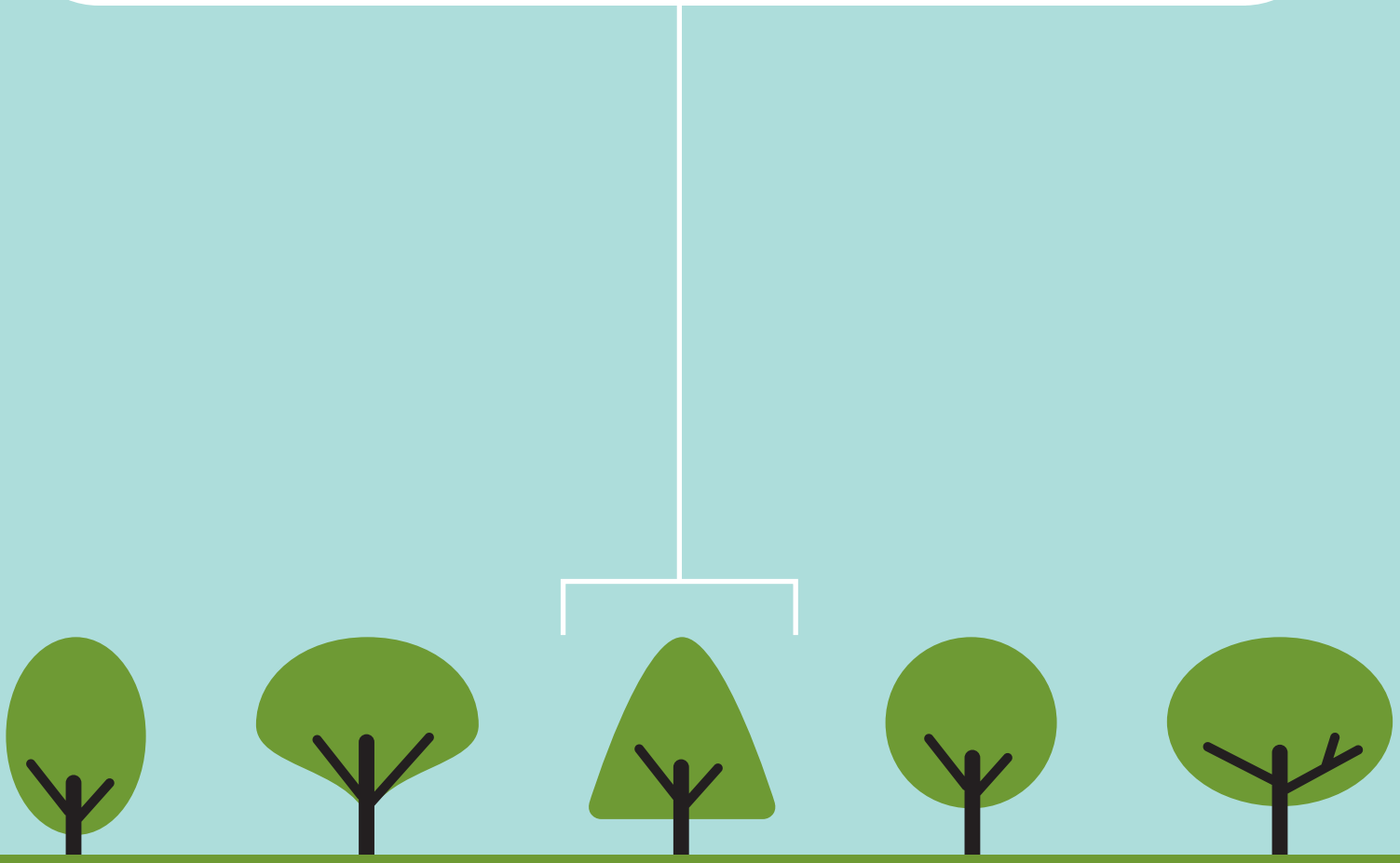
VERMONT TREE SELECTION GUIDE



PLANT **LIVE** GROW

Vermont Urban & Community Forestry Program

part of the Vermont Department of Forests, Parks & Recreation

in partnership with the University of Vermont Extension

Table of Contents

INTRODUCTION	1
SITE CONDITIONS	3
SPECIAL CONSIDERATIONS	6
TREE SELECTION WORKSHEET	8
KEY TO TREE SPECIES LIST	9
KEY TO SCIENTIFIC NAMES	10
RESOURCES FOR MORE INFORMATION	11
TREE SPECIES LIST	12

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Recognition is given to all the people who offered assistance to this project, especially Pamelia Smith, professor, and Elizabeth Clark, graduate, of Vermont Technical College who helped develop the tree list, to David Schneider, Warren Spinner, and Jeff Young for their review, and to Sensible World for the design.

Introduction

Are you getting ready to plant a tree or maybe several trees? Whether you are planning to plant on your own lawn, in a community park, along a street, or in a tree pit, careful tree selection is essential to the tree's long-term success. We have all heard time and time again to plant 'the right tree in the right place'. Our latest Tree Selection Guide for Vermont was developed just for this purpose - to help you match trees to sites to achieve lasting shade.

To use this guide, you should first consider four questions that will help you critically evaluate the planting purpose, the site, future needs and desires. Begin by reviewing the following text 'Questions to Consider when Planting Trees', than fill in the 'Tree Selection Worksheet' on page 8. The completed worksheet can then be compared to the tree list and lead you to selecting the right tree(s) for the right place(s).

We are excited that in addition to this printed version of the tree guide, we also able to offer an online searchable database that allows you the flexibility to filter the tree guide's information for easier tree selection. The searchable database can be accessed from our website at www.vtcommunitytrees.org.

RIGHT TREE - RIGHT PLACE

When we plant trees, they are often located in sites that are much less suitable than native forests for tree growth. Trees within developed communities are often exposed to human caused stresses such as air pollution, elevated temperatures, compacted soils, and confined spaces. Because healthy community trees are the foundation of healthy forests, proper selection of tree species and planting site is crucial. Careful planning should ensure that the "right tree" is established in the "right place", or the plants can outgrow a site, damage roads, foundations and sidewalks, or be susceptible to diseases and insect infestations.

Consider the following four questions before establishing trees for long-term growth and health:

- What is the purpose and use of the planting?
- What are the site conditions above and below ground?
- What type of maintenance will be required?
- What is the best tree species for long-term success?

City Hall Park, Burlington, VT

PURPOSE OF PLANTING

Tree species and varieties vary tremendously in the services and benefits that they can provide. To achieve desired outcomes, it is necessary to identify the purposes for the planting. For example, specific tree species and varieties can be chosen for one or more of the following characteristics:

Aesthetics

- Provide color, flowers or fruit
- Compliments a building or beautifies a street, park, home, institution or neighborhood

Environmental Improvement

- Reduce soil erosion and manage stormwater
- Improve air and water quality
- Offer shade in the summer and reduce winds in the winter
- Provide wildlife habitat and food
- Reduce noise and create buffers
- Increase plant diversity

Social Benefits

- Instill community pride
- Provide a quiet, peaceful oasis
- Offer outdoor recreation such as bird watching

Economic Advantages

- Increase property values
- Encourage patronage to downtown retails and tourism
- Reduce energy costs

Despite the numerous advantages that trees provide, there are also potential problems that must be considered. Trees can contribute to:

- Litter with messy fruit, branches or large leaves
- Damage to pavement and utilities
- Costs for establishment, maintenance, and removal

This planting meets several indented purposes: screening, traffic calming, gateway, fall color and shade .Leddy Park, Burlington, VT.

Site Conditions

BELOW GROUND ASSESSMENT

Roughly 80 percent of urban tree health problems originate from conditions below ground. A tree is supported both structurally and nutritionally by its roots, and any limitations placed thereon will result, directly or indirectly, in future health problems.

Soil Texture, defined by the soil's relative amounts of sand, silt and clay, influences moisture holding capacity, drainage rate, and nutrient availability. Clay soils retain moisture and nutrients but are prone to compaction.

Understanding a site's limitations and potentials is necessary for successful plantings and involves analyzing above and below ground conditions.

Sandy soils drain well and resist compaction, but can be nutrient poor and moisture deficient. Soil texture can be approximately evaluated by rubbing moistened soil between your fingers. Sandy soils feel gritty, clay soils feel smooth, and loam soils are a combination of both gritty and smooth.

Soil Structure is determined by the arrangement of soil particles (sand, silt and clay) and their associated pore spaces. Land development and use often degrades soil by increasing compaction, adding pollutants, excavating and removing topsoil, and fostering runoff and erosion. Accordingly, soil assessment and requiring best management practices for soil conservation is necessary for a successful community forestry program. The dominant soil constraint in urban areas is soil compaction, which destroys the soil structure by reducing pore spaces needed for air, water and roots. Depending upon the degree of compaction, plant health and survival can be severely reduced. Although plant species vary in tolerance, no plant is immune to the negative impacts of severely compacted soils. The addition of soil amendments, selecting more tolerant species and tillage are some options. The measurement of the soil's bulk density, the weight of the dry soil per unit volume, is an alternative useful measurement; as bulk density increases, compaction increases. Another helpful indicator of soil health is the presence or absence of earthworms. In more favorable soil conditions, earthworms will be plentiful throughout the soil upper horizon.

