, provisions for not overwatering the tree. Tips for supplemental watering can be found in the upcoming watering section.

Soil pH

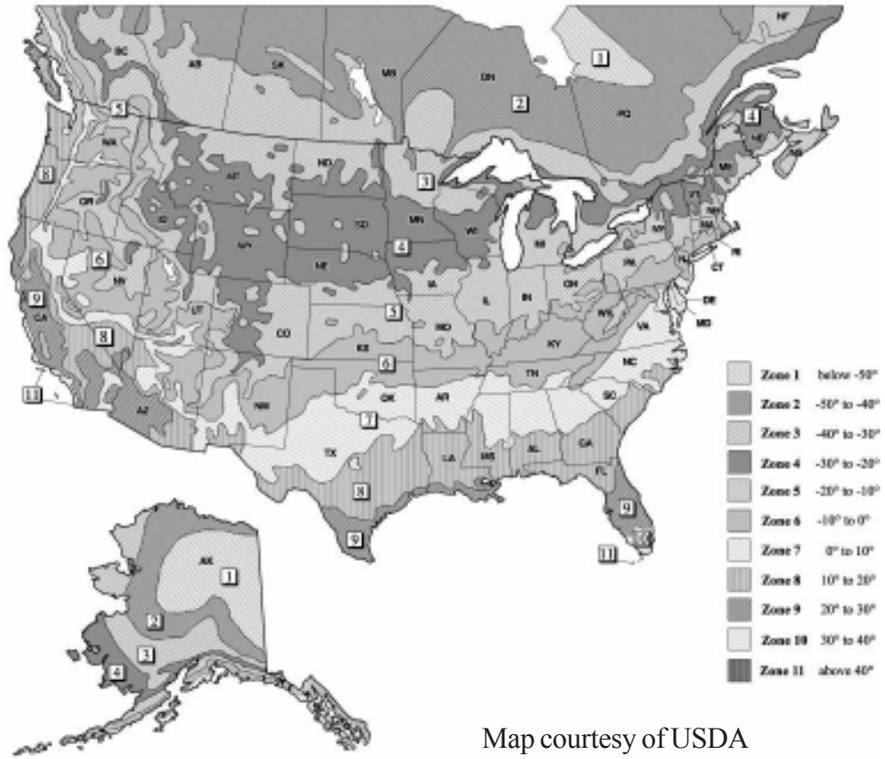
Soil pH is an index of soil acidity and alkalinity. A pH of less than 7 is considered acidic, and a pH greater than 7 is considered alkaline. As mentioned earlier, most of Westminster's soils are high in clay and correspondingly high in pH and alkalinity. Most tree species have evolved in lower pH conditions making them susceptible to a host of nutrient problems in Westminster soils. Tips on alkaline tolerant species and fertilizing can be found later in the booklet.



LIGHT LEVELS

Trees require sunlight to photosynthesize carbon dioxide and water into sugars and oxygen. Without this process trees fail to grow and ultimately fail to survive. However, Westminster has over 300 days of sunshine per year. Coupling this with our dry climate can result in too much sunlight exposure affecting a tree's health. Positioning more shade tolerant species on north sides of houses and other structures can be the difference in a healthy tree versus a stressed, diseased, or insect-ridden tree.

Anyone who has lived in the Westminster area is aware of the weather inconsistencies that occur here. Any day of the year could see a high in the 60 F range whereas damaging frosts can also occur at least 9 months of the year. With this in mind, it is wise to choose tree species hardy or acclimated to this zone. Hardiness zones have been developed for the United States by the U.S. Department of Agriculture. These zones are based on a range of average lowest temperatures that can occur in that zone. As shown in the map, Westminster is in zone 5. Be aware that choosing a species not hardy to zones 1 to 5 can and will probably suffer freeze damage in Westminster.



Map courtesy of USDA

TREES FOR WESTMINSTER

In this section you'll find a list of tree species and cultivated varieties (cultivars). Additional comments on each tree are provided concerning the previously discussed considerations before planting. Tips on nursery selection criteria and transportation will also be discussed.

The species lists to follow are arranged by smaller ornamental trees, larger shade trees, and conifer trees with various notes on each species. It should be noted that for each tree there is an estimated size for average mature heights and widths.

Colorado Champion Tree Program

The goal of the Colorado Champion Tree Program is to note the biggest and best specimens of individual tree species currently growing in our state. The list is maintained by the Colorado Tree Coalition (for more information go to www.coloradotrees.org), and it is another way to evaluate tree performance in Colorado. Anyone can nominate a tree to be a Colorado Champion, and the current list has over 700 trees from all across the state. We've taken this list of state champs, and noted the height and spread of the current state champion. Species that do not have current documented champions are noted as NA on the species list.

Full Symbology Descriptions for Species Lists
♦- Water Lover: Tree performs best long term when grown in soils that often have high moisture
❖- Drought Tolerant: Tree is able to adapt to sites that are often dry for extended periods of time
≈- Avoid Alkaline Soils: Tree performs poorly in alkaline soils or in areas with a pH greater than 7.2
⌘- Flowers: Tree will produce noticeable and attractive flowers
♉- Insect or Disease Issues: Tree has a common yet significant insect or disease association
❀- Fleshy Fruit: Tree will produce a fleshy fruit
♈- Fall Color: Tree will often have a fall color of orange, red or purple
♋ - Forester Favorite: Trees listed as favorites from a survey of local City Foresters and Arborists

Small, Deciduous Trees

The following list includes trees that typically do not exceed 30 feet in height when fully grown. Use one-half of branch spread (diameter) to locate a tree planting location near structures.

♦- Water Lover ❖- Drought Tolerant ≈- Avoid Alkaline Soils ⌘- Flowers
♉- Insect or Disease Issues ❀- Fleshy Fruit ♈- Fall Color ♋-Forester Favorite

Plant Name	Average & CO Champion Height/Spread	USDA Zone	Symbols	General Comments on the Tree Species
Small Deciduous Trees				
Alder, Thinleaf *Alnus tenuifolia*	25/15 & 48/15	2	♦	Rocky Mountain native able to tolerate moist soils. Most often sold in a clump form and is a good alternative for aspen plantings. Amber bark and interesting cone-like fruits give this tree notable winter interest.
Amur Maackia *Maackia amurensis*	25/35 & NA	4	⌘	This legume is a good choice for poor soils as it is a nitrogen fixing plant and it can tolerate alkaline soils. Many small leaflets make up the foliage of this tree. Expect white flowers mid-summer turning into 3 to 4 inch flat pods.
Apple, Fruit Tree *Malus spp.*	20/25 & 41/46	3-5	⌘ ❀	So many choices to choose from with a great variety of sizes and shapes. Don't just settle for species you like at the supermarket as some varieties' fruit ripens too late in the season. Be sure to look into fireblight susceptibility.
Apricot *Prunus mandshurica*	15/15 & 44/30	4	⌘ ❀	This small fruit tree develops with a spreading, round-headed crown filled with dark green heart-shaped leaves. Before leaf emergence, the branches of this tree will be filled with 1 1/4 inch pink flowers in April.
Ash, Single Leaf *Fraxinus anomala*	15/15 & 31/15	4	❖	This tree is native to southwestern Colorado and may be difficult to find at nurseries. Canopy is made up of gray-green leaves with light brown samaras forming in summer. Tree is able to tolerate poor soils and dry conditions.
Aspen, Quaking *Populus tremuloides*	30/20 & 109/33	2	♉	This white-barked Colorado native is a favorite for Front Range homeowners. Unfortunately this tree tends to struggle with numerous biotic and abiotic disease issues. Tree is often short-lived.
Birch, Western River *Betula occidentalis*	15/15 & 33/32	3	♦	Rocky Mountain native able to tolerate moist soils. Most often sold in a clump form, and is a good alternative for aspen planting. Cherry colored bark dotted with white lenticels. Tree can tolerate shady locations.
Boxelder *Acer negundo*	30/30 & 72/88	2	♉ ♈	Fast growing medium sized tree that tends to be prone to storm damage. Tolerant of poor soil conditions. Leaf form will vary from branch to branch. Can be attractive to boxelder bugs. There are some new and improved cultivars with nice red fall color.
Cherry, European Bird *Prunus padus*	20/20 & NA	3	⌘ ❀	Cold hardy tree very similar to chokecherry. Tree will fill with fragrant drooping white flowers in early spring. The flowers will develop into small black fruits that birds enjoy. Trees of the *prunus* genus are often short-lived.

