CITY OF HAYDEN, IDAHO
TREE STANDARDS MANUAL

"A guide for best management practices in tree planting, care, and maintenance of the Hayden Community Forest."

Triangle Park - Spring, 2003

Developed and printed by the
Hayden Community Forestry Commission
and Hayden City Staff

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INTRODUCTION

The City of Hayden is growing and developing, and trees are recognized as a major asset to the community. Tree species are becoming more varied, requiring new management practices. The City and its residents recognize these changes and actively promote the protection and attention of the trees to assure their viability for future generations.

Trees assist in stormwater mitigation, air quality control, trap underground pollutants, conserve energy, produce oxygen, increase property values, visually soften architectural elements, reduce sun radiation, provide thermal cover and beautify the environment. Trees and their proper management can provide untold benefits to the community and the many generations to come.

SECTION I. PUBLIC TREE STANDARDS AND SPECIFICATIONS

Chapter 1

GENERAL GUIDELINES

1. The specifications in this manual are the minimum standards for planting, pruning, maintenance and protection of all public trees. Exceptions to these standards must be by written approval of the city.

CHAPTER 2

DEFINITIONS

The words “shall” and “will” are mandatory and “may” is permissive. Words not defined in this section shall have their common and ordinary meaning.

Caliper: The diameter of the tree’s trunk at 6” above the root collar on trees 4” in diameter or smaller. 12” above the ground for 5” diameter or larger trees.

Certified Arborist: A person in possession of a current International Society of Arboriculture Certification.

Community forest: The total of all public and private trees and shrubs within the City of Hayden.

Controller: Every person (owner, agent, tenant, occupant, or lessee) who exercises care, custody and control of private real property that abuts a right-or-way upon which a public tree or shrub is located.

Dripline: The area directly under the tree’s canopy where the essential mass of roots is found.

*Hayden Community Forestry Commission***:** An advisory commission appointed by the Mayor and approved by the City Council to assist in the City in the management of its community forest.

Figure 1 - Dripline

Hazard tree: A tree identified by the City Administrator or Administrator’s designee to be a threat to cause personal injury or property damage.

Injurious pest or disease: Refers to organisms capable of seriously damaging the form or structural integrity of the tree.

I.S.A.: The International Society of Arboriculture.

Landscaping: To add enhancements for beautification purposes.

Natural area trees: Those trees located in the area of the City in open space containing a majority of native tree species.

Park trees: All trees in public parks and in all areas owned by the city, excluding those trees in the public right-of-way.

Person: Any individual, firm, partnership, corporation, association, company, Municipal Corporation or other governmental entity of organization of any kind.

Planting strip: The area within the road right-of-way that can be landscaped, including the following (refer to fig. 2)

A. *The area 2' from the sidewalk, curb or undeveloped street edge (future improvement allowance)(undefined).*
B. *The area in the median strip or swale (defined).*
C. *The area between the curb and the sidewalk (defined).*

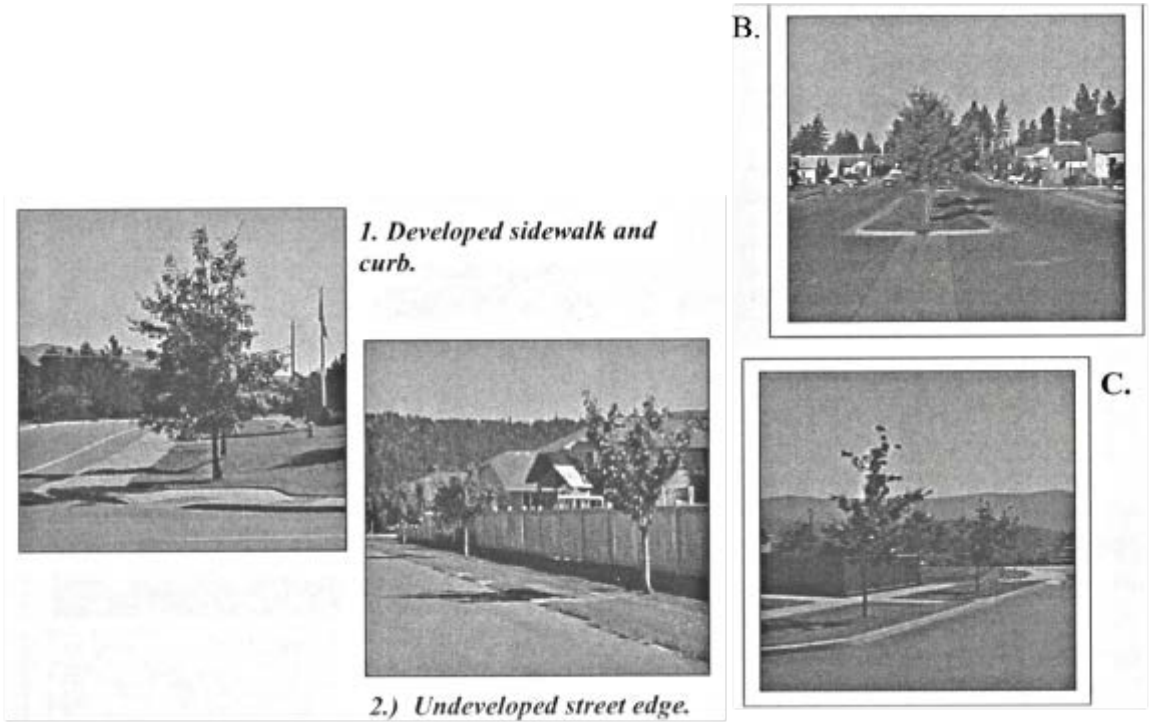


Figure 2 – Planting Strips

*Private Tree***:** A tree that is not a public tree.

*Pruning***:** The removal of plant parts, dead or alive, in a careful and systematic manner so as to not damage other parts of the plant or the tree as a whole.

*Public right-of-way***:** Improved or unimproved public property owned by, dedicated to, or deeded to, the public for its use for the purpose of providing vehicular, pedestrian, and other public use.

Public tree or shrub: A tree or shrub that is situated in such a manner that any part of the tree trunk or shrub base at ground level is on public property or a public right-of-way.

Root barrier: A device or material designed to direct root growth mechanically or chemically.

Root crown: Where roots emerge from the trunk. (Also trunk flare, root flare, root collar)

*Street trees***:** All public trees located within public rights-of-way.

Topping: The severe cutting back of limbs within a tree's crown to such a degree that only stubs remain or the removal of the top part (trunk and limbs) of a coniferous tree (refer to fig. 3), thereby removing a significant portion of the normal crown.

Figure 3 – A topped Silver Maple

Tree appraisal: To quantify a dollar value for a tree by using accepted national standards.

Tree classes: The following are tree classes (refer to fig. 4):

Class I: Small trees which do not attain a mature height of more then 30 feet. Typical spacing is 15-25 feet.

Class II: Medium sized trees, 30-60 feet in mature height. Typical spacing is 30-40 feet.

Class III: Large trees, more than 60 feet in mature height. Typical spacing is 40-50 feet.

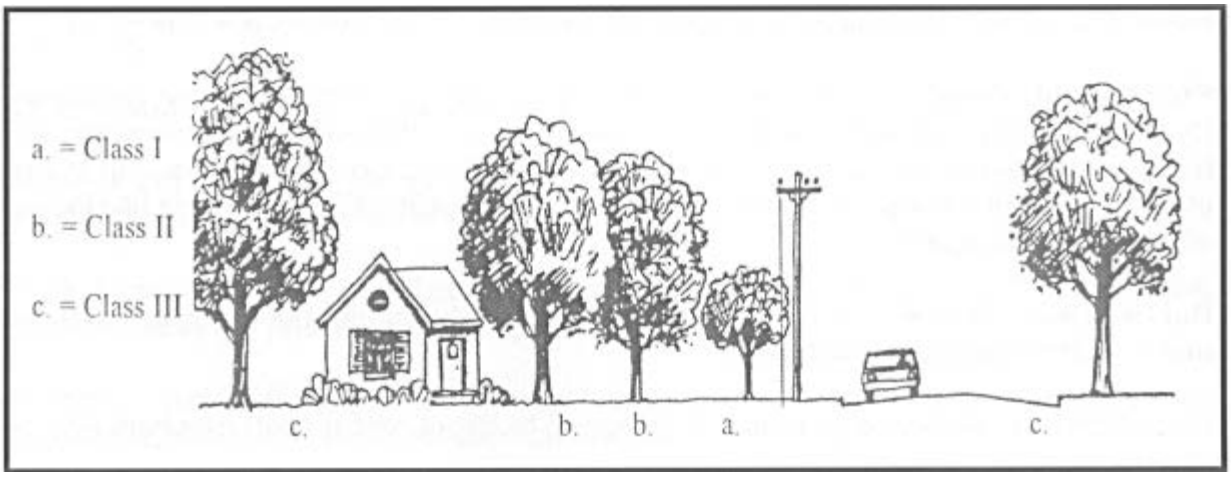


Figure 4 – Tree Classes

*Tree Form***:** The visual shape of a tree's crown based on the genetic or cultivated characteristics of the tree species (refer to fig. 5)

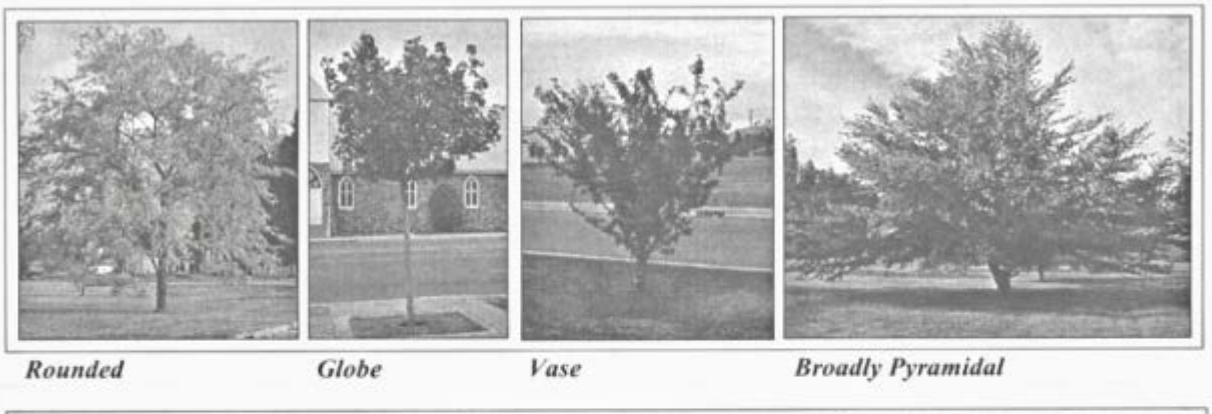


Figure 5 – Tree Forms

Tree removal: The complete removal of a tree including the grinding of the stump and the cleanup of all debris material.

