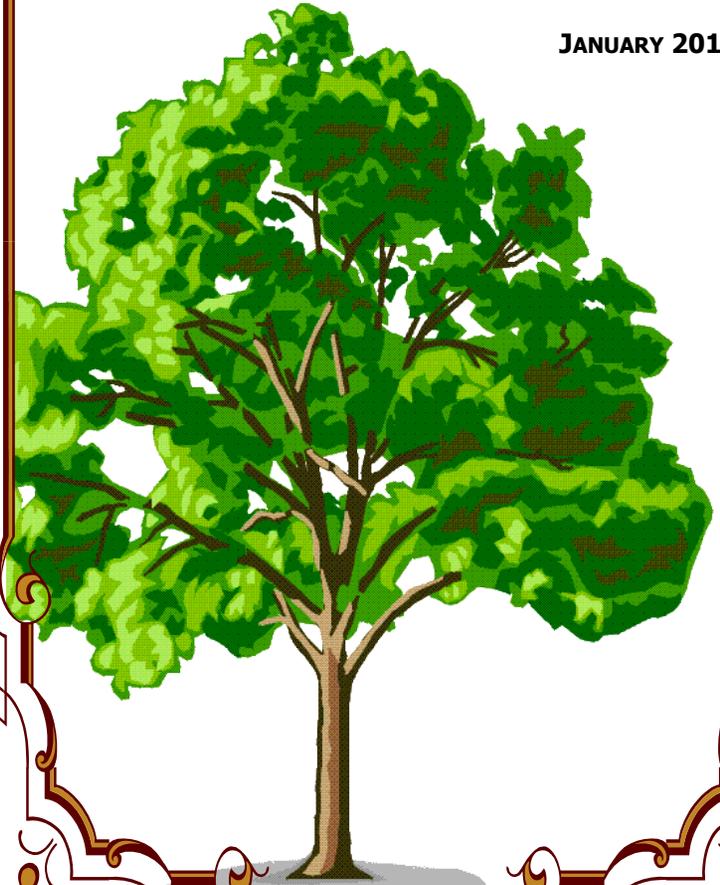




CITY OF DUPONT
CITIZEN'S TREE CARE MANUAL

JANUARY 2012



ACKNOWLEDGEMENTS

We gratefully acknowledge the generosity of Lisa Burban and Jill Johnson for permission to adapt the *Tree Owner's Manual for the Northeastern and Midwestern United States*, USDA Forest Service, for this manual.

Illustrations by Jennifer Salveson, unless otherwise noted.

Text developed by Micki McNaughton, Arborea, LLC.

Funds for this project were provided by the Urban and Community Forestry Program administered through the State of Washington Department of Natural Resources and the USDA Forest Service.



NOTES



From the cherry blossoms lining the lane near Iafrati Park to the wooded corridor of Sequelitchew Creek, the City of DuPont is defined by its trees. They lend its streets grace and dignity, providing a sense of place and community. DuPont's trees are an important symbolic link with the City's history and its future. Our trees are a valuable City asset that supports the economic, environmental and social vitality of our community.

To make the most of this versatile resource, we need to ensure that our trees are healthy and structurally sound. As with our homes—even our own health—proper care will help ensure that our 'green citizens' remain strong, safe community members. Come along with us as we learn how to take care of our trees, so that they take care of us!

City of DuPont Tree Board

John Ehrenreich

Kerri McConnell

Bill McDonald

Micki McNaughton

Dawn Masko, City Administrator

Peter Zahn, Public Works Director

TREE BOARD MISSION:

"To encourage quality tree care and management in the City of DuPont to help achieve the benefits and values of a healthy urban forest."

BENEFITS OF TREES

- ✓ **Trees absorb CO₂.** One acre of mature trees absorbs the amount of CO₂ produced in one year by a car driven 26,000 miles.
- ✓ **Trees clean the air.** Trees absorb pollutant gases and filter particulates out of the air.
- ✓ **Trees provide oxygen.** One acre of mature trees provides oxygen for 18 people for one year.
- ✓ **Trees reduce the urban “heat island” effect.** Trees cool urbanized areas by up to 10°F through shade and the release of water vapor into the air.
- ✓ **Trees conserve energy.** Strategically planted trees may reduce summer air conditioning costs by up to 50 percent.
- ✓ **Trees conserve water.** Shade from trees slows evaporation from the soil; moisture is captured in leaves, branches and trunks.
- ✓ **Trees improve water quality** Trees reduce runoff by slowing rainfall impact through canopy capture. Tree roots aid infiltration of water into the soil to reduce surface flow.
- ✓ **Trees help prevent soil erosion.** Tree roots slow runoff, aid water infiltration into soil and hold soil in place.
- ✓ **Trees shield people from ultra-violet light.** Large tree canopies reduce UV-B exposure by up to 50 percent; UV-B is a contributor to the most common form of cancer, skin cancer.
- ✓ **Trees contribute to health.** Patients who can see trees and nature typically heal faster with fewer complications. Children diagnosed with ADHD show fewer symptoms when they have access to trees and nature. Access to trees and nature reduces mental fatigue. People are typically more active in communities with greater tree canopy coverage.
- ✓ **Trees support economic vitality.** Business districts planted attractively with trees attract more customers and increase the amount of time customers spend in a shopping district.
- ✓ **Trees slow traffic.** Trees provide natural traffic control when planted along streets.
- ✓ **Trees increase property values.** Beautiful trees in a well-planted, well-maintained property can raise property values by as much as 15 percent.
- ✓ **Trees contribute to a sense of community.** Trees link us to the past, help us reach into the future, bring us together with our neighbors through community events, and provide a sense of place.