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Small Deciduous Trees				
Cherry, Cornelian *Cornus Mas*	20/15 & 12/12	5	⌘ ❀	An interesting species of dogwood with a knockout display of yellow flowers covering leafless branches in late February to early March. These flowers lead to bright red fruits that birds enjoy. Can grow into a very nice specimen.
Cherry, Sour/Pie *Prunus spp.*	Various & 37/25	3-5	⌘ ❀	There are many cultivars of pie cherry to choose from. This species is much easier to grow in our area than sweet cherries, and you only need one for fruit production. Birds will fight you for the fruit from these trees.
Chokecherry *Prunus virginiana*	25/25 & 35/12	2	⌘ ❀	Plant grows naturally along our mountain streams as large shrubs. Nurseries sell the native form and various cultivars that boast red summer foliage. Tree perform best when grown as a clump or with a shaded trunk. Fragrant white spring flowers lead to fruits good for jelly making or bird attraction.
Chokecherry, Amur *Prunus maackii*	25/25 & 31/12	2	⌘ ❀	Most notable characteristic of this tree is its metallic-like copper colored bark that is very smooth to the touch in areas where it isn't exfoliating. White spring flowers lead to fruit for the birds.
Corktree, Amur *Phellodendron amurense*	25/35 & 42/65	5		Tree often boasted as being tolerant of urban conditions, but mixed review from local growers. Tree leafs out late and drops its leaves early losing some interest but avoiding storm damage. Mature bark is spongy and interesting to the touch.
Crabapple varieties *Malus spp.*	Various	3-5	⌘ ❀ ♈ ♋	Classic tree for the Front Range with spring blossoms of white, pink, or red. Foliage can range from green to purple with mature canopy forms of various shapes and sizes. Fruit can be large for jellies, small and persistent on branches leading to little mess, or non-producing. Always ask about an individual cultivar's resistance to fireblight.
Dogwood, Pagoda *Cornus alternifolia*	15/20 & NA	5	⌘ ❀ ♈	Small statured ornamental excellent for tight spaces. Tree will perform well in shady conditions. Small pale yellow flowers in May leading to small black fruit. Light red fall color. Excellent choice for shady spots.
Golden Rain Tree *Koelreuteria paniculata*	30/30 & 35/32	5	⌘ ❖	Tolerant of poor soils and drought. Tree has an exotic look with incised leaves and an open form. Bright yellow flowers in July lead to interesting small lantern-like fruit. Tree is able to tolerate drought and poor soils.

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Hawthorn, Cockspur *Crataegus crusgalli*	15/20 & NA	3	⌘ ❖ ❀ ♈ ♋	Inch long thorns provide excellent shelter for birds but make pruning and tree climbing difficult (there is also a very nice thornless variety of this species). White spring flowers lead to bright red 1/2 inch fruits. Notable orange to red fall color.
Hawthorn, Downy *Crataegus mollis*	25/30 & 39/46	3	⌘ ❖ ❀ ♈ ♋	Two inch thorns provide shelter for birds, and add great winter interest to the bare silhouette of this tree. White spring flowers lead to bright red 1 inch diameter fruits. Fall color can vary from yellow to red. Able to tolerate drought and poor soils.
Hawthorn, Russian *Crataegus ambigua*	15/20 & NA	3	⌘ ❖ ♋ ❀	Tree naturally has a twisted and gnarled form great for specimen trees. White spring flowers lead to showy, cherry-like red fruit. Thorns are much smaller and fewer than other hawthorns. Tree is able to tolerate drought and poor soils.
Hawthorn, Washington *Crataegus phaenopyrum*	15/15 & NA	4	⌘ ❖ ❀ ♈ ♋	Another well-armed tree with 3/4 inch long thorns. White spring flowers lead to smaller 1/4 inch sized red fruits that hang on into winter. Fall foliage turns scarlet orange and can be very attractive. Tree is able to tolerate drought and poor soils.
Ironwood *Ostrya virginiana*	25/15 & 38/20	4		Interesting ornamental with grayish bark that has a muscle-like appearance. Tree will develop spring catkins and fall hop-like fruits. Tree naturally grows as an understory species and will tolerate shade.
Lilac, Japanese Tree *Syringa reticulata*	20/15 & 36/25	4	⌘	Upright tree form of the popular lilac species. Large white clusters of flowers are filled with the well known fragrance of traditional lilac shrubs. Younger bark tends to be an attractive shiny reddish-brown.
Lilac, Peking Tree *Syringa pekinensis*	15/15 & 38/25	4	⌘	Tree form of lilac that has smaller foliage than the Japanese tree lilac. Creamy white flowers are very fragrant. Attractive brown bark is often exfoliating on trees as they mature.
Magnolia, Star *Magnolia stellata*	15/10 & NA	5	⌘	Hardy species of magnolia that develops well in a large shrub-like form. Early spring opens large buds to striking white star-shaped flowers. Grows best in a soil with adequate drainage.
Maple, Bigtooth *Acer grandidentatum*	30/20 & 31/27	3	❖ ♈	Rocky Mountain native is quite tolerant of dry conditions. Develops well as a small tree or large shrub. Very attractive traditional maple leaves that turn to a soft red in the fall. One of the few maples tolerant of alkaline soils.

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Pear, Callery *Pyrus calleryana*	30/15 & NA	4	⌘ ❀ ♈ ♋	Many cultivars of this species are available, and all have outstanding spring displays of white flowers before leaves emerge. Can be susceptible to early and late season freeze damage. Cultivars available with outstanding red fall color.
Pear, Ussurian *Pyrus Ussuriensis*	25/20 & 40/24	3	⌘ ❀ ♈ ♋	Most cold hardy of all the ornamental pears. White spring flowers before leaves emerge are very showy. Fall color ranges from yellow to orange to burgundy red. Tree has shown good fire blight resistance. Larger fruit potential.
Plum, American *Prunus americana*	10/10 & 18/28	2	⌘ ❖ ❀	Native tree or large shrub with fragrant white spring flowers that open before leaves emerge. One inch diameter plums will develop with good flavor. Tree can tolerate dry alkaline soils. Trees tend to sucker and form thickets.
Plum, Fruit Tree *Prunus spp.*	Various	5	⌘ ❀	There are a wide variety of plum trees that will easily grow in our climate. Most varieties only need one tree to pollinate. Trees typically will bear young with a fruit crop that can be quite plentiful.
Plum, Ornamental *Prunus spp.*	Various	3-5	⌘ ❀ ♈	There are several species and cultivars of ornamental plums boasting impressive spring displays of white flowers. Tree foliage will vary from dark green to distinctive purple Some cultivars have nice red fall color.
Redbud, Eastern *Cercis canadensis*	25/20 & 38/28	5	⌘	The early spring purplish-pink flowers are very eye-catching as they cover leafless branches. Leaves are heart-shaped and have a nice yellow fall color. Trees may need shelter, but there are many nice specimens up and down the Front Range.
Russian Olive *Elaeagnus angustifolia*	25/25 & 58/73	2	⌘	A noxious weed that has taken over many of Colorado's riparian water ways. Gray foliage, pleasant smelling flowers, and ability to tolerate poor soils/harsh conditions make this plant tempting. This is not a recommended tree.
Salt Cedar *Tamarix spp.*	15/20 & NA	2	⌘	A noxious weed that has taken over many of Colorado's riparian water ways. Pink spikes of summer flowers make this plant tempting, but it is strongly encouraged that trees be removed to control spreading.
Serviceberry Varieties *Amelanchier spp.*	Various	3-5	⌘ ❀ ♈	There are many species of serviceberry ranging from small shrubs to small ornamental trees. Most bear attractive white spring flowers that turn to fruit good for birds. Many cultivars have nice red fall color, and are good alternative to aspens.

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Small Deciduous Trees				
Sumac, Staghorn *Rhus typhina*	15/15 & NA	3	❖ ♈	An aggressive sumac that can overwhelm a gardener with a strong tendency to sucker and colonize an area. Tree grows quickly and is able to tolerate very poor soils. The leaves are long and serrated with an impressive fall color display of red and orange.
Wafer Ash *Ptelea trifoliata*	10/15 & NA	5	❖	Native tree that is able to tolerate very dry conditions. Its small leaves are joined by fragrant 1/2 inch white flowers late in the summer. The flowers turn to small wafer-like fruits adding further interest to the tree's reddish bark. Leafs out late.
Yellowhorn *Xanthoceras sorbifolia*	20/15 & NA	5	⌘	Unusual smaller ornamental often with a form closer to a large shrub. The most notable attribute of this tree is the red-throated white flower clusters developing in May. Tolerant of alkaline soils and difficult to find at nurseries.

Large Trees for Shade.

The following list includes trees that will exceed 30 feet in height when fully grown. These trees should not be placed under or near power lines or other overhead structures. Use one-half of branch spread (diameter) indicated on chart to locate trees near structures.