Tree ring: The area at the base of the tree that is cleared of competing turf and weeds, and maintained with mulch material (refer to fig. 6)

Tree service: Commercial services provided for trees, including, but not limited to: planting, removal, pruning, or engaging in technical arboriculture practices.

Tree standards: The set of specifications concerning the planting, care and maintenance of trees as contained in the "Hayden Tree Standards Manual".

Figure 6 – Tree Ring

CHAPTER 3

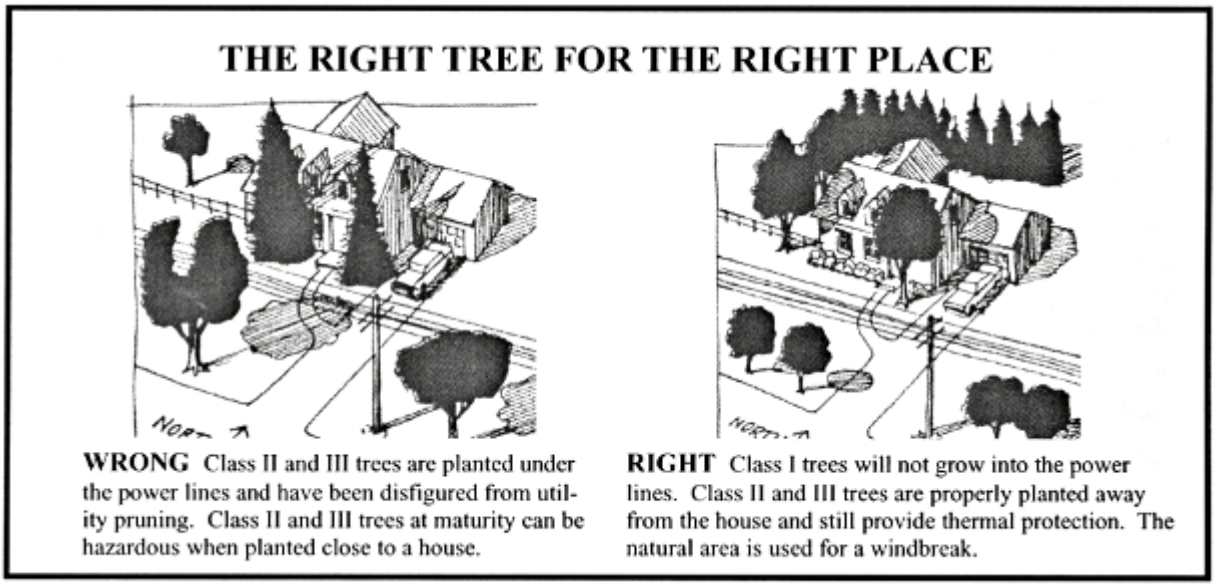
PLANTING

Planting guidelines for Public Trees

The City encourages species and age class diversity in managing our City's public and street trees. Plantings with a variety of trees are not subject to large-scale losses from disease or natural life cycles. City policy for public trees is to plant "the right tree for the right place."

Site factors to be considered are:

1) The type of location to be planted (natural or developed area)
2) The mature height and width of the tree
3) The size of the planting strip
4) The presence of overhead wires



Public trees should not be planted where they will obstruct or interfere with buildings or public improvements, or interfere with traffic or public safety. Public trees should not be planted in the following places unless approved by the City Administrator or Administrator's designee.

Within 2' of an existing curb face	Within 10' of an alleyway access
Within 4' of any building or structure	Within 10' of fire hydrants and utility poles
Within 4' of a meter vault box	Within 10' of a public sanitary sewer or water line
Within 4' of residential driveways	Within 20' of street light standards
Within 6' of commercial driveways	Within 20' in front of a stop sign or yield sign

"Think before you plant." Good planning is the key to a successful life of a tree.

PROBLEM:

This is a maze of overhead power lines and guy wires.

This tree will grow into the wires within 7 to 10 years.

SOLUTION: A small Class I tree should be planted on this site.

New development: During its review of the development plans, the City will approve the number and type of trees to be planted.

Established areas: New street tree plantings need a permit and city approval and will be in accordance with this Tree Standards Manual. Property owners are encouraged to consider existing trees and landscaping when choosing trees to plant.

Public projects: All public projects will follow these standards.

Figure 7 - Vision clearance
A vision clearance triangle is 50' from the intersection's road or curb edge

1. All trees and shrubbery near streets must comply with the vision clearance standards in Hayden Municipal Code 6-1-4 and Idaho Code 49-221. Any new tree planted at an intersection must be planted in accordance to Hayden City Code Section 6-1-4 (refer to fig. 7).
2. A root barrier device may be required if the need is determined during the review of the planting plan.
3. All street trees that are removed must be replaced, unless otherwise approved by the City Administrator or Administrator's designee.
4. The minimum size for trees to be planted on the right-of-way is 2" caliper unless otherwise approved by the City Administrator or Administrator's designee.
5. Containerized or ball and burlap stock may be used for public trees. The person (or other entity) that planted the tree is responsible for replacing the tree if it dies within three years.

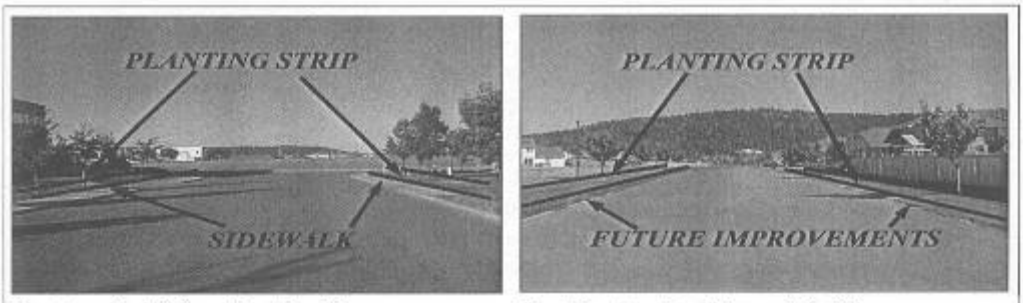
Street Tree Spacing and Location Guidelines

- The City encourages spacing trees so that their canopies will not overlap when they are mature. The City may approve wider spacing if it is necessary for safe use of the street or sidewalk, or for other good reason. When space is limited, or to achieve specific design effects, closer spacing may be approved. Class I trees should be planted in small planting areas and under public utilities wires. The city encourages planting Class II and Class III trees wherever practical because they are better for visual screening and temperature modification (refer to fig. 8)

Tree Size	Minimum Width	Spacing
Class I	4ft.	23ft.
Class II	4 - 5ft.	30ft.
Class III	6 - 8ft.	40ft.

Figure 8 - Street tree spacing

- Where the planting strip is limited on both sides by physical obstructions such as curbs, sidewalks or fences (a defined strip), street trees should be planted mid-way between the defining obstructions (see Approved Street Tree Planting Lists – plant strip width column in Section II). Where the planting strip is between the sidewalk and the property line, street trees should be planted 3-7 feet behind the sidewalk, depending on the species selected (refer to fig. 9).
- In undefined planting strips, street trees should be planted 3-5 feet from the curb (at least one-half the plant strip width). If there are no curbs or sidewalks, future improvements should be considered when planting (refer to fig. 9).



Plant trees 3 - 7ft. from the sidewalk
Figure 9 - Planting location

Consideration should be made for future improvements to roadways.

- Street trees must have a minimum planting strip of 16 sq. ft. (4 ft X 4 ft). Street trees planted under an overhead utility line must not exceed 35 feet in height at maturity (class I). Any street tree to be planted that does not meet these standards must have prior approval from the City Administrator or Administrator's designee.

Planting Methods

- Before digging in the right-of-way begins, the person responsible for planting the tree shall obtain a permit from the city and contact the “Call Before You Dig” utility number 1-800-428-4950.
- If trees cannot be planted immediately, place them in a shady, protected spot and keep the root ball moist through frequent, light watering.

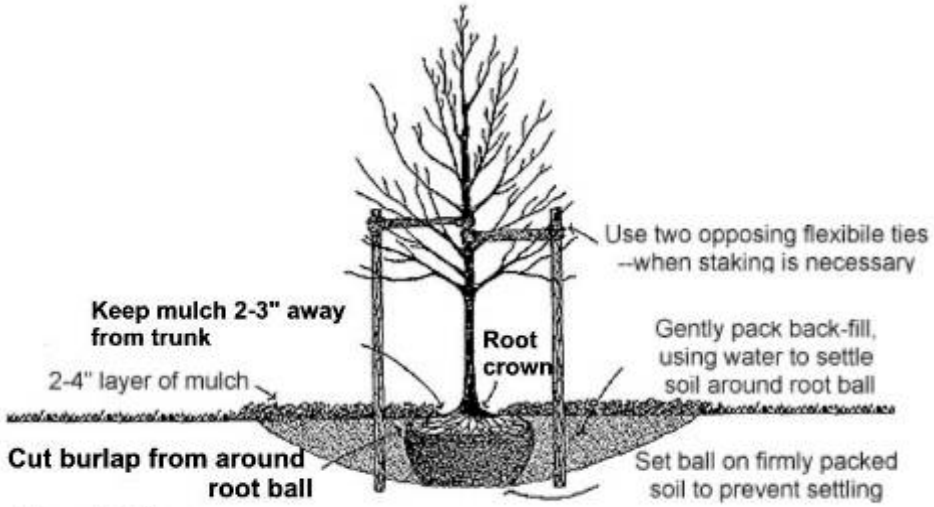


Figure 10 - Planting

1. Before digging the hole, loosen any wrapping or remove soil to expose the root crown.
1. Measure the height and width of the root ball and dig the hole about 10% shallower than this depth and as wide as possible (at least 2X times the width of the ball - up to 5X wider in compacted soils).
2. Remove all wire baskets, burlap, containers, twine, tags, wire or tree wrap to the maximum extent possible.
3. Lift the tree by the root ball (NOT by the trunk), center the tree in the hole, making sure the root crown will be above grade level when the hole is filled.
4. Straighten the tree in the hole. Before you begin backfilling have someone view the tree from several directions to confirm the tree is straight. Once you begin backfilling it is difficult to reposition.