RESTRICTED STREET TREES FOR DUPONT

Some trees are not appropriate for planting as street trees: some have aggressive roots that are infamous for breaking sidewalks, some have roots that pioneer into water and sewer pipes and some have brittle wood or poor branching structure that doesn't hold up well during our occasional storms. The use of the following trees for street trees in DuPont is restricted, per DuPont Public Works Standards Chapter 5.7 *Street Trees and Landscaping*:

Section 5.7.4

- Poplar and cottonwood (*Populus* species; invasive roots in water and sewer systems, weak brittle wood)
- Soft maples (selected *Acer* species; aggressive root systems, weak brittle wood)
- Sweet gum (*Liquidambar styraciflua* and its cultivars; aggressive root systems, weak brittle wood)
- Orchard-type trees that bear large edible fruit (fruit may pose a pedestrian hazard on sidewalks)

Other trees that are not recommended for use as street trees in DuPont are

- Other members of the Poplar family, such as aspen and white poplar (*Populus* species; invasive roots in water and sewer systems, weak brittle wood)
- Willows (*Salix* species; invasive roots in water and sewer systems, weak brittle wood)
- European Mountain Ash (*Sorbus acuparia*; weak brittle wood, fruit may pose a hazard on sidewalks)
- Nut-bearing orchard-type trees (nuts may pose a pedestrian hazard on sidewalks)

In addition, many of our beautiful native trees just get too big for the space we have available in right-of-way parking strips, thus are not suitable for use as street trees.

RECOMMENDED STREET TREES, CONTINUED

H = Expected Mature Height
 W = Expected Mature Canopy Width
 F = Flowering
 FC = Fall Color

Appropriate for 8-foot minimum planting space		H	W	F	FC
Common Name	Botanic Name				
Ash, Autumn Applause	<i>Fraxinus americana</i> 'Autumn Applause'	40	25	N	Y
Ash, Prairie Spire	<i>Fraxinus pennsylvanica</i> 'Rugby'	45	20	N	N
Ash, Urbanite	<i>Fraxinus pennsylvanica</i> 'Urbanite'	50	40	N	N
Ash, Windy City	<i>Fraxinus americana</i> 'Tures'	45	35	N	Y
Coffeetree, Espresso	<i>Gymnocladus dioica</i> 'Espresso' (seedless)	60	40	N	N
Elm, Allee	<i>Ulmus parvifolia</i> 'Emer II'	50	35	N	Y
Hazel, Turkish	<i>Corylus colurna</i>	45	30	N	N
Honeylocust, Skyline	<i>Gleditsia triacanthos</i> 'Skycole'	45	35	N	Y
Hophornbeam	<i>Ostrya virginiana</i>	40	25	N	N
Linden, Sterling	<i>Tilia tomentosa</i> 'Sterling'	45	35	N	Y
Maple, Autumn Blaze	<i>Acer x freemanii</i> 'Jeffersred'	50	40	N	Y
Oak, Bur	<i>Quercus macrocarpa</i>	55	45	N	N
Oak, Red	<i>Quercus rubra</i>	50	45	N	Y
Oak, Scarlet	<i>Quercus coccinea</i>	50	40	N	Y
Oak, Shumard	<i>Quercus shumardii</i>	50	40	N	Y
Oak, Swamp White	<i>Quercus bicolor</i>	45	45	N	Y
Oak, White	<i>Quercus alba</i>	50	45	N	Y
Pagodatree, Regent	<i>Sophora japonica</i> 'Regent'	50	45	Y	Y
Pear, Aristocrat	<i>Pyrus calleryana</i> 'Aristocrat'	40	28	Y	Y
Silverbell, Mountain	<i>Halesia monticola</i>	40	35	Y	N
Tuliptree	<i>Liriodendron tulipifera</i>	60	40	Y	Y
Yellowwood	<i>Cladrastis kentukea</i>	30	40	Y	Y
Zelkova, Green Vase	<i>Zelkova serrata</i> 'Green Vase'	50	40	N	Y

Note that the specifically recommended tree species and cultivars are important; for example, Sterling Linden (*Tilia tomentosum* 'Sterling') does not exhibit the sooty mildew and aphid problems that occur in the more commonly planted lindens (Basswood [*Tilia americana*]; Littleleaf Linden [*T. cordata*]).

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RECOMMENDED STREET TREES, CONTINUED

H = Expected Mature Height

W = Expected Mature Canopy Width

F = Flowering

FC = Fall Color

Appropriate for 7-foot minimum planting space		H	W	F	FC
Common Name	Botanic Name				
Birch, Himalayan	<i>Betula jacquemontii</i>	40	30	N	Y
Crabapple, Tschonoskii	<i>Malus tschonoskii</i>	35	20	Y	Y
Dogwood, Starlight	<i>Cornus kousa</i> x <i>nutalli</i> 'KN 43'	30	20	Y	Y
Elm, Frontier	<i>Ulmus carpinifolia</i> x <i>parvifolia</i> 'Frontier'	40	30	N	Y
Honeylocust, Shademaster	<i>Gleditsia triacanthose</i> 'Shademaster'	45	35	N	Y
Ironwood, Persian	<i>Parrotia persica</i>	30	20	N	Y
Maple, Hedge	<i>Acer campestre</i>	30	30	N	N
Maple, Pacific Sunset	<i>Acer truncatum</i> x <i>platanoides</i> 'Warrenred'	30	25	N	Y
Tupelo	<i>Nyssa sylvatica</i>	35	25	N	Y

Note that the specifically recommended tree species and cultivars are important; for example, Himalayan Birch (*Betula jacquemontii*) is resistant to bronze birch borer and has stronger wood than European White Birch (*Betula pendula*).

