

RECOMMENDED SWALE TREES FOR HAYDEN

a subset of the

Master Recommended Tree List For Hayden
Spring 2008

Recommended Trees for Hayden
and a Guide to Their Selection,
Planting, and Long Term Care

Prepared by
City of Hayden Community Development Department
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RECOMMENDED SWALE TREES FOR HAYDEN, IDAHO

Spring 2008

Introduction

This list is established to provide a quick reference of allowable street trees for use by homeowners, business owners, developers, engineers, and landscape architects. This list also serves as a reference guide for selecting trees to meet Code shading requirements.

Using the List

The list is divided into three height groups, Type I-Small trees, Type II-Medium trees, and Type-III-Large trees. Each group lists the trees by common name and botanical name. Where a cultivated variety, or cultivar, is available, the cultivar is listed below the species.

The characteristics of each specie or cultivar are listed to the right of the common name. When selecting a tree, determine the limitations of the planting site. Look for trees that are suitable for your site based upon the site limitations.

Where a cultivar has characteristics different from the parent species, such as height or spread, those characteristics will be identified separately. Where the cultivar characteristics are similar to the parent species, such as rooting depth or growth rate, the box will be blank.

On sites where shading is needed, the amount of shade cast by the tree is located in the shading column. The approximate square footage of shade cast by a tree is calculated by the shadow of a 15 year old tree at noon on the first day of Summer. Actual shade production will be determined by the growth rate of a tree on a particular site.

When a proposed tree is not on the list, consult with the Urban Forester before planting the tree.

Selection

The master list of recommended trees for the Hayden area contains a general description of each tree and the appropriate use for the tree. For ease of use, the list is divided into Type I-Small, Type II-Medium, and Type-III-Large trees. Type I-Small trees are generally 30 feet in height or less. Type II-Medium sized trees are generally 30 feet to 50 feet in height. And finally, Type III-Large trees are generally 50 feet in height or taller.

All of the trees on this list have characteristics which make them desirable. Most of the trees on this list could be used for locations other than along city streets. The trees listed have been selected for their resistance to injurious insects or diseases, though there are no pest free trees. The information accompanying each tree species is meant to be used as a guide for decision making purposes.

The height and spread figures are given for trees at maturity. Trees with rapid growth rate can be expected to grow at least two feet per year when young. Those with moderate growth rates will grow between one and two feet per year when young. Slower growing trees will generally grow less than one foot per year when young. Please remember, growth rates are considered in general terms. Soil conditions and water availability will greatly influence the actual growth rate of a tree.

For purposes of calculating the approximate shading area provided by a particular tree specie or cultivar, shading square footages are provided. The square footage area is based upon the shadow of a 15 year old tree on June 21 at noon. The shadow is based upon the growth of the tree under normal landscape conditions. In *Manual of Woody Landscape Plants – Their Identification, Ornamental Characteristics, Culture, Propagation and Uses* 3rd Ed., Dr. Michael Dirr provides growth estimates based upon field observation throughout North America.

Root growth is listed as shallow, medium or deep. These are relative terms and describe the root system in its natural setting. The majority of a trees root system is typically within the upper three feet of soil. However, actual soil conditions on site, as well as irrigation patterns, will ultimately determine the depth of rooting of a tree.

Spacing recommendations are based upon future growth estimates. These minimum spacing distances provide for adequate canopy growth, while still providing for aesthetics. Planting trees too close together for initial effect will typically result in poor performance as the trees mature.

The planter width column provides a minimum planter size for each tree. The widths are based upon typical rooting patterns in a natural setting, and the mature size of the tree. Specific site conditions may require a wider planter than that recommended. Planting a tree in too small of a planter will typically lead to poor tree performance, infrastructure damage, or both.

The comments section provides helpful insight into special characteristics of a particular tree. Specific comments are noted for those species that have limiting characteristics. General pruning requirements are also included.

Users of this list should keep in mind that no tree species is perfect and no one species will meet all the needs of a particular area. It is important that a selected tree species or cultivar be adaptable to the space available, laterally, horizontally and vertically, while meeting the aesthetic needs of the area.

