

THE TREE CARE GUIDE



**A handy guide
to planting and
maintaining your trees**

***Forest
Enhancement
Program***

 **Manitoba
Hydro**

FOREST ENHANCEMENT PROGRAM

The Manitoba Hydro Forest Enhancement Program has been in operation since 1995, funding hundreds of community tree planting projects throughout the province. Thousands of trees have been planted at schools, churches, boulevards, parks and recreation centres, memorials and campsites all over Manitoba. These trees serve to educate, beautify, and to provide erosion control, shade and windbreaks. The Forest Enhancement Program provides a way for people to become involved in their communities and create beautiful and useful green spaces for future generations.

ACKNOWLEDGMENTS

The [Tree Care Guide](#) was researched and developed by Jody Rutledge on behalf of the Manitoba Hydro Forest Enhancement Program.

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Coalition to Save the Elms

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CELEBRATING TREES

Canadians have a national culture linkage with the outdoors. It identifies us historically and defines much of what we celebrate. One need only look to our currency to see this on going love-affair with the natural environment being reflected as something that makes us uniquely Canadian. Trees are integral to this national vision of Canada; just as planting trees is an act of faith in the future that speaks to our collective need to celebrate and enjoy natural things.

Tree planting is an ecological investment whose rewards will be enjoyed for generations. By acting on the steps in this booklet and by consulting your local nursery, your project has an excellent chance of succeeding.

FOREWORD

The [Tree Care Guide](#) provides basic guidance for the participants of Manitoba Hydro's Forest Enhancement Program and the general public, to help ensure successful tree planting projects.

Proper planning, planting and maintenance are key for growing flourishing trees that will provide long lasting enjoyment. Simply putting a tree in the ground is not enough. Careful thought must be given to the purpose of the planting, location of the planting, tree selection and how the trees will be cared for once they are in the ground.

This booklet is organized as a step-by-step checklist of fundamentals to help you with your tree planting project. When looking for information specific to your endeavour, it is always a good idea to contact the professionals at your local nursery. You may also obtain valuable information from:

- Manitoba Conservation Districts Association
- Manitoba Habitat Heritage Corporation
- Manitoba Forestry Association
- Manitoba Conservation - Forestry Branch

PREPARING A PLANTING PLAN

SETTING OBJECTIVES

The planting plan will identify what tree species to plant, where to plant and how trees will be maintained.

What do you want to accomplish?

For Aesthetics or Community Revitalization, consider trees that provide:

- Shade (elms, maples...).
- Interesting foliage and colour (amur maple, chokecherry, tamarack...).
- Showy blossoms and fruit (apples, mountain ash...).

IT'S A FACT!

Cottonwood trees are hardy for our climate but the fruit is plentiful and has feathery hairs that can be messy in some situations. Be sure to consider this.

For Windbreaks and Screens, consider trees that are:

- Low maintenance (poplars, willows...).
- Suited to extreme wind and weather conditions (poplars, willows...).
- Drought tolerant (ash, oak...).

IT'S A FACT!

Fast-growing trees may be an appealing choice but tree species that grow an average of 1.5 metres a year may be weak and prone to breakage from high winds.

For Shade, consider trees that have:

- A long life span (spruce, oak, basswood...).
 - Known sturdiness and disease resistance (ash, oak...).
 - Large or spreading crowns (ash, basswood, lindens...).
- or a crown shape that suits your needs:



Full Crowned



Pyramidal



Spreading



Multi-stemmed



Weeping



Vase-Shaped



Columnar

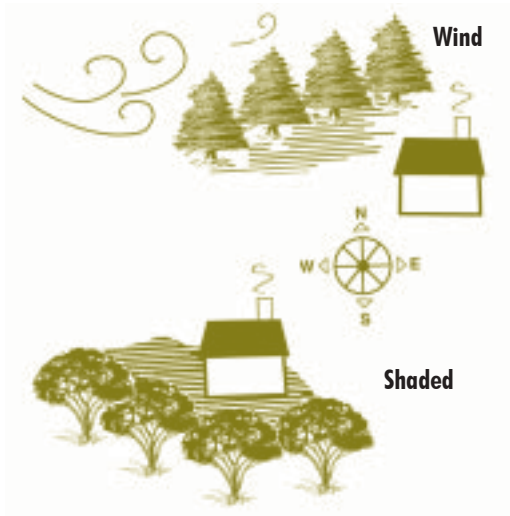
For Education, decide on a theme that integrates:

- Site characteristics.
- Tree life cycle.
- Planting method.
- Short and long-term maintenance needs.