RECOMMENDED STREET TREES, CONTINUED

H = Expected Mature Height
 W = Expected Mature Canopy Width
 F = Flowering
 FC = Fall Color

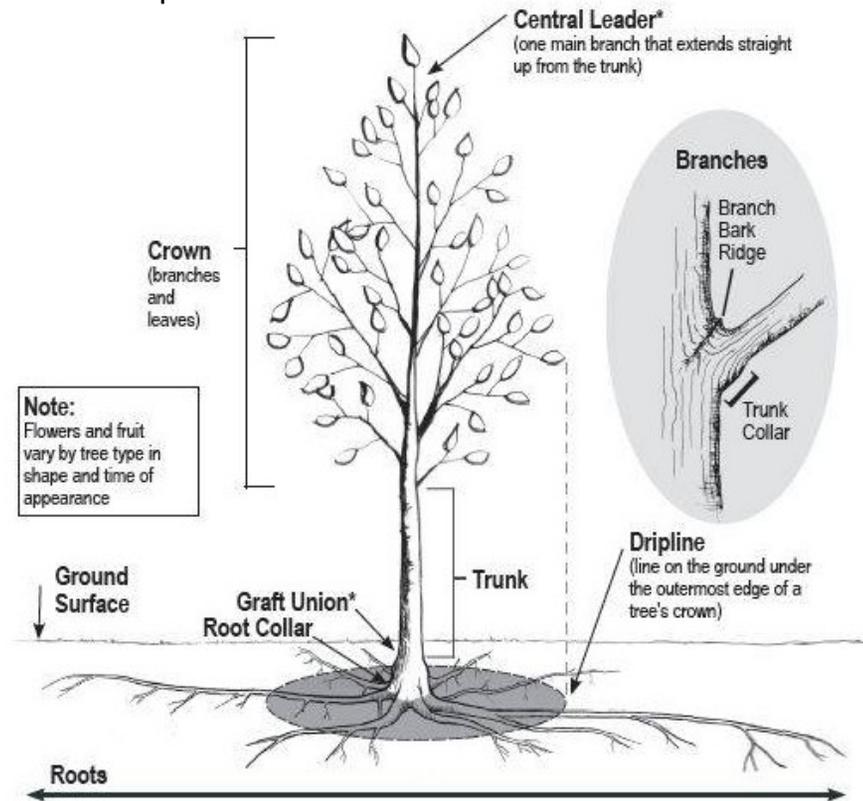
Appropriate for 6-foot minimum planting space		Botanic Name	H	W	F	FC
Common Name	Botanic Name					
Dogwood, June Snow	<i>Cornus controversa</i> 'June Snow'	30	40	Y	Y	
Hawthorn, Toba	<i>Crataegus x mordenensis</i> 'Toba'	20	20	Y	N	
Hawthorn, Washington	<i>Crataegus phaenopyrum</i>	25	20	Y	Y	
Magnolia, Galaxy	<i>Magnolia liliflora</i> x sprengeri 'Galaxy'	30	15	Y	N	
Magnolia, Oyama	<i>Magnolia sieboldii</i>	20	15	Y	N	
Magnolia, Rustica Rubra	<i>Magnolia x soulangiana</i> 'Rustica Rubra'	20	20	Y	N	
Magnolia, Wada's Memory	<i>Magnolia x kewensis</i> 'Wada's Memory'	30	20	Y	N	
Maple, Henry	<i>Acer henryi</i>	25	25	N	Y	
Maple, Rocky Mountain Glow	<i>Acer grandidentatum</i> 'Schmidt'	25	15	N	Y	
Oak, Crimson Spire	<i>Quercus alba</i> x robur 'Crimschmidt'	45	15	N	Y	
Pear, Edgewood	<i>Pyrus calleryana</i> x <i>betulaefolia</i> 'Edgewood'	30	25	Y	Y	
Pear, Prairie Gem	<i>Pyrus ussuriensis</i> 'MorDak'	25	25	Y	Y	
Plum, Thundercloud	<i>Prunus cerasifera</i> 'Thundercloud'	20	20	Y	N	
Smoketree, American	<i>Cotinus obovatus</i>	25	20	Y	Y	
Sourwood	<i>Oxydendron arboreum</i>	25	18	Y	Y	

Note that the specifically recommended tree species and cultivars are important; for example, Thundercloud Flowering Plum (*Prunus cerasifera* 'Thundercloud') is cleaner and more disease-resistant than Blireiana Flowering Plum (*Prunus x blireiana*).

BASIC TREE BIOLOGY

It's important to know the parts of a tree, and how those parts work, so you understand how to plant and care for trees to keep them healthy and strong.

Basic tree parts:



- **Roots** gather nutrients and water for the tree and provide a stable foundation for its structure.
- **Root collar**, sometimes called the root flare, is the portion of the trunk just above the ground; a tree does a great deal of its gas exchange ("breathing") here.
- **Graft union** is the point where a bud or scion from a desirable cultivar was grafted onto more vigorous rootstock.

RECOMMENDED STREET TREES FOR DUPONT

H = Expected Mature Height
 W = Expected Mature Canopy Width
 F = Flowering
 FC = Fall Color

- The trunk supports the crown and is a critical support structure for the tree.
- Central leader is the strong, straight continuation of the trunk through the canopy, particularly important to maintain in young trees so they grow structurally sound, and are easy to limb up for clearance.
- Bark protects the trunk, branches and twigs, and contains the xylem and phloem on its inner surface. Xylem and phloem conduct water and nutrients between the roots and the leaves, in similar fashion to our blood vessels.
- Limbs, branches and twigs form the crown structure and are an important part of a tree's structure.
- Branch collars, sometimes called trunk collars, form where branches grow out of the trunk. Branch collars contain special cells that help trees contain disease and rot from damage further out on the limb. It's important not to injure the collar when pruning so the wound will callus over properly and protect the interior of the tree from pests and disease.
- Leaves are a tree's food factory; through a complex chemical process, chlorophyll in leaves produces the sugars and nutrients that trees need to grow and thrive. It's important, therefore, to leave as many leaves on a tree as possible.
- Crown consists of the branches, twigs and leaves supported by the trunk.
- Dripline is an imaginary line on the ground following the edge of the crown, often used to establish a Critical Root Zone (CRZ) to protect a tree's roots, during construction activities for example. A more accurate rule-of-thumb to estimate the extent of a tree's roots is to calculate *one foot radius* from the base of the trunk for each *inch* of trunk diameter.