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Large Trees for Shade				
Ash, Green *Fraxinus pennsylvanica*	55/30 & 68/69	3	♉	Extremely popular shade tree that has developed more significant insect problems in recent years. May need to spray this tree for lilac/ash borer on an annual basis to keep the tree healthy. Tolerant of poor soil conditions and nice yellow fall color.
Ash, White *Fraxinus americana*	55/30 & 78/81	4	♉♈	Extremely popular shade tree that has developed more significant insect problems in recent years. May need to spray this tree for lilac/ash borer on an annual basis to keep the tree healthy. Tolerant of poor soil conditions and nice purple fall color.
Ash, Misc. Varieties *Fraxinus spp.*	40/25 & NA	3-4	♉	Many different species of ash trees are available from nurseries. Most can grow well in poor soils and are reliable shade trees if insect problems are prevented. Trees are often sold as seedless cultivars with yellow fall color.
Birch,Cutleaf Weeping *Betula pendula* 'Gracilis'	35/25 & 61/53	3	♉♦	White peeling bark and pendulous branches make this tree quite striking. There are many nice specimens of this species along the Front Range, but weeping birch struggle with dry winters and infestations of bronze birch borer.
Birch, Paper *Betula papyrifera*	35/20 & 39/26	3	♉♦	As this tree matures, white peeling bark adds great interest. Tree offers a nice display of yellow foliage in the fall. This medium sized tree will struggle if forced to deal with dry winter soils and may be prone to borer attacks.
Buckeye, Ohio *Aesculus glabra*	40/35 & 54/37	3	⌘❀ ♈	Eye-catching five-lobed palmate leaves. Large greenish-yellow flowers stand upright from branches in spring, turning to prickly seed pods later in the season. Dark green foliage turns to shades of orange or yellow in fall.
Catalpa, Western *Catalpa speciosa*	55/35 & 60/48	4	⌘❖ ♋	This tree is most distinguishable by its large leaves that resemble elephant ears. Attractive clusters of white flowers develop towards the end of June. These blossoms develop into 12 inch long cigar-like bean pods.
Cherry, Black *Prunus serotina*	55/30 & 73/53	4	⌘❀	This is the tree of the Prunus genus that can become the largest in our area. Early season fragrant white flowers turn to reddish-black fruit great for the birds. Tree is seldom planted today, and is likely hard to find at nurseries.
Cottonwood, Lanceleaf *Populus x acuminata*	55/45 & 99/103	3	♦	This native hybrid of plains and narrowleaf cottonwood is a fast-growing tree, quite tolerant of poor soil conditions. Prefers a wet soil and may not be a long-lived tree. Most nurseries sell only sterile clones - not cotton-bearing. **11.**

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Large Trees for Shade				
Cottonwood, Narrowleaf *Populus angustifolia*	60/40 & 115/48	2	♦	This native cottonwood is very cold tolerant. It naturally grows up to 8000' elevation. Tree is prone to sprouting up new shoots around its root zone making it a nuisance when planted in the wrong location. Typically sold as cottonless clones.
Cottonwood, Plains *Populus sargentii*	75/55 & 94/89	4	♦	This is the large native cottonwood lining the waterways of the Front Range. Tree needs moisture to survive, but can live for over 100 years. Tree needs space, and is best utilized in open areas. Typically sold as cottonless clones.
Elm, American Cultivars *Ulmus americana*	60/40 & NA	4	♉❖	American elms were devastated by Dutch Elm Disease in the 1970s, but the species is beginning to make a comeback with new introductions less susceptible to the disease. This is one of the great street trees of our past, and we should learn from this tree.
Elm, Hybrids/Species *Ulmus spp.*	Various	3-5	❖♈	There are numerous other species of elms and a variety of cultivars that are beginning to become more common in the tree trade. Many of these hybrids have shown very good resistance to Dutch Elm Disease. Fall color, insect & disease resistance, interesting bark, and sight adaptability continue to impress.
Elm, Siberian *Ulmus pumila*	60/40 & 95/97	4	❖♉	This tree is commonly referred to as a weed/trash tree. The tree is resistant to Dutch Elm Disease, but the foliage is like candy to elm leaf beetle. The seeds from this tree are plentiful and will lead to many unwanted new trees. Not a recommended species.
Ginkgo *Ginkgo biloba*	40/30 & 65/34	4	❀	A truly historic tree being traced back over 150 million years. This tree is actually classified as a gymnosperm (as are pine trees). Fan-shaped leaves are very unusual. Nice yellow fall color. Ask for male cultivars to avoid malodorous fruit.
Hackberry *Celtis occidentalis*	55/40 & 90/56	3	❖❀ ♋	A rugged and adaptable shade tree able to tolerate very harsh conditions. Corky and rough bark as it matures adds winter interest. Leaves likely to develop small bumps or galls that are an aesthetic problem. Nice yellow fall color.
Hickory, Shagbark *Carya ovata*	55/40 & 61/45	4		This tree is seldom planted along the Front Range, yet there are some impressive specimens scattered across the state. Bark becomes peeled and plated as so named. Tree will develop an edible sweet nut as a fruit. **12.**

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Honeylocust *Gleditsia triacanthos*	55/40 & 81/59	4	❖♋	A classic tree used commonly along the Front Range. This tree continues to be impressive through tolerance of harsh and dry sites. Small leaves turn yellow in the fall, and most nurseries only sell seedless cultivars (no more brown spiraling pods).
Hornbeam, European *Carpinus betulus*	40/30 & NA	5		Tree often sold as an upright columnar cultivar, but it is naturally a medium sized shade tree. Smaller leaves with jagged serrated edges turn to yellow in the fall. Buds of this tree are large and notable in winter.
Horsechestnut *Aesculus hippocastanum*	45/40 & 59/63	4	⌘❀ ♈	The seven-lobed palmate leaves are eye-catching. Large flowers with hints of yellow and red stand upright from branches in spring, turning to prickly seed pods later in the season. Dark green foliage turns to shades of yellow and brown in the fall.
Katsuratree *Cercidiphyllum japonicum*	40/20 & NA	5	♈	This tree is not common around the Front Range, but is noted to be cold tolerant to extremes greater than our own. Its heart-shaped leaves emerge reddish-purple, turn to bluish green in summer, and then fade to orange-yellow in the fall.
Kentucky Coffeetree *Gymnocladus dioica*	55/45 & 73/55	4	⌘❖ ♋	A rugged tree able to tolerate poor soil and drought. Young trees tend to look empty as the tree grows without small twiggy branches. Matures to an impressive looking specimen. Female trees produce white flowers which turn to interesting bean pods.
Linden, American *Tilia americana*	60/40 & 75/69	3	⌘ ♋	A classic American tree with a mature canopy form that is very pyramidal. Heart shaped leaves change from dark green to yellow in the fall. Mid-season yellow flowers produce a pleasant aroma. Avoid use in areas with high reflective heat.
Linden, Littleleaf *Tilia cordata*	45/30 & 96/42	4	⌘ ♋	This is the most popular of the linden trees also forming a pyramidal canopy. Small heart shaped leaves change from dark green to yellow in the fall. Mid-season yellow flowers produce a pleasant aroma. Avoid use in areas with high reflective heat.
Linden, Redmond *Tilia x euchlora*	50/40 & 52/34	4	⌘ ♋	This linden tends to be one-sided when young, but still develops to a pyramidal canopy. This has much larger heart shaped leaves with nice yellow fall color. Mid-season yellow flowers produce a pleasant aroma.

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Locust, Black *Robinia pseudoacacia*	40/30 & 62/43	4	⌘❖ ♉	A very adaptable tree capable of growing in very poor soils. Depending on cultivar, the tree will produce showy white to purple chains of flowers in early June. This is a thorn bearing species, and may require annual preventative spraying for borer.
London Plane Tree *Plantanus x acerifolia*	65/45 & 86/79	5		A hybrid between American sycamore and oriental plane tree with large maple-like leaves. A fast growing tree with beautiful bark made up of a mix of colors ranging from cream to green to light brown. Tree will bear light brown 1" diameter seed balls.
Maple, Autumn Blaze *Acer x freemanii 'Jeffersred'*	50/40 & NA	4	≈♈	Extremely popular retail tree, now commonly planted. A cross between red maple and silver maple, and will often display a good red fall color. Often struggles in our soils with pH issues, and iron chlorosis is a common problem.
Maple, Norway Varieties *Acer plantanoidies*	50/35 & 79/57	4	≈	Species of maple with a wide array of cultivars to choose from at the nursery. Classic maple leaves come in dark green, purple, to variegated. Trees perform best in areas with low reflective heat. Trees bear twin-winged seed pods.
Maple, Red *Acer rubrum*	45/35 & 54/41	4	≈♈	Tree with the classic red fall color so strongly desired by residents. Trees can be grown in our area, but soils are the limiting factor. Look for lower, acidic, pH and good drainage to have success. Don't use in areas with high reflective heat.
Maple, Silver *Acer saccharinum*	65/55 & 82/103	3	≈	This species of maple was widely used as street trees as the Front Range cities developed. Over time they proved to be prone to branch failure and decay, lowering their popularity. Best used in open areas where fast growth and large size is desired.
Maple, Sugar *Acer saccharum*	50/45 & 79/66	3	≈♈	The tree of maple syrup can be grown along the Front Range and can reach a notable mature size. Successful establishment and growth typically takes place in soils with a lower pH and good drainage. Don't use in areas with high reflective heat.
Mulberry, White *Morus alba*	35/35 & 42/65	5	❖❀	Tree can be somewhat invasive and is often considered good only for the birds. The tree is able to tolerate poor soils and dry conditions. Weeping forms of this species may be the most useful for landscape purposes.