Figure 11 - Planting

5. Fill the hole about 1/2 full of water and gradually backfill with soil. Gently but firmly pack the soil around the base of the root ball. Then saturate with 5 gallons or more of water to fill all holes and cavities around the roots. Finish filling the hole, tamp gently and water again with another 5 gallons, or more. More soil may need to be added after the water has drained and the fill has settled. Make certain the root crown remains exposed.

6. Cover the tree ring area of the newly planted tree with 3-4 inches of organic mulch material. The mulch should be pulled 2 to 3 inches back from the trunk of the tree. Recycled composted and screened yard debris, or wood chips are recommended mulch materials. Rock is not an acceptable mulch (refer to fig. 11)
7. Stake trees only if it is necessary for adequate stability. Ties should be only tight enough to support the tree but not enough to prevent swaying. Tie material should be flexible and at least 1" wide where it touches the tree. All ties, stakes should be removed within a year. If the tree still requires support, adjust the tie system.
8. New trees need to be watered to a depth of 12 to 18 inches at least once a week during the first two growing seasons if they are to become well established. During hot and dry periods, new trees will need more frequent watering. At least five gallons of water per application, usually more, will be needed. Proper mulching helps conserve soil moisture.
9. Maintain tree rings or install adequate edging material to keep turf and weeds out of the ring.

Quality of Plant Materials

High quality plant materials are desired for plantings. The minimum acceptable standard for plant materials shall conform to the American Association of Nurserymen's American Standard for Nursery Stock, (ANSI Z60.1-1996) and will be true to name and type. Broken, damaged, diseased and substandard tree stock will not be allowed to be planted in the right-of-way. Trees planted must be free from bark damage, decay, sunscald, insect pests or other objectionable disfigurements (refer to fig. 12 and fig. 13).

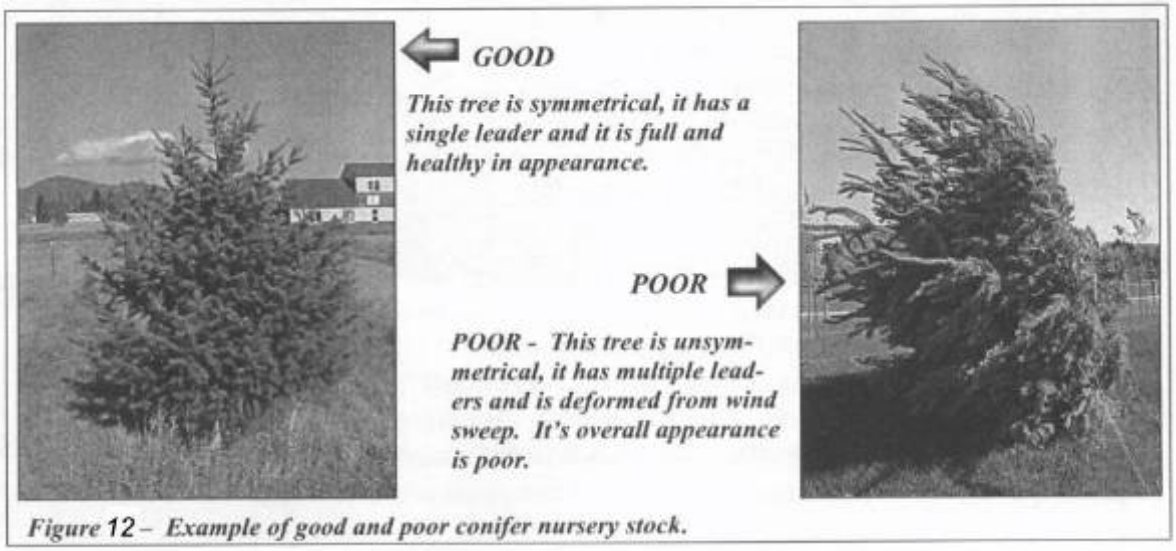


Figure 12 – Example of good and poor conifer nursery stock.

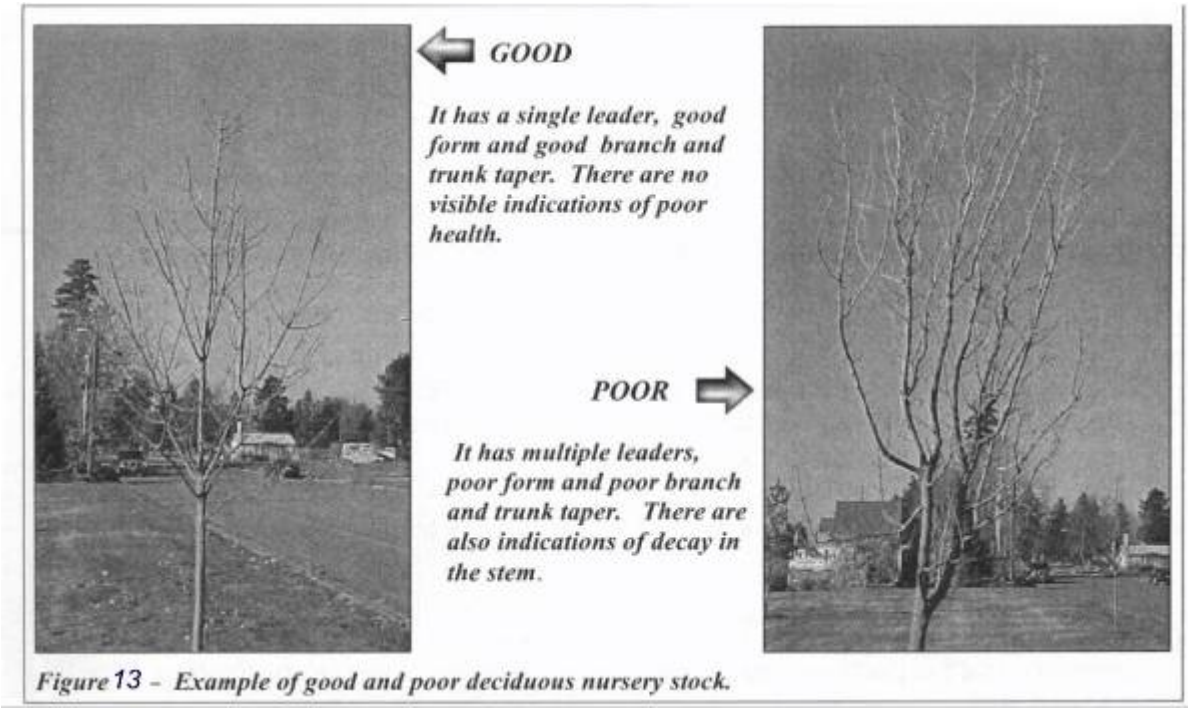


Figure 13 – Example of good and poor deciduous nursery stock.

Quality of Work

- The best time to plant trees is spring or late fall when the trees are dormant. Ball and burlap or containerized stock may be planted successfully most of the year except during very hot and dry periods of the summer.
- Handle tree stock carefully to avoid causing damage during planting.
- If any bark is damaged or branches broken during planting, the damage should be properly treated immediately. Trees that are so badly damaged that it is doubtful they will survive or grow properly must be replaced.

Do not cause a public hazard while planting a street tree, including the following:

1. Leaving open planting holes unattended or without barricades.
2. Failing to clean up debris promptly.
3. Blocking any access.

Acceptance

- All street tree plantings must be in accordance with this manual unless otherwise authorized by the City Administrator or Administrator's designee.
- Unacceptable planting must be corrected to the standards of this manual. If the City does the corrective measures, the costs will be charged to the contractor, landowner or the primary developer of the project.

Chapter 4

PRUNING

Pruning Guidelines for Public Trees

- Trees must not be pruned in a way that will endanger their health.
- Branches and foliage of street trees must not interfere with safe public passage. They should be pruned so that clearance over streets is at least 12 feet and at least 10 feet over pedestrian areas.
- Remove sprouts and suckers growing on the trunk at least 10 feet above the ground.
- When dead or broken limbs endanger the public or property, they must be promptly and properly removed. It is not necessary to get authorization prior to the work when the pruning is needed immediately for safety.
- To protect the future welfare of the tree, any pruning of the roots of a street tree must have prior approval from the City.

PROPER PRUNING WILL MAKE A DIFFERENCE!

These two trees are the same species, Green Ash, and are about the same age. The tree on the left is a healthy specimen with good natural tree form. The tree on the right has numerous insect and disease problems and very poor tree form.

GOOD

This tree has been properly pruned. Dead and dying limbs and larger limbs that were crowding other limbs have been pruned from the tree.

POOR

This tree has been improperly pruned by "topping". All the major limbs have been removed over many years. Poorly attached limbs, "suckers", grow back and create hazards.

Methods of Pruning

The standard for pruning public trees is ANSI Z133.1, ANSI A300 Tree Care Operations and I.S.A. Tree Pruning Guidelines. Copies are on file in the City office. An International Society of Arboriculture certified Arborist shall oversee all pruning of public trees unless otherwise approved by the City Administrator or Administrator's designee. Topping is an unacceptable arboriculture practice and is strictly prohibited under Hayden Municipal Code Section 10-2-8.a. (refer to fig. 14).