Appropriate for 5-foot minimum planting space		H	W	F	FC
Common Name	Botanic Name				
Amur Maackia	Maackia amurensis	25	20	Y	N
Chokecherry, Canada Red	Prunus virginiana 'Canada Red'	25	20	Y	Y
Crabapple, Adirondack	Malus 'Adirondack'	18	10	Y	N
Crabapple, Golden Raindrops	Malus 'Schmidtcutleaf'	20	15	Y	Y
Crabapple, Royal Raindrops	Malus 'Royal Raindrops'	20	15	Y	Y
Crabapple, Sugartyme	Malus 'Sutyzam'	18	15	Y	N
Crabapple, Thunderchild	Malus 'Thunderchild'	20	20	Y	Y
Dogwood, Celestial	Cornus 'Rutdan'	20	20	Y	Y
Dogwood, Chinese	Cornus kousa	20	20	Y	Y
Hawthorn, Lavalie	Crataegus x lavaliei	28	20	Y	N
Hawthorn, Thornless Cockspur	Crataegus crus-galli 'Inermis'	25	25	Y	Y
Hornbeam, American	Carpinus caroliniana	25	20	N	Y
Lilac, Japanese Ivory Silk	Syringa reticulata 'Ivory Silk'	20	15	Y	N
Maple, Tartarian	Acer tartaricum	25	20	N	Y
Maple, Trident	Acer buergerianum	20	20	N	Y
Mountain Ash, Red Cascade	Sorbus americana 'Dwarfcrowm'	18	8	Y	Y
Redbud, Oklahoma	Cercis reniformis 'Oklahoma'	25	30	Y	N
Serviceberry, Cumulus	Amelanchier x hybrida	25	15	Y	Y
Serviceberry, Lustre	Amelanchier cv. 'Rogers'	25	18	Y	Y
Serviceberry, Robin Hill	Amelanchier x grandiflora 'Robin Hill'	20	15	Y	Y

Note that the specifically recommended tree species and cultivars are important; for example, Red Cascade Mountain Ash (*Sorbus americana* 'Dwarfcrowm') is a much more desirable street tree than European Mountain Ash (*Sorbus aucuparia*).

RESOURCES

The Alliance for Community Trees
www.actrees.org

The American Grove
www.americangrove.org

The Arbor Day Foundation
www.arborday.org

City of DuPont official website
www.ci.dupont.wa.us

Human Dimensions of Urban Forestry and Urban Greening
www.naturewithin.info

Landscape and Human Health Laboratory
lhlh.illinois.edu

National Tree Benefits Calculator
www.treebenefits.com

Tree Care Industry Association
www.tcia.org

Trees Are Good! (ISA public outreach website)
www.treesaregood.org

USDA Forest Service Pacific Southwest Research Center
www.fas.fed.us/psw/programs/uesd/uep/research

USDA Forest Service Urban and Community Forestry
www.fs.fed.us/ucf

Washington Grove
www.americangrove.org/wa

Washington State Department of Natural Resources
Forestry, Forest Health & Forest Ecology
www.dnr.wa.gov/ResearchScience/ForestryForestEcology

Washington State Department of Natural Resources
Urban and Community Forestry Program
www.dnr.wa.gov/urbanforestry

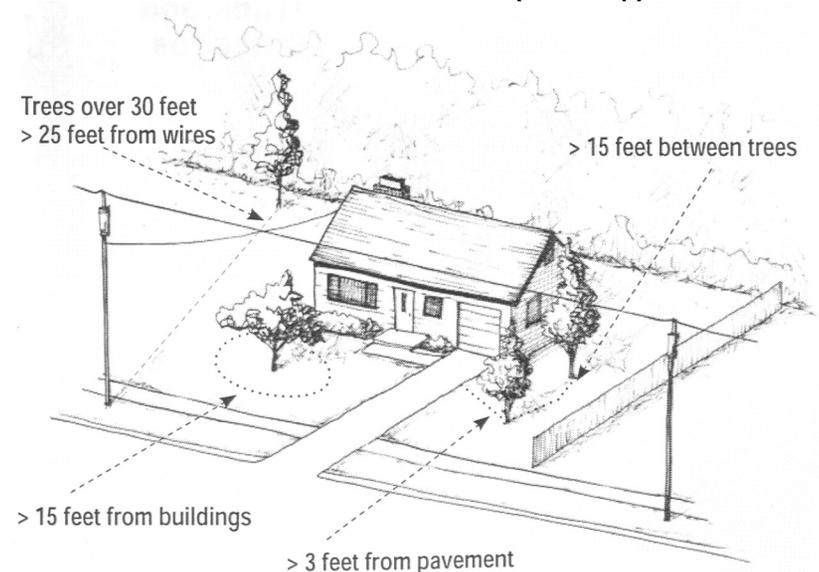
NEW TREES

THE RIGHT PLACE

*"The best time to plant a tree was twenty years ago;
the next best time is NOW!"* — old proverb

There's nothing more exciting than planting new trees! To ensure a long, healthy, beautiful life, begin by finding the Right Place for your tree:

- Look up: are there utility lines overhead of the planting site?
- Look around: wherever possible, stay at least
 - ◆ 3 feet from pavement or fencing in *any* direction
 - ◆ 15 feet from buildings
 - ◆ 10 feet from driveways
 - ◆ 10 feet from safety or traffic signage
 - ◆ 10 feet from fireplugs
 - ◆ 35 feet from street corners (visibility)



- Look down (underground): **always call the free utility marking service at 811.** Washington State law requires that anyone preparing *any* excavation to know what is underground before beginning to dig. Better to wait a few days for the utility locate service rather than disrupt vital utilities to your community—or worse yet, injure yourself.

Caution!

Remember that trees grow! That cute little tyke in the pot has the potential to become VERY BIG, so make sure there is space for the tree to grow: adequate space for the canopy to develop to its full potential and adequate space for the roots so the tree remains stable and healthy.

- Sun and wind protection: What direction are the prevailing winter winds? How high is the summer sun? If reducing energy costs is one reason you're planting a tree, be sure to think about where to plant it to get the best effect.
- Soils: are the soils where you propose to plant the tree heavily compacted due to construction or road-building activities? These soils are very difficult for young trees' roots to grow into.
- Septic system: if your home has a septic system, please do not plant a tree over the tank or leach field; the tree's roots will reduce the functionality of the system and may cause it to fail.
- View: Remember the mature size of your tree when planning its location; do not plant a large tree where it will impact a view that you or your neighbors love. That will lead to topping or other bad pruning practices—and higher pruning expenses—as the tree grows.