The final consideration is the availability of trees on the list. Every effort is made to list trees that are commercially available, and to work with local nurseries to ensure they are stocked. If the tree is not in stock at a local nursery, ask the salesperson to order the tree and have it shipped in. When a particular tree is not available at the grower, a substitute with similar characteristics maybe selected from the list.

Questions regarding street tree characteristics may be called into the City at 208-772-4411.

Planting

Heavily compacted soils, or soils with high clay content, typically limit the movement of oxygen to within only a few inches of the surface. To minimize the potential impact to curbs and sidewalks, adequate soil preparation is essential. Proper soil preparation not only fosters deeper root systems, it provides adequate growing conditions, which ultimately leads to healthier trees. Where possible, till the soil within the entire planter to a depth reaching uncompacted soil.

Landscape Detail 1 provides directions for proper tree planting. Proper planting will ensure the tree thrives for many years. Improperly planted trees will not attain their full potential, and will be adversely affected by pest problems. Place the root crown of the tree at or slightly above finish grade. The top of root ball is not always the top of root crown. Trees are typically planted deep in the container, and in the field. You will need to remove excess soil and girdling roots before planting the tree.

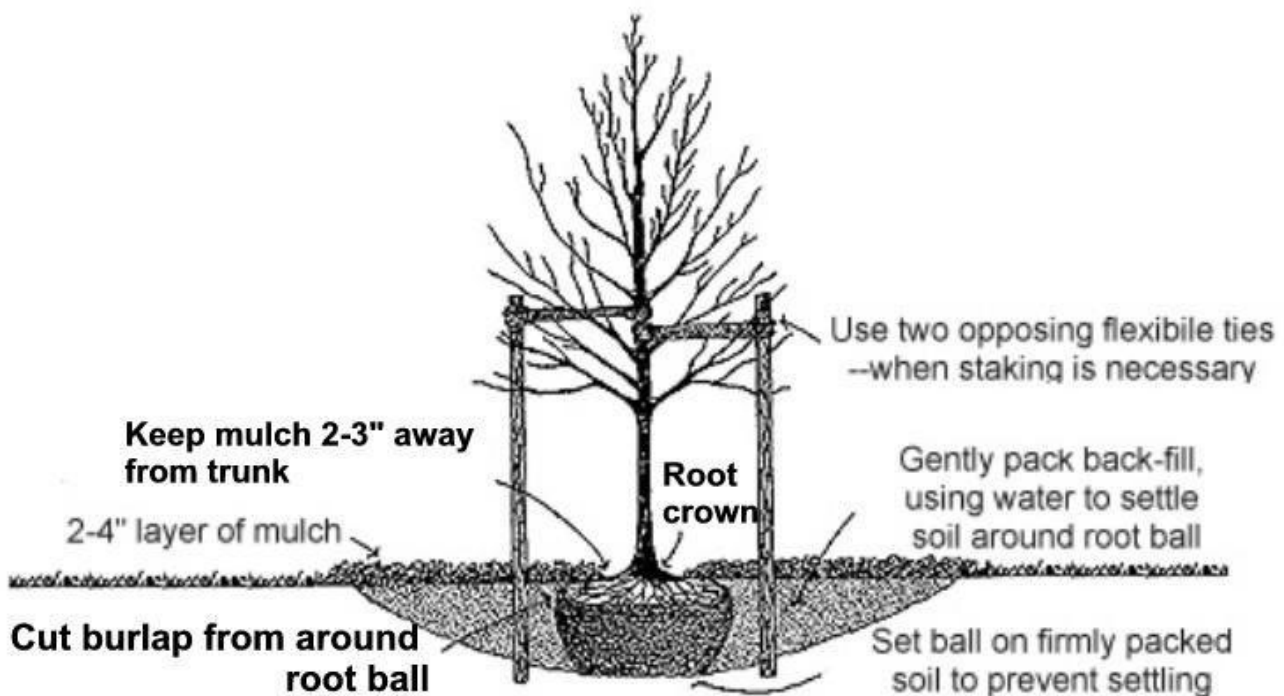


Figure 10 - Planting

Plastic root barriers provide a measure of protection for curbing and sidewalk. However, they do not guarantee damage prevention. To provide the greatest level of protection, root barriers must be installed properly, with at least ½-inch of barrier above final grade, mulch, or turf thatch layer. Failure to install the root barrier properly will result in roots growing over the top of the barrier, rendering it ineffective.