Drainage is the soil's ability to intercept and remove surface or groundwater and is influenced by soil texture and structure. Clay soils which are easily compacted often lack poor spaces to allow water to drain freely limiting the availability of oxygen to the roots. Sandy soils with large pore hold little water and are often too dry for many trees. Soil compaction and obstacles such as bedrock and other impermeable objects beneath the soil can also inhibit drainage. To determine your sites drainage, observe the site, especially after a rain event. Is the water draining or is it standing on the surface? A day or so after a rain event, dig into the soil, is it wet or dry. If you want a more accurate drainage rate (fast, moderate, slow), dig a hole one foot deep and fill it with water. Fast drains more than 6 inches in an hour; moderate drains 1 – 6 inches per hour, and slow less than 6 inches per hour. The addition of organic matter or choosing drought tolerant species is recommended for dry soils and installing supplemental drains or choosing species that can tolerate intermittent flooding is recommended for wet soils.

Soil pH and plant nutrients are important for determinants of a site's suitability for plant growth. The successful growth of most plants requires 10 to 14 essential nutrients in an appropriate balance. Although plants may tolerate extreme conditions, symptoms of nutrient deficiencies or toxicities affect the quality of the foliage, rate of growth, and susceptibility to pests and diseases. The availability of these elements is affected by soil pH and organic matter content. Most plants prefer soils within a pH range between 5.5-7.0. Soils in Vermont tend to be acidic, although, areas surrounded by sidewalks, foundations and roads tend to have higher alkalinity, with pH above 7.5 due to limestone-based

ingredients. Soil fertility, pH and organic matter can be evaluated using standard soil tests and is recommended before planting. Soil testing is available through the University of Vermont's Soil Testing Lab for a nominal charge per sample. Materials and instructions needed for sampling soils can be obtained at Vermont Cooperative Extension offices located throughout the state.

For more information on UVM's Soil Testing Laboratory Contact: University of Vermont Soil Testing Laboratory, Room 219 Hills Building, Burlington, VT 05405
phone 802-656-3030
web site www.uvm.edu/pss/ag_testing/

Road Salt is frequently used to deice roads and sidewalks during winter months. The use of salts, most commonly sodium chloride (NaCl), can reduce water absorption, nutrient uptake, root growth and long-term plant growth. Therefore, locations that will receive frequent salting should be noted and salt tolerant plants should be planted. Salt damage to soils is usually most severe within 25 ft. of a road. Planting tolerant species further away from or above the grade of the roadway can help reduce problems associated with de-icing salts. Pay close attention to the typical speed of the traffic moving adjacent to the planting site. Faster moving traffic increases the area of salt spray and may require you to plant further from the road. Plants in these areas near roads are also often exposed to air pollutants such as ozone that also can cause stress. If high salts are a problem at the site, extensive watering to leach the salts out of the soil can help as long as the soil is well-drained.

Rooting Space is the volume of soil available for root growth. Inadequate rooting space will limit water, nutrient uptake, and oxygen exchange necessary for successful plant growth. Common barriers to rooting space include sidewalks, roads, underground obstacles, soil compaction, and containers.

Heavily compacted soils can also be an obstacle for expanding tree roots and, although some species may be more tolerant to this, it is a good idea to include only uncompacted soils in your determination of available rooting space or usable soil volume. This is the amount of soil available for tree root growth. When determining usable soil volume, take into account that tree roots grow near the surface, primarily in the top 2 to 3 feet of soil. For this reason soil below 3 feet would not be considered in soil volume calculations.

In this guide we list the recommended soil volume for each species. These recommendations are under ideal circumstances, and in many cases you will be forced to plant in much tighter areas. Compensating for this by planting in longer, narrow strips are generally acceptable; however be certain root system can spread far enough in all directions to keep the tree windfirm when fully grown.

Where soil volumes are restricted select smaller species, those known to have limited root systems, or those that are especially heat and drought tolerant. The use of engineered soils or root cells can be incorporated to increase soil volume available for tree roots and meet load-bearing requirement for structurally sound pavement installation. Another preventative method is to guide roots away by installing root barriers made of either rigid plastic or herbicide treated polypropylene.

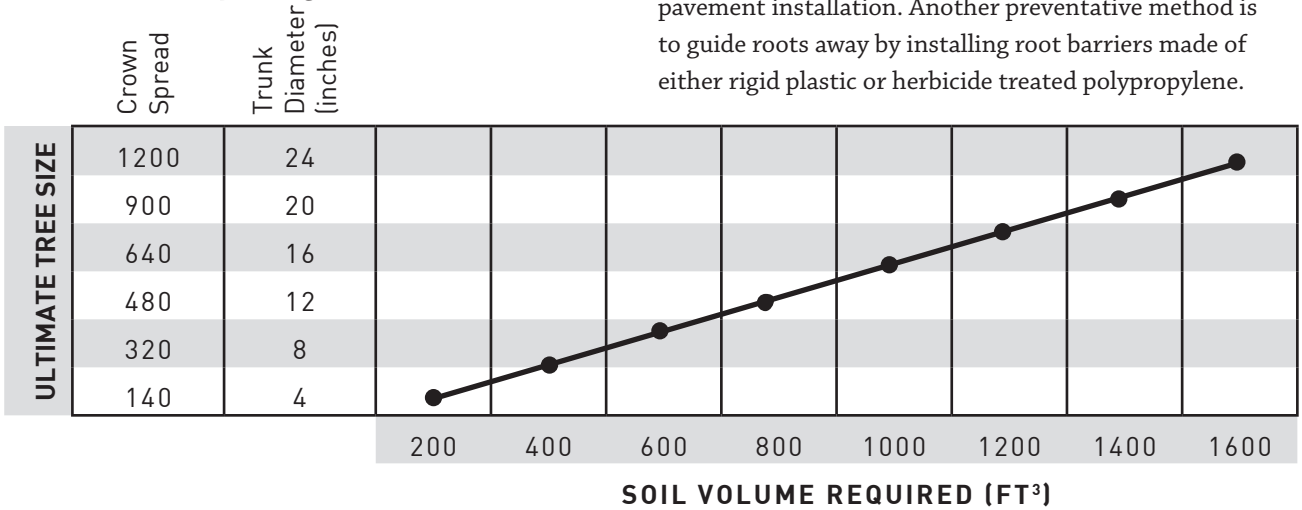


Figure 1. Soil volume & ultimate tree size relationship. James Urban, Urban Trees + Soils, Annapolis, MD

ABOVE GROUND CONDITIONS

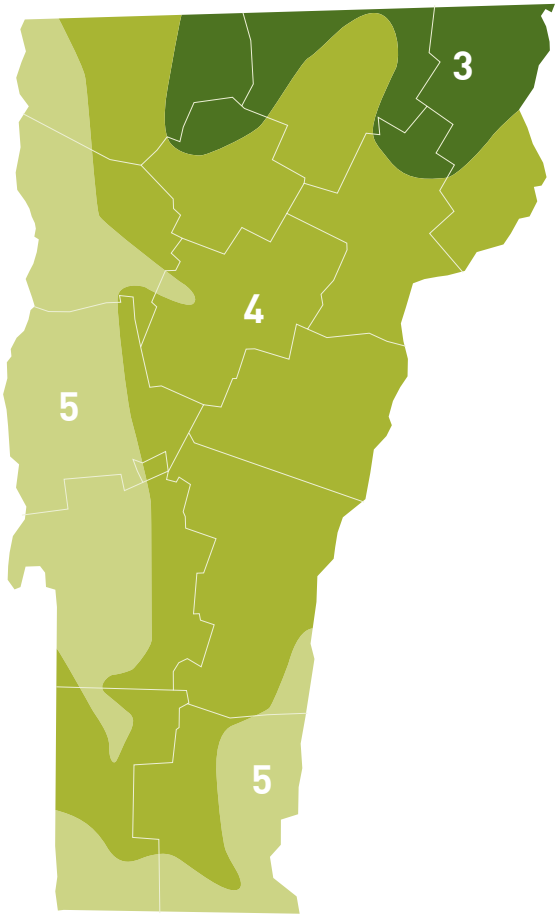
Just as trees require a healthy root system, they need a healthy stem and crown. The ability of a tree's crown to capture sunlight and manufacture food for the tree dictates the overall success of that tree, as long as the roots are able to support the crown with water and nutrients. Once you have identified all potential limitations below ground, look at the above ground conditions to make sure that nothing will prevent your trees from developing full, healthy crowns.

Exposure is important as plants differ in there adaptations to temperature and ability to withstand cold. Plant Hardiness Zones have been developed by the USDA to assist in selecting plants adapted to the climate of a particular region. Plant rating for hardiness zone is based on a plant's ability to survive over winter at a specified average minimum winter temperatures. The lower the temperature, the lower the zone number. Vermont's USDA hardiness zones ranges from 5b – 3A. Furthermore, microclimates exist within communities that are influenced by the gray infrastructures from different amounts of light (natural or artificial), wind exposure, participation patterns to temperature extremes.