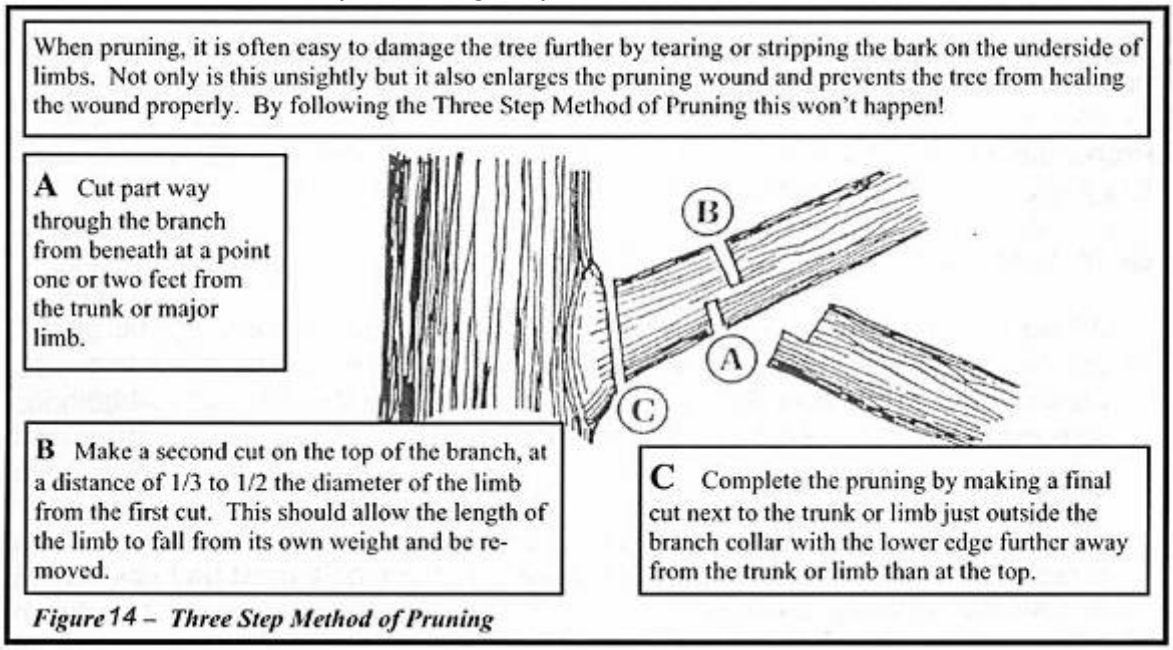


Figure 14 – Three Step Method of Pruning

Quality of Work/Pruning

- Make all final pruning cuts in a way that encourages natural callus growth to cover the wound.
- Make all final pruning cuts in a way that prevents the bark and wood from tearing back.
- Use sharp and clean tools. Disinfect tools when working with trees that have infectious disease.
- Clean up branches, logs or any other debris promptly.
- The use of climbing spurs or spike shoes on public trees is prohibited.
- Never leave any severed or partially cut branches in the upper part after arborist or other tree workers leave the site.

Chapter 5

REMOVAL

Guidelines for the Removal of Public Trees
Before removing a Public Tree or trees, a private individual must obtain permission from the City to do so. The application for a permit to remove a Public Tree or trees is available from the City.

Public Safety
Proper safety procedures are required if work sites place the public at risk. Signage, flagging and other public safety issues should follow Idaho Code.

Quality of Work

- All debris must be removed from the sidewalk and street as soon as possible. Merchantable trees or firewood material will be removed at a time which is agreeable to both the landowner and the City Administrator or Administrator's designee. All other debris must be removed by the end of the day it is produced.

- The stump and primary roots must be ground to at least 8" below the soil surface. The time period for grinding will be determined by the landowner and the City Administrator or Administrator's designee. To prevent a public safety hazard the stump hole must be back filled immediately after the grinding.

Chapter 6

MAINTENANCE

Maintenance Standards

- The health of public trees should be promoted by providing adequate inspection monitoring and maintenance.
- Any public tree, which poses a threat to other trees in the community because of a disease or insect infestation, should be treated to control the spread of the problem. Whenever possible the use of integrated pest management is recommended.
- The standards for planting and maintenance in this manual are applicable to all park and natural area trees. Public trees will be pruned by ANSI and I.S.A. specifications.

Street trees: All street trees should be inspected by the City Administrator or Administrator's designee to determine their condition and maintenance needs. Any needed maintenance should be scheduled. Heavily damaged or disfigured street trees should be removed and replaced as soon as practical.

Park trees: All park trees in developed open space areas should be inspected annually to determine their condition and maintenance needs. Any needed maintenance should be scheduled. Park trees will be replaced when necessary to meet the goals of the park management plan.

Natural area trees: Natural area trees should be inspected as necessary to determine their condition and need for maintenance. Needed maintenance should be scheduled. The maintenance plan should consider the integrity and needs of the stand and existing plant community.

Whenever practical, improve wildlife habitat during the maintenance of natural areas. Where woody debris or tree stumps provide valuable habitat, they are exempt from the requirement to clean up debris. Nurse wood for tree regeneration may be left on site.

CHAPTER 7

PROTECTION AND PRESERVATION OF PUBLIC TREES

General Guidelines

Public Trees constitute an asset that belongs to every community resident. Therefore abusing or destroying any public tree is prohibited under Hayden Municipal Code Section 10-2-8. This includes topping, improper pruning, breaking stakes or supports for a public tree, burning or encouraging any burning near the trunk, defacing it, or attaching signs or notices, nails, screws, or other such devices, applying toxic substances, removal or replacement without permission.

During Construction

- Site or landscape plans for any development shall show all existing public trees to be saved and those to be removed. Removal is by permit only. Every effort should be made to preserve desirable trees. The City Administrator or Administrator's designee will provide information about appropriate ways of preserving the trees.
- Public trees to be saved should be marked prominently during the construction, repair, alteration or removal of any building or structure. When the trunks of save trees are likely to be damaged, they should be protected with fencing. To avoid soil compaction around the root zones, fencing should include the area under the dripline of the trees (refer to Fig. 15).

During construction, protect public trees by;

1.) *Pruning limbs in the way of the construction.*

2.) *Fertilizing, watering and aerating the trees to minimize stress.*

3.) *Fencing trees and natural areas to prevent compaction.*

4.) *Adding a temporary 3" mulch layer to prevent compaction.*

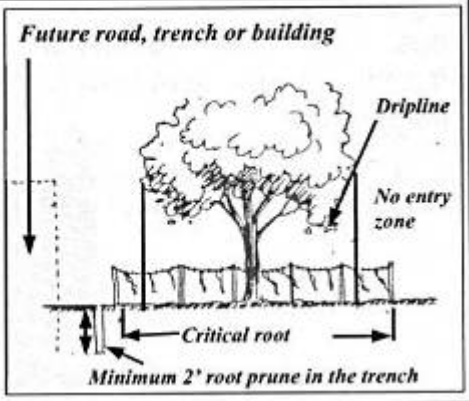


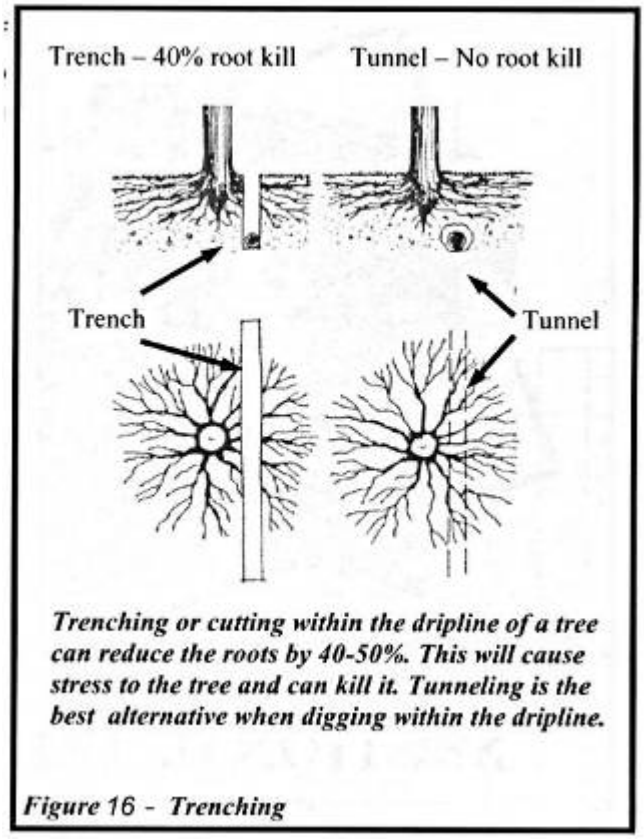
Figure 15 – Protecting the root zone

- Any trenching within the dripline of public trees must be done by hand to tunnel under and preserve the main support roots (refer to fig 16).

- Curb cuts should not be closer than 6 feet from the trunk of the tree. Paving should be at least 3 feet from the tree trunk.

- Avoid cutting surface roots whenever possible. Sidewalks and paving should be design to avoid such damage.

- Avoid disturbing the soil within the dripline of trees such as removing the topsoil, compacting the soil or adding fill dirt.



Trenching or cutting within the dripline of a tree can reduce the roots by 40-50%. This will cause stress to the tree and can kill it. Tunneling is the best alternative when digging within the dripline.

Figure 16 - Trenching

- Excavation or trenching requiring root cuts should be done rapidly to minimize drying out the cut root. Make smooth, flush cuts on tree roots. Back fill before the roots have a chance to dry out, and water the tree immediately. Irrigation may be necessary throughout the hot and dry summer season.

- In the interest of preserving public trees, the City may coordinate with the Urban Forestry Commission by notifying them of any applications for new curb, gutter, walkway or driveway installations or other improvements which might require the removal of, or cause injury to any public tree or interfere with the goals of the City's street tree plan.

SECTION II.

RECOMMENDED TREES FOR HAYDEN

A Four-list 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

Native Tree List
Screening Tree List
Shading and Parking Lot Tree List
Swale Tree List

Prepared by
City of Hayden Community Development Department
March 25, 2008

Approved by the
Community Forestry Commission
April 24, 2008

Adopted by
City Council Resolution No. 2008-7
May 28, 2008

RECOMMENDED 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 with 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 Hayden Urban Forester at 208-209-0987.

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 affect 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.