Turf at the base of a young sapling can inhibit the production of new roots, stunting the trees growth. Chemicals secreted by the roots of turfgrass act as a growth regulator for tree roots. Further, string trimmers and mowers used to maintain the turf will damage the trunk of the tree. The easiest way to solve this problem is to create and maintain a turf ring around the tree. Community Canopy recommends creating a circle at least three feet in diameter. The Hayden tree planting detail shows a minimum tree ring diameter of three feet.

Apply a three to four-inch thick layer of composted mulch within the tree ring. Mulch keeps the soil cooler for new roots, reduces water loss, and reduces the growth of weeds. The mulch also provides a visual barrier for weed eaters and lawn mowers. Make sure the mulch is kept from the base of the tree. Do not form mulch “volcanoes” around the base of the tree. Not only are the “volcanoes” unsightly, they damage the trunk of the young tree.

Maintenance

Proper irrigation is essential to good tree growth. Do not over water the tree! Over watering removes oxygen from the soil. Inadequate oxygen in the soil leads to root death and shallow rooting. In turn, shallow rooting causes damage to turf, maintenance equipment, sidewalks, buildings, and other landscape improvements. In either case, the tree is often removed prematurely. Water trees, shrubs, groundcovers, and turf based upon need, not time! Less water needs to be applied in the Spring and Fall than in the Summer. The typical water need is 0.26 inches of water per day in the middle of July, but only a tenth of that in early Spring or late Fall! Increase water applications as the need increases. Begin to decrease the water application as the season cools and the days shorten. Apply water more infrequently, but to a greater depth. Proper irrigation saves money and fosters good plant growth!

Maintain a tree ring around each tree. The ring will provide basic protection from string trimmers and lawn mowers. Increase the ring size as the tree grows. Apply additional mulch as the old mulch decays. Do not allow weeds or turf to overgrow the tree ring!

Prune the trees only as necessary, removing no more than one-quarter of the canopy at any one time. Early developmental pruning will establish the long-term structure of a tree. Reference the comment section for information on the developmental pruning needs. Some species or cultivars require more aggressive developmental pruning than others. “Bleeding” trees should be pruned in late-Summer or Fall. For more pruning information, please reference the ANSI A300 Pruning Standards and the Best Management Practices for Pruning Manual.

Do not top trees. This practice destroys the natural defense mechanisms of a tree, and allows wood decay to progress unimpeded. Plant a smaller tree if space is limited.

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Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Amur maple, Flame maple <i>Acer ginnala</i>	20' – 25'	20'	Slow	Deep	3'	20' - 25'	Yes	Small round headed shade tree for areas of restricted space. Leaves medium green with red stalks. Bright red fall color. <u>Needs some early developmental pruning. Swales must drain well for optimal tree performance.</u>
American hornbeam <i>Carpinus caroliniana</i>	20' – 30'	20' – 30'	Slow	Medium – Deep	4'	25'	Yes	Small tree for swale locations, as it tolerates periodic flooding. The tree performs best where swales drain. Interesting fluted bark. Very strong wood.
Thornless cockspur hawthorn <i>Crataegus crus-galli</i> var. <i>inermis</i>	20' – 30'	20 – 35'	Slow – Medium	Medium	3'	25' – 30'	Yes	Thornless cultivar of hawthorn. <u>Can be used in swales if they drain well, otherwise plant just above the swale bottom.</u> Hawthorns can be subject to many diseases, especially when stressed.
English hawthorn <i>Crataegus laevigata</i>	15' – 20'	15' – 20'	Slow	Medium	3'	15'	Yes	This hawthorn has thorns. <u>Can be used in swales if they drain well.</u> Because of its small size, use only where space is very limited. May be subject to many diseases when stressed.
Snowbird hawthorn <i>Crataegus x mordenensis</i> 'Snowbird'	20' – 25'	20'	Slow	Medium	3'	20'	Yes	<u>This hawthorn has thorns.</u> Can be used if swales drain well. Double petal flowers. May be subject to diseases when stressed.
Leprechaun ash <i>Fraxinus pennsylvanica</i> 'Johnson'	15' – 20'	15' – 20'	Slow	Shallow - Medium	5'	15' – 20'	Yes	A true genetic dwarf. Grafted to green ash rootstock, so roots can be shallow in certain circumstances. Due to its small size, use only where space is very limited.
Prairifire crabapple <i>Malus</i> 'Prairifire'	20'	20'	Moderate	Medium	5'	20'	Yes	One of the best crabapple cultivars. Resistant to all typical crabapple diseases. Can sucker if apple rootstock is used. <u>Swales must drain well.</u>
<u>Robinson crabapple</u> <u><i>Malus</i> 'Robinson'</u>	<u>25'</u>	<u>25'</u>	<u>Moderate</u>	<u>Medium</u>	<u>5'</u>	<u>20' – 25'</u>	<u>Yes</u>	<u>Small ornamental tree for restricted areas. Disease resistant. Birds eat the fruit. Yellow-red fall color. Can sucker if apple rootstock is used. Swales must drain well.</u>

Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Sugartyme crabapple <i>Malus</i> 'Sugartyme'	15' – 20'	15'	Moderate	Medium	5'	15'	Yes	Small ornamental tree for restricted areas. Due to its small size, use only where space is very limited. Disease resistant. Birds eat the fruit. Yellow-red fall color. Can sucker if apple rootstock is used. <u>Swales must drain well.</u>
Mugo pine <i>Pinus mugo</i>	15' – 20'	20' – 25'	Slow	Medium	5'	15' – 20'	Yes	Small pine for use as an evergreen screen. Can tolerate moist soils if they eventually drain. Place at the upper edge of a swale. <u>NOT FOR USE AS A STREET TREE.</u>
Red Cascade mountainash <i>Sorbus americana</i> 'Dwarfcrowne'	15' – 20'	20'	Slow	Shallow – Medium	4'	25'	Yes	Small ornamental tree for restricted areas. Due to its small size, use only where space is very limited. Needs training to maintain a central leader. Well draining swales are best for this tree.
Brandon Arborvitae <i>Thuja occidentalis</i> 'Brandon'	10' – 15'	4' – 6'	Slow – Moderate	Shallow – Medium	6'	5'	Yes	Smaller scale arborvitae. Protection from snow and ice may be needed. Will tolerate wet soils. <u>NOT FOR USE AS A STREET TREE.</u>
Weeping Canadian hemlock <i>Tsuga canadensis</i> 'sargentii'	10' – 15'	15' – 25'	Moderate	Shallow – Medium	8'	20' – 25'	Yes	Will tolerate wet soils. This species has many pest problems. However, it provides screening under moist conditions. Plant at the upper edge of swales. <u>NOT FOR USE AS A STREET TREE.</u>
Wireless zelkova <i>Zelkova serrata</i> 'Schmidtlow'	20' – 25'	25' – 35'	Moderate	Shallow – Medium	8'	30'	Yes	A broadly pyramidal tree. Developmental training is a must when the tree is young.

Type II - Medium Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Freeman maple Acer X freemanii	40' – 60'			Moderate – Fast	Shallow – Medium	8'		Yes	This tree is a cross between red maple (Acer rubrum) and silver maple (Acer saccharinum). Growth rate is faster than red maple. Structure is better than silver maple. Developmental pruning is a must when the tree is young. While it tolerates wet soils, this hybrid does better in soils that drain.
'Armstrong'	50' – 70'	15' – 20'	51 SF				20'		Columnar cultivar with a canopy spread of 15' to 20'. Use in areas of limited canopy space. Very fast grower. <u>Developmental pruning is critical to maintaining a good structure.</u>
'Autumn Blaze' ('Jeffersred')	40' – 50'	40'	452 SF				40'		Fast grower with a broad oval canopy. Branch angles tend to be narrower. Developmental pruning is needed to minimize included bark. Susceptible to freeze damage on young twigs.
'Autumn Fantasy' ('DTR 102')	40' – 50'	40'	452 SF				40'		Similar to 'Autumn Blaze', but with wider branch angles.
'Celebration' ('Celzam')	45'	20' – 25'	79 SF				25'		Similar to Armstrong, but with wider branch angles. Shorter than most cultivars. Use in areas of limited canopy space. Developmental pruning is required to maintain good form.
'Morgan' ('Indian Summer')	45' – 50'	40'	491 SF				40'		Good branch angle attachment. Brilliant fall color. Very fast growing. Due to its rapid growth, developmental pruning is critical to establishing good structure.
'Scarlet Sentinel' ('Scarsen')	45'	25' – 30'	154 SF				25'		Broadly columnar canopy. Good branch angles. Use in areas of limited canopy space. Developmental pruning is important to maintaining good form.