Overhead Space is the available growing space above the ground to accommodate plant growth. Planting plans should recognize the size and shape of the tree throughout its life, and allow enough overhead space for the mature crown size. Major problems and costs caused by trees planted too close to buildings, power lines, streetlights, and traffic signs can be avoided by selecting species that will not require repetitive pruning, grow roots that will disrupt underground utilities or building foundations, or develop limbs that will grow into utility lines or reduce traffic safety. To avoid overhead utility conflicts select small trees with a maximum mature height of 25 ft. for locations under overhead power lines, medium trees with a maximum height of 45 ft. for locations 20 – 40 ft. away and larger trees for locations greater than 40 ft. away. Other street tree standards includes locating trees at least 5 ft. from water mains, gas boxes and inlets or manholes, 10 ft. from fire hydrants and 15 ft. from a street lights.

Hardiness Zone Map

Zone 3 -30º F to -40º F | **Zone 4** -20º F to -30º F
Zone 5 -10º F to -20º F



Legal Concerns Always check on ownership or easement locations as well as historical or landmark status that may prohibit you from planting in a certain area. Check local ordinances that may prohibit the planting of certain species.

Special Considerations

TREE MAINTENANCE

Maintenance needs and arboriculture practices for urban forests depend on their function, site condition, species and age compositions. Some trees will require intensive maintenance and considering the available manpower and maintenance needs will aid in effective tree species selection. The advantages and disadvantages of tree species should be weighed against each other in the selection process. Regardless of species selected, all plantings require maintenance during the early stages of establishment, most importantly watering. Investing in tree care and maintenance, especially in the establishment years will result in healthy long-lived trees.

Properly pruned trees are not only more aesthetically pleasing, but stronger. Pruning young trees can significantly reduce the likelihood of limb or structural trunk failure as the tree matures. This means a longer life span for the tree and a better return on your investment. Before you prune, always have an objective in mind. Consider the following reason to prune your tree:

Safety Remove branches that could fall and cause injury or interfere with utility lines, roads.

Health Remove disease or insect infected wood, improve structure, reduce likelihood of damage during storms.

Fruit Production Increase light and air circulation.

Appearance Control plant size and form, enhance views.

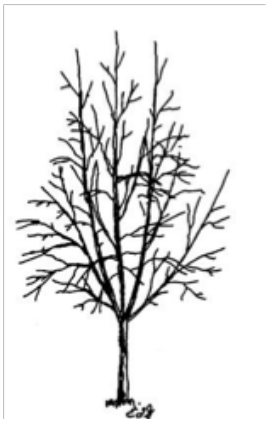
Whether you are pruning to establish good form and branch structure on a young tree or pruning to maintain a healthy mature tree, pruning is a multi-year endeavor. Here are some steps to guide you as your tree grows:

Pruning three years after planting

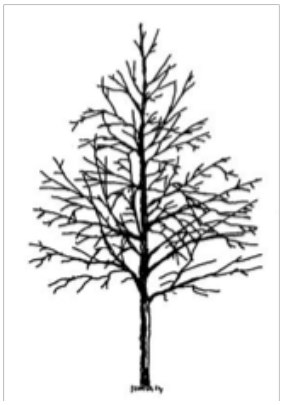
- Select a central leader (single trunk) and remove or shorten co-dominant leaders or competing leaders.
- Promote strong branch unions with the main stem structure. Look for "U" shaped unions and the branch bark ridge. Remove or reduce branches with weak or a "V" shaped union.

Pruning as the tree grows

- Thin the crown. Remove rubbing branches and continue to promote one central leader. Reduce or remove competing leaders.
- Raise crown to provide clearance for sidewalks, vehicles and buildings. Check local ordinances for minimum branch height mandates (e.g. 8' over sidewalks).
- Reduce the height and spread of the crown as necessary. Always bring the branch back to a lateral branch at least 1/3 the size of the stem removed.



Before



After

TREE SPECIES SELECTION

Based on the purpose, site conditions and maintenance requirements develop a set of criteria that will be used to select the most suitable plants. Certain criteria should hold more weight than others. Choose plants based on its' ability to withstand environment conditions, prevention of infrastructure conflicts and for the long-term sustainability of the community forest. Rarely will you find the perfect tree that will fit an entire list of selected criteria, yet answering these important questions can avoid many unforeseen pitfalls. The green infrastructure is the only infrastructure that will increase in value over time if the "right tree" is put in the "right place".

SPECIES DIVERSITY

Maintaining a high level of species diversity in our urban ecosystems is important. Besides providing the aesthetic appeal of a variety of shapes and sizes along streets or in town greens and parks, increasing diversity can also help safeguard against species-specific insect or disease outbreaks. Simply selecting the right tree for every site should in itself create diversity, yet we often rely far too heavily on one seemingly ideal species, as was the case with the American elm.

It is important to recognize that species diversity is not only a function of how many species are present, but also depends on the proportion of each species relative to others and their overall spatial distribution. In other words, planting a single tree of one species for every hundred trees of another species scarcely improves your diversity. Similarly, diversity is only improved significantly if all species are growing together, intermingled over an entire area as opposed to having each species in a separate area. Maintaining a predetermined level of diversity, such as specifying that no one species should comprise more than 5 percent of the community tree population is a good way to help prevent some of these situations from occurring.

PEST AWARENESS

Two potential insect pests are threatening Vermont's trees and for this very reason increasing species diversity is important. The emerald ash borer has already destroyed millions of ash trees. Ash trees are a popular urban tree for its tolerance to tough growing conditions and have already been used in large quantities in many communities. Caution should be used when selecting ash trees, especially if large numbers of the tree already exists.

Asian long-horned beetle is another pest of great concern. This beetle has a larger tree appetite range and feasts on a variety of trees including maple, elm, horsechestnut, ash, birch, poplar, willow and many more. If any trees in the landscape are showing signs of infestation, take action by learning more and calling for assistance.

More information on Vermont invasive tree pests, visit our website at www.vtcommunityforestry.org, or www.emeraldashborer.info/ or www.uvm.edu/albeetle/

If you suspect an non-detected invasive pest occurs in your area or for more information, contact the Forest Biology Lab at 802-241-3606.

POTENTIALLY INVASIVE TREES

We have been planting non-native trees in the landscape for hundreds of years and have enjoyed the diversity and beauty they bring. However, we are now more aware of a few that have aggressive growth habits that result in their invasion into wild, unmanaged areas such as wetlands and woodlands. Once established, these invasive exotic trees can significantly disrupt habitats. Thus, we all need to be aware of these few species and avoid or use caution when planting.

For this publication, we have removed any species that appears on the 'Invasive Species Watch List' produced by the Vermont Invasive Plant Council. These non-native plants have the potential to become invasive in Vermont based on their behavior in other northeastern states. Tree species of interest on this list include: amur maple (Acer ginnala), Norway maple, (Acer platanoides), and black locust (Robinia pseudoacacia).

There are a few other non-native tree species commonly used in the landscape that have begun to cause some concern of their potential to become invasive. Currently, these species are not on the Vermont quarantine or watch list, but we should keep a close eye on them and we advise not planting them near natural settings where they could invade. These species include: Catalpa (Catalpa speciosa), Goldenrain Tree (Koelreuteria paniculata), amur corktree (Phellodendron amurense), and japanese tree lilac (Syringa reticulate).

For more information on invasive plants visit the Vermont Invasive Plant Council's website at www.vermontinvasiveplants.org

Tree Selection Worksheet

Complete the following worksheet to help identify appropriate trees for the site.

Tree Site & Space

Site location/Description: _____

Desired mature height: _____ Desired mature spread: _____

Desired Tree Characteristics

Form

☐ Spreading ☐ Columnar ☐ Round

☐ Upright Oval ☐ Pyramidal ☐ Vase

Hardiness Zone

☐ 5a (-15° to -20°) ☐ 4b (-20° to -25°) ☐ 4a (-25° to -30°) ☐ 3b (-30° to -35°)

Does Well In

☐ Drought ☐ Poor Drainage ☐ Alkaline Soil ☐ Salt ☐ Shade ☐ Air Pollution

Features of Interest

☐ Flowers ☐ Fruits ☐ Wildlife ☐ Fall Foliage ☐ Winter Interest

☐ Native to VT ☐ Evergreen ☐ Fits Under Power Lines

Rooting Space

☐ **Small**
Planting sites with limited soil volume, such as narrow greenbelts and pits less than 6 feet wide. Depths should be 3 feet. Planting should not occur in less than 4 by 4 feet spaces.

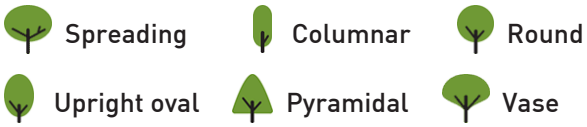
☐ **Medium**
Planting sites with an intermediate amount of soil volume. Green belts greater than 6 feet wide, but still limited in the amount of below ground growing space.

☐ **Large**
Planting that are large soil volume such as parks and open space.

Note: On the tree species list, the smallest planting rooting space is listed.

Key to Tree Species List

Form. Indicates the natural shape of the tree.



Tolerances. Indicates the species ability to withstand drought, poor drainage, alkaline soil, salt, air pollution and shade.

Mature. The total height of a typical species at maturity.

Crown Spread. The total width of a typical species crown at maturity.

Rooting Space. Lists the recommended soil volume for the species/cultivar assuming a square area that is 3 feet deep (e.g. 25' corresponds to a volume of 25'x25'x3'). Rooting space is calculated by taking half of a trees mature crown spread.