For Energy Conservation, consider trees that provide wind protection and shade.

Your trees should:

- Have long life spans (pine, spruce, basswood...).
- Be hardy for the local setting (spruce, ash, maple...).
- Have tall, spreading crowns (conifers, maple, poplar hybrids...).



Evergreens planted on the northwest side of a building create windbreaks that can shield a home against wind and snow, reducing heating costs as much as 30 percent. Deciduous trees provide shade during the summer and permit sun to shine through in the winter. Tree shade can reduce air conditioning costs in residential and commercial buildings by 15 to 50 percent.

Tree Canada Foundation 2001.

IT'S A FACT!

Well-positioned trees can shade buildings and park spaces in the summer and divert prevailing winds in the winter. Energy costs can be decreased twelve months a year!

CONSIDERING LOCAL SOIL AND CLIMATE CONDITIONS

Soil

- Trees need soil with adequate nutrient levels, organic matter and good drainage.
- Select trees that are suitable for the soil found at the site.
- Seek advice from your local nursery.

Local Climate

Be aware of the following when selecting tree species:

- Annual rainfall - Is the planting site normally wet or dry?
- Wind exposure - Will the trees be sheltered from prevailing winds?
- Amount of direct and indirect sunlight - Will seedlings or young trees be shaded?

Drainage

- Good drainage is important for almost all landscape trees.
- Monitor the planting site for drainage patterns.
- Avoid planting in low areas.

IT'S A FACT!

Most soils should be amended using silty loam topsoil high in organic matter with less than 27% clay. Additional sand and organic matter may be needed in extreme cases.

SELECTING TREE SPECIES

Experience from Manitoba Hydro's Forest Enhancement Program suggests that the following trees have good survival rates:

Hoopsi blue spruce	Cherries
Blackhills spruce	Amur maple
White spruce*	Basswood/Lindens
Colorado spruce	Silver maple
Fallgold ash	Manitoba maple
Patmore ash	Paper birch
Green ash	Siberian larch/Tamarack
Black ash	Showy mountain ash
Mancana ash	Aspens
Manchurian ash	Poplars
Bur oak	Apples
Willows	

* Manitoba's provincial tree

The following species also perform well in Manitoba climatic conditions:

Fruit Trees

Canadian Plum*	Native	9 metres
Native Chokecherry*	Native	5-7 metres (not all chokecherry varieties qualify)
Pincherry*	Native	16 metres
Buffalo Berry	Native	6 metres
Sea-Buckthorn	Introduced	5 metres

*susceptible to black knot

Lilacs

Golden Eclipse Tree Lilac	6 metres
Ivory Silk Tree Lilac	6 metres

Most other varieties of tall growing lilacs have a mature height of 3 metres.