Type II - Medium Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Sycamore maple Acer pseudoplatanus	40' – 60'	35' – 45'	452 SF	Moderate	Medium	8'	35' – 40'	Yes	Salt tolerate species for use in swales. Swales must drain – the tree will not tolerate stagnant soils. Developmental training is a must.
Red maple Acer rubrum	40' – 60'	35' – 45'		Moderate – Fast	Shallow – Medium	8'		Yes	A broadly pyramidal tree, with several cultivars. As a species, red maples will tolerate wet soils, but prefers adequate drained soils. Use only the cultivars listed below, as cultivars developed in the southern end of the range are not cold hardy here. Developmental training is a must when the tree is young.
		'Bowhall'	10' – 15'	50 SF			15'		Very narrow cultivar of red maple. Included bark can be a problem. Use in areas of limited canopy space. Developmental pruning is critical to long term branch structure. Good Fall coloration.
		'Karpick'	20'	79 SF			20'		Somewhat wider than 'Bowhall' maple. Included bark can be a problem if not developmentally pruned. Use in areas of limited canopy space.
		'Northwood'	35'	452 SF			35'		Good cold tolerance. Better branch structure. Developmental pruning needed to maintain a good branch structure. Excellent Fall color.
		'October Glory'	35' – 40'	491 SF			40'		Acceptable branch structure, but needs developmental pruning to maintain good form. One of the best, and longest, Fall coloring trees.
Red Sunset ('Franksred')	45' – 50'	35' – 40'	706 SF				35'		Good cold tolerance. Good branch structure. Excellent Fall coloration. Can show manganese deficiencies, which causes Summer leaf scorching.
		'Schlesingeri'	60' – 70'	35' – 50'	615 SF		10'	40'	One of the oldest, and largest, red maple cultivars. Earliest of the Fall coloring maples.

Type II - Medium Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
'Sun Valley'	35' – 45'	30' – 40'	200 SF	Moderate			35'		Smaller canopy red maple, with oval canopy and good branch structure. Cold hardy.
Norwegian Sunset maple <i>Acer truncatum</i> X <i>plantanoides</i> 'Keithsform'	35'	25'	115 SF	Slow – Moderate	Medium	6'	25'	Yes	This tree is a hybrid between Chinese maple (<i>Acer truncatum</i>) and Norway maple (<i>Acer plantanoides</i>), and is fairly drought tolerant. It will tolerate swales if they drain well. Developmental pruning is necessary to establish a good structure, especially for the Norwegian Sunset. This cultivar has narrower branch angles of the two.
Pacific Sunset maple <i>Acer truncatum</i> X <i>plantanoides</i> 'Warrensred'	30'	25'	115 SF	Slow – Moderate	Medium	6'	25'	Yes	Similar to Norwegian Sunset maple. However, the wider branch structure makes this the better of the two cultivars. This tree can be used under taller power lines.
Black alder <i>Alnus glutinosa</i>	40' – 60'	20' – 40'	491 SF	Fast – Moderate	Shallow – Medium	10'	30'	Yes	This species tolerates wet conditions, such as poorly draining swales. It will also perform very well in well draining swales. The wood can be brittle, requiring periodic pruning to maintain canopy structure. Still, its wood is stronger than silver maple. Self-seeds under very wet conditions.
River birch <i>Betula nigra</i>	40' – 70'	30' – 50'	706 SF	Fast – Moderate	Shallow – Medium	10'	30' – 35'	Yes	This species is resistant to bronze birch borer. While river birch tolerates wet conditions, they also tolerate dry Summer conditions. Very interesting bark. Aphids can be a problem at times. Like black alder, the wood can be brittle, requiring periodic pruning to maintain canopy structure.
'Dura-Heat' ('BNMTF')	35' – 50'		615 SF				35'		Best cultivar for high heat conditions. Cold tolerant. Moderate aphid resistance.