Planting Area

Small Indicates planting sites with limited soil volume, such as narrow greenbelts and pits less than 6 feet wide. Depths should be 3 feet. Planting should not occur in less than 4 by 4 feet spaces.

Medium Indicates planting sites with an intermediate amount of soil volume. Green belts greater than 6 feet wide, but still limited in the amount of below ground growing space.

Large Indicates planting that are large soil volume such as parks and open space.

Hardiness. The lowest zone rating for each species.

2a -45° to -50°
2b -40° to -45°
3a -35° to -40°
3b -30° to -35°
4a -25° to -30°
4b -20° to -25°
5a -15° to -20°

Limitations. Problems you might encounter with a specific tree planted in Vermont.

1. Weak wood and/or branch structure making it susceptible to breakage during ice or snow accumulation and strong winds.
2. Fruit and/or leaves can be a litter problem.
3. Sensitive to insect/disease pests.
4. Limited availability, making it different to locate at local nurseries.
5. Prone to excessive sucker growth from roots or lower stem and may require regular pruning.
6. Indicates tree should be planted only during the spring.

Features. Indicates which species and cultivars have the following features.

Flower Indicates which species have notable flowers.

Fruit Indicates which species have notable fruits.

Fall Foliage Indicates which species have notable fall foliage.

Winter Interest Indicates which species have notable winter interest.

Native to Vermont Indicates which species that are inherent and original to New England.

Under Power Lines Indicates which species can be planted underneath power lines (<25 ft. in height).

Invasive Alert Indicates which species should be kept under cultivation & not planted in a wild environment.

Evergreen Indicates which species have evergreen leaves or needles.

Wildlife Refers to whether a tree's fruit has wildlife value.

Key to Scientific Names

Common Name	Scientific Name
Amur Corktree	*Phellodendron*
Apple	*Malus*
Ash	*Fraxinus*
Baldcypress	*Taxodium*
Beech	*Fagus*
Birch	*Betula*
Black Gum, Tupelo	*Nyssa*
Buckeye, horeschestnut	*Aesculus*
Cedar	*Thuja*
Cherry	*Prunus*
Dawn Redwood	*Metasequoia*
Dogwood	*Cornus*
Elm	*Ulmus*
Filbert, Hazel	*Corylus*
Fir	*Abies*
Fringetree	*Chionanthus*
Hackberry	*Celtis*
Hawthorn	*Crataegus*
Hemlock	*Tsuga*
Hickory	*Carya*
Honeylocust	*Gledistsia*
Hophornbeam	*Ostrya*
Katsura	*Cercidiphyllum*
Kentucky Coffeetree	*Gymnocladus*
Lilac	*Syringa*
Linden	*Tilia*
Maple	*Acer*
Musclewood, Ironwood	*Carpinus*
Oak	*Quercus*
Pear	*Pyrus*
Pine	*Pinus*
Redbud	*Cercis*
Shadbush, Serviceberry	*Amelanchier*
Silverbell	*Halesia*
Spruce	*Picea*
Sycamore, Planetree	*Plantanus*
Walnut	*Juglans*
Witchhazel	*Hamamellis*
Yellowwood	*Cladrastis*

BUYING A TREE

Purchasing a tree is an investment. Like buying a car, you'll want to inspect the trees at the nursery to ensure you are purchasing the highest quality. The quality of the planting stock you purchase is one of the most important factors when it comes to survival and long-term health of new trees. High quality trees will establish themselves more quickly than less healthy trees and require less pruning and maintenance in subsequent years.

Checklist for purchasing a tree

- Purchase stock from a reputable nursery. For a list of nurseries affiliated with GreenWorks - Vermont Nursery and Landscape Association go to greenworksvermont.org/members/
- Select the appropriate stock for your planting needs: Bare root, container or balled and Burlapped (B&B)
- Inspect the roots.
- Inspect the trunk for signs of damage or weakness in the bark.
- Inspect the crown for a leader.

Resources for More Information

PUBLICATIONS

Bassuk, Nina. 2009. Recommended Urban Trees. Urban Horticultural Institute, Cornell University. Ithaca, NY. ***www.hort.cornell.edu/uhi/outreach/recurbtree/index.html.***

Dirr, Michael A., 2009. Manual of Woody Landscape Plants—Their Identification Ornamental Characteristics, Culture, Propagation and Uses. Stipes Publishing Company. Champaign, IL.

Dirr, Michael A. Dirr's Hardy Trees and Shrubs: An Illustrated Encyclopedia. Timber Press. Portland.

Pellet, Norman E. and Mark Starrett. 2002. Landscape Plants for Vermont. The University of Vermont Extension. Burlington, VT. *www.uvm.edu/mastergardener/LPV2002/LPV.htm*

Watson, Gary W. and E. B. Himelick. 1997. Principles and Practice of Planting Trees and Shrubs. International Society of Arboriculture. Savoy, IL.

ONLINE

- Vermont Urban and Community Forestry Program www.vtcommunityforestry.org
- Green Works: Vermont Nursery and Landscape Association www.greenworksvt.org
- Urban Horticulture Institute, Cornell University www.hort.cornell.edu/uhi/index.html
- USDA Forest Service, Urban and Community Forestry Program www.fs.fed.us/ucf/

SEARCHABLE TREE DATABASES

- Vermont Tree Selection Guide www.vtcommunitytrees.org
- Northern Trees http://orb.at.ufl.edu/TREES/index.html
- UConn Plant Database www.hort.uconn.edu/Plants/

TREE CARE INFORMATION

- International Society of Arboriculture www.treesaregood.com

SEARCHABLE URBAN FORESTRY & ARBORICULTURE RESOURCES

- UFind: Urban Forestry Index www.urbanforestryindex.net/
- Urban Forestry South www.urbanforestrysouth.org/

TREE SPECIES LIST

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
Abies concolor	—	White Fir		3a	50	25	15	L							6	
Specimen tree. Most tolerant spruce and good replacement for disease sensitive Colorado blue spruce.																
Abies fraseri	—	Fraser Fir		4a	40	25	15	L							6	
Specimen or accent tree. Avoid hot and dry conditions, and high pH.																
Acer campestre	—	Hedge Maple		5	30	30	15	S								
Possibly a zone 4. Extremely adaptable and tolerates severe pruning. Prune early for structure and may need to be limbed up for clearance. Slow grower. Primary host of Asian Longhorned Beetle.																
Acer x freemanii	'Armstrong'	Freeman Maple		4a	60	20	20	M							1,6	
Fastigiate. Cross between a red and silver maple. Fast grower, early structural pruning needed. Primary host of Asian Longhorned Beetle.																
A. x freemanii	Autumn Blaze® 'Jeffersred'	Freeman Maple		4a	50	40	20	M							1,6	
Cross between a red and silver maple. Fast grower, early structural pruning needed, concern over branch breakage as it ages. Excellent orange to red fall color. Primary host of Asian Longhorned Beetle.																
A. x freemanii	'Sienna'	Freeman Maple		4a	40	40	20	M							1,6	
Cross between a red and silver maple. Strong central leader for species, early structural pruning needed. Deep orange to red fall color. Primary host of Asian Longhorned Beetle.																
A. x freemanii	'Red Pointe'	Freeman Maple		4a	45	30	20	L							1,6	
Cross between a red (75%) and silver (25%) maple. Early structural pruning needed. Excellent fall red color and heat tolerance. Primary host of Asian Longhorned Beetle.																
Acer griseum	'Ginzam' Gingerbread™	Paperbark Maple		5	25	25	13	S							4,6	
Specimen tree. Potentially zone 4 in protected sites. Trifoliate leaves and beautiful peeling bark. Finer bark and faster growth than species. Primary host of Asian Longhorned Beetle.																
Acer miyabei	'Morton' State Street™	Miyabe Maple		4	40	40	20	S							4	
Specimen tree. More cold hardy alternative to A. Campestre. Corky bark. Primary host of Asian Longhorned Beetle.																
Acer rubrum	—	Red Maple		3	75	40	20	M							1,6	
Fast grower and easy to transplant Chlorosis can occur in alkaline soils. Somewhat weakened wooded, prune for structure. Thin bark can easily be damages. Fall color and intensity varies. Primary host of Asian Longhorned Beetle.																
A. rubrum	'Autumn Flame'	Red Maple		3b	50	30	20	M							1,6	
Excellent and early red fall color that last longer than species. Notable for its young round habit. Primary host of Asian Longhorned Beetle.																
A. rubrum	'Bowhall'	Red Maple		4	50	15	20	M							1,6	
Upright form with broad columnar head. Yellow to red fall color. Primary host of Asian Longhorned Beetle.																
A. rubrum	Northwood®	Red Maple		3b	50	35	20	M							1,6	
Selected for tolerance to harsh winter conditions. Orange to red fall color. Branches ascent upward. Primary host of Asian Longhorned Beetle.																