SIDEWALKS AND TREES

Streets and sidewalks are for everyone's use. In DuPont, property owners are responsible for maintaining the sidewalk and planting strip, or roadway shoulder if no sidewalk is present, that adjoins their property.

DuPont Municipal Code Chapter 14.02 requires that sidewalks be maintained in good repair, fit and safe for the public to use. A notice will be issued to the adjacent property owner if the City determines that a sidewalk is in need of repair. The City may direct property owners to repair problematic sidewalks; however, the City prefers to work cooperatively with property owners to address such issues.

A sidewalk is considered to be in need of repair when

- There are cracks greater than 1/2-inch wide
- There are multiple cracks or spalls over 50% or more of a single sidewalk panel
- There is a fault or other surface irregularity greater than 1/2-inch in depth
- A piece of the sidewalk can be moved with ordinary foot pressure

The City may provide concrete-grinding or asphalt shims as a temporary safety measure for cracks or faults less than 1/2-inch, as funds allow.

Repair of damaged sidewalks requires a permit, available through City Hall. The permit ensures that the repaired sidewalk will meet the City's current sidewalk standards.

If trees are causing the sidewalk damage, property owners should consult with a certified arborist (ISA or TCIA) to discuss possible options for controlling future damage. Such options may include root pruning by a professional, root barriers or in extreme cases, removal of the tree.

TREE REMOVALS

Trees, like people, have a lifespan; sometimes it's time to let our green friends go. Alternatively, a tree may be deemed a nuisance or hazard, and require removal to reduce exposure to risk and liability.

Whatever the reason for removal, please hire a professional for this work, to ensure the safety of you and your family, your neighbors and your property. A tree falling on your home or your neighbor's car can wipe out any savings that might have been made by doing the removal yourself.

Many of the same tips for choosing an arborist are important when choosing someone to take a tree down:

- Ask for local references and check those references.
- Ask for the arborist's experience and record of safety in felling. In particular, find out if he/she has experience in felling trees in an urban setting—much different than logging trees in the forest!
- Get more than one bid or estimate; do not automatically accept the lowest bid. Never pay in advance.
- Hire an arborist who is bonded, licensed and insured. Ask for proof.
- Ask if they will remove the waste wood, or cut it to length for you if you prefer. Ask if they will grind the stump for you, and fill the grinding hole with soil.
- Get the work details and estimate in writing.
- Check with the Public Works Dept. at (253) 912-5381 to see whether a Right-of-Way Permit is needed if the arborist needs to use the right-of-way as workspace to do the job safely.

If you wish to remove a street tree, please call City of DuPont Public Works Department at (253) 912-5381.

THE RIGHT TREE

Now that you have chosen the perfect spot for your tree, let's look at how to choose the right tree for that location.

- Soils: are your soils gravelly? Sandy? Wet and boggy? There's a tree appropriate to nearly any soil condition; be sure to choose a tree that enjoys, or at least tolerates, the conditions at the planting site.
- Exposure: is the location sunny or shady? Windy or protected? Again, you and your tree will be happier if the tree's preferences match the site better.
- Space: much less pruning will be required if your new tree fits the space available. Be sure there's enough space for roots, too.

Caution!

Remember that trees grow! This is particularly important to remember if planting under or near utility lines. Trees planted under utility lines should reach a mature height of 25 feet or less to remain outside the Safety Zone, approximately 10 feet in all directions from the lowest wire (neutral). Planting smaller trees under utility lines

- reduces fire hazards;
- limits the need for frequent (and expensive) pruning; and
- maintains the shapeliness and beauty of trees because they do not need to be pruned for clearance.

- Function: are you planting for shade? Wind protection? Screening from a busy street? To frame your home or a view?
- Seasonal interest: would you like flowers? Fruit? Fall foliage color? Interesting bark?
- Are you planting a street tree? If so, please check the *Recommended Street Tree List* at the back of this Manual.

CHOOSING A GOOD-QUALITY TREE

Trees of poor quality may be cheaper, but will cost more in the long run as you struggle to keep them healthy and beautiful. Factors to consider in choosing a high-quality tree include

- **Roots:** the root system should be loose enough that you can 'massage' it easily. Root-bound trees rarely establish well because their roots never stretch out into the surrounding soil; they may even roll out of the ground under the weight of the canopy as the tree grows. Avoid circling roots as well, as they may 'girdle' the trunk, creating a weak area at the base of the trunk with high potential for tree failure. You should be able to find a root at least as large as your thumb in the upper two inches of soil in the nursery pot or dirt ball.
- **Trunks:** look for straight trunks with good branch development and evidence of root flare (root collar) development. The bark should be uninjured, and there should be no sign of disease or pests.
- **Canopy:** the canopy should be even-sized and well-balanced, even in a small young tree. There should be a strong central leader visible (this is typically not found on trees that mature to a small size, such as flowering plums or dogwoods).
- **Branches:** branches should be well-attached to the trunk with a well-defined branch (or trunk) collar and spaced regularly around the trunk; not broken, diseased or damaged. Branch angles should be close to 90°, unless the species or cultivar is narrow and upright.
- **Leaves:** leaves should be well-hydrated, with a healthy color typical for the species or cultivar; not torn or diseased.

TREE DOCTOR: PESTS AND DISEASES

The best way to keep your trees insect- and disease-free is to make sure that they are the Right Tree in the Right Place; the next best way is to keep them healthy.

Occasionally, however, even the healthiest trees will develop problems due to an introduced pest or disease to which they have no immunity. Examples of these are:

- Cherry tortrix beetle
- Asian long-horned beetle
- Gypsy moth
- Emerald ash borer
- Dutch elm disease
- Sudden oak death
- Thousand canker disease

There's a lot of information about these and other pests and diseases online; a quick Internet search will provide a plethora of information. Be sure that the website you consult offers accurate and timely information; the best are sponsored by the USDA Forest Service Research Centers and the Washington State University Extension Service. Links for these are on the Resource page toward the end of this Manual.