Type II - Medium Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
'Heritage' ('Cully')	40' – 60'		706 SF				40'		Consistent salmon bark coloration. Cold tolerant. Heat tolerant.
Magnifica hackberry <i>Celtis occidentalis</i> X <i>laevigata</i> 'Magnifica'	50'	40'	706 SF	Moderate	Shallow – Medium	10'	35'	Yes	This hybrid species is better adapted to street tree use than its parents, common hackberry (<i>Celtis occidentalis</i>) and sugarberry (<i>Celtis laevigata</i>). It can be used in swales. Salt tolerant.
Katsura tree <i>Cercidiphyllum japonicum</i>	40' – 60'	25' – 45'	706 SF	Moderate – Fast	Shallow – Medium	10'	35'	Yes	Will tolerate periodic flooding, provided the soil eventually drains. Tree needs supplemental watering when young. <u>Requires developmental pruning to establish a good form, and periodic pruning to maintain good form.</u> Do not over-thin the canopy – it will sunburn.
White Ash <i>Fraxinus americana</i>	50' – 80'	45' – 70'		Moderate	Medium	8'		Yes	As a species, it is a better shade tree than green ash (<i>Fraxinus pennsylvanica</i>), and can tolerate wet conditions. However, it has many potential pest problems. Cultivars may have some resistance to pest problems. Emerald ash borer may potentially eliminate this as a useful shade tree.
'Autumn Applause'	40'	25'	176 SF				25'		Densely branched, narrow canopy. Developmental pruning will be required to establish a good branch pattern. Male cultivar.
'Autumn Purple' ('Junginger')	45'	50'	706 SF				35' – 40'		Broadly pyramidal cultivar. One of the best Fall coloring ash trees. Young saplings have a tendency to split at ground level.
'Empire'	50'	25'	176 SF				25'		Narrow pyramidal canopy with a strong central leader. Good cold tolerance. Ample Fall coloration. Developmental pruning required to establish a good branch structure.

Type II - Medium Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
'Skyline' ('Skycole')	50'	40' – 45'	706 SF				35' – 40'		Broadly oval cultivar with good branch angles and a central leader. Good Fall coloration.
'Windy City' ('Tures')	45' – 50'	35' – 40'	491 SF				35' – 40'		Broadly oval cultivar with a strong central leader. Resists frost cracking. Developmental pruning needed to establish a good branch structure. Excellent Fall coloration. Reportedly a male cultivar.
Manchurian Ash Fraxinus mandshurica 'Mancana'	40' – 50'	20' – 25'	176 SF	Moderate	Shallow – Medium	8'	25'	Yes	Tolerates both dry and wet conditions. Adequate drainage will improve growth. May be susceptible to damage by late Spring frosts. Developmental pruning needed establish a good branch structure.
Fallgold ash Fraxinus nigra 'Fallgold'	40' – 50'	25' – 30'	176 SF	Moderate	Shallow – Medium	10'	25'	Yes	Tolerates both dry and wet conditions. Adequate drainage will improve growth. Developmental pruning needed establish a good branch structure.
Urban Bouquet ash Fraxinus ornus 'JFS-Coate'	30' – 40'	20' – 30'	176 SF	Moderate	Shallow – Medium	8'	25'	Yes	Seedless. Fragrant flowers in May and June, which is unusual for ash trees. Use only in the most sheltered areas.
Green Ash Fraxinus pennsylvanica	50' – 60'	25' – 30'		Fast	Shallow – Medium	8' – 10'	30'	Yes	Once established, this species will grow just about anywhere. Salt tolerant. Emerald ash borer may potentially eliminate this as a useful shade tree.
'Centerpoint'	45' – 50'	35'	254 SF				30' – 35'		Broader canopy with good branch angles. It still needs developmental pruning to maintain the central leader. Seedless.
'Cimmaron' ('Cimmzam')	50' – 60'	30'	254 SF				30'		Narrow canopy when young, gradually expanding with age. Orange-red Fall colors. Developmental pruning is important with this cultivar.
Dakota Centennial ('Whapeton')	40' – 50'	30' – 40'	452 SF				30' – 35'		Very cold tolerant. Maintains a good central leader. Deep yellow Fall color.