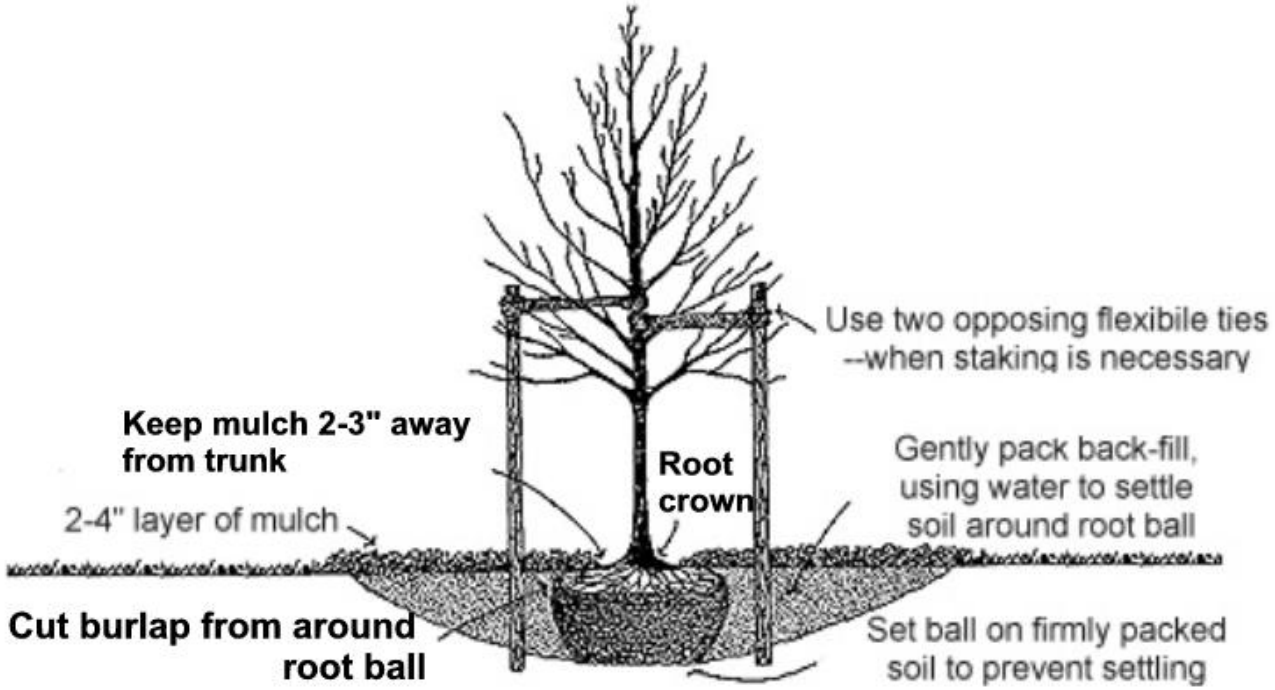


Figure 10 - Planting

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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RECOMMENDED NATIVE 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
March 25, 2008

Approved by the
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April 24, 2008

Adopted by
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May 28, 2008

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
Sub-alpine fir *Abies lasiocarpa*	50’ – 70’	25’ – 30’	50 SF	Very Slow	Shallow – Medium	6’	25'	No	Evergreen conifer. This tree grows very slowly. The typical height over many years is approximately 50’ in our area. Under ideal conditions, this tree can grow over 100’ tall.
White spruce *Picea glauca*	40’ – 60’	20’	113 SF	Moderate	Shallow – Medium	10’ – 12’	15’ – 20’	No	Narrow canopied conifer for restricted sites. However, the root system needs adequate space. Needles are a whitish-gray color. Low branches can cause visibility problems. Susceptible to root rots in wet soils.

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
White Fir Abies concolor	50’ – 70’	25’ – 30’	50 SF	Very Slow	Shallow – Medium	6’	25'	No	Evergreen conifer. This tree grows very slowly. The typical height over many years is approximately 50’ in our area. Under ideal conditions, this tree can grow over 100’ tall.
Grand Fir Abies grandis	30’ – 45’	30’ – 35’	154 SF	Slow	Medium	6’	25’ – 35’	No	A relatively disease and pest free tree. It tolerates poor soil conditions. Developmental pruning is required to maintain good form.
Western Larch *Larix occidentalis*	90’ – 120’	25’ – 40’	254 SF	Moderate – Fast	Medium	10’ – 12’	30’	No	Not tolerant of west soils. Prefers well draining soils. Very cold tolerant. This is a large tree; plant only where there is space!

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
Blue Spruce *Picea pungens*	30’ – 60’	20’	78 SF	Slow – Moderate	Medium	8’ – 10’	20’	No	Prefers rich, moist soils that drain well. Subject to spider mites and Cooley’s adelgid. ‘Glauca’ is the most common cultivar.
Ponderosa Pine *Pinus ponderosa*	60’ – 100’	25’ – 35’	113 SF	Moderate	Medium	10’ – 12’	30’	No	Drought tolerant native. Prefers deep, well drained soils. Can be attacked by a number of pests if growing conditions are poor. Some tolerance to salts. Three-needle pine with a coarse appearance. Produces large cones!
Doug-Fir Pseudotsuga menzeisii	70’ – 100’	25’ – 35’	113 SF	Moderate – Fast	Medium	10’ – 12’	30’	No	Drought tolerant native. Does not like wet soils. Doug-fir will grow faster in the Inland Empire with periodic deep watering. Produces heavy cone crops.

RECOMMENDED SCREENING TREES FOR HAYDEN

a subset of the

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Spring 2008

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May 28, 2008

Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Allum lawson cypress *Chamaecyparis lawsoniana 'allumii'*	25’	15’	Slow	Shallow-Medium	6’	10’ – 15’	No	Prefers moist, but well drained soils. Small scale evergreen screening tree for use under power lines. Root rots can be a problem if soil remains saturated for long periods. Dark green canopy is denser than Stewart golden cypress. NOT FOR USE AS A STREET TREE.
Stewart golden cypress *Chamaecyparis lawsoniana 'stewartii'*	25’	15’ – 20’	Slow	Shallow – Medium	6’	15’	No	Prefers moist, but well drained soils. Small scale evergreen screening tree for use under power lines. Root rots can be a problem if soil remains saturated for long periods. Golden green canopy is more open than Allum lawson cypress. NOT FOR USE AS A STREET TREE.
Cripps golden cypress *Chamaecyparis obtusa ‘Crippsii’*	25’	15’ – 20’	Slow	Shallow – Medium	6’	15’ – 20’	No	Prefers moist, but well drained soils. Small scale evergreen screening tree for use under power lines. Root rots can be a problem if soil remains saturated for long periods. Golden canopy similar to Stewart golden cypress. NOT FOR USE AS A STREET TREE.
Long stalked holly *Ilex pedunculosa*	20’ – 30’	15’ – 25’	Slow – Moderate	Medium	5’	15’ – 20’	No	Small scale holly provides year round interest. Likes moist, but not water logged soil. Could tolerant to -20 degrees. NOT FOR USE AS A STREET TREE.
Tolleson’s Weeping Rocky Mountain juniper *Juniperus scopulorum* ‘Tolleson’s Weeping’	20’	10’ – 15’	Slow	Medium	5’	10’ – 15’	No	Small scale weeping juniper for evergreen screens under power lines. Will withstand some drought once established. Will not tolerate wet soils. Disease and insect pests can cause problems. NOT FOR USE AS A STREET TREE.
Tanyosho pine *Pinus densiflora 'umbraculifera'*	10’ – 25’	10’ – 25’	Slow	Medium	5’	15’ – 20’	No	Small pine with an umbrella shaped canopy. Decorative orange-red bark. Tolerant of cold temperatures.
Mugo pine *Pinus mugo*	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. NOT FOR USE AS A STREET TREE.

Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Brandon Arborvitae *Thuja occidentalis* '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. NOT FOR USE AS A STREET TREE.
Weeping Canadian hemlock *Tsuga canadensis '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. NOT FOR USE AS A STREET TREE.

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
Sub-alpine fir *Abies lasiocarpa*	50' – 70'	25' – 30'	50 SF	Very Slow	Shallow – Medium	6'	25'	No	Evergreen conifer. This tree grows very slowly. The typical height over many years is approximately 50' in our area. Under ideal conditions, this tree can grow over 100' tall.
Insencecedar *Calocedrus decurrens*	40' – 50'	25' – 35'	176 SF	Slow – Moderate	Shallow – Medium	10'	30'	No	Slower growing conifer for use as a screen. This tree can reach tall heights overtime. Well draining soil is needed.
White spruce *Picea glauca*	40' – 60'	20'	113 SF	Moderate	Shallow – Medium	10' – 12'	15' – 20'	No	Narrow canopied conifer for restricted sites. However, the root system needs adequate space. Needles are a whitish-gray color. Low branches can cause visibility problems. Susceptible to root rots in wet soils.

Golden-larch *Pseudolarix amabilis*	30’ – 50’	30’ – 40’	35 SF	Very Slow	Medium	6’	25’ – 30’	No	Deciduous conifer similar to tamarack. Seedlings may be difficult to find. Best used as an accent tree.

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
White Fir Abies concolor	50’ – 70’	25’ – 30’	50 SF	Very Slow	Shallow – Medium	6’	25'	No	Evergreen conifer. This tree grows very slowly. The typical height over many years is approximately 50’ in our area. Under ideal conditions, this tree can grow over 100’ tall.
Grand Fir Abies grandis	30’ – 45’	30’ – 35’	154 SF	Slow	Medium	6’	25’ – 35’	No	A relatively disease and pest free tree. It tolerates poor soil conditions. Developmental pruning is required to maintain good form.
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.
Japanese Larch *Larix kaempferi*	70’ – 90’	25’ – 40’	254 SF	Moderate – Fast	Medium	8’	25’ – 30’	No	Not tolerant of salts. Will not tolerate drought. Needs moist, draining soils. Plant in sunny areas.
Western Larch *Larix occidentalis*	90’ – 120’	25’ – 40’	254 SF	Moderate – Fast	Medium	10’ – 12’	30’	No	Not tolerant of west soils. Prefers well draining soils. Very cold tolerant. This is a large tree; plant only where there is space!
Dawn redwood Metasequoia glyptostroboides	70’ – 80’	25’ – 30’	176 SF	Fast	Shallow – Medium	10’ – 12’	25’	No	A deciduous conifer. Prefers moist, well draining soil. Few pest problems.
Black Spruce *Picea mariana*	40’ – 65’	10’ – 20’	78 SF	Moderate	Shallow	10’ – 12’	10 – 20’	Yes	Prefers moist soil. Grows at the edge of streams, bogs and lakes. Will tolerate stagnant water, but prefers soils that drain. Use at the upper edge of a swale. The root system is typically very shallow.
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.
Oriental Spruce *Picea orientalis*	50’ – 60’	20’	78 SF	Slow	Medium	8’ – 10’	20’	No	Tolerates gravelly soils. Likes draining soils. Better form than white spruce. Very graceful form. Protect from dry, Winter winds when young.