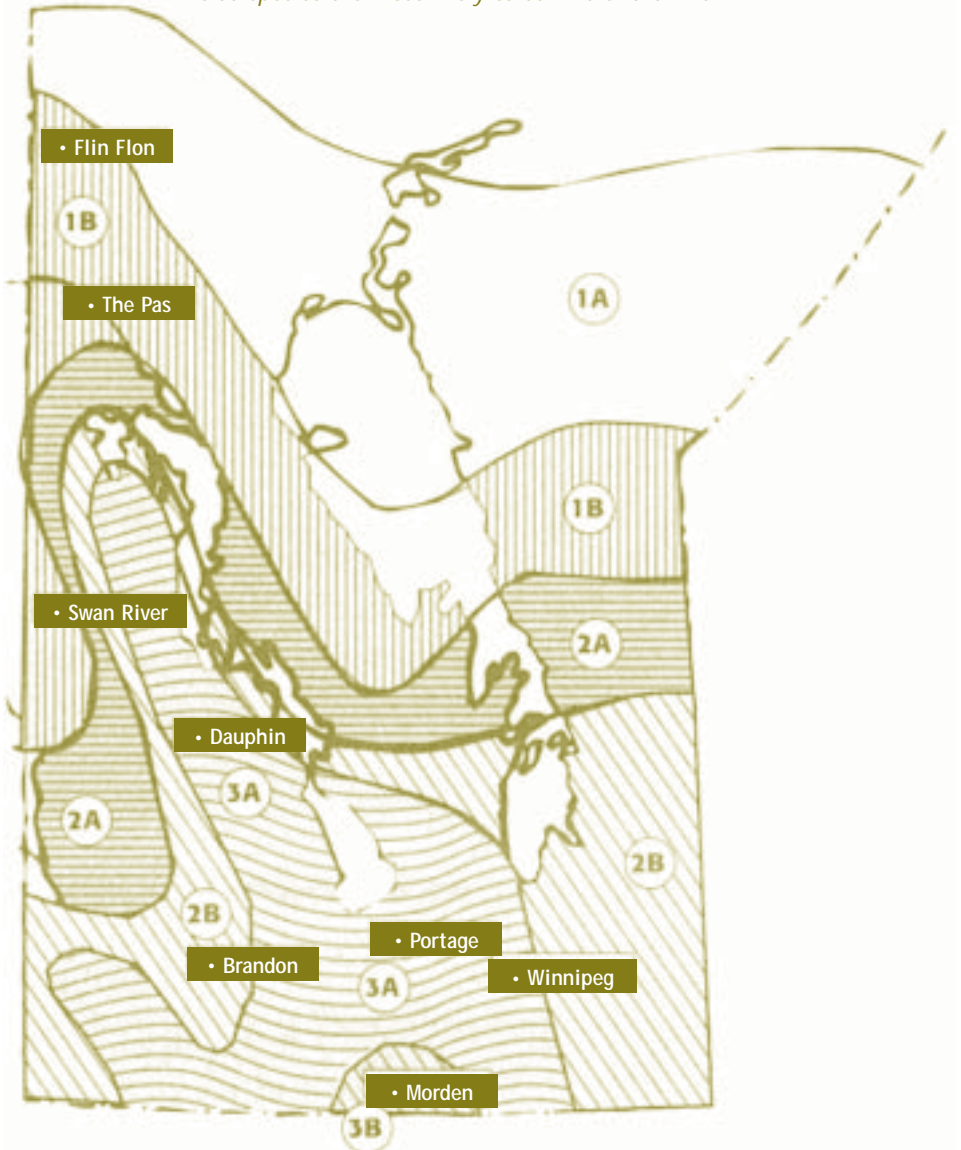
Black Knot is a fatal disease that attacks plum and cherry species trees. Shubert chokecherry seems to be particularly susceptible to infection and may infect other trees. Black Knot must be attacked quickly before it spreads by careful pruning and immediate removal and disposal of all cut branches. Do not leave pruned branches on site to avoid spreading infection.



There are certain plant characteristics to consider when selecting trees: consult your local nursery.

Manitoba's Hardiness Zones

Based on climate conditions, indicating where plant and tree species are most likely to survive and thrive.



- **Hardiness:** Select species that are hardy for your region.
- **Species Diversity:** Be sure to include two or more species in your planting.
- **Tree Size & Aesthetics:** Select species based on their suitability as both a seedling and a mature tree.
- **Growth Rate:** A fast growing tree species may be weaker than a slow growing tree species and may be at a greater risk to damage in extreme weather events.
- **Salt Tolerance:** Consider salt tolerance of a tree species when planting on boulevards or near moderate to high-speed traffic routes. Silver maple, ash, Russian olive, poplar, willow, lilac, European larch and Colorado spruce are some species that demonstrate better salt tolerance than others.
- **Drought Tolerance:** Species native to an area of low annual moisture are well suited to local growing conditions.
- **Maintenance:** Select a species knowing the amount and type of care required.

IT'S A FACT!

Conifers require more water than deciduous trees for two to five years **after** planting!

CHOOSING STOCK TYPE AND SIZE

Select the stock type and size of tree based on:

- **Planting Site:** Sites with a lot of foot traffic or young children may require larger size tree stock.
- **Capability of the people planting the trees.**
- **Availability of equipment:** tree spade, backhoe, shovels.
- **Survival rate:** bare root, potted, balled in burlap.

Common stock types:

Bare Root

This stock type is commonly sold with peat moss covering the roots. Avoid damage to the root ball by careful handling and planting soon after purchase. The peat moss and roots should be kept moist, covered and out of sunlight before planting. Cuts or tears to the roots increase its vulnerability to infection and disease. Drying out of this stock type can occur easily and should only be planted in early spring when soil moisture levels are higher.



Potted – These trees are sold in plastic or peat pots (1- 5 gallon sizes). This container grown stock offers better protection against transplant shock and drying of roots during transport and storage. This stock type can be planted at any time during the growing season; however, spring and fall are preferred for Forest Enhancement Program projects. This stock type should be kept shaded, cool and watered if being stored for one or more days. **All pots must be REMOVED prior to planting!**



Balled in Burlap (B&B) – Trees are sold with burlap secured with twine or wire surrounding the root ball. All burlap, twine and wire should be removed prior to planting. If the stock will be stored for one or more days it should be kept shaded, cool and watered. Be sure to handle this stock by lifting the soil ball. **NEVER** move a B&B tree by lifting at the stem.