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
A. rubrum	October Glory®	**Red Maple**		5a	50	35	20	M							1,6	
Dependable orange to red fall color which starts later than others. Dark green summer leaves. Limitations due to cold hardiness. Primary host of Asian Longhorned Beetle.																
A. rubrum	'Red Sunset'	**Red Maple**		4b	50	40	20	M							1,6	
Dependable orange to red fall color. Colors earlier than October Glory and more cold tolerant. Primary host of Asian Longhorned Beetle.																
Acer saccharinum	—	**Silver Maple**		3	70	50	35	L							1,5	
Fast grower, with fairly weak wood. Shallow rooting system can cause sidewalk damage and can clog drain pipes. Useful for wet areas . Transplants well.																
Acer saccharum	—	**Sugar Maple**		3	75	50	25	M								
Does not perform well in tight, compacted situations. Primary host of Asian Longhorned Beetle.																
A. saccharum	'Bonfire'	**Sugar Maple**		3	65	50	25	M								
Does not perform well in tight, compacted situations. Orange to red fall color. Primary host of Asian Longhorned Beetle.																
A. saccharum	Fall Fiesta®	**Sugar Maple**		3	75	50	25	M								
Does not perform well in tight, compacted situations. Fast grower. Yellow, orange and red fall color. Primary host of Asian Longhorned Beetle.																
A. saccharum	Green Mountain®	**Sugar Maple**		3	70	45	25	M								
Dark green summer foliage. Variable. Performs better than species in dry, tight conditions. Primary host of Asian Longhorned Beetle.																
A. saccharum	'Legacy'	**Sugar Maple**		3	50	35	25	M								
Red to orange fall color, dark, lustrous summer leaves. Performs better than species in dry, tight conditions. Primary host of Asian Longhorned Beetle.																
Acer triflorum	—	**Three-flower Maple**		5	30	30	15	M							4	
Specimen tree. Primary host of Asian Longhorned Beetle.																
Acer truncatum	—	**Purpleblow Maple**		4	25	30	15	S							4	
Adaptable and hardy. Future selection, 'Main Street.' Primary host of Asian Longhorned Beetle.																
Aesculus x carnea	'Briotii'	**Ruby Red Horsechestnut** (RED)		5a	40	40	20	M							2,6	
Specimen tree. Sometimes listed as zone 4. Primary host of Asian Longhorned Beetle.																
Aesculus glabra	—	**Ohio Buckeye** (YELLOW)		3	60	40	20	L							2,3 4,6	
Reserve for large areas. Can be messy with little ornamental value. Primary host of Asian Longhorned Beetle.																
Aesculus hippocastanum	'Baumanii'	**Horsechestnut** (WHITE)		4a	75	70	35	L							1,3,6	
Double white flowers and fruitless. Prune in spring, avoid extremely dry condition. Leaf scorch, leaf blotch and powdery mildew can be a problem. Primary host of Asian Longhorned Beetle.																

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Amelanchier arborea	'JFS-Arb' Spring Flurry®	**Downy Serviceberry** (WHITE)		4	35	20	10	S								
Not reliable under high stress conditions. Good tree form. Orange fall color.																
Amelanchier laevis	'Snowcloud', 'Majestic'	**Allegheny Serviceberry** (WHITE)		4	25	15	10	S								
Not reliable under high stress conditions. Fastigiate form. Scarlet fall color. Vigorous grower.																
Amelanchier canadensis	'Trazam' Traditional®	**Shadblow Serviceberry** (WHITE)		3	30	20	10	S							5	
Not reliable under high stress conditions. Strong central leader and good branch habit. Orange fall color. Heavy fruiting.																
A. canadensis	'Sprizam' Spring Glory®	**Shadblow Serviceberry** (WHITE)		3	12	10	10	S							5	
Not reliable under high stress. Small compact form. Orange to yellow fall color.																
Amelanchier x grandiflora	'Autumn Brilliance'	**Apple Serviceberry** (WHITE)		4a	25	25	13	S							3	
Not reliable under high stress conditions. Red fall color.																
A. grandiflora	'Autumn Sunset'	**Apple Serviceberry** (WHITE)		4a	30	25	13	S							3	
Not reliable under high stress conditions. Rich orange fall color. Strong central leader. Perhaps better drought tolerance.																
A. grandiflora	'Ballerina'	**Apple Serviceberry** (WHITE)		4a	20	15	13	S							3	
Not reliable under high stress conditions. Shrub or small tree. Red fall color.																
A. grandiflora	'Princess Diana'	**Apple Serviceberry** (WHITE)		4a	25	15	13	S							3	
Not reliable under high stress conditions. Red fall color. Can be multi or single stemmed.																
Betula nigra	'Moonshine' Dura Heat®	**River Birch**		4a	45	35	18	S							1,6	
Exfoliating bark. Develops chlorosis in high pH. Leaf spot in wet years. Most adaptable birch.																
B. nigra	'Little King' Fow Valley®	**River Birch**		4a	15	15	10	S							1,6	
Exfoliating bark. Develops chlorosis in high pH. Leaf spot in wet years. Most adaptable birch. Small form.																
B. nigra	'Cully' Heritage®	**River Birch**		4a	50	35	18	S							1,6	
Exfoliating bark. Develops chlorosis in high pH. Leaf spot in wet years. Most adaptable birch.																
B. nigra	'Dickinson' Northern Tribute™	**River Birch**		3	40	35	18	S							1,6	
Exfoliating bark. Develops chlorosis in high pH. Leaf spot in wet years. Most adaptable birch.																
Carpinus betulus	'Fastigiata'	**European Hornbeam**		5a	35	20	10	S							4,6	
Cultivar name misleading as plant develops oval shape. Tolerates heavy pruning. Urban tolerant. Good for screens, hedges, groupings, planter boxes, around buildings.																
Carpinus caroliniana	—	**American Hornbeam/ Musclewood**		3a	30	25	13	S							4,6	
Slow to recover from transplanting. Tolerates pruning for hedge or screen.																

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C. caroliniana	'JN Globe' Ball O' Fire™	**American Hornbeam/ Musclewood**		3a	30	25	10	S							4,6	
Slow to recover from transplanting. Red fall color. Tolerates pruning for hedge or screen.																
C. caroliniana	'JN Upright' Firespire™	**American Hornbeam/ Musclewood**		3	30	15	10	S							4,6	
Slow to recover from transplanting. Orange to red fall color. Tolerates pruning for hedge or screen.																
C. caroliniana	'CCSQU' Palisade™	**American Hornbeam/ Musclewood**		3a	30	15	10	S							4,6	
Slow to recover from transplanting. Yellow fall color. Tolerates pruning for hedge or screen.																
Carya glabra	—	**Pignut Hickory**		4	65	40	20	L							~~2,4~~6	
Golden yellow fall color. Difficult to transplant.																
Carya ovata	—	**Shagbark Hickory**		4	80	35	28	L							~~2,4~~6	
Yellow to brown fall color. Difficult to transplant. Beautiful 'shaggy' bark.																
Catalpa speciosa	—	**Northern Catalpa [WHITE]**		4a	60	40	20	L							2,4	
Coarse large leaves. Tough tree for large landscapes.																
Celtis laevigata	'All Seasons'	**Sugar Hackberry**		5a	80	50	25	M							1,6	
Smooth gray bark like beech. Yellow fall color. Good tolerance to tough conditions. Does respond well to injury.																
Celtis occidentalis	—	**Common Hackberry**		3a	60	50	25	M							1,6	
Good tolerance to tough conditions. Affected by several pests that do not kill the tree, but can make it unattractive.																
C. occidentalis	'Prairie Pride'	**Common Hackberry**		3	55	50	25	M							1,6	
Good tolerance to tough conditions. Affected by several pests that do not kill the tree, but can make it unattractive. Lighter fruit crop and does not develop witches broom.																
C. occidentalis x C. laevigata	'Magnifica'	**Magnifica Sugar Hackberry**		5	50	40	25	M							1,6	
Cross between Sugar and Common Hackberry. Less hardy, but withstands drought, salt and compacted soil better.																
Cercidphyllum japonicum	—	**Katsuratree**		4b	60	35	18	M							1,6	
Difficult to transplant, water is needed during establishment.																
C. japonicum	'Rotfuchs' 'Red Fox'	**Katsuratree**		4b	60	35	18	M							1,6	
Difficult to transplant, water is needed during establishment. Red foliage and slower grower than species.																
Cercis canadensis	—	**Eastern Redbud** (PINK)		4	25	25	13	S							1	
Avoid wet soils. Suffers when stressed.																
C. canadensis	'Alba'	**Eastern Redbud** (WHITE)		4b	25	25	13	S							1	
Avoid wet soils. Suffers when stressed.																
C. canadensis	'Forest Pansy'	**Eastern Redbud** (ROSE-PURPLE)		5b	25	25	13	S							1	
Avoid wet soils. Suffers when stressed. Purple foliage.																