♦- Water Lover ❖- Drought Tolerant ≈- Avoid Alkaline Soils ⌘- Flowers
☿- Insect or Disease Issues ❀- Fleshy Fruit ♈- Fall Color ♋-Forester Favorite

Plant Name	Average & CO Champion Height/Spread	USDA Zone	Symbols	General Comments on the Tree Species
Large Deciduous Trees				
Oak, Bur *Quercus macrocarpa*	60/45 & 97/78	3	❖♋	Forester favorite Tolerates poor soils and drought. Rugged corky branches and stems give this long-lived tree good winter interest. Bears an acorn with a fuzzy cap, and leaves are dark green on top and gray green beneath.
Oak, Chinkapin *Quercus muehlenbergi*	45/45 & 60/60	5	♈	Another large oak showing good potential as it is able to deal with the high pH in many of our soils. Leaves have a margin that is sharply serrated, and typically the tree has a russet fall color. Will bear an acorn about 3/4" long.
Oak, English *Quercus robur*	60/45 & 99/70	5		Impressive oak has performed well in our poor soils and dry climate. Dark green leaves turn brown in the fall and often hold onto branches into winter. Often sold as a columnar cultivar. Bears a slender acorn that is about 1" long.
Oak, Red *Quercus rubra*	65/45 & 96/72	4	≈♈	Beautiful oak with green leaves often turning to dark red in the fall. Tree can struggle in our soils as high pH brings on chlorosis. Best used in neutral to acidic, well-drained soils.
Oak, Shumard *Quercus shumardii*	65/45 & 90/77	5	≈♈	Less commonly used in our area, but there are some impressive specimens on the Front Range. Tree can often struggle in our soils as high pH brings on chlorosis. Best used in neutral to acidic well-drained soils.
Oak, Swamp White *Quercus bicolor*	45/40 & 84/69	4		A very nice oak that may struggle in high pH soils depending on seed source. Dark, lustrous green leaves on top and the bottoms are fuzzy with a light gray color. Shaggy peeling bark adds winter interest. Bears one inch long acorns.
Pagodatree, Japanese *Styphnolobium japonicum*	45/40 & 68/58	4		Good tolerance of urban conditions. Canopy of small leaves and unusually green-colored stems. Upright creamy white flowers fill the tree in late July, changing to interesting small seed pod. May be prone to storm damage.
Pecan *Carya illinoensis*	65/55 & 82/82	4	⌘	Not a common tree along the Front Range, but with a state champ reaching over 80 feet there is potential. Species prefers a well-drained soil. Tree develops a tap root, making it more difficult to transplant.
Poplar, Silver *Populus alba*	65/50 & 80/74	3	♦	Commonly found along waterways; identified by the white color of its upper trunk and silvery leaves. Females produce cotton. Produces sprouts to colonize an area.
Poplar, Upright *Populus nigra*	50/15 & N/A	3	♦	Many cultivars are available and are most appealing to those with small yards not allowing space for large trees. These trees grow very quickly, but are very short lived, leading to difficult removals in tight backyards.

♦- Water Lover ❖- Drought Tolerant ≈- Avoid Alkaline Soils ⌘- Flowers
☿- Insect or Disease Issues ❀- Fleshy Fruit ♈- Fall Color ♋-Forester Favorite

Plant Name	Average & CO Champion Height/Spread	USDA Zone	Symbols	General Comments on the Tree Species
Large Deciduous Trees				
Sycamore *Platanus occidentalis*	75/55 & 115/74	4		A fast growing tree with beautiful bark made up of colors ranging from cream to green to light brown. Tree will bear light brown 1" diameter seed balls. Has the potential to become a very large tree, so make sure you have space.
Tree of Heaven *Ailanthus altissima*	45/35 & 67/64	4	❖	This tree can be quite aggressive and it can easily colonize an entire lot if allowed to sucker/sprout at will. This tree may be rugged and drought tolerant, but it holds little landscape value and is not a recommended tree.
Tuliptree *Liriodendron tulipifera*	50/40 & 75/48	4	⌘	Tree will perform best in a well-drained, more acidic soil limiting its use in our area. The shape of this tree's leaves is quite unique with a notable broad flat tip. Tree produces interesting orange flowers in late May.
Turkish Filbert *Corylus colurna*	5/20 & 43/24	4		A medium-sized tree that maintains a more upright form. Margins of the dark green leaves are sharply serrated and have a nice yellow fall color. Catkins on the tree add interest in early spring. Tree produces a nut with an unusual casing.
Walnut, Black *Juglans nigra*	55/40 & 83/70	4	☿	A classic tree known for the value and beauty of its wood. Tree will produce walnuts that will be attractive to wildlife. Development of taproot makes this species difficult to transplant. New issues with a beetle/fungus complex that may be a serious concern.
Walnut, English *Juglans regia*	35/35 & 47/42	5	☿	A smaller tree than the nigra species with interesting silver gray bark when mature. Performs best in a well-drained soil. Tree will bear 2" diameter edible nuts. New issues with a beetle/fungus complex may be a serious concern.
Whitebeam, Swedish *Sorbus intermedia*	35/35 & 51/51	4	⌘❀	Medium-sized tree with leathery leaves with an oak-like shape. The leaves are dark green on top and velvety gray underneath. Tree produces white clusters of flowers in late spring turning to bright orange berries in fall.
Yellowwood *Cladrastis kentuckea*	40/35 & 52/29	5	⌘	Medium-sized tree developing smooth gray bark. Tree will produce dangling chains of fragrant white flowers. Tree is able to fix nitrogen from the atmosphere and is tolerant of alkaline soils. Attractive yellow fall color.
Zelkova, Japanese *Zelkova serrata*	40/30 & 48/36	5	♈	Medium-sized vase shaped tree that may need more protection than other tree species. Tree may have potential for our area if our average lowest temperatures continue to rise. A fast grower with decent bronze-red fall color.

Coniferous (Evergreen) Trees

The trees found in the following list are often referred to as evergreens, but there are some conifers that will drop their needles and should be considered deciduous.

♦- Water Lover ❖- Drought Tolerant ≈- Avoid Alkaline Soils ⌘- Flowers
♉- Insect or Disease Issues ❀- Fleshy Fruit ♈- Fall Color ♋-Forester Favorite

Plant Name	Average & CO Champion Height/Spread	USDA Zone	Symbols	General Comments on the Tree Species
Coniferous Trees				
Arborvitae *Thuja occidentalis*	25/15 & 46/24	3		Many cultivars of this plant are available with options of green to yellow foliage and a variety of mature sizes. Foliage is soft to the touch. Tree may develop best out of strong winter winds and hot afternoon sun. Heavy snow can disfigure this tree.
Baldcypress *Taxodium distichum*	45/25 & 56/43	4	♈	A conifer that drops all its foliage in the fall. Green needles turning to orange-brown in October. Cones are small 1/2" in diameter and quite unique. Trees do not perform well in high pH soils and may suffer from chlorosis problems.
Cedar, Blue Atlas *Cedrus atlantica* 'Glauca'	35/25 & 24/17	6		An eye-catching evergreen with silvery blue foliage. Not known for its cold tolerance, this species may be best used in a microclimate with shelter. Current state champion is in Westminster and is quite striking.
Cypress, Arizona *Cupressus arizonica* var. *glabra*	30/15 & 29/15	5	❖	An unusual native evergreen found in the mountains of New Mexico. This tree has an upright form becoming broader with age. Foliage is an attractive bluish-gray color with a pungent aroma. Bark is reddish and exfoliating.
Fir, Douglas *Pseudotsuga menziesii*	60/30 & 111/40	4		Stands of species are commonly found across the Rocky Mountains. This tree is not used frequently in the urban landscape. Soft short needles are a nice dark green color. Three-inch cones covered with unusual bracts can be quite abundant as trees mature.
Fir, White or Concolor *Abies concolor*	60/25 & 138/34	3		An evergreen with an appearance very similar to the blue spruce. Foliage can range from green to icy-blue. Unlike the blue spruce, the needles of the fir are very soft to the touch. Tree maintains narrower form as it matures.