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
Blue Spruce *Picea pungens*	30’ – 60’	20’	78 SF	Slow – Moderate	Medium	8’ – 10’	20’	No	Prefers rich, moist soils that drain well. Subject to spider mites and Cooley’s adelgid. ‘Glauca’ is the most common cultivar.
Ponderosa Pine *Pinus ponderosa*	60’ – 100’	25’ – 35’	113 SF	Moderate	Medium	10’ – 12’	30’	No	Drought tolerant native. Prefers deep, well drained soils. Can be attacked by a number of pests if growing conditions are poor. Some tolerance to salts. Three-needle pine with a coarse appearance. Produces large cones!
Southwestern White Pine *Pinus strobiformis*	60’ – 100’	25’ – 35’	113 SF	Moderate	Medium	10’ – 12’	30’	No	Drought tolerant species from New Mexico. Prefers deep, well drained soils. Blister rust can be a problem. Five-needle pine with a fine appearance. Produces large cones.
Vanderwolf Pine *Pinus flexilis* ‘Vanderwolf’	30’ – 55’	15’ – 35’	113 SF	Moderate	Medium	8’ – 10’	25’	No	Faster growth rate than species. Fine textured five-needle pine with twisting, blue-green foliage. Blister rust can be a problem.
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

RECOMMENDED STREET AND PARKING LOT TREES FOR HAYDEN

a subset of the

Master Recommended Tree List For Hayden
Spring 2008

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May 28, 2008

Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Trident maple *Acer buergerianum*	25’ – 30’	25'	Moderate	Medium	4'	20' - 25'	No	A small shade tree with a round shaped crown and small, 3-lobed leaves. The leaves are glossy green turning yellow to red in the fall. This tree must be properly pruned to grow more upright and provide needed pedestrian and vehicular clearance. Somewhat drought tolerant.
Amur maple, Flame maple *Acer ginnala*	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. Needs some early developmental pruning. Swales must drain well for optimal tree performance.
Rocky Mtn. Glow maple *Acer grandidentatum* ‘Schmidt’	30'	20' - 25'	Slow	Deep	3'	20' - 25'	No	Small round headed shade tree for areas of restricted space. Iridescent reddish orange fall color. Drought tolerant when established.
Paperbark maple *Acer griseum*	20’ – 30’	20’ – 30’	Slow	Medium	4’	25’ – 30’	No	Small shade tree with tri-foliate leaves similar to boxelder. This tree needs well draining soils. Needs some early developmental pruning. Beautiful bark. Moderate fall color.
Apollo maple *Acer sacharrum* ‘Barrett Cole’	25’	10’	Slow	Medium	4’	10’ – 15’	No	Small, columnar canopy. Needs fertile, well-drained soil. Fall colors are yellow to red. Needs developmental pruning.
‘Crescendo’ sugar maple *Acer* saccharum ‘Morton’	25’ – 30’	25’ – 30’	Slow	Medium	5’	25’	No	Excellent heat and drought tolerance. Good branch structure. Prefers well draining soils for optimal growth. Good Fall color.
Tartarian maple *Acer tartaricum*	15’ – 25’	20’ – 25’	Slow – Moderate	Medium	4’	20’	No	This tree needs drier rooting conditions. Somewhat drought tolerant when established. Yellow and red fall color.

Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Chinese maple *Acer truncatum*	20' - 25'	20'	Slow - Moderate	Medium	4'	20'	No	Very drought tolerant once established. Needs developmental pruning. Yellow, orange and red in the fall.
Snow Cloud serviceberry *Amelanchier laevis* 'Snowcloud'	20' – 25'	15' – 20'	Moderate	Deep	3'	15' – 20'	No	Snow white flowers in the spring. Coppery-orange fall color. Needs developmental pruning. Sometimes questionable under unfavorable growing conditions.
American hornbeam *Carpinus caroliniana*	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.
Constellation dogwood *Cornus florida X kousa* 'Rutcan'	20' – 25'	20'	Moderate	Deep	4'	20'	No	White flowers in the late Spring. Resistant to dogwood anthracnose. Erect tree with wide branch angles. More vigorous than Korean dogwood.
Stellar Pink dogwood *Cornus florida X kousa* 'Rutgan'	20	20'	Moderate	Deep	4'	20'	No	White flowers in the late Spring. Resistant to dogwood anthracnose. Erect tree with wide branch angles. More vigorous than Korean dogwood.
Korean dogwood *Cornus kousa*	20' - 30'	20' - 30'	Slow – Moderate	Medium	4'	20' - 25'	No	More drought tolerant than Eastern flowering dogwood. Needs developmental pruning. Select saplings with dominant central leaders.
Thornless cockspur hawthorn *Crataegus crus-galli* var. *inermis*	20' – 30'	20 – 35'	Slow – Medium	Medium	3'	25' – 30'	Yes	Thornless cultivar of hawthorn. Can be used in swales if they drain well, otherwise plant just above the swale bottom. Hawthorns can be subject to many diseases, especially when stressed.
English hawthorn *Crataegus laevigata*	15' – 20'	15' – 20'	Slow	Medium	3'	15'	Yes	This hawthorn has thorns. Can be used in swales if they drain well. Because of its small size, use only where space is very limited. May be subject to many diseases when stressed.

Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Snowbird hawthorn *Crataegus x mordenensis* 'Snowbird'	20' – 25'	20'	Slow	Medium	3'	20'	Yes	This hawthorn has thorns. Can be used if swales drain well. Double petal flowers. May be subject to diseases when stressed.
Washington hawthorn *Crataegus phaenopyrum*	25' – 30'	20' – 25'	Slow	Medium	4'	20' – 25'	No	Use 'Princeton Sentry' when available, it is nearly thornless. May be subject to diseases when stressed. Very showy fruit.
Leprechaun ash *Fraxinus pennsylvanica* '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 *Malus* '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. Swales must drain well.
Robinson crabapple *Malus* 'Robinson'	25'	25'	Moderate	Medium	5'	20' – 25'	Yes	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.
Sugartyme crabapple *Malus* ' 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. Swales must drain well.
Tanyosho pine *Pinus densiflora 'umbraculifera'*	10' – 25'	10' – 25'	Slow	Medium	5'	15' – 20'	No	Small pine with an umbrella shaped canopy. Decorative orange-red bark. Tolerant of cold temperatures.
Accolade Cherry *Prunus sargentii* 'Accolade'	20' – 25'	20' – 30'	Moderate	Medium	5'	25'	No	Semi-double deep rose pink blossoms. Smaller cultivar of parent for use under power lines. Needs well draining soil.

Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Snow Goose Cherry *Prunus serrulata* 'Snow Goose'	20’	20’	Moderate	Medium	5’	20’	No	Semi-double bright white flowers in the Spring. Brilliant orange-red colors in the Fall. Needs well draining soil.
Canada red chokecherry *Prunus virginiana* ‘Canada Red’	20’- 30’	20’ – 25’	Moderate - Fast	Medium	5’	25’	No	Burgundy colored leaves during the growing season. Needs well draining soil. May produce some fruit. Susceptible to black knot
Red Cascade mountainash *Sorbus americana* 'Dwarfcrown'	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.
Snow Charm Japanese snowbell *Styrax japonicus* ‘JFS-E’	20' - 30'	15' - 20'	Slow – Moderate	Medium – Deep	4'	20'	No	Transplant this tree in the Spring. Like moist, but well drained soil. Needs supplemental irrigation in the Summer.
Summer Sprite linden *Tilia cordata* 'Halka'	15’ – 20’	10’	Slow	Medium	4’	10’ – 15’	No	A true genetic dwarf. Small ornamental tree for restricted areas. Due to its small size, use only where space is very limited. Not for use where larger Type I trees can be used.
Wireless zelkova *Zelkova serrata* '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
Hedge maple *Acer campestre*	30' – 45'	30' – 35'	154 SF	Slow	Medium	6'	25' – 35'	No	A relatively disease and pest free tree. It tolerates poor soil conditions. Developmental pruning is required to maintain good form.
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. Developmental pruning is critical to maintaining a good structure.
'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.

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
'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.
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.

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
'Schlesingeri'	60' – 70'	35' – 50'	615 SF			10'	40'		One of the oldest, and largest, red maple cultivars. Earliest of the Fall coloring maples.
'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 *Acer truncatum X plantanoides* 'Keithsform'	35'	25'	115 SF	Slow – Moderate	Medium	6'	25'	Yes	This tree is a hybrid between Chinese maple (*Acer truncatum*) and Norway maple (*Acer plantanoides*), 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 *Acer truncatum X plantanoides* '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.
Red horsechestnut *Aesculus X carnea*	30' – 40'	30' – 35'	176 SF	Slow – Moderate	Medium	6'	30'	No	A good substitute for common horsechestnut. Less susceptible to leaf scorch and mildew. Brilliant red flowers in the Spring.
Black alder *Alnus glutinosa*	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.

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
River birch *Betula nigra*	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.
‘Heritage’ (‘Cully’)	40’ – 60’		706 SF				40’		Consistent salmon bark coloration. Cold tolerant. Heat tolerant.
European hornbeam *Carpinus betulus*	40’ – 60’	30’ – 40’	491 SF	Slow – Moderate	Medium	8’	35’	No	This species will tolerate wet soil if they drain well, otherwise drier soils are preferred. Developmental pruning will aid in developing a good branch structure. For maximum shade, do not use the common cultivar ‘Fastigiata’.
Magnifica hackberry *Celtis occidentalis X laevigata* ‘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 (*Celtis occidentalis*) and sugarberry (*Celtis laevigata*). It can be used in swales. Salt tolerant.
Katsura tree *Cercidiphyllum japonicum*	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. Requires developmental pruning to establish a good form, and periodic pruning to maintain good form. Do not over-thin the canopy – it will sunburn.

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
Yellowwood *Cladrastus kentukea (lutea)*	30’ – 50’	40’ – 55’	452 SF	Moderate	Medium	8’	35’ – 40’	No	Can tolerate moist, well-drained soils. Requires developmental pruning to establish a good form. Otherwise, the tree is prone to splitting. Prune only in the Summer – this tree is a profuse bleeder!
Turkish Filbert *Corylus colurna*	40’ – 50’	35’ – 40’	452 SF	Moderate	Medium	8’	35’	No	Cold and heat tolerate tree. Supplemental water needed the first few summers to reestablish the root system. After that, it is drought tolerant. Soils may be moist, must drain. Developmental pruning needed when young.
White Ash *Fraxinus americana*	50’ – 80’	45’ – 70’		Moderate	Medium	8’		Yes	As a species, it is a better shade tree than green ash (*Fraxinus pennsylvanica*), 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.
‘Skyline’ (‘Skycole’)	50’	40’ – 45’	706 SF				35’ – 40’		Broadly oval cultivar with good branch angles and a central leader. Good Fall coloration.