Type II - Medium Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
'Patmore'	50' – 60'	35'	254 SF	Moderate			35'		Similar to 'Centerpoint' ash. Very cold tolerant. Developmental pruning is important with this cultivar.
'Prairie Spire' ('Rugby')	45'	20'	113 SF				20'		Very narrow cultivar. Seedless. Developmental pruning is critical establishing good branch angles. Intense golden yellow Fall color.
'Summit'	45'	25'	176 SF				25' – 30'		Narrow oval canopy. Marketed as seedless. Needs developmental pruning to establish a good structure, and periodic pruning to maintain it. Bright yellow Fall color.
Thornless Honeylocust <i>Gleditsia triacanthos inermis</i>	30' – 70'	30' – 70'		Fast	Medium	8'		Yes	Extremely variable in height and width. Very salt tolerant. The species and cultivars tolerate wet conditions. Use named cultivars. Species and cultivars are susceptible to pod gall midge.
'Halka' ('Christie')	40' – 45'	40' – 45'	452 SF				35' – 40'		Broad oval canopy with good branching. Developmental pruning will ensure good branch structure. May periodically produce sterile seed pods.
'Imperial' ('Impcole')	30' – 35'	30' – 35'	314 SF				30' – 35'		Slightly smaller than 'Halka', and with descending branches. Branch tip dieback may be a problem in extremely cold Winters.
'Moraine'	40' – 50'	40' – 45'	452 SF				35' – 40'		One of the earliest and best thornless cultivars. Larger canopy for good shade. Developmental pruning needed to establish good branch structure.
'Shademaster'	40' – 45'	40' – 45'	452 SF				35' – 40'		Like 'Moraine', but with ascending branches. Developmental pruning is needed to establish a good branch structure.
'Skyline' ('Skycole')	40' – 45'	30' – 35'	314 SF				30' – 35'		Pyramidal form. Best resistance to pod gall midge. Developmental pruning needed.

Type II - Medium Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
			314 SF				30' – 35'		Broad oval canopy with 45 degree branch angles. Fast growing shade tree. Developmental pruning will be necessary to establish good branch structure.
Black tupelo <i>Nyssa sylvatica</i>	30' – 50'	25' – 30'	176 SF	Slow	Medium	6'	25'	Yes	For best results, transplant this tree in the Spring. Beautiful Fall color. Will tolerate wet conditions, but prefers soils that do eventually drain. Produces a small drupe, which is eaten by birds. Developmental pruning is needed to maintain a good branch structure.
Callery pear <i>Pyrus calleryana</i>	30' – 60'	35' – 45'		Very Fast	Medium	8' – 10'		Yes	The species is a very fast growing tree, but is not readily available. DO NOT plant the cultivar 'Bradford', it self destructs after about 15 years.
	'Aristocrat'	40' – 50'	25' – 35'				25' – 30'		Better structure than 'Bradford'. Developmental pruning is required to establish a good branch structure. Good for swales, as long as they eventually drain. It is susceptible to fire blight. Fruit is 1/2" and prolific.
	'Autumn Blaze'	30' – 40'	25' – 30'				25' – 30'		Better structure than 'Bradford'. Red Fall color. Branches are more horizontal to the central leader. Developmental pruning is required to establish a good branch structure. Good for swales, as long as they eventually drain. It is susceptible to fire blight. Fruit is 1/2", and very prolific.
	'Chanticleer' ('Glensform')	40'	15' – 20'				15' – 20'		Very narrow canopy. Branches start horizontal, and then they curve upwards. Better resistance to fire blight. Developmental pruning needed to establish a good branch structure. Fruit is 1/2", and prolific.
	'Trinity'	30' – 35'	25' – 30'				25'		Broad oval canopy, with a flatter branch structure. Developmental pruning is still needed. Heavy blossom production. Very little fruit.

Type II - Medium Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Prairie Gem pear <i>Pyrus ussuriensis</i> 'Mordak'	35' – 45'	35' – 45'	452 SF	Moderate	Medium	8'	30' – 35'	Yes	Very cold tolerant. Resistant to fire blight. Produces 1-1/2" fruit if cross pollinated. Developmental pruning needed.
Village Green zelkova <i>Zelkova serrata</i> 'Village Green'	40' – 50'	40' – 50'	491 SF	Moderate	Medium	10'	35' – 40'	Yes	Can tolerate swales if planted off-center. Swales must drain. Broad canopy resistant to Dutch elm disease and elm leaf beetle.