Field Grown (tree spade) – This is typically large stock and will require a professional to lift, transport and plant. Vulnerability to transplant shock and root ball damage is low. If this type of stock is to be stored for more than a day or two the root ball must be burlap wrapped, kept moist and shaded.



“CALL BEFORE YOU DIG”

Call local utilities when planning your project. They will review your plans and visit the site to mark any service lines or pipes present. Planting directly over these service lines and pipes must be avoided to ensure that future problems do not result.

Trees should not be planted under or within 5 meters of overhead powerlines. If this is unavoidable, plant shrubs or low growing trees in these areas.

Utilities to Remember:

- Manitoba Hydro and Centra Gas (1 866 480-1212)
or in Winnipeg 480-1212
- MTS
- Cable Provider
- Water & Sewer Provider



DECIDING WHEN TO PLANT

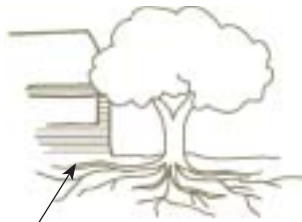
- The Forest Enhancement Program suggests planting trees in the spring before bud break or fall when the trees are dormant and less likely to suffer transplant shock.
- Trees should not be planted after mid-October.
- Water stress and risk of transplant shock will increase during periods of high temperatures and low precipitation. Plant at times when these conditions can be avoided.

DETERMINING TREE SPACING

- Be sure to allow for adequate tree growth above and below ground when planning the location and relative position of the trees.
- Consider the size of the tree and the spread of its crown and roots at maturity when planting near buildings or other permanent site structures.



Seedling 1st year



*Foundation Problems

Too close - forces excessive pruning

**Trees planted too close to a structure can cause excessive pruning and tree roots will penetrate cracked foundations and any other cracked or fractured underground structures.*



Seedling 1st year



No Foundation Problems

Proper spacing - pruning not required

Tree Spacing Guidelines:

- Trees in urban soils should be planted no less than 4 meters apart.
- Trees in undisturbed soils should be at least 2.5 meters apart.
- Trees should be planted at least 2.5 meters away from sidewalks and walkways.
- Trees should be planted at least 4 meters away from buildings.

ARRANGING FOR PURCHASING, TRANSPORTATION AND STORAGE

OBTAINING PRICE QUOTATIONS

Several quotations should be collected for cost comparison from local nurseries or suppliers and should include:

- Cost of tree stock.
- Freight charges.
- Any additional materials: topsoil, mulch and peat moss.

Compare cost and overall stock quality to find the best supplier. Remember, cheaper is not always better! To ensure high quality stock is purchased, inspect and select the trees prior to purchase.

INSPECTING STOCK QUALITY

Good quality tree stock will show:

- **Normal growth form:** At least half of all foliage should be found on the lower two thirds of the tree.
- **Tapered stem:** The stem should taper slightly from bottom to top. Severe taper or reverse taper trees should be avoided.
- **Correct pruning:** Branches and twigs should not be torn or show other signs of damage. Do not purchase trees that show oozing or “bleeding” cuts.
- **Green foliage:** No discoloration, spots or insect feeding should be seen. Foliage should not be wilting or drooping.
- **Leaf buds:** Abundant bud set should be seen on trees purchased in fall or spring. Actively growing branch tips should be present on stock purchased in mid to late summer.
- **One main stem:** Trees should have one main stem and no pruning scars at the base of the tree. Be careful not to confuse this with graft faces.
- **Healthy bark:** Bark should be free of mechanical or insect damage. Check for abrasions caused by guards, wires or stakes.
- **Healthy root growth:** Root ball should show abundant fibrous root growth. Roots should not be circling the pot and should not be kinked or cut.
- **Quality guarantee:** Nurseries will often guarantee their stock quality for at least one year from time of purchase. Trees should be replaced with like or similar species of the same size and quality.

PLANNING TRANSPORTATION AND STORAGE

- Always minimize the time between purchase and planting.
- During transport, trees should be covered and kept moist.
- Avoid moving trees during extreme temperatures.
- Once trees are on site they should be inspected for damage that may have occurred during shipping. The soil or peat moss that covers the roots should be moist.
- If trees must be stored, they should be covered, watered and shaded.
Assign a project member to take care of the trees.