♦- Water Lover ❖- Drought Tolerant ≈- Avoid Alkaline Soils ⌘- Flowers
♉- Insect or Disease Issues ❀- Fleshy Fruit ♈- Fall Color ♋-Forester Favorite

Plant Name	Average & CO Champion Height/Spread	USDA Zone	Symbols	General Comments on the Tree Species
Coniferous Trees				
Juniper, One Seed *Juniperus monosperma*	20/15 & 22/23	4	❖	This native tree has an impressive ability to withstand extremely dry conditions. Tree will develop a large mounded habit as it often becomes as wide as it is tall. Foliage ranges from casts of blue to green.
Juniper, Rocky Mountain *Juniperus scopulorum*	30/15 & 40/23	3	❖	This native upright juniper species offers a variety of cultivars allowing for many selections yielding various mature sizes and colors of foliage. Most are columnar in form with good tolerance of drought and poor soil.
Larch, European *Larix decidua*	70/30 & 81/50	2	♈	Another conifer that drops all its foliage in the fall. Green needles grow from unique pedestals on the twigs, and the foliage will turn an eye-catching yellow in the fall. Tree is very cold tolerant and able to adapt to alkaline soils.
Pine, Austrian *Pinus nigra*	55/30 & 76/65	4	♋	One of the most commonly used conifers in our area. Dark green stiff needles of about 3 to 5 inches add nice winter color. This tree is very tolerant of poor urban soils and conditons. Two to three inch cones form as tree matures.
Pine, Bristlecone *Pinus aristata*	30/20 & 63/41	2	❖	Specimens of this Rocky Mountain native are said to be some of the oldest living things on earth (4,000 yrs. old). Needles are dark-green and coated with dots of white resin. Tree often has an irregular form, and branches appear similar to a bottlebrush.
Pine, Limber *Pinus flexilis*	40/25 & 62/67	4	❖	This is a drought tolerant Rocky Mountain native that has an open form. Bark will develop to a smooth texture with a white cast. Needles are flexible and soft to the touch. Tree performs best in a well-drained soil.
Pine, Pinyon *Pinus cembroides edulis*	20/15 & 30/42	4	❖	This tree is native to the southern Rocky Mountains and has an impressive ability to tolerate extremely dry conditions. Tree has short green needles and will grow with a mounding habit. Cones will bear edible seeds. Do not overwater this tree.
Pine, Ponderosa *Pinus ponderosa*	55/30 & 144/52	3	❖ ♋	Classic Rocky Mountain native with an open form. Needles are quite long and on some trees can be up to 10 inches. Good tolerance of dry conditions and performs best in well-drained soils. Bears cones of 3" to 6" as tree matures.
Pine, Scotch *Pinus sylvestris*	55/25 & 60/53	2		The bark of this pine is quite notable as it is colored with a mix of oranges and reds. Needles are bluish-green, short and stiff, giving the tree a more open mature appearance. Tree is quite tolerant of windy and exposed sites.

♦- Water Lover ❖- Drought Tolerant ♒- Avoid Alkaline Soils ⌘- Flowers
♉- Insect or Disease Issues ❁- Fleshy Fruit ♈- Fall Color ♋-Forester Favorite

Plant Name	Average & CO Champion Height/Spread	USDA Zone	Symbols	General Comments on the Tree Species
Coniferous Trees				
Pine, Southwestern White *Pinus strobiformus*	45/35 & 90/42	5	❖	This pine is native to Colorado's southern mountains and is closely related to limber pine. Needles up to 6 inches long are soft to the touch, and can be quite attractive with a bluish-green color. Best performance in sheltered areas.
Spruce, Black Hills *Picea glauca* Densata	45/25 & 63/44	2		A spruce that maintains a more compact form as it matures. This cultivar of white spruce has dark green needles and will bear smaller 2-inch cones. Tree is tolerant of alkaline soils and is very cold hardy.
Spruce, Colorado *Picea pungens*	80/30 & 153/26	2	♋	This is the Colorado State tree. Genetics will determine needle color ranging from dark green to icy-blue. Cultivars are available to ensure color or smaller mature sizes. This native tree needs lots of space and regular watering.
Spruce, Norway *Picea abies*	60/30 & 68/60	2		Dark green needles make up the canopy of this spruce, and the tree will bear unusually long cones for a spruce (up to 6 inches long). Trees can perform well in average soils if there is adequate moisture. The fastest growing of the spruces.
Spruce, Serbian *Picea omorika*	55/25 & NA	4		This spruce has a narrow and pyramidal mature form. Needles are dark green with a silvery underside giving the tree a blended appearance of gray and green. Tree will bear a small 1 1/2" cone. Tree is native to limestone mountain areas of Yugoslavia.

SELECTING TREES AT THE NURSERY

Once you have chosen your tree species, it's time to select it at the nursery. To successfully transplant a tree into your landscape it is imperative you start with a healthy specimen. Too often the buyer will be lured by low prices on certain trees that have either been held over from previous years or poorly maintained in a nursery field or holding area. You often "get what you pay for" when it comes to nursery trees.

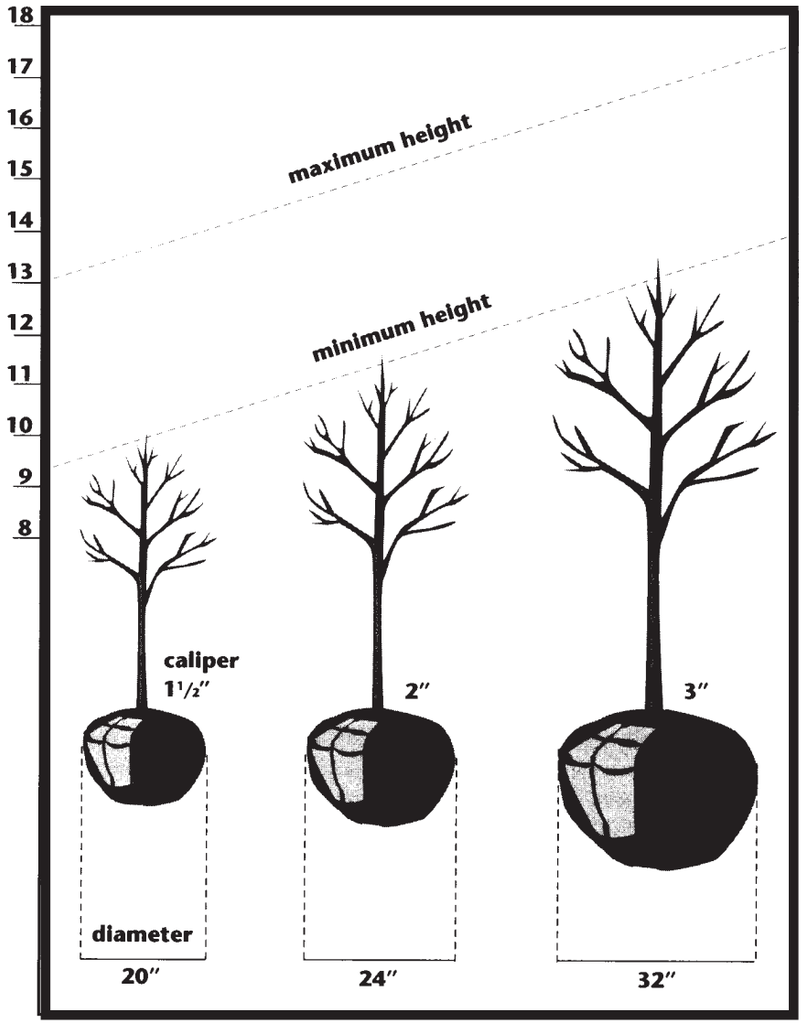
Look for a healthy tree that has a good growth rate. Careful observation of the twigs will reveal growth from year to year. Choose a tree that has a good trunk taper. Avoid trees that have been pruned severely or headed back. Foliage should be evenly distributed on the upper 2/3 of the tree. The tree should have a main, central stem with several lateral branches distributed evenly around it. An exception to this would be on small-growing, multi-stemmed ornamental trees. Check the tree for mechanical damage. Do not purchase a tree that has an injury to the main stem. Look closely at the leaves and twigs of the tree. Any sign or symptom of an insect or disease should discourage you from purchasing the tree. Get down in the dirt. Examine the root ball of the tree. Balled and burlapped trees should have a solid ball with a basket and twine around it. The trunk should not rock back and forth inside the ball. Make sure the twine is not too tight and girdling the tree. Avoid trees with circling roots.

The healthier the tree you choose the sooner it will become established in the landscape. Larger trees are not always better and they often take longer to establish. Unhealthy nursery trees are unhealthy landscape trees leading to unwanted insect and disease problems. Selection of the tree in the nursery is as important as selection of the right tree species.

Good Tree Structure

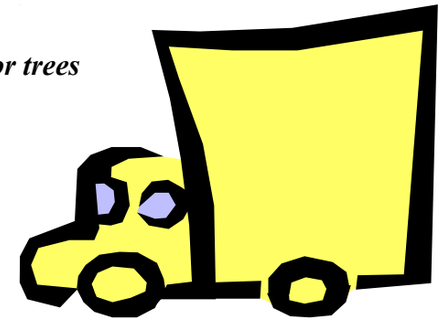
Courtesy of the University of Florida

The tree you select should meet the requirements of this chart.