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C. canadensis	'Royal White'	**Eastern Redbud** (WHITE)		4	25	25	13	S							1	
Avoid wet soils. Suffers when stressed. May be more cold hardy than 'Alba' the other white flowered form.																
C. canadensis	'Northern Strain'	**Eastern Redbud** (ROSE)		4	25	25	13	S							1	
Avoid wet soils. Suffers when stressed. More cold hardy species.																
Chionanthus virginicus	—	**White Fringtree**		4	25	25	13	S								
Specimen small tree. Very adaptable.																
Cladrastis kentukea (lutea)	—	**Yellowwood** (WHITE)		4a	50	55	25	L							1,6	
Structural pruning is necessary for poor branch attachment. Prune in summer to avoid bleeding.																
Cornus mas	'Golden Glory'	**Corneliancherry Dogwood** (YELLOW)		4b	20	20	10	S							2,5	
Can be pruned to raise crown for more tree like form and expose exfoliating bark. Relatively adaptable, but may slow to reestablish. Heavy bloomer, but may be less cold hardy.																
C. mas	'Redstone'	**Corneliancherry Dogwood** (YELLOW)		4b	25	20	10	S							2,5	
Can pruned to raise crown for more tree like form and expose exfoliating bark. Relatively adaptable, but may slow to reestablish. Heavy fruit set.																
Corylus colurna	—	**Turkish Fildert**		4	50	30	15	S							2	
Tolerant of tough conditions, but will require watering for establishment.																
Crataegus crus-galli var. inermis	'Cruzam' Crusader™	**Thornless Cockspur Hawthorn** (WHITE)		4a	25	25	13	S							3,6	
Thornless cultivar.																
Crataegus laevigata	'Crimson Cloud'	**English Hawthorn** (RED)		4	25	20	10	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns.																
C. laevigata	'Paulii'	**English Hawthorn** (RED)		4	25	20	10	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns. Double flowers.																
Crateagus phaenopyrum	'Fastigiata'	**Washington Hawthorn** (WHITE)		4a	30	25	13	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns. Columnar with flowers and fruit smaller than species.																
C. phaenopyrum	'Princeton Sentry'	**Washington Hawthorn** (WHITE)		4a	30	20	10	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Almost thornless, can be grown to single trunk for street tree.																
C. phaenopyrum	Presidential™	**Washington Hawthorn** (WHITE)		4a	15	15	10	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns. Tree form.																
C. phaenopyrum	Washington Lustre®	**Washington Hawthorn** (WHITE)		4a	25	25	13	S							3,6	

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances						Limitations	Features
									Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade		
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Good vigor and fewer thorns.																
Crataegus viridis	'Winter King'	**Winter King Hawthorn** (WHITE)		4a	25	25	13	S							3,6	
Adaptable and tolerant of many conditions. Pruning lower limbs may be necessary if planted as street tree. Thorns. Good fall color and showy winter/fall fruit.																
Fagus sylvatica	'Riversii'	**European Beech**		4a	50	40	20	L							6	
More tolerant of urban soil conditions than American Beech - avoid wet soils. Many cultivars exist, this one has deep purple leaves.																
Fraxinus americana	—	**White Ash**		3	70	60	30	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Purple fall color.																
F. americana	'Autumn Purple®'	**White Ash**		4	45	60	30	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Reddish to purple fall color. Seedless																
F. americana	'Empire'	**White Ash**		3	50	25	13	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Strong central leader. Red to purple fall color.																
F. americana	'Greenspire'	**White Ash**		3	40	30	15	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Upright form. Orange fall color.																
F. americana	Northern Blaze® (Jefnor)	**White Ash**		3	60	30	15	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Seedless. Purple fall color.																
Fraxinus pennsylvanica	—	**Green Ash**		2	60	30	15	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure.																
F. pennsylvanica	'Bergeson'	**Green Ash**		3	50	35	18	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Seedless. Yellow in fall. One of the most cold hardy.																
F. pennsylvanica	'Cimmzam' Cimmaron®	**Green Ash**		4	60	30	15	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure, but noted for a central leader and good branching. Red to yellow fall color.																
F. pennsylvanica	'Marshall's Seedless'	**Green Ash**		3a	50	40	20	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Seedless. Yellow fall color.																
F. pennsylvanica	'Patmore'	**Green Ash**		3a	60	35	18	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. Seedless.																
F. pennsylvanica	'Summit'	**Green Ash**		3b	45	25	13	M							1,3	
Host of Emerald Ash Borer, plant with caution. Adaptable and tolerant. Prune for structure. One of the most cold hardy. Uniform crown.																
Ginkgo biloba	'Autumn Gold'	**Ginkgo**		4	50	30	15	S							6	

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Adaptable and tolerant. Golden yellow fall color. Fruitless. Prune in spring. Symmetrical, broad and rounded crown.																
G. biloba	'Magyar'	**Ginkgo**		4	50	25	13	S							6	
Adaptable and tolerant. Yellow fall color. Fruitless. Prune in spring. Upright, ascending branching.																
G. biloba	'Princeton Sentry'	**Ginkgo**		4	60	25	13	S							6	
Adaptable and tolerant. Yellow fall color. Fruitless. Prune in spring. Upright habit that tapers to a point.																
Gleditsia triacanthos var. inermis	'Halka'	**Honey Locust**		4a	40	40	20	M							3,6	
Adaptable and tolerant. Prune in fall. Fruitless. Round head with less dropping branches.																
G. triacanthos var. inermis	'Imperial'	**Honey Locust**		4a	30	35	18	M							3,6	
Adaptable and tolerant. Prune in fall. Seedless. Essentially fruitless. Most compact and formal form.																
G. triacanthos var. inermis	'Moraine'	**Honey Locust**		4a	40	50	25	M							3,6	
Adaptable and tolerant. Prune in the fall. Fruitless. Golden yellow fall color. Wide spreading crown.																
G. triacanthos var. inermis	'Shademaster'	**Honey Locust**		4a	45	35	18	M							3,6	
Adaptable and tolerant. Prune in the fall. Essentially fruitless. Upright, symmetrical habit.																
G. triacanthos var. inermis	'Skyline'	**Honey Locust**		4a	45	35	18	M							3,6	
Adaptable and tolerant. Prune in the fall. Essentially fruitless. Ascending branches. Bright golden yellow fall color. One of the most cold hardy.																
G. triacanthos var. inermis	'Sunburst'	**Honey Locust**		5	35	30	15	M							3,6	
Adaptable and tolerant. Prune in the fall. Fruitless. Golden leaves on new growth changing to bright green. More susceptible to canker disease.																
Gymnocladus dioicus	—	**Kentucky Coffeetree**		3b	70	50	25	L							2	
Adaptable and tolerant to urban conditions. Good for large areas.																
Halesia carolina	—	**Carolina Silverbell** (WHITE)		4	35	25	13	S							6	
Difficult to transplant. Chloratic in high pH soils.																
Hamamelis virginana	—	**Whitchhazel** (YELLOW)		3	25	20	10	S								
Prefers a moist soil. Moderate tolerance. Attractive yellow fall color. Flowers in the fall.																
Hydrangea paniculata	—	**Panicle Hydrangea**		3	20	20	10	S								
Very adaptable, hardy, urban tolerant plant. Over 70 cultivars.																
Juglans nigra	—	**Black Walnut**		4	75	60	30	L							2,6	
Tolerates drier soils, but prefers moist soils. Open crown. Difficult to transplant.																
Juniperus virginiana	—	**Eastern Red Cedar**		4	50	20	10	S							6	
Tolerant of tough conditions. Good as specimen, in groupings, hedges or screens.																

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Koelreuteria paniculata	—	Panicled Golden-raintree (YELLOW)		5	40	40	20	S							6	
Tolerant and adaptable. Prune in the winter. Somewhat weak wooded. Yellow flowers in summer.																
Larix decidua	—	European/ Common Larch		2	75	30	15	L							6	
Needs moisture, well-drained and sunny conditions. Deciduous conifer with yellow fall color. More tolerant of cultivation than native Eastern Larch.																
Liquidambar styraciflua	'Moraine'	American Sweetgum		5	60	35	18	M							2,6	
Slow to reestablish. Not tolerant of urban conditions. Prune during winter. Most vigorous on wet site. Red fall color.																
Liriodendron tulipfera	—	Tuliptree (GREEN-YELLOW)		5	90	50	25	L							6	
Reserve for large areas. Prune in winter. Develops scorch in poor, tight growing conditions. Yellow fall color.																
Maackia amurensis	—	Amur Maackia (WHITE)		4a	25	25	13	S								
Adaptable. Summer white flowers. Attractive bronze colored bark.																
Magnolia acuminata	—	Cucumbertree Magnolia (GREEN-YELLOW)		4a	80	60	30	L							6	
Slow to reestablish and not tolerant of tough conditions. Reserve for large areas. Prune after flowering. Thin barked, easily damaged.																
Magnolia stellata	—	Star Magnolia (WHITE)		4a	25	15	8	S							1,6	
Avoid extreme sites and areas that heat up early in the spring to protect flower buds.																
M. stellata	'Centennial'	Star Magnolia (WHITE)		4a	25	15	8	S							1,6	
Avoid extreme sites and areas that heat up early in the spring to protect flower buds. Slight pink on the flower, good upright form.																
M. stellata	'Royal Star'	Star Magnolia (WHITE)		4a	10	15	8	S							1,6	
Avoid extreme sites and areas that heat up early in the spring to protect flower buds. Pink buds, white flowers. Densely branched.																
Malus baccata	'Jackii'	Siberian Crabapple (WHITE)		3	30	15	8	S							2	
Deep green foliage. Highly resistant to scale and Japanese beetle. Low branching prune for clearance.																
Malus sargentii	—	Sargent Crabapple (WHITE)		4	15	12	6	S							2,3	
Tolerant, small, dense tree. Relatively resistant to most crabapple diseases and insect problems.																
Malus spp.	'Adams'	Crabapple (PINK)		4	25	25	13	S							2	
Rounded, dense crown. Reddish foliage in youth turning purple with age.																
M. spp.	Brandywine® 'Branzam'	Crabapple (ROSE-PINK)		3	20	20	10	S							2	
Double flowers. Reddish to purple fall color.																
M. spp.	'Cardinal'	Crabapple (SCARLET)		4	20	20	10	S							2	
Few fruits. Spreading, flat-topped. Purple-red foliage.																