KNOWING HOW TO PLANT

PREPARING THE PLANTING HOLE

- Dig the hole two times wider than the root ball and slightly deeper than the height of the root ball.
- Planting depth is correct when the root flare is JUST BELOW the soil surface. The root flare is the point at which the tree stem divides into the root system. Locate the tree's root flare by carefully removing soil around the base.
- Plant trees so root flare is slightly above ground level to allow the root flare to settle just below the soil surface.



Two times wider than the root ball

IT'S A FACT!

Prepare the planting holes before the stock arrives; it's a great way to minimize storage time for the trees!

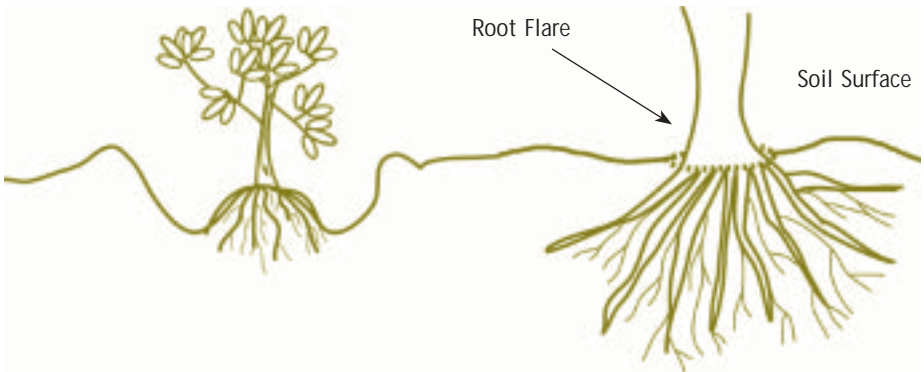
INSTALLATION TECHNIQUES

- Remove ALL containers, burlap, twine and wire from the root ball. The soil around the roots should be left intact and the roots should not be kinked or broken.
- Prune any damaged or diseased roots with a sharp, sterile, knife.
- Be sure to have quality backfill on site for planting the trees. It should be composed of no less than 5% organic matter and no more than 27% clay.

Planting method varies with stock type. Here are some tips.

For Bare Root Stock:

- Build a small mound of soil in the centre of the hole. Let the roots drape naturally over this mound making sure they are not kinked.



- Backfill about three-quarters of the hole and tamp the soil to remove any air pockets. Water to promote good contact between the roots and soil. Finish filling the hole and tamp slightly. Water thoroughly.

IT'S A FACT!

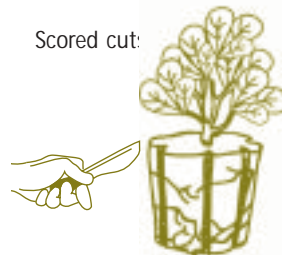
Soil that is highly compacted decreases the roots ability to exchange oxygen and carbon dioxide. Backfill should be slightly tamped to remove any air pockets. **DO NOT STOMP** on the soil!

- The finished planting hole should be saucer-shaped and surrounded by a soil embankment. This is required for all stock types. During heavy rainfall, monitor the embankment and open to reduce flooding.



For Potted Stock:

- Remove containers by tapping the sides and bottom.
- DO NOT force the plant out of the pot. It may be necessary to cut the sides of the pot to remove the plant.
- Score the root ball by making vertical cuts down the root ball.



Butterflying is an acceptable alternative:



Butterfly cut

- Plant these trees slightly above ground level to allow the root flare to settle so the root flare is just below the soil surface. Backfill two-thirds of the hole with soil. Tamp and water. Fill the remaining hole to create a saucer-shaped cup and embankment. Tamp and water.

For Balled in Burlap Stock:

- Remove all wire, twine and fabric prior to planting.
- The hole should be deep enough that the top of the soil ball is at ground level.
- Position the tree in the centre of the hole and backfill around the bottom third of the root ball. Firmly press this soil around the base. Water gently.
- Fill the hole to ground level to create a saucer and embankment.
- Tamp and water thoroughly.

IT'S A FACT!

Many trees do not survive because they are planted too deep. Proper planting depth is critical! The root flare should be just below the soil surface. Monitor the depth throughout the planting process by using a string line drawn across the planting hole.

Once the tree is planted, remove all nametags and flag tape.
If identification is necessary, place a nameplate on a soil stake.