American Forestry Association

Covered transport is best for trees



Transporting Your Tree

Whether the tree purchased is bare-root, containerized, or balled and burlapped it needs to be protected during transport from the nursery. Place a wet material (towels, burlap, etc.) around the roots or rootball to keep the root system moist during travel. Tree canopies, extending from vehicles should be covered with a tarp to avoid excessive damage and moisture loss from the foliage. Give the root ball support on its sides as you travel avoiding rolling and damage to the tree. If the trunk lays on an edge of the vehicle place something soft underneath it to avoid unnecessary damage to the main stem. Once home, the tree should be planted as soon as possible. If planting must be delayed, keep roots moist with supplemental water and place the tree in a protected location.

Always handle trees by container or root ball

PLANTING YOUR TREE

This section details procedures for planting trees. Methods for planting trees have come and gone over the years. As more is learned through research of planting methods, specifications are continually changed. Tree planting standards continue to evolve though time, and there has always been some disagreement over the specific details of how best to install a tree. We have tried to break down what we feel are the best steps for residents to follow.

Trees are generally available from the nursery in one of three forms; **bare root, balled and burlapped, or containerized.** Utility locates should be called prior to installing any tree. Locate number: 1-800-922-1987.

Bare Root Trees

Bare root trees are usually small and easy to transplant. Since there is no soil on the root system, they are light weight. It is vital that the roots be kept moist. Bare root trees are normally planted during the dormant season before roots and buds begin to grow (March – April).

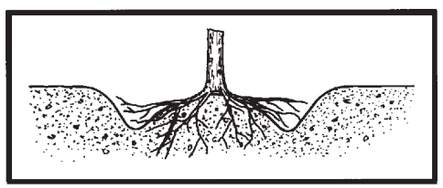


Fig. 7.1 Planting bare-root trees. Spread the roots over the compacted soil mound.

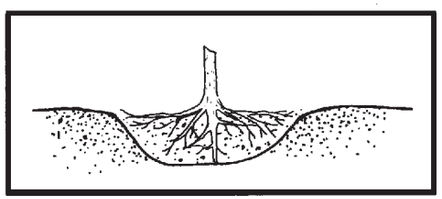


Fig. 7.2 If there is a tap root present, plant the bare-root tree as shown. Staking may be required on bare-root trees.

From ISA Arborists' Certification Study Guide

Bare root trees should be planted on small, compacted mounds within the planting holes. The roots should be spread out running away from the tree (do not spiral them around the inside of a small hole). The trunk should be positioned at a depth in which the main roots are just below grade (do not bury the trunk of the tree). Exposure of the roots to air must be minimized to reduce drying. Since the root system is limited, trees that are planted bare root may require staking.

CONTAINERIZED AND BALLED AND BURLAPPED TREES

- Mark out a planting area two to three times the diameter of the rootball (wider dug planting pits will greatly benefit newly planted trees).
- Using your finger (or a blunt tipped probe), try to dig down into the ball around the trunk to locate a major root or a notable increase in the diameter of the trunk (a.k.a. trunk flare). Once this point is found, this will be your gauge to install the tree at the proper depth. Your tree should never be planted so deeply that the trunk looks like a telephone pole going into the ground (you need to see at least a small flare above ground line).
- Using a shovel, remove the ring of sod from the planting area. Once the turf is out of the way, use a rototiller or shovel to then loosen and mix the soil within the planting area to the depth that will allow the trunk flare to be at or slightly above grade.
- Dig a shallow hole in the center of the prepared area to allow the tree to be installed on solid ground rather than on loose soil taking care not to leave the tree too high or low.
- Care should be taken to not crack or damage the root ball of the tree, and the trunk should never be used as a leverage point for moving the root ball (use the wire basket, sides of the root ball or container to maneuver the tree).
- Containerized trees should have the containers removed before placing the root ball in the hole. Once the container has been removed, check the root ball to see if encircling roots are present. If the roots appear to circle the container, work to separate the roots to allow them to develop away from the trunk. If the roots are large or massed, use a sharp knife or pruners to cut several vertical slices up the side of the ball to prevent the formation of girdling roots.
- Typically minimum standards call for removal of at least the top portion of the wire basket and burlap covering the soil ball of balled and burlaped trees. If you choose to remove the entire wire basket from the tree, tip the tree on its side next to the hole, and cut off the very bottom ring of the cage and remove it from under the ball (if you choose to remove all the burlap, this is also the best time to remove the bottom of the burlap by cutting out a circle with a knife). Make one final cut to the cage somewhere along the next ring up from the removed portion (note which side of the ball this is on as you'll need to continue these cuts up the side of the ball once the tree is in the pit). Using the remaining portion of the cage to support the ball, slowly roll the tree down into the planting pit.

Removing bottom of wire basket

■ Once the tree is set on solid ground in the center of the area, check that the tree is standing upright and in a fashion that is acceptable as its final position. Use the excavated native soil as backfill to help stabilize or straighten the tree. Once the tree is stabilized, begin to cut up the side of the basket and burlap while backfilling the hole (the cage and burlap should be pulled out while in the process of backfilling. At a minimum you should try to remove cage and burlap from the top third of the root ball.

■ All twine, flags and tags should be removed from the tree. Twine left tightly wound around the trunk of the tree will lead to dead trees.

■ Native soil is best used as the backfill material. If you choose to amend the soil, do not blend your backfill beyond 25% organic matter and 75% native soil. Fertilizer is not recommended for newly planted trees.

■ Create a small berm around the edge of the planting area to allow deep soaking when watering. Use water instead of your feet to settle the soil (this prevents excessive compaction), and fill in air pockets with soil as the area settles.

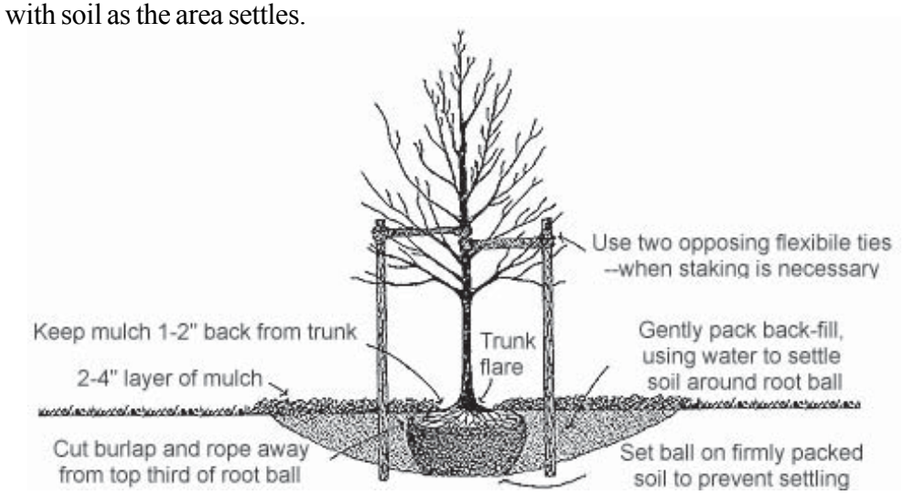


Diagram Courtesy of the International Society of Arboriculture

MULCHING, STAKING, AND WRAPPING

The area around the tree should be mulched with two to four inches of organic mulch. The mulch will help reduce competition from grasses and weeds, conserve soil moisture, and moderate soil temperature extremes. The mulch should not be placed against the stem of the tree as that can cause bark suffocation or crown rot. Black plastic should not be placed under the mulch since it restricts water movement and oxygen availability to the roots.

Staking of newly planted trees is not always necessary. In fact, staking can have detrimental effects on the development of a tree. When compared to trees that have not been staked, staked trees produce less trunk taper, develop a smaller root system and are more subject to breaking or tipping after stakes are removed. In addition, staked trees may become injured or girdled from the staking materials.

Some trees, however, cannot stand upright without support. In windy sites, in sandy soils, or when trees are quite tall, staking may be required to hold the plant upright until it can support itself. In other instances, staking may be recommended to reduce movement of the rootball and subsequent damage to the fine, absorbing roots. In urban sites, stakes are sometimes used to protect young trees from mechanical (equipment) damage and to reduce vandalism.

One, two, or three stakes may be used to support a tree. If a single stake is used, it should be placed on the upwind side of the tree. Use tree straps, or cloth strapping to attach the stake wiring to the tree. Do not use wire through rubber hose. Be sure to remove the stakes in one year.

Many early references recommend wrapping the trunks of newly planted trees to protect against temperature extremes, sunscald, boring insects, and drying. More recent research indicates that temperature differentials at the bark are greater with **tree wrap** than without. Further, tree wrap tends to hold moisture on the bark and can lead to fungal problems. Also, insects tend to burrow between the bark and the wrap and can be worse with wrap than without it. Tree species often planted in Westminster such as honeylocust, maples, and lindens are extremely susceptible to sunscalding. Wrapping trees from November to April may or may not prevent this type of damage.