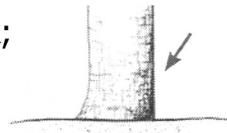
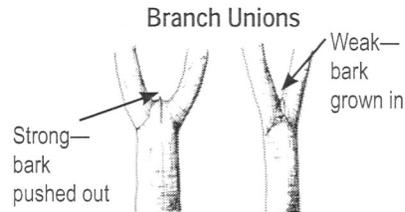
But what about common seasonal aggravations like aphids and sooty mildew? Again, the best defenses are the Right Tree in the Right Place in good health; neither condition is around long, a few weeks usually. There is little that can be done about sooty mildew; however, some options for addressing aphids include

- Washing aphids off leaves with a strong stream of water from a hose
- Systemic insecticides (although these may be expensive and can be hard on beneficial insects)
- Avoiding honeydew drippings on cars by parking elsewhere for the duration

WHEN GOOD TREES GO BAD

A tree may be green and lush, but still have structural defects or internal rot that may cause it to be unsafe. Inspect your trees regularly, especially after storms, and keep your eyes open for these common risks:

- Included bark in a branch attachment or double trunk
- Weak trunk or branch attachments
- Broken, dead or hanging branches
- Large cracks in the trunk or larger branches
- Internal decay as evidenced by shelf fungi, gummy exudates or sunken spots
- A lean of approximately 45° or more is considered risky if the tree is not well-rooted
- Recent change in degree of lean, particularly if the soil or grass is lifted on the opposite side of the tree
- Girdling roots that compress the trunk; a flat-sided trunk without a root flare at ground level is a good indicator
- Buckling in the trunk of a weak-wooded tree, such as aspen or alder
- Sapsucker damage often *looks* awful, but may not affect the tree's health or soundness at all



If you have any questions regarding the soundness or safety of your trees, call an expert. Experienced arborists can put your mind at ease, identifying and remediating a problem or offering possible solutions. Some homeowner's insurance policies will reimburse for regular tree inspections, similar to preventive care paid by a health insurance policy.

Trees are sold in one of three ways:

- Balled-and-burlapped (B & B): trees should be freshly dug; the root system with its soil is wrapped in burlap. Sometimes there is also a wire cage to help in moving the tree.
- Containerized: there are a wide variety of container types available, all the way from typical nursery pots to bags of various materials that are designed to help a tree grow healthy root systems in a confined space.
- Bare-root: all dirt has been washed from the roots, making the tree very easy to handle. It is imperative that the roots be kept moist and never allowed to dry out. Fruit trees are the most commonly-found bare-root trees, but occasionally ornamental trees may also be found bare-root.

Remember to keep your tree watered if you can't plant it immediately; never let the roots or root ball dry out.

Before you leave the nursery or garden center, it's a good idea to write down

- Type of tree—species, variety, etc.
- Mature height and canopy width
- Where the tree was purchased
- Date of purchase
- Warranty period and particulars

Moving your tree is usually easier if the branches are tied with twine or some other soft material.

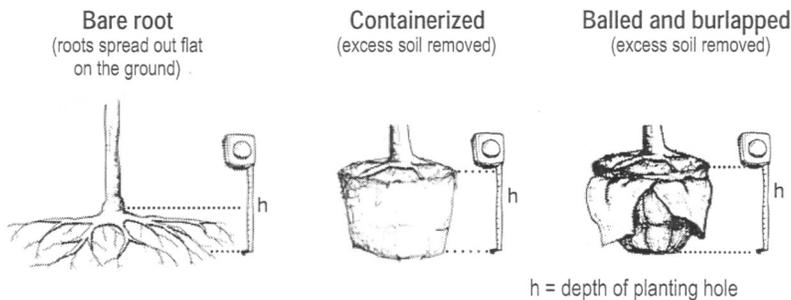
If your tree has leaves or needles, wrap it with a tarp or other protection while transporting to reduce wind damage and desiccation.

Do NOT lift your tree by the trunk! Lift the tree by the rootball, cage or container. For larger trees, use a hand-truck, or tip to one side and roll. Steady by holding near the base of the trunk.

PLANTING YOUR NEW TREE

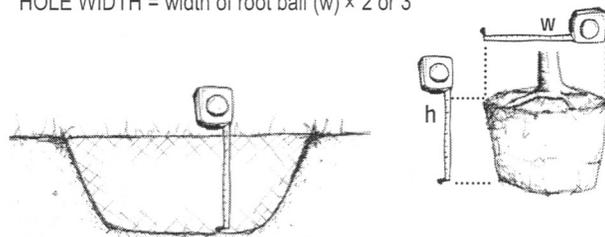
Now for the fun part! Here's a good way to give your new tree a *great* start in life:

- Remove all wrappings and tags from trunk and branches.
- Prune away dead, diseased, broken or rubbing branches.
- Poke around in the top of the dirt ball to locate the top structural root; it should be about the size of your thumb. Clear away all dirt in the container or rootball above that root.



- Dig a good hole: the old saying is to dig a \$5000 hole for a \$50 tree, and that's a good start! The hole should be wide enough to accommodate the roots when they're spread out, usually two to three times the width of the rootball in the container or B & B. Make the hole only as deep as the roots up to the root flare; avoid a deep cylindrical 'plug' hole; roots have difficulty growing beyond such a planting hole.

HOLE DEPTH = height of root ball (h)
HOLE WIDTH = width of root ball (w) × 2 or 3



HIRING AN ARBORIST

Consider hiring an arborist if the pruning job is too big for you to tackle safely on your own. If a branch removal calls for a ladder and chainsaw, it may be time to consider a professional for the job—*your* safety is paramount!

Tips for selecting an arborist:

- Ask for local references and check those references.
- Get more than one bid or estimate; do not automatically accept the lowest bid. Never pay in advance.
- Hire an arborist who is bonded, licensed and insured. Ask for proof.
- Look for current certification by the International Society of Arboriculture (ISA) or Tree Care Industry Association (TCIA). Arborists certified by either organization have been rigorously tested to ensure high standards of skill and knowledge.