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M. spp.	'Centzam' Centurion®	**Crabapple** (ROSE-RED)		4	25	20	10	S							2	
Upright branching. Dark reddish green leaves.																
M. spp.	'Dolgo'	**Crabapple** (WHITE)		3	40	25	13	S							2	
Flowers well in alternate years. Open habit.																
M. spp.	'Donald Wyman'	**Crabapple** (RED-PINK)		4	20	25	13	S							2	
Spreading form, dark green foliage. Fruit persistent in winter.																
M. spp.	Golden Raindrops™	**Crabapple** (WHITE)		4	15	20	10	S							2	
Golden yellow fruit. Small, slender, horizontal spreading.																
M. spp.	'Hargozam' Harvest Gold ®	**Crabapple** (WHITE)		4	30	20	10	S							2	
Flowers one week later than most crabs. Gold fruit that persist through winter. Moderately columnar to vase-shaped.																
M. spp.	'Indian Magic'	**Crabapple** (DEEP PINK)		4	20	20	10	S							2	
Small, red, persisting fruit. Rounded habit. Orange to red fall color.																
M. spp.	'Indian Summer'	**Crabapple** (ROSE-RED)		4	18	25	13	S							2	
Purple green foliage. Broad globe-shaped.																
M. spp.	'Prairifire'	**Crabapple** (RED)		4	20	20	10	S							2	
Red-purple, persistent fruit. Upright when young turning round. New leaf growth maroon turning green.																
M. spp.	'Red Jewel'	**Crabapple** (WHITE)		4	15	12	10	S							2	
Rounded habit with horizontal branches. Dark green foliage.																
M. spp.	'x robusta'	**Crabapple** (WHITE)		4	40	25	13	S							2	
Oval, dense branching.																
M. spp.	'Selkirk'	**Crabapple** (ROSE-RED)		4	25	25	13	S							2	
Glossy fruits. Open, upright. Foliage opens reddish green turning to dark green.																
M. spp.	Sugar Tyme™	**Crabapple** (WHITE)		4	18	15	7.5	S							2	
Persistent red fruit. Upright oval. Dark green foliage.																
M. spp.	'Thunderchild'	**Crabapple** (PINK)		3	20	20	10	S							2	
Compact, upright-spreading. Deep purple leaves.																
M. spp.	'x zumi'	**Crabapple** (WHITE)		4	20	20	10	S							2	
Pyramidal habit, may become rounded.																
Metasequoia glyptostroboides	—	**Dawn Redwood**		5	100	50	25	L							4	
Performs best in moist, deep, well-drained, slightly acidic soils. Avoid frost pockets which may affect fall foliage.																
M. glyptostroboides	'Sheridan Spire'	**Dawn Redwood**		5	60	30	15	L							4	
Performs best in moist, deep, well-drained, slightly acidic soils. Avoid frost pockets which may affect fall foliage. More upright.																
Nyssa sylvatica	—	**Black Tupelo**		4b	50	35	18	M							4,6	

Scientific Name	Cultivar	Common Name [Flower Color]	Form	Hardiness Zone	Mature Height	Crown Spread	Soil Volume	Planting Area	Tolerances: Drought	Poor Drainage	Alkaline Soil	Salt	Air Pollution	Shade	Limitations	Features
Difficult to transplant. Fall pruning. Great summer foliage and brilliant red fall color. Not for the most tough urban sites, but could make a nice street tree.																
Ostrya virginiana	—	Hophornbeam		3b	45	30	15	S							4,6	
Slow to reestablish. Performs best in cool, moist, well-drained slightly acidic soils.																
Phellodendron amurense	His Majesty™	Amur Corktree		3b	45	30	15	L							6	
Tolerant and adaptable. Prune in winter. Reserve for large areas. Interesting bark. Yellow fall color. Male, so will not produce fruit, but can pollinate.																
P. amurense	'Macho'	Amur Corktree		4	45	45	23	L							6	
Tolerant and adaptable. Prune in winter. Reserve for large areas. Interesting bark. Yellow fall color. Male, so will not produce fruit, but can pollinate.																
Picea abies	—	Norway Spruce		2	60	30	15	L							2,3	
Reserve for large areas. Performs best in well-drained, sandy soils. Prune in spring. Consider P. orientalis and P. omorika.																
Picea glauca	—	White Spruce		2	60	20	10	L							3	
Adaptable and tolerant. Reserve for large areas. Prune in spring. Consider P. orientalis and P. omorika.																
Picea omorika	—	Serbian Spruce		4	60	25	30	M								
Noted for excellent foliage. One of the most adaptable spruces.																
Picea orientalis	—	Oriental Spruce		5a	60	25	30	L							4	
Noted for excellent foliage.																
Pinus cembra	—	Swiss Stone Pine		3	40	20	10	M							4	
Small, dense pine. Requires well-drained, loamy soils in full sun. Slow grower.																
Pinus nigra	—	Austrian Pine		4	60	30	15	M							3	
Adaptable and tolerant. Stiff, dark green needles. With age, becomes flat topped and umbrella like.																
Pinus strobus	—	Eastern White Pine		3	80	40	20	L							1,3	
Easily transplanted and grown. Prefers moist, well-drained, acidic soils. Susceptible to white pine blister rust. Choose certified rust resistant plants. Also susceptible to white pine weevil. Prone to breakage from strong winds, ice and heavy snow.																
Platanus x acerifolia	'Bloodgood'	London Planetree		5	85	70	35	L							2,3	
Adaptable and tolerant. Attractive bark. Cold injury in harsh winters. Tolerates severe pruning. Drops twigs and leaves.																
P. acerifolia	'Morton Thornhill' Exclamation™	London Planetree		5	60	45	23	L							2,3	
Adaptable and tolerant. Attractive bark. Cold injury in harsh winters. Tolerates severe pruning. Drops twigs and leaves.																

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P. acerifolia	Ovation™	**London Planetree**		5	50	60	30	L							2,3	
Adaptable and tolerant. Attractive bark. Cold injury in harsh winters. Tolerates severe pruning. Drops twigs and leaves.																
Platanus occidentalis	—	**Sycamore**		4b	100	80	40	L							2,3	
Prefers deep, rich, moist soils. Cold injury in harsh winters. Attractive bark. Drops twigs and leaves.																
Prunus maackii	—	**Amur Chokecherry** (WHITE)		2b	35	35	28	S							3,6	
Attractive bark. Dense round canopy. Prune to maintain tree shape.																
Prunus sargentii	'Columnaris'	**Sargent Cherry** (PINK)		5a	35	15	8	S							6	
Good yellow, orange to red fall color - develops early. Attractive bark. With age, becomes vase shaped. Short-lived.																
Prunus sargentii x P. subhirtella	'Accolade'	**Accolade Flowering Cherry** (PINK)		5a	35	20	10	S							6	
Good yellow, orange to red fall color - develops early. Attractive bark. Short-lived. Open habit.																
Pyrus calleryana	'Aristocrat'	**Callery Pear** (WHITE)		4	45	20	10	S							1,6	
Adaptable and tolerant. Prune for structure to avoid branch splitting, but much better than 'Bradford'. Blooms later.																
P. calleryana	'Chanticleer'	**Callery Pear** (WHITE)		4	30	15	10	S							1,6	
Adaptable and tolerant. Prune for structure to avoid branch splitting, but much better than 'Bradford', also narrow, longer-lived and hardier.																
P. calleryana	'Jaczam' Jack™	**Callery Pear** (WHITE)		4	15	10	10	S							1,6	
Adaptable and tolerant. Prune for structure. Yellow fall color. Good where space is limited.																
P. calleryana	'Jilzam' Jill™	**Callery Pear** (WHITE)		4	15	15	10	S							1,6	
Adaptable and tolerant. Prune for structure. Yellow fall color. Good where space is limited.																
Pyrus ussuriensis	—	**Ussurian Pear** (WHITE)		3	35	50	25	S							4	
Hardy pear with dense, rounded habit. Dark green, glossy leaves turn red to purplish in fall.																
Quercus alba	—	**White Oak**		3b	60	60	30	L							2,6	
Attractive bark. Growth is slow, transplant at a small size. Reserve for large areas.																
Quercus bicolor	—	**Swamp White Oak**		4a	60	60	30	M							2,6	
Attractive bark. Easier to transplant than Q. alba. Likes acid soils. Yellow to red fall color.																
Quercus imbricata	—	**Shingle Oak**		4	60	60	30	M							2,6	
Adaptable. Reserve for large areas. Transplants easier than most oaks.																
Quercus macrocarpa	—	**Bur Oak**		3a	80	90	45	L							2,6	