Type III - Large Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Freeman maple <i>Acer X freemanii</i>	40' – 60'			Moderate – Fast	Shallow – Medium	8' – 10'		Yes	This tree is a cross between red maple (<i>Acer rubrum</i>) and silver maple (<i>Acer saccharine</i>). Growth rate is faster than red maple. Structure is better than silver maple. Developmental pruning is a must when the tree is young. While it tolerates wet soils, this hybrid does better in soils that drain.
'Armstrong'	50' – 70'	15' – 20'	51 SF				20'		Columnar cultivar with a canopy spread of 15' to 20'. Use in areas of limited canopy space. Very fast grower. <u>Developmental pruning is critical to maintaining a good structure.</u>
'Marmo'	60' – 70'	35' – 40'	491 SF				35'		Broadly columnar canopy. Branches angles are wider than 'Armstrong'. Developmental pruning is needed to ensure a good branch structure.

Type III - Large Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
'Wright Brothers'	50' – 75'	35' – 40'	491 SF	Rapid			40'		Fast growing with cone-shaped canopy. Resists frost cracking and sunscald. Very cold tolerant. Very thick branching habit. Developmental pruning is needed to establish good branch spacing.
Champ Tree Green Ash Fraxinus pennsylvanica 'National 1999'	50' – 55'	40' – 45'	491 SF	Moderate – Fast	Shallow – Medium	10' – 12'	35' – 40'	Yes	Excellent form with deep green glossy foliage. One of the larger green ash cultivars. Developmental pruning is needed to establish a good branch structure.
European Larch Larix decidua	70' – 75'	25' – 30'	176 SF	Moderate – Fast	Medium	8'	25'	Yes	A deciduous conifer. Will cast filtered shade in the Summer, and none in the Winter. Will tolerate wet soils, but prefers draining soils.
Serbian Spruce Picea omorika	50' – 60'	20' – 25'	78 SF	Slow – Moderate	Medium	8' – 10'	20'	Yes	Tolerates moist soils that eventually drain. Cold tolerant. Subject to aphids and budworms.
Swamp white oak Quercus bicolor	50' – 60'	50' – 60'	491 SF	Slow – Moderate	Shallow – Medium	10' – 12'	35' – 45'	Yes	Very tolerant of wet soils, especially if they eventually drain. Needs an acid soil. Very broad canopy with horizontal limbs.
Pin Oak Quercus palustris	60' – 70'	25' – 45'	706 SF	Fast	Medium	10' – 12'	35' – 40'	Yes	Will tolerate wet conditions. Soils must eventually drain. Very fast growth. Chlorosis is a problem on iron deficient soils. Holds its leaves in the Winter as a juvenile. Produces an acorn crop every other year. Aphids can be a problem. Needs developmental pruning. Lower limbs angle downwards.
Shumard Oak Quercus shumardii	40' – 60'	40' – 60'	254 SF	Moderate	Medium	10' – 12'	40'	Yes	Will tolerate swales if the soils eventually drain. Will not tolerate stagnant swales. Acid soils foster good growth. A good replacement for scarlet oak. Acorn crops occur every two years. Needs developmental pruning.
Baldcypress Taxodium distichum	50' – 70'	20' – 30'	78 SF	Moderate	Shallow	10' – 12'	25'	Yes	Very tolerant of wet conditions. Deciduous conifer. May have problems with branch cankers. A crop of small cones are produced each year

Type III - Large Stature Trees

Common Name Scientific Name	Height	Spread	Shade Area at 15 Years	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Valley Forge American Elm <i>Ulmus americana</i> 'Valley Forge'	60' – 80'	60' – 80'	706 SF	Moderate – Fast	Shallow – Medium	10' – 12'	40' – 45'	Yes	Dutch elm Disease resistant cultivar. Tolerates wet soils, or soil under periodic flooding. Salt tolerant. Distinct V-shaped canopy. Developmental pruning needed to establish a good branch structure. Elm leaf beetle may be a problem.