APPLYING MULCH

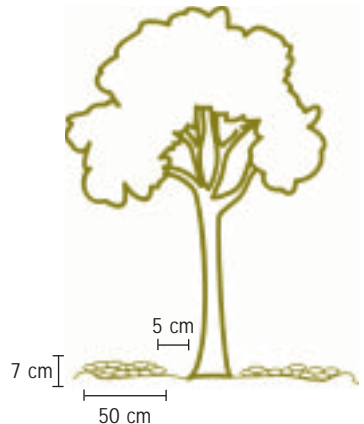
Mulch is important for several reasons:

- Keeps the soil moist by decreasing evaporation.
- Decreases competition from weeds.
- Creates a buffer between the tree and weed trimmers or mowers.
- Increases the effectiveness and longevity of fertilizer applications.
- Moderates soil temperature.

Mulch types include bark chips, wood chips, rock, flax shives, sawdust, hay, straw and even old newspapers.

How to apply a layer of mulch:

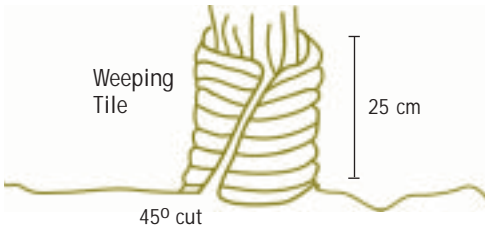
- Do not cover the area immediately surrounding the stem, measure out 5 cm and begin there.
- Spread the mulch around the tree to a distance of approximately 50 cm from the stem.
- The mulch layer should be approximately 7 cm deep.
- Reapply as needed.



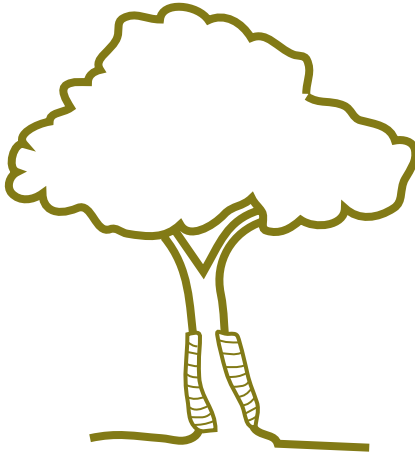
PROVIDING PROTECTION

Tree guards are used to protect the stem against animal and machine damage. Each tree should be protected with a tree guard or wrap. Materials used for tree guards include:

- Weeping tile
- Plastic tubing
- Plastic lattice or coils
- Trees will often be sold with flexible white plastic coils already present. These are satisfactory for the first year but should be replaced as the tree grows.
- Tree guards should be at least 25 cm tall. Cut the weeping tile down one side at a 45° angle and fit it around the tree base.



Weeping tile or corrugated plastic tubing is an inexpensive and effective material that can be used to protect tree stems for many years.



IT'S A FACT!

Many trees will die or be damaged by tree guards left on for too long. Remember to check the tree protection regularly to ensure it is not damaging the trees.

PREPARING A MAINTENANCE PLAN

WATERING

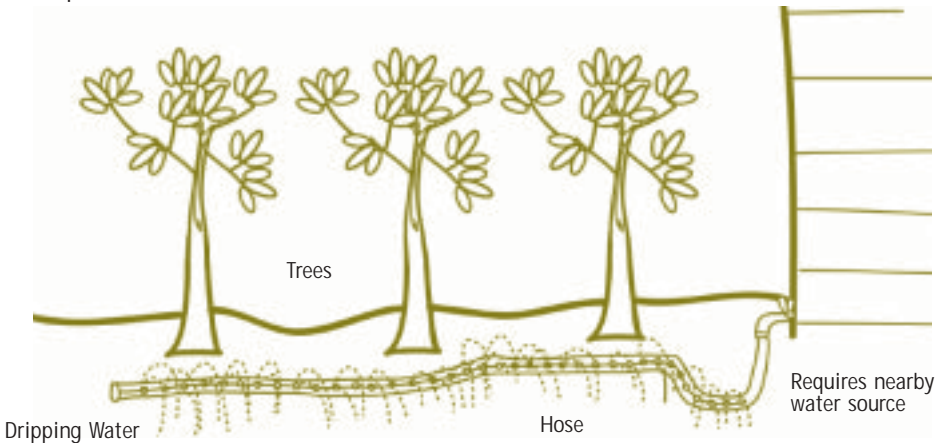
Adequate watering may be the single most important factor affecting the survival of transplanted trees. A drought stressed tree is more likely to succumb to other threats including transplant shock, pests or disease.