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
'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			8'			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.
'Patmore'	50' – 60'	35'	254 SF	Moderate			35'		Similar to 'Centerpoint' ash. Very cold tolerant. Developmental pruning is important with this cultivar.

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 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.
Blue ash *Fraxinus quadrangulata*	50' – 70'	40' – 50'	452 SF	Slow – Moderate	Medium	8' – 10'	40'	No	Similar to American ash, though it needs well draining soil. Developmental pruning is needed to establish a good branch structure.
Ginkgo *Ginkgo biloba*	50' – 80'	30' – 50'		Slow – Moderate	Medium	8'		No	This species is an ancient, living transition tree between conifers and hardwoods. It is classified with conifers, such as pines, but it grows like a hardwood. NEVER plant field seedlings! It could be a female with rancid smelling fruit. ALWAYS <u>select a named male cultivar!</u>
'Autumn Gold'	50'	30' – 35'	254 SF				30' – 35'		Brilliant yellow Fall color, almost iridescent. Needs developmental pruning to prevent narrow branch angles and included bark.
'Fairmount'	45' – 60'	30'	176 SF				30'		Narrow canopy tree with good branch angles. Good Fall coloration. The tree can grow tall.
'Halka'	45' – 50'	40'	314 SF				35' – 40'		Broader canopy than most ginkgo cultivars, and will produce large amounts of shade with age.
'Princeton Sentry' ('PNI 2720')	45' – 60'	25'	113 SF				20' – 25'		Very narrow canopy for constricted areas. Good branch angles for such a narrow tree. Developmental pruning will prevent included bark.
'Saratoga'	40' – 45'	30'	176 SF				30'		Smaller scale ginkgo with very distinctive foliage, and a distinct central leader.

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
Thornless Honeylocust *Gleditsia triacanthos inermis*	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.
'True Shade'	40'	35'	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 *Nyssa sylvatica*	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.

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
American hophornbeam *Ostrya virginiana*	25' – 40'	25' – 30'	176 SF	Slow	Medium – Deep	6'	25'	No	Transplant this tree in the Spring or early Summer. Graceful, lacey branch form. Few pest problems. Soils can be moist, but must drain.
Sargent cherry *Prunus sargentii*	40' – 50'	35' – 45'	452 SF	Moderate	Shallow – Medium	10' – 12'	35'	No	Beautiful Spring blossoms, followed by small purple drupe in early Summer. Developmental pruning needed to establish a good branch structure. Use where the drupe fruit will not cause problems. Will not tolerate wet soils.
Yoshino cherry *Prunus X yedoensis*	30' – 40'	30' – 40'	314 SF	Fast – Moderate	Shallow – Medium	10' – 12'	30'	No	Beautiful Spring blossoms, followed by small purple drupe in early Summer. Developmental pruning needed to establish a good branch structure. Use where the drupe fruit will not cause problems.
Callery pear *Pyrus calleryana*	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'	254 SF				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'	254 SF				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'	78 SF				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.

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
'Trinity'	30' – 35'	25' – 30'	254 SF				25'		Broad oval canopy, with a flatter branch structure. Developmental pruning is still needed. Heavy blossom production. Very little fruit.
Prairie Gem pear *Pyrus ussuriensis* '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.
English oak *Quercus robur*	40' – 60'	40' – 60'	314 SF	Slow – Moderate	Medium	8'	35' – 40'	No	The species is susceptible to powdery mildew. Large stature in the landscape. Prefers well drained soils. Does produce acorns.
'Regal Prince Oak' ('Long')		10' – 15'					10' – 15'		Very narrow cultivar, producing very little shade. Resistant to powdery mildew.
'Rosehill Oak' ('Asjes')		20' – 25'	78 SF				20' – 25'		Wider branched cultivar producing some shade. Resistant to powdery mildew.
Korean mountainash *Sorbus alnifolia*	40' – 50'	20' – 40'	452 SF	Moderate – Fast	Shallow – Medium	10' – 12'	30' – 35'	No	Adaptable to many soil types. The tree does produce clusters of fruit. Though more tolerant of pests than European mountainash, it is still susceptible to many. Maintain plant health to minimize pest problems. Do not over prune.
European mountainash *Sorbus aucuparia*	20' – 40'	20' – 35'	314 SF	Moderate – Fast	Shallow – Medium	10' – 20'	25'	No	Does not like compacted soils. Keep tree healthy to minimize pest problems. The tree does produce clusters of fruit. Do not over prune.
Oak-leaf mountainash *Sorbus X hybrida (thuringiaca)*	25' – 35'	20' – 30'	176 SF	Moderate – Fast	Shallow – Medium	10' – 20'	25'	No	Leaves look like oak leaves. Keep tree healthy to minimize pest problems. Developmental pruning needed. Do not over prune.
American linden *Tilia americana*	60' – 80'	35' – 45'	706 SF	Moderate	Medium	8' – 10'	40'	No	The species is a very large headed tree. Can tolerate moist soils if drained well. Large leaves. Cultivars are better suited for urban use. Can have problems with aphids.

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
'American Sentry'	45' – 55'	20' – 25'	78 SF	Moderate	Medium	8' – 10'	25'	No	Narrow canopy. Developmental pruning needed to minimize included bark. Medium green Summer foliage.
'Legend'	40' – 55'	30' – 40'	314 SF	Moderate	Medium	8'	35'	No	Broadly pyramidal with a distinct central leader. Leaves hold green color all Summer. Developmental pruning needed to maintain the central leader.
'Lincoln'	40' – 55'	15' – 25'	78 SF	Moderate	Medium	8'	20' – 25'	No	Narrow canopy. Developmental pruning needed to minimize included bark. Lighter green Summer foliage.
'Redmond'	35' – 45'	25' – 30'	254 SF	Slow – Moderate	Medium	8'	25' – 30'	No	Pyramidal canopy with a distinct central leader. Developmental pruning needed to maintain the central leader.
Greenspire littleleaf linden *Tilia cordata* 'Greenspire'	40' – 50'	30' – 35'	254 SF	Slow – Moderate	Medium	8'	35'	No	Broadly pyramidal with a distinct central leader. Leaves hold green color all Summer. Developmental pruning needed to maintain the central leader. Tougher than American linden. Can have aphid problems.
Silver linden *Tilia tomentosa*	50' – 70'	30' – 45'	452 SF	Moderate	Medium	8' – 10'	40'	No	Large headed shade tree. Tolerates moist soil, if it drains. Silver underside of leaves shimmer in the wind.
'Green Mountain' ('PNI 6051')	45' – 60'	40'	706 SF	Moderate – Fast		8' – 10'	40'	No	Faster growing cultivar for rapid shade. Maintains a central leader. Developmental pruning needed to maintain good branch structure. Tolerates heat and drought.
'Sterling'	50'	40'	452 SF	Moderate		8' – 10'	40'	No	Similar to Green Mountain, but slower growing. Yellow Fall color.
Crimean linden *Tilia X euchlora*	40' – 60'	20' – 30'	176 SF	Moderate	Medium	8' – 10'	25'	No	Hybrid with yellow Fall color. More resistant to aphids. Tolerates hot, dry conditions. Developmental pruning needed to maintain 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
Frontier elm *Ulmus* 'Frontier'	40' – 50'	30' – 35'	452 SF	Fast	Shallow – Medium	10'	30' – 35'	No	Vase shaped hybrid with red fall color. Moderate resistance to elm leaf beetle. Prefers moist soil. Developmental pruning needed to maintain a good branch structure. The vase shape may be a problem under heavy snow or ice loads.
Athena Chinese Elm *Ulmus parvifolia* 'Emer I'	35' – 45'	45' – 55'	452 SF	Moderate – Fast	Medium	10'	40'	No	Very lacy structure in an umbrella form. Developmental pruning needed to maintain good branch structure. Interesting bark. Resistant to Dutch elms disease and elm leaf beetle. Prefers well drained soils. Some salt tolerance. The spreading canopy may be a problem under heavy snow or ice loads.
Village Green zelkova *Zelkova serrata* '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 *Acer X freemanii*	40’ – 60’			Moderate – Fast	Shallow – Medium	8’ – 10’		Yes	This tree is a cross between red maple (*Acer rubrum*) and silver maple (*Acer saccharine*). 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. Developmental pruning is critical to maintaining a good structure.
‘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.
Sugar maple *Acer saccharum*	60’ – 70’	40’ – 55’		Slow – Moderate	Medium	8’ – 10’		No	Susceptible to salt damage. Does not like small planting spaces or restricted root zones. Prefers fertile, well draining soil.
‘Bonfire’	50’ – 65’	40’ – 50’	615 SF	Moderate – Fast			35’ – 40’		More tolerant of heat. Irregular branching pattern needs developmental pruning. Fall color listed at brilliant red.
‘Commemoration’	45’ – 50’	35’ – 40’	452 SF	Fast			35’ – 40’		Thick, heavy textured canopy for dense shade. Fast grow with narrow branch angles. Developmental pruning is critical to maintaining a good structure.
‘Endowment’	45’ – 50’	15’ – 25’	113 SF	Fast			20’		Narrower canopy with very fast growth. Developmental pruning is critical to maintaining a good structure. Tolerant of heat.

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
'Majesty' ('Flax Mill Majesty')	60' – 80'	40' – 50'	615 SF	Fast			40'		Fast growing with egg-shaped canopy. Resists frost cracking and sunscald. Very cold tolerant. Very think branching habit. Developmental pruning is needed to establish good branch spacing.
'Green Mountain'	65' – 75'	40' – 50'	452 SF	Moderate			35' – 40'		This cultivar is listed for use in hot dry areas. Slower growth with leathery leaves.
'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 think branching habit. Developmental pruning is needed to establish good branch spacing.
European beech *Fagus sylvatica*	50' – 60'	35' – 45'		Slow – Moderate	Shallow	10' – 12'	35'	No	Species will not tolerate wet, low oxygen soils. Will not tolerate salt. Makes a fine, strong canopied tree. Prune tree in the late summer to avoid bleeding.
'Fernleaf' ('Asplenifolia')	55' – 65'	45' - 55'	254 SF				35'		Dark green foliage with cut edges. Looks similar to aspen leaves. Beautiful Winter bark. A bit faster growing. Developmental pruning needed to establish a good branch structure.
'Purple' ('Pupurea')	45' – 55'	35' – 45'	254 SF				35'		Very deep purple color in Spring. Developmental pruning needed to establish a good branch structure. Spring, changing to purple-green in the Summer.
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.
Espresso Kentucky Coffeetree *Gymnocladus dioicus* 'Espresso'	45' – 55'	30' – 35'	254 SF	Slow – Moderate	Medium	8'	30' – 35'	No	Vase shaped canopy like American elm. Seedless cultivar. Prune in Winter. Wood can be brittle. Developmental pruning needed to establish and maintain a good branch structure. Cold tolerant.