WATERING

The amount of water your tree needs depends on many factors including soil texture, location in the landscape, species, amount of mulch around the root system, weather, and time of year.

Most of the soils in Westminster are heavily compacted clay. This "tight" soil can hold a lot of water and create dangerously low oxygen levels in the tree's root system. Occasionally, take a soil sample in the tree's root zone and squeeze it together. If water oozes out of the sample the tree is being overwatered. Although we live in a semi-arid climate, too much water for a newly planted tree can be as devastating as a lengthy drought. If the soil forms a ribbon or ball, soil moisture is probably adequate. If the soil crumbles, the tree needs watering. Check the soil on a newly planted tree at least weekly and add water as needed. A deep root feeder hooked to a hose is often an efficient way to get water to the tree's root system.

Location of the tree in the landscape can determine its water needs. If it is planted on a highly exposed southern exposure it will require significantly more water than if planted in shade or a protected location. Trees planted in concrete areas or next to buildings often receive excess amounts of solar radiation and will dry out sooner as well.

As discussed earlier, the type of tree planted can determine its water needs. In general all newly planted trees need supplemental water to become established. However, once established, watering regimes can vary greatly. For instance, a pinyon may never need supplemental water after establishment, whereas a cottonwood would require significant amounts of additional water.

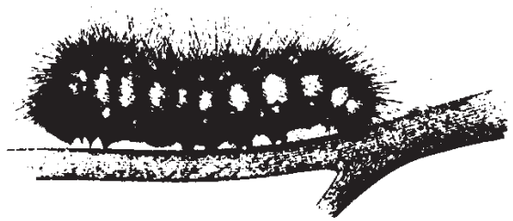
Soaking in a newly planted tree

Courtesy of Greeley forestry

Also mentioned earlier was the importance of a three to four inch mulch layer around the tree. The mulch layer needs to be replenished yearly to insure water conservation abilities of the soil in the root zone. The mulch also reduces weed and grass growth around the tree. Weeds and grass growing in a tree's root zone can "rob" the tree's roots of significant amounts of moisture.

In late August through September when nights cool and days shorten watering should be minimized. A tree needs to complete its "hardening off" process during this period. A tree is encouraged to grow if watered excessively in the fall thus making it susceptible to freeze damage in September and October.

Once leaves have dropped and the winter months set in, it is important to keep monitoring soil moisture. It is not uncommon for an extended warm, dry spell to occur in Westminster during the winter months. During these periods add water to the tree through hose soaking or root feeders. Above all, always be aware of the weather. At times rain fall and snowfall are more than adequate to meet your tree's water needs.



SPRAYING

Insects and diseases can become problems on any given tree. Some species are more resistant to pest problems, but all trees can be affected at some time or another. The important thing to remember here is just because you find an insect crawling on the leaf of your tree you should not immediately pull out your garden sprayer, fill it with an insecticide, and spray to your heart's content. Everyone should have a threshold of damage they are willing to accept until chemical controls are needed. And when chemical control is necessary be sure to follow the pesticide label's exact directions and try to use the environmentally "friendly" pesticides such as soaps and refined horticultural oils. Above all, determine the nature of the problem first, and then decide on a course of action. Blanket sprays at periodic intervals (which are still common practice in many areas) are useless, bad for the environment, and detrimental to beneficial insects such as honey bees and ladybugs. A well-maintained and vigorous tree is the best defense a tree has against insect and disease problems.

FERTILIZING

Newly planted trees do not need fertilizers. Once established the tree's root system is then able to absorb supplemental chemicals added in the form of fertilizers. Standard tree fertilizers with nitrogen-phosphorous-potassium ratios of 3-1-2 with added micronutrients (such as Iron, Zinc and Manganese) may be helpful to tree growth. If necessary, these should be applied in the spring when leaves and stems are elongating. Use a root feeder around the tree in the tree's drip line. Do not fertilize after July as this may encourage growth that may not "harden off" before the first fall freeze.

Be careful not to plant tree species susceptible to chlorosis (nutrient deficiencies) in highly alkaline soils. These species include the soft maples (red, silver), red oaks (pin, northern red) and several others.

Autumn blaze maple struggling with chlorosis

PRUNING

Generally, a newly planted tree should not be pruned regularly until it is established. By leaving the maximum amount of food producing leaves on the new tree you are helping in initial establishment. However, once planted, carefully inspect your tree for dead, diseased, broken, crossing, and other unneeded branches. Remove those with clean, sharp hand pruners, loppers, or saws. Be careful with your cuts and make sure they leave smooth edges and no stubs remain on the tree.

Once established, frequent pruning can occur. It is best to choose a time of year during dormancy (say late February, early March) and inspect the tree for dead, diseased, crossing, or broken branches. Lower branches may be removed periodically as well. Be sure you are leaving at least 2/3 of the height of the tree in foliage, however. As the tree matures never consider topping as a reasonable alternative for pruning. Hire a reputable, licensed, insured, and certified tree company to help you with your mature tree maintenance needs.
Check the website http://hort.ifas.ufl.edu/woody/pruning for further pruning details.

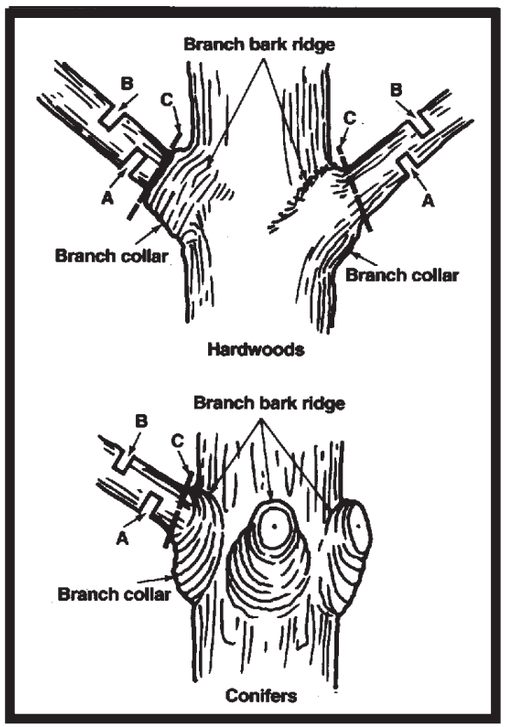


Fig. 8.2 Pruning Principles. The first cut (A) undercuts the limb. The second cut (B) removes the limb. The final cut (C) should be just outside the branch collar to remove the resultant stub.

From ISA Arborists' Certification Study Guide

Why NOT to "Top" - Eight Good Reasons
(Courtesy of the National Arbor Day Foundation)

1. Starvation: Good pruning practices rarely remove more than 1/4 to 1/2 of the crown, which in turn does not seriously interfere with the ability of a tree's leafy crown to manufacture food. Topping removes so much of the crown that it upsets an older tree's well-developed crown-to-root ratio and temporarily cuts off its food-making ability.

2. Shock: A tree's crown is like an umbrella that shields much of the tree from the direct rays of the sun. By suddenly removing this protection, the remaining bark tissue is so exposed that scalding may result. There may also be a dramatic effect on neighboring trees and shrubs. If these thrive in shade and the shade is removed, poor health or death may result.

3. Insects and Disease: The large stubs of a topped tree have a difficult time forming callus. The terminal location of these cuts, as well as their large diameter, prevent the tree's chemically based natural defense system from doing its job. The stubs are highly vulnerable to insect invasion and the spores of decay fungi. If decay is already present in the limb, opening the limb will speed the spread of the disease.

4. Weak Limbs: At best, the wood of a new limb that sprouts after a larger limb is truncated is more weakly attached than a limb that develops more normally. If rot exists or develops at the severed end of the limb, the weight of the sprout makes a bad situation even worse.

5. Rapid New Growth: The goal of topping is usually to control the height and spread of a tree. Actually, it has the opposite effect. The resulting sprouts (often called water sprouts) are far more numerous than normal new growth and they elongate so rapidly that the tree returns to its original height in very short time-and with a far denser crown.

6. Tree Death: Some older trees are more tolerant to topping than others. Beeches, for example do not sprout readily after severe pruning and the reduced foliage most surely will lead to death of the tree.

7. Ugliness: A topped tree is a disfigured tree. Even with its regrowth it never regains the grace and character of its species. The landscape and the community are robbed of a valuable asset.

8. Cost: To a worker with a saw, topping a tree is much easier than applying the skill and judgement of good pruning. Therefore, topping may cost less in the short run. However, the true costs of topping are hidden. These include reduced property value, the expense of removal and replacement if the tree dies, the loss of other trees and shrubs if they succumb to changed light conditions, the risk of liability from weakened branches, and increased future maintenance.