Tips on Watering:

- Water the tree regularly for the first TWO years after planting. Some trees may need watering for three or four years to become established.
- Water the trees at least once a week. Increase frequency during dry periods and decrease during wet periods.
- Conifers may require more water than deciduous trees.
- Irrigation is not adequate if the trees have wilted foliage or show slow, stunted growth.
- Ideally, trees should be watered in the early morning.
- Watering should taper off a few weeks before the first frost.

Watering Methods:

- Slow-drip irrigation: This method is most effective at producing a tree with a healthy and expansive root system. Each week, let water trickle for a few hours to ensure deep soil saturation.



- Hose or water truck: Trees should be thoroughly soaked once a week to ensure water is delivered deep into the soil.

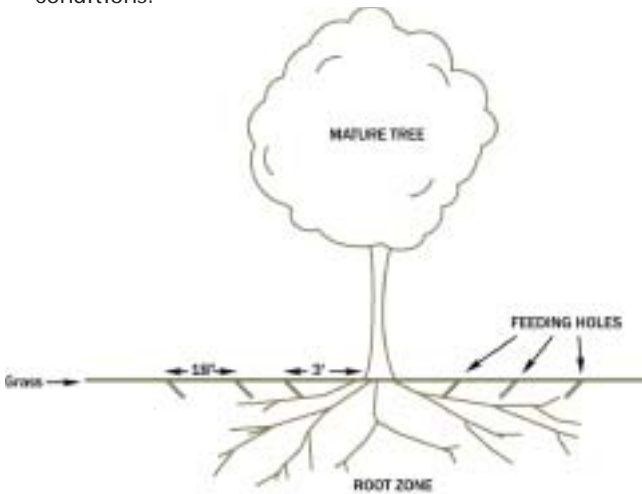
FERTILIZING

Fertilizers are not a cure for an unhealthy tree but rather will enhance growth that is already occurring. Fertilizers should be used with care. Don't hesitate to consult your nursery or the supplier.

- It is not necessary to add fertilizer at time of planting.
- Fertilizing is part of good long-term maintenance and should be applied every one to two years, depending on soil conditions.
- First fertilizer application should be at the beginning of the second growing season. Be sure to follow the manufacturer's recommendations for application method and rate.
- Check with the nursery to determine local soil conditions.



Aerial view showing placement of fertilizing holes around new or mature trees



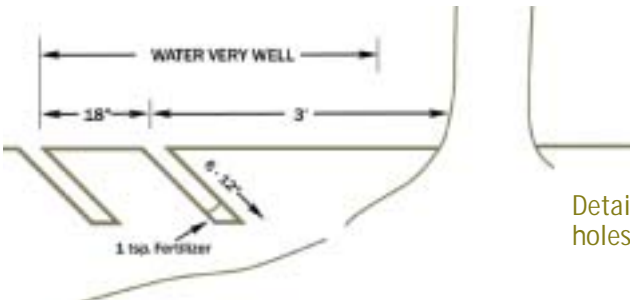
Examples of fertilizers to use are:

20:20:20

16:20:0

11:48:0

Others are good as long as they DO NOT contain weed controlling herbicides.



Details of tree/shrub fertilizing holes and fertilizer placement

STAKING

There are two reasons to stake your trees:

- Protective staking is used in high traffic areas. They protect against mower or weed trimmer damage and will divert foot traffic away from the tree base.
- Support staking is used to stabilize a tree as it establishes. These stakes should not be rigid but rather allow for restricted movement of the stem.

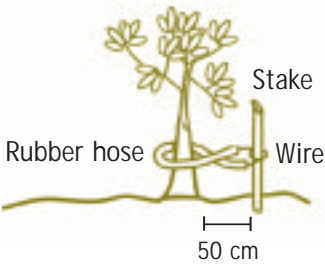
How to Stake a Tree for Support:

- Trees smaller than two metres will require one stake and larger trees will require two or more.
- Stakes should be 2 m long and secured 50 cm into the ground.
- Stakes should be placed 50 cm away from the stem.
- Using a 9 – 12 gauge wire strung through rubber hose, loop it around the tree and back to the stake making two loops.
- The tie should be about a quarter of the way up the stem.

Tree greater than 2 metres



Tree less than 2 metres



IT'S A FACT!

Support stakes should remain on the tree for only one growing season. Test stability by moving the trunk back and forth. Remove the stakes if the soil around the roots does not move. If the tree needs to be staked for another season, growth requirements are not being met.