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Adaptable. Reserve for large areas. Difficult to transplant. More tolerant of urban conditions than most oaks.																
Quercus muehlenbergii	—	Chinkapin Oak		4	50	55	28	M							2,6	
Adaptable. Slow grower and difficult to transplant. Red, yellow to brown fall color.																
Quercus palustris	—	Pin Oak		4a	70	50	25	M							2,6	
Adaptable. Moderate tolerance, but very intolerant of high pH soils. Strongly pyramidal habit.																
Quercus robur	'Fastigiata'	English Oak		5a	50	15	25	M							2,6	
Adaptable and tolerant. Twig dieback in harsh winters.																
Q. robur	'Pyramich' Skymaster®	English Oak		5a	50	25	13	M							2,6	
Adaptable and tolerant. Twig dieback in harsh winters. Mildew resistant. Tighter than 'Fasitgiata'.																
Quercus rubra	—	Northern Red Oak		3b	75	60	30	L							2	
Adaptable and tolerant expect for high pH. Transplants easily and grows fast for an oak.																
Sassafras albidum	—	Common Sassafras (YELLOW)		5a	60	40	20	M							4,5,6	
Difficult to transplant. Prefers a moist, acid, well-drained soil.																
Styphnolobium japonicum	'Princeton Upright'	Scholar-tree (WHITE)		5a	40	50	25	M							1,2	
Also known as Sophora japonica. Adaptable and tolerant once established after transplanting. Twig dieback in harsh winters. Summer flowers. More upright.																
S. japonicum	'Regent'	Scholar-tree (WHITE)		5a	50	45	23	M							1,2	
Also known as Sophora japonica. Adaptable and tolerant once established after transplanting. Twig dieback in harsh winters. Summer flowers, blooms earlier.																
Syringa reticulata	—	Japanese Tree Lilac (WHITE)		3	30	25	13	S								
Adaptable and tolerant. Blooms in summer. Prune after flowering. Attractive bark. A couple of reported sites where the tree has reseeded.																
S. reticulata	'Ivory Silk'	Japanese Tree Lilac (WHITE)		3a	25	15	13	S								
Adaptable and tolerant. Heavy blooms in summer. Prune after flowering. Attractive bark.																
S. reticulata	'Summer Snow'	Japanese Tree Lilac (WHITE)		3a	20	15	13	S								
Adaptable and tolerant. Heavy blooms in summer. Prune after flowering. Attractive bark. Small tree with compact crown.																
Taxodium distichum	—	Baldcypress		5a	70	30	15	L							6	
Adaptable and tolerant expect for high pH. Can handle extensive flooding. A deciduous conifer.																
Thuja occidentalis	—	White Cedar		3	60	15	8	S							1	
Adaptable and tolerant, but prefers moist, rich soils. Tolerates pruning. Heavy snow can cause damage.																

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T. occidentalis	'Nigra'	**White Cedar**		3	20	8	8	S							1	
Adaptable and tolerant, but prefers moist, rich soils. Tolerates pruning. Heavy snow can cause damage. Good dark green foliage.																
T. occidentalis	'Smaragd,' 'Emerald'	**White Cedar**		3	15	4	8	S							1	
Adaptable and tolerant, but prefers moist, rich soils. Tolerates pruning. Heavy snow can cause damage. Bright emerald green foliage.																
T. occidentalis	'Techny'	**White Cedar**		3	15	10	8	S							1	
Adaptable and tolerant, but prefers moist, rich soils. Tolerates pruning. Heavy snow can cause damage. Good dark green foliage. Slow grower.																
T. occidentalis	'Bailyard' Frontyard®	**American Linden , Basswood** (YELLOW)		4	75	40	20	M							1,3,5	
Adaptable and tolerant. Prune for structure. Symmetrical, pyramidal habit with denser branching.																
T. occidentalis	'Continental Appeal'	**American Linden , Basswood** (YELLOW)		4	60	40	20	M							1,3,5	
Adaptable and tolerant. Prune for structure. Wide, dense crown with narrow ascending branches.																
Tilia americana	Legend™	**American Linden , Basswood** (YELLOW)		4	55	35	28	M							1,3,5	
Adaptable and tolerant. Prune for structure. Distinctly pyramidal with a central leader and better branching than species.																
T. americana	'Redmond'	**American Linden , Basswood** (YELLOW)		4	60	30	15	M							1,3,5	
Adaptable and tolerant. Prune for structure. Uniform, pyramidal habit.																
Tilia cordata	'Baileyi' Shamrock®	**Littleleaf Linden** (YELLOW)		3	45	30	15	M							1,3,5	
Adaptable and tolerant. Prune for structure. More open crown. Quick grower.																
T. cordata	'Chancole' Chancellor®	**Littleleaf Linden** (YELLOW)		3	35	20	10	M							1,3,5	
Adaptable and tolerant. Prune for structure. Narrow upright habit. Better branch angles.																
T. cordata	'Glenleven'	**Littleleaf Linden** (YELLOW)		3	50	35	28	M							1,3,5	
Adaptable and tolerant. Prune for structure. Open habit. Quick grower.																
T. cordata	'Greenspire'	**Littleleaf Linden** (YELLOW)		3	45	30	15	M							3	
Adaptable and tolerant. Prune for structure. Uniform branching, straight trunk and dark green leaves.																
Tilia x euchlora	—	**Crimean Linden** (YELLOW-WHITE)		3	60	30	15	M							5	
Adaptable and tolerant. Graceful habit with branches touching ground.																
Tilia tomentosa	—	**Sliver Linden** (YELLOW)		4b	70	55	28	M							5,6	
Adaptable and tolerant. Most drought tolerant of the lindens. Silver underside of leaves.																
T. tomentosa	'Green Mountain'	**Silver Linden** (YELLOW)		4b	60	40	20	M							5,6	
Adaptable and tolerant. Most drought tolerant of the lindens. Silver underside of leaves. Fast grower with dense crown.																
T. tomentosa	'Sashazam' Satin Shadow®	**Silver Linden** (YELLOW)		4b	50	40	20	M							5,6	
Adaptable and tolerant. Most drought tolerant of the lindens. Silver underside of leaves. Uniform, symmetrical growth. Dark green leaves with silver undersides.																

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Tsuga canadensis	—	**Eastern Hemlock**		3	70	35	28	L							3,6	
Avoid hot, dry and windy locations. Tolerates shade and severe pruning. Host to invasive insect pest, hemlock wooly adelgid.																
Ulmus americana	'Jefferson'	**American Elm**		3b	50	50	25	S							3	
Adaptable and tolerant. Prune in the fall. Vase shape with arching limbs. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. americana	'Delaware #2'	**American Elm**		3b	70	80	40	S							3	
Adaptable and tolerant. Prune in the fall. Broad spreading crown. Good resistance to DED. Primary host of Asian Longhorned Beetle.																
U. americana	'New Harmony'	**American Elm**		4	50	50	25	S							3	
Adaptable and tolerant. Prune in the fall. Good form, DED tolerance is less than other cultivars. Primary host of Asian Longhorned Beetle.																
U. americana	'Princeton'	**American Elm**		3b	60	40	20	S							3	
Adaptable and tolerant. Prune in the fall. Good form and DED resistance. Long-history, developed before DED. Primary host of Asian Longhorned Beetle.																
U. americana	'Valley Forge'	**American Elm**		5	70	70	35	S							3	
Adaptable and tolerant. Prune in the fall. Classic elm form with excellent DED resistance. Not as cold hardy. Primary host of Asian Longhorned Beetle.																
Ulmus x spp.	'Morton' Accolade™	**Elm**		4	70	50	25	S								
Adaptable and tolerant. Prune in the fall. American elm-like habit. Glossy dark green foliage. Golden yellow fall color. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. x spp.	'Discovery'	**Elm**		3b	45	35	18	S								
Adaptable and tolerant. Prune in the fall. Upright, compact, oval to vase-like habit. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. x spp.	'Frontier'	**Elm**		5	35	25	13	S								
Adaptable and tolerant. Prune in the fall. Dark green foliage, red fall color. Case shaped habit. Primary host of Asian Longhorned Beetle.																
U. x spp.	'New Horizon'	**Elm**		3b	50	25	13	S								
Adaptable and tolerant. Prune in the fall. Upright and full crown. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. x spp.	'Patriot'	**Elm**		5	70	50	25	S								
Adaptable and tolerant. Prune in the fall. Upright, stiffly vase-shaped. Narrower than most elms. Good DED resistance. Primary host of Asian Longhorned Beetle.																
U. x spp.	'Prospector'	**Elm**		4	70	60	30	S								
Adaptable and tolerant. Prune in the fall. American elm-like habit. Great vigor. Primary host of Asian Longhorned Beetle.																
Viburnum prunifolium	—	**Blackhaw Viburnum** (WHITE)		3	30	15	8	S								
Adaptable. Transplants well. Small tree.																
Zelkova serrata	'Green Vase'	**Japanese Zelkova**		5a	70	50	25	S							1	

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		Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. Vase shape with upright branching. Bronze to red fall color.														
Z. serrata	'Green Veil'	**Japanese Zelkova**		5a	70	55	28	S							1	
		Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. Upright narrow vase shaped.														
Z. serrata	'Halka'	**Japanese Zelkova**		5a	50	30	15	S							1	
		Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. More open and less uniform crown. Yellow fall color.														
Z. serrata	'Musashino'	**Japanese Zelkova**		5a	45	15	8	S							1	
		Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. Upright, tight, narrow crown. Yellow fall color.														
Z. serrata	Village Green™	**Japanese Zelkova**		5a	40	40	20	S							1	
		Adaptable. Attractive bark. Young trees susceptible to frost. Prune in the fall. Straight trunk. Wide and dense canopy. Red fall color.														