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
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.
Japanese Larch *Larix kaempferi*	70’ – 90’	25’ – 40’	254 SF	Moderate – Fast	Medium	8’	25’ – 30’	No	Not tolerant of salts. Will not tolerate drought. Needs moist, draining soils. Plant in sunny areas.
Tuliptree *Liriodendron tulipifera*	70’ – 90’	35’ – 50’	706 SF	Fast	Shallow – Medium	10’ – 12’	35’ – 40’	No	Very fast growing tree; make sure there is space! Shallow, fleshy root system. Aphids can be a real problem. Developmental pruning is needed establish a good branch structure.
Cucumbertree magnolia *Magnolia acuminata*	50’ – 80’	50’ – 60’	706 SF	Fast	Shallow – Medium	10’ – 12’	35’ – 40’	No	Prefers deep, well draining soils. Plant in the early Spring. Can produce fruit on some trees. Prune after blossom.
Dawn redwood Metasequoia glyptostroboides	70’ – 80’	25’ – 30’	176 SF	Fast	Shallow – Medium	10’ – 12’	25’	No	A deciduous conifer. Prefers moist, well draining soil. Few pest problems.
White Oak *Quercus alba*	50’ – 80’	40’ – 70’	452 SF	Slow – Moderate	Medium – Deep	10’ – 12’	40’	No	Hardy oak species. Does not like to have its root system disturbed once established. Does not tolerate compacted soils. Prefers deep, well draining soils. Subject to aphid infestations. Produces a cyclical acorn crop.
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.
Scarlet Oak *Quercus coccinea*	70’ – 75’	40’ – 50’	706 SF	Moderate	Medium	10’ – 12’	40’	No	Best Fall color of all oaks. Leaves persist through the Winter as a juvenile tree. Prefers sandy soils. Produces an acorn crop every other year. Subject to aphid infestations. Developmental pruning is required to establish 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
Forest Green Oak *Quercus frainetto* 'Schmidt'	45' – 55'	30' – 40'	254 SF	Slow – Moderate	Medium	10' – 12'	35'	No	Upright form with a central leader. Drought tolerant. Prefers deep, well drained soils. Aphids can be a problem. Developmental pruning is required. Produces a yearly acorn crop. Holds its foliage in the Winter when young.
Bur Oak *Quercus macrocarpa*	70' – 80'	70' – 80'	314 SF	Slow – Moderate	Medium	10' – 12'	40'	No	Very large oak tolerant of most urban conditions. Will tolerate wet soils in the Spring if they eventually drain. Produces an acorn crop every year. Acorns can be up to 1-inch in diameter and 1-1/2 inch long. Needs developmental pruning.
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.
Westminster Globe oak *Quercus robur* 'Michround'	40' – 55'	40' – 50'	254 SF	Slow – Moderate	Medium	10' – 12'	35' – 40'	No	Smaller sized oak is a cultivar of English oak. Very cold tolerant. May have problems with mildew. Produces an acorn crop every other year. Needs good draining soil. Needs developmental pruning.
Red Oak *Quercus rubra*	60' – 75'	60' – 75'	314 SF	Moderate – Fast	Medium	10' – 12'	40'	No	Prefers dry, sandy or gravelly soils. Will tolerate periodically moist soils. Needs acid soils. Aphids can be a problem. Acorn crops occur every two years.
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
Boulevard Linden *Tilia americana* 'Boulevard'	50' – 60'	20' – 30'	254 SF	Moderate	Medium	8' – 10'	40'	No	Columnar canopy. Can tolerate moist soils if drained well. Large leaves. Needs developmental pruning to develop good branch structure. Can have problems with aphids.
Valley Forge American Elm *Ulmus americana* '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.
Accolade elm *Ulmus japonica X wilsoniana* 'Morton'	65' – 75'	55' – 65'	706 SF	Moderate – Fast	Shallow – Medium	10' – 12'	40' – 45'	No	Dutch elm disease resistant hybrid. Resistant to elm leaf beetle feeding. Distinct V-shaped canopy. Developmental pruning needed to establish a good branch structure. Prefers well draining soils.
Allee Chinese Elm *Ulmus parvifolia* 'Emer II'	65' – 70'	55' – 65'	706 SF	Moderate – Fast	Medium	10' – 12'	40' – 45'	No	Very lacy structure in an umbrella form. Developmental pruning needed to maintain good branch structure. Interesting bark. Yellow Fall color. Resistant to Dutch elms disease and elm leaf beetle. Prefers well drained soils. Some salt tolerance. The spreading canopy may be a problem under heavy snow or ice loads.
Burgundy Chinese elm *Ulmus parvifolia* 'Burgundy'	65' – 70'	55' – 65'	706 SF	Moderate – Fast	Medium	10' – 12'	40' – 45'	No	Very lacy structure in an umbrella form. Developmental pruning needed to maintain good branch structure. Interesting bark. Burgundy Fall color. Resistant to Dutch elms disease and elm leaf beetle. Prefers well drained soils. Some salt tolerance. The spreading canopy may be a problem under heavy snow or ice loads.
Green Vase zelkova *Zelkova serrata* 'Green Vase'	60' – 70'	40' – 50'	706 SF	Moderate – Fast	Medium	10'	40'	No	Similar to American elm vase-shaped form. Developmental pruning needed to establish good branch structure. Resistant to Dutch elms 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
Halka zelkova *Zelkova serrata* 'Halka'	45' – 55'	30' – 40'	314 SF	Moderate – Fast	Medium	10'	35'	No	Narrower branch structure. Developmental pruning needed to establish good branch structure. Resistant to Dutch elms disease and elm leaf beetle.

RECOMMENDED SWALE TREES FOR HAYDEN

a subset of the

Master Recommended Tree List For Hayden
Spring 2008

Prepared by
City of Hayden Community Development Department
March 25, 2008

Approved by the
Community Forestry Commission
April 24, 2008

Adopted by
City Council Resolution No. 2008-7
May 28, 2008

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 *Acer ginnala*	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. Needs some early developmental pruning. Swales must drain well for optimal tree performance.
American hornbeam *Carpinus caroliniana*	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 *Crataegus crus-galli* var. *inermis*	20' – 30'	20 – 35'	Slow – Medium	Medium	3'	25' – 30'	Yes	Thornless cultivar of hawthorn. Can be used in swales if they drain well, otherwise plant just above the swale bottom. Hawthorns can be subject to many diseases, especially when stressed.
English hawthorn *Crataegus laevigata*	15' – 20'	15' – 20'	Slow	Medium	3'	15'	Yes	This hawthorn has thorns. Can be used in swales if they drain well. Because of its small size, use only where space is very limited. May be subject to many diseases when stressed.
Snowbird hawthorn *Crataegus x mordenensis* 'Snowbird'	20' – 25'	20'	Slow	Medium	3'	20'	Yes	This hawthorn has thorns. Can be used if swales drain well. Double petal flowers. May be subject to diseases when stressed.
Leprechaun ash *Fraxinus pennsylvanica* '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 *Malus* '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. Swales must drain well.

Type I – Small Stature Trees

Common Name Scientific Name	Height	Spread	Growth Rate	Rooting Depth	Minimum Planter Width	Optimum Spacing	Swale Suitable	Description
Robinson crabapple *Malus* 'Robinson'	25'	25'	Moderate	Medium	5'	20' – 25'	Yes	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.
Sugartyme crabapple *Malus* ' 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. Swales must drain well.
Mugo pine *Pinus mugo*	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. NOT FOR USE AS A STREET TREE.
Red Cascade mountainash *Sorbus americana* 'Dwarfcrown'	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 *Thuja occidentalis* '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. NOT FOR USE AS A STREET TREE.
Weeping Canadian hemlock *Tsuga canadensis '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. NOT FOR USE AS A STREET TREE.
Wireless zelkova *Zelkova serrata* '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. Developmental pruning is critical to maintaining a good structure.
‘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.
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.

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
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.
‘Sun Valley’	35’ – 45’	30’ – 40’	200 SF	Moderate			35’		Smaller canopy red maple, with oval canopy and good branch structure. Cold hardy.

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
Norwegian Sunset maple *Acer truncatum X plantanoides* 'Keithsform'	35'	25'	115 SF	Slow – Moderate	Medium	6'	25'	Yes	This tree is a hybrid between Chinese maple (*Acer truncatum*) and Norway maple (*Acer plantanoides*), 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 *Acer truncatum X plantanoides* '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 *Alnus glutinosa*	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 *Betula nigra*	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.
'Heritage' ('Cully')	40' – 60'		706 SF				40'		Consistent salmon bark coloration. Cold tolerant. Heat tolerant.
Magnifica hackberry *Celtis occidentalis X laevigata* '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 (*Celtis occidentalis*) and sugarberry (*Celtis laevigata*). It can be used in swales. Salt tolerant.

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
Katsura tree *Cercidiphyllum japonicum*	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. Requires developmental pruning to establish a good form, and periodic pruning to maintain good form. Do not over-thin the canopy – it will sunburn.
White Ash *Fraxinus americana*	50' – 80'	45' – 70'		Moderate	Medium	8'		Yes	As a species, it is a better shade tree than green ash (*Fraxinus pennsylvanica*), 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.
'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.

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
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.
'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 *Gleditsia triacanthos inermis*	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.

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
'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.
'True Shade'	40'	35'	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 *Nyssa sylvatica*	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 *Pyrus calleryana*	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'	254 SF				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'	254 SF				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.

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
'Chanticleer' ('Glensform')	40'	15' – 20'	78 SF				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'	254 SF				25'		Broad oval canopy, with a flatter branch structure. Developmental pruning is still needed. Heavy blossom production. Very little fruit.
Prairie Gem pear *Pyrus ussuriensis* '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 *Zelkova serrata* '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 *Acer X freemanii*	40' – 60'			Moderate – Fast	Shallow – Medium	8' – 10'		Yes	This tree is a cross between red maple (*Acer rubrum*) and silver maple (*Acer saccharine*). 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. Developmental pruning is critical to maintaining a good 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
'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.
'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 think 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
Valley Forge American Elm *Ulmus americana* '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.