Credit: ISA



Credit: TCIA

- Beware of doorknockers or cold-calls; would you hire a doctor from a flyer on your car windshield? A dentist who called you to solicit your business? Respect your trees, and yourself, enough to hire the best.
- A good arborist rarely recommends topping, and should offer other options if topping is requested. **AVOID TREE TOPPING** at all costs (*your* costs!).
- A good arborist should not use climbing spurs to work in your tree; do not allow this practice as it opens wounds in the tree trunk that allow disease and insects into the heart of the tree.

TOPPING

In a word, ***DON'T!*** Topping is one of the worst things you can do to a tree; it is extremely harmful to trees for a variety of reasons:

- Topping opens the 'heart' of the tree to rot, which may make the tree unsound and unsafe.
- Topping may actually make a tree hazardous, by creating openings for disease, pests and decay.
- Topping cuts usually produce sprouts that are weakly attached to the trunk and thus more likely to break off in a storm.
- Topping starves a tree through canopy loss.
- Topping may shorten the lifespan of a tree through malnutrition and stress.
- Topping removes the protection of branches and leaves, leaving the canopy interior exposed to sunlight and heat which may burn tissues beneath the bark.

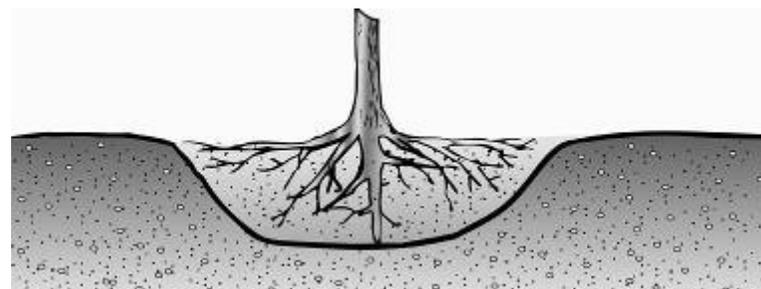
Topping may also be called rounding over, hatracking, heading, tipping, height reduction or stubbing.

Topping is expensive, both initially and into the future. Trees will typically try to replace lost leaves by throwing a multitude of shoots, which then have to be removed, an endless cycle. Topping often leads to expensive removal of a tree that has become a liability.

As if that weren't enough, topping is *ugly!* The tree no longer has its natural form and grace.

As you can see, topping is not only an insult to your tree, it's an insult to your pocketbook. It is clearly not in the best interests of you, or your tree. Contrast that to the powerful positive effects of proper pruning that make your tree healthier, more beautiful, safer and extends its useful life.

- Put the tree in the hole. If containerized, remove the container and 'massage' roots to loosen. Spread roots out in the shallow bowl, clipping any problem roots such as those that circle or kink. If balled-and-burlapped, make sure the hole is the proper depth—from bottom of root ball to root collar and no deeper—before removing all wrappings.
→ Remove all materials: twine, burlap, wire cage, etc. Remember the root collar from Page 1? Don't bury it; that's where the tree 'breathes.'



Credit: International Society of Arboriculture

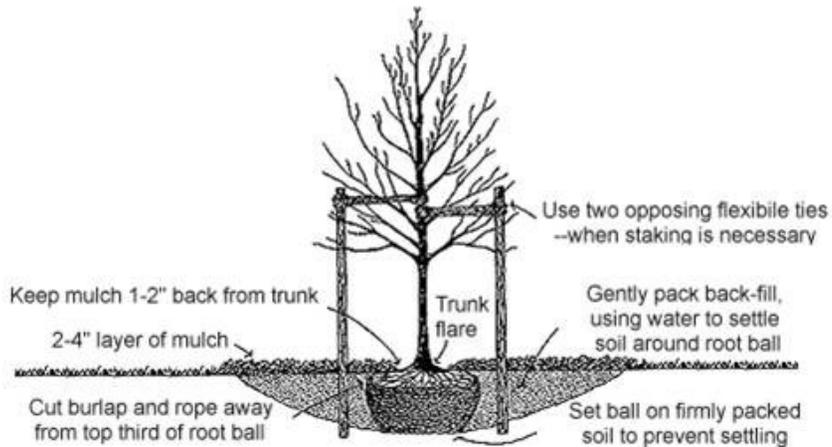
- Make sure the trunk is straight and backfill the hole with native soil, breaking up clumps if necessary. This is a 'tough love' situation; don't pamper your young tree with goodies in its planting hole—it won't send its roots out to become strongly established. Be sure that the root collar is free of soil.
- Water the entire planting hole thoroughly.
- Apply mulch two to four inches deep over the entire planting hole. Spread mulch so that it looks like a donut, not a volcano! Less than two inches of mulch doesn't effectively reduce the loss of soil moisture or discourage weeds; more than four inches prevents oxygen from reaching the tree's roots. Mulch should not touch the trunk or cover the root collar. For best long-term results, mulch should be a biodegradable material: shredded wood chips, rough compost, etc. Do not use sawdust or grass clippings.



Credit: International Society of Arboriculture



- Stake only if necessary; sometimes staking is a good idea more to protect the tree than to support it. Use sturdy stakes solidly installed, one on either side of the planting hole, no closer than 2 feet to the tree. Use a soft, stretchy material to fasten the tree to the stakes at right angles: wide nylon straps, rubber locklink, old t-shirts ripped into strips, even old nylon stockings! Never use wire or twine, even inside hose, as it cuts into tender young wood and may cut off the flow of water and nutrients to part of the tree.
- Leave stakes no longer than one or two years.



Credit: City of Olympia

Voila! Your new baby tree is home!

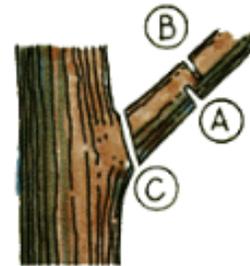
A few guidelines to help you prune your older trees well:

- Use the proper tools; chainsaws may be too large to make a good cut for the branches you're removing.
- Use clean, sharp tools. Dirty dull tools are more difficult to use, and may spread disease.
- Don't remove more than 50 percent of live canopy; remember that the tree needs leaves to feed itself.
- Prune carefully; remember that bad pruning cuts won't grow back and can cause long-term damage.
- Use correct pruning technique. For large branches, you may need to use a three-part cut:



Never use hedge shears to prune your trees.