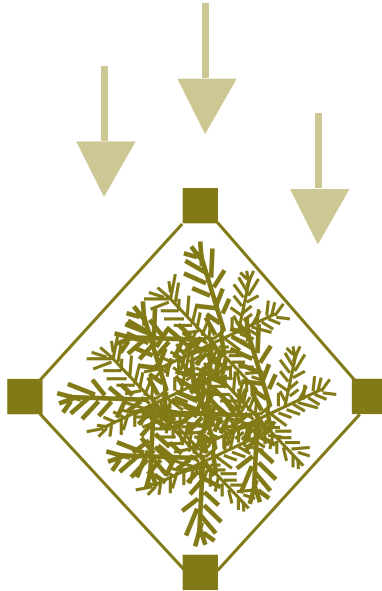


Stakes are a common source of damage to the tree trunk and should be checked frequently for fit and stability.



WINTER PROTECTION

- Trees require adequate water before winter.
- Decrease frequency of watering in fall to correspond to lower temperatures.
- Water before ground freezes.
- Burlap can be used to protect evergreens from winter drying. The fabric should be attached to wooden stakes and placed so that the burlap does not make contact with the foliage.



Conifers suffer from both wind and snow desiccation. Complete wrapping will help avoid having young trees dry out during winter, reducing winter-kill.

PRUNING

Correct pruning is essential to the health and form of your trees. Pruning should only be done after mid-October and before the end of April. No heavy pruning should be done before the second growing season.

Tips on Pruning:

- After planting, prune any dead or torn branches and lightly prune small, internal branches, leaving all major branches intact. This will compensate for any root loss during the transplant.
- Sterilize tools between pruning trees to prevent spread of infection or disease. Use a 1:1 solution of water to chlorine bleach or denatured alcohol.
- The Canadian Forestry Service recommends that all cut faces be left untreated. Tree paint or other solvents used to “seal” the cut are unnecessary.
- Remove competing root or stem sprouts as they appear.

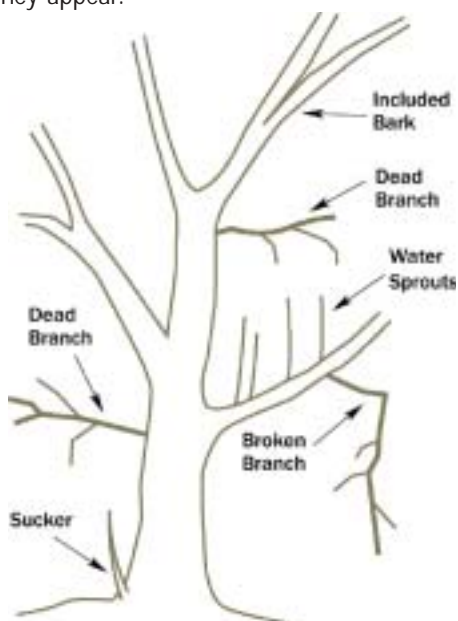
Remember a simple pruning rule:

Never remove more than one-third of a branch and never remove large branches that make up more than one-third of the crown.

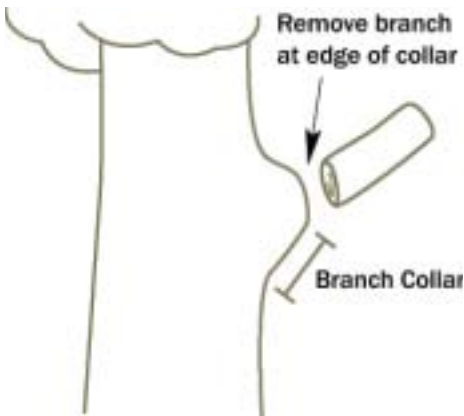
General Tree and Shrub Pruning Guidelines

Correct pruning is essential to keep shrubs and trees healthy and safe in an urban environment. General pruning is not very difficult and can be done by anyone who is willing to invest time in caring for their trees and shrubs. To assist you with proper pruning techniques, please follow the guidelines set out here.

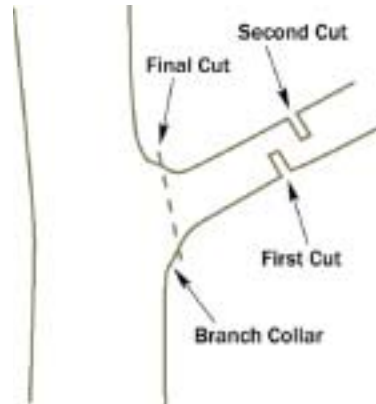
- Proper equipment is a must! Use a pair of good quality bypass pruners or pruning saw, depending on the size of branch to be removed.
- It is recommended that pruning tools be sterilized in a 1:1 solution of water and bleach or denatured alcohol (gas