TREE SERVICES AVAILABLE TO WESTMINSTER RESIDENTS

The information contained in this booklet is designed to give the reader an overview of tree planting and maintenance. Of course, there is much more information not discussed on each topic that is covered in this booklet. Living in Westminster, you do have another free resource. The Parks Services Division of the Department of Parks, Recreation and Libraries hires an urban forester that can assist you with your tree care concerns. This person is available to answer questions over the phone or through e-mail. Feel free to call (720) 887-2446 or e-mail rdavis@cityofwestminster.us with your tree concerns.

Other tree related services offered by the City of Westminster include the Plant-A-Street Tree Program, the Living Legacy Memorial Tree Program, limb and Christmas tree recycling programs, a tree donation program, annual Arbor Day celebration in April, and Code Enforcement activities (please see ordinances that follow). Additional information on each of these programs is available by contacting the Department of Parks, Recreation and Libraries at (303) 658-2192.

Rob Davis
Parks Division
City Forester
(720) 887-2446
rdavis@cityofwestminster.us

Parks, Recreation and Libraries
General Information
(303) 658-2192

CITY OF WESTMINSTER
MUNICIPAL CODE
TREES AND SHRUBBERY

13-3-1: DIRECTOR'S POWER TO ADOPT RULES AND SPECIFICATIONS: The Director of Parks, Recreation & Libraires shall have the power to promulgate rules, regulations, and specifications of the trimming, spraying, removal, planting, pruning, and protection of trees, shrubs, vines, and other plants upon the public right-of-way of any street, alley, sidewalk, or any other public place in the City.

13-3-2: DIRECTOR'S POWER TO TRIM TREES AND COLLECT COSTS:

(A) The Director of Parks, Recreation & Libraries or his authorized representatives shall have the power to trim, spray, remove, plant, and protect all trees, shrubs, vines, hedges, and other plants upon the public right-of-way of any street, alley, sidewalk, or other public place or to require the owner or occupant of the property, or their agent, abutting on the right-of-way of any street, alley, sidewalk, or other public place to trim, remove or protect any tree, shrub, vine, hedge, or other plant which may project beyond the property line of such owner, occupant, or agent, onto to over public property in a manner which interferes with the safe use of the right-of-way, at the expense of such owner.

(B) If the property owner, occupant or agent, refuses or neglects to trim, protect, or remove any such tree, shrub, vine, hedge, or other plant within ten (10) days after receipt of a written notice from the Director to do so, the Director may do or cause to be done the necessary work incident thereto, and the expenses thereof shall be collected from the owner of such property, and shall be a lien against said property until paid or may be assessed and collected pursuant to Section 9-4-5 (B) of this Code. (792 1634)

13-3-3: REMOVAL OF DEAD OR DANGEROUS TREES:

(A) It shall be the duty of the owner, occupant or agent of any property to remove any dead trees or dead, overhanging boughs dangerous to life, limb, or property located on the premises of such owner, occupant or agent, or upon public property abutting the premises of such owner, occupant, or agent, upon receipt of written notice from the Director of Parks, Recreation and Libraries to do so and within such reasonable time as specified in said notice. (A1889)

(B) If such owner, occupant, or agent fails to remove same within the time required, the Director of Parks, Recreation & Libraries or his authorized representative is authorized to remove or cause to be removed such trees or branches at the expense of such owner, occupant or agent and the cost of such removal shall be a first and prior lien on the property as provided by Title I, Chapter 31 of this Code, and may be assessed and collected pursuant to Section 8-4-5 (B) of this Code.

13-3-4: REMOVAL OR TREATMENT OF INFECTED OR INFESTED TREES:

(A) The Director of Parks, Recreation & Libraries or his authorized representatives are empowered to inspect any trees, shrubs, vines, hedges, plants, logs or branches existing or growing upon any property within the City. The Director or his authorized representatives shall from time to time conduct surveys to determine if any destructive or communicable disease or other pestilence exist which may be detrimental or endanger the good health and well being of trees or other plant life in the City.

(B) Upon discovery of any destructive or communicable disease or other pestilence which endangers the growth, health, life, or well being of other trees or plants, or which is capable of causing an epidemic spread of communicable disease or insect infestation such as Dutch Elm Disease, the Director of Parks, Recreation & Libraries or his authorized representatives shall at once notify in writing the owner, occupant or agent of the premises whereon the same are located, or the owner, occupant or agent of the premises abutting on public property whereon the same are located, of the condition thereof, and direct such owner, the same are located, of the condition thereof, and direct such owner, agent or occupant to eradicate, remove, or otherwise control such condition within a reasonable time to be specified in said written notice.

(C) Should the owner, occupant or agent of said premises fail or refuse to comply with the terms of the written notice provided for in subsection 13-3-4 (B), the Director of Parks, Recreation & Libraries or his authorized representatives may enter upon the premises and cause to be removed, treated or otherwise care for such infected or infested trees, shrubs, vines, hedges, plants, logs, or branches in order to eradicate or control disease or insect infestation. The expense therof shall be a first and prior lien upon the property, as provided by Title I, Chapter 31 of this Code, shall be collected from the owner, occupant or agent and may be assessed and collected pursuant to Section 9-4-5 (B) and Title I, Chapter 31 of this Code. (792 1634 1680 1889)

13-3-5: COMPLIANCE REQUIRED; UNLAWFUL ACTS:
It shall be unlawful:

(A) For the owner, occupant or agent of any premises to fail or refuse to comply with the requirements set forth in any notice issued under any Section of this Chapter, within the time specified in said notice, or to fail or refuse to comply with any rule or regulation promulgated by the Director of Parks, Recreation & Libraries under the authority granted in this Chapter. (A1889)

(B) To plant or place upon any public right-of-way or other public place in the City any trees, shrubs or other plants other than as prescribed in rules and regulations promulgated by the Director of Parks, Recreation & Libraries. (A1889)

(C) Because the Department of Parks, Recreation & Libraries has discovered the existence of Dutch Elm Disease in trees at various locations within the City of Westminster, and such trees must be treated or disposed of immediately to prevent the spread of that disease to uninfected trees. (792 1889)

WHY PLANT TREES?

- For more pleasant shady summer living.
- For savings on your electric bill. The shade of three well-placed trees can cut air conditioning costs 15%.
- To cool hot streets and parking lots. Cities are "heat islands" that are 5 to 9 degrees hotter than surrounding areas. And cities spread each year.
- For their shade and transpiration (giving off water), provide natural, "low-tech" cooling that means less need to build dams, coal-burning power plants, and nuclear generators.
- To work as air cleaners, reducing the amount of harmful CO_2. Due to the burning of fossil fuels,CO_2 in our atmosphere may soon double. A tree can absorb 26 pounds of CO_2 per year or about 2.5 tons per acre - and replace it with life-giving oxygen.
- To provide shelter for wildlife, slow rainfall runoff, prevent soil erosion, muffle noise, and provide privacy.
- For windbreaks, trees can be shields against wind and snow; heating costs can be reduced by as much as 30%.
- To encourage shoppers to spend more time and pay more for products. Research show that well-landscaped areas with healthy trees promote more spending among shoppers.
- To help reduce stress in the work place and speed recovery of hospital patients.
- To encourage kids to spend more time outside in green areas so they will have an easier time paying attention when indoors.
- To instill increased community pride, leading to lower crime rates.
- To stop the loss of urban trees. In some cities, as many as 4 trees die or are removed for each new one planted.
- To add beauty and grace to any community setting: they make life more enjoyable and offer a rich inheritance for future generations.

Tree Establishment Rate is Influenced by a Variety of Factors

Encourages Growth	Limits Growth	Little or No Effect
Loose Soil	Compacted Soil	Peat or Organic Matter Added to Backfill
Proper Irrigation Mgmt	Little or No Irrigation	Root Stimulant Product
Mulch 8' or More Around the Planting Hole	Grass and Weeds Close to Trunk	Fertilizing at Planting
Root Flare Slightly Above Soil Surface	Planting too Deep	Adding Spores of Mycorrhizae*
Leaving Top of Tree Intact	Pruning at Planting	Water Absorbing Gels

* Can enhance growth on seedlings under certain circumstances

These guidelines are based on the following research: Beeson and Gilman 1992; Gilman 1994; Gilman and Beeson 1996; Gilman al. 1996; Gilman et al. 2001; Gilman et al. 2002; Harris and Gilman 1993; Watson and Himelick 1982.

Table Courtesy of the University of Florida

For more tree information, checkout the following web sites:

- Colorado Tree Coalition Web Site; http://www.coloradotrees.org/
- National Arbor Day Foundation Web Site; http://www.arborday.org/
- Tree Care Web Site; http://www.treesaregood.com/
- CSU Cooperative Extension Fact Sheets; http://www.cerc.colostate.edu/factsheet.html
- University of Florida Horticulture Web Site; http://hort.ifas.ufl.edu/woody/
- Tree Related Information Site; http://www.treelink.org/
- City of Westminster Web Site
  (Browse to Environment then Urban Forestry); http://www.ci.westminster.co.us/

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