Credit: City of Tacoma



Credit: City of Tacoma

- Cut A: make a short cut on the underside of the branch to prevent bark tears if you lose control of the branch.
- Cut B: remove the heavy end of the branch; may require multiple cuts.
- Cut C: make the final cut cleanly just outside the branch collar.

- Never make flush cuts; the branch collar contains special cells that help close the wound and protect the tree from disease, pests and rot.
- Do not leave stubs, which may promote internal rot.
- Stay on top of pruning tasks in order to keep branch removals as small as possible: smaller wounds creates less stress to the tree and close faster than large pruning wounds.
- Don't clean branches leaving a tuft of leaves at the end; this "lion's tailing" creates weak branches and may cause branch failure.
- Wound dressings are not necessary, and in fact, may foster disease, insects and rot.

PRUNING YOUR MATURING TREE

As a tree matures, pruning becomes more important

- for safety (traffic clearance, sign clearance, etc.)
- for shape (lightly thinning heavy branch ends)
- for structural training, to maintain a strong leader
- for aesthetics

Pruning should always have a purpose, and should always be done thoughtfully—you can't glue branches back on once you've cut them off!

The best time to prune is when you have enough time to take your time and do it properly. Here are a few suggestions for scheduling pruning tasks:

- Structural pruning is best done during the winter when the structure of deciduous trees is apparent due to lack of leaves.
- Dead, diseased or broken limbs may be removed at any time.
- Deciduous trees should NOT be pruned during leaf expansion; the wound will weep sap copiously and may attract insects and disease pathogens. Be careful to prune flowering trees AFTER they bloom; if you prune in late winter or spring, you will most likely remove the flower buds! Light pruning may be done in summer to reduce weight at branch ends.
- Coniferous trees may be pruned anytime, except early summer during the flush of new growth.

Caution!

Never work near powerlines!

Overhead wires that carry electricity are very dangerous; for your own safety and that of others, call your local power provider for assistance if you have a tree near powerlines that needs trimming or pruning.

CARING FOR YOUR NEW TREE

The two most important things you can provide for your new tree are water and protection against 'mower blight.'

Newly-planted trees need a minimum of 5 gallons of water per week during the growing season when they're in leaf, roughly May through September. Lack of water will stress a young tree, sometimes to the point of death. Providing ample water while the tree is young will help ensure a healthy, sound, disease- and pest-free tree for years. Once the tree is well-established, usually about 3 years here in the Pacific Northwest, the roots will be able to find water and nutrients on their own.

A young tree's roots are not yet able to make efficient use of fertilizers. If you *must* fertilize, please use an organic fertilizer and a light hand. Spread fertilizers sparingly at the drip line of the tree where the tiny feeder roots can take up those nutrients.

Anything that causes damage to the thin bark of a young tree is stressful, and that certainly includes wounds from string trimmers, weed whackers or lawn mowers. If the wound encircles the whole trunk, the tree may even die. The vessels which transport water and nutrients throughout the tree, the xylem and phloem, lie immediately beneath the bark and are easily cut or damaged in a young tree.

A large mulch circle will help prevent such damage, as well as reduce evaporation of important soil moisture. A mulch circle also helps reduce stressful competition for water and nutrients from grass and weeds.



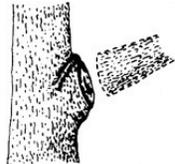
Credit: City of Tacoma

PRUNING YOUR NEW TREE

A young tree needs as much of its 'food factory,' its leaves, left intact as possible; therefore, a young tree doesn't require much pruning. Removing *dead, diseased, or damaged* branches—the three Ds—helps to reduce stress and keep the tree healthy.

Guidelines to keep in mind when pruning young trees:

- Prune with a purpose: remove only the three Ds (see above) to provide clearance or improve structure.
- Prune properly: bad pruning cuts can cause long-term damage.
- Make cuts as small as possible: smaller wounds create less stress to the tree than large pruning wounds.
- Prune off branches just outside the branch collar: this allows for faster wound closure and less exposure to disease pathogens and pests.
- Do not leave stubs, which may invite disease pathogens or pests.
- Never remove more than approximately 20 percent of a young tree's live canopy.



Pruning cuts should be made just outside the branch collar.

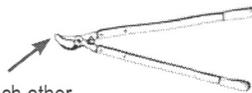
Credit: City of Tacoma

Hand pruner—bypass type



Bypass blades cross each other like those in a scissors.

Lopper—bypass type



Hand saw



Pruning saws usually have curved blades with teeth that cut when you pull.

GOOD PRUNING TOOLS

EXISTING TREES

What about trees that are already in place? Now we'll learn how to care for them, too, so that they are safe, sturdy members of our community.

- Water is just as important to a maturing tree as to a young tree, although most well-established trees are able to find enough on their own. During hot, dry summers, though, your older trees will also appreciate a long soak at the drip line every couple of weeks, which will help to reduce stress and keep the tree healthier.
- Fertilizer may be helpful to your tree if it is undergoing stress due to drought, damage to roots or other parts of the tree, or severe pruning. Fertilizer does not feed a tree, it just makes nutrients more available; trees feed themselves through the complex process of photosynthesis.
- Mulch performs the same functions for maturing trees as for young trees: it keeps soil temperatures even, reduces the loss of soil moisture, and reduces competition for water and nutrients from grass and weeds. A large mulch circle also protects the lower trunk from wounding by string trimmers, weed whackers and lawn mowers, one of the most common injuries found on urban trees.
- Protection from injury due to construction or traffic is important to maintain the health and soundness of your tree. Open wounds invite disease and pests, which may lead to internal rot that compromises the structural stability and safety of a tree.
- Protect the root zone; roots not only provide the water and nutrients that a tree needs to grow and thrive, they also anchor the tree. Reducing root mass or compromising root strength through tearing or crushing may cause the tree to die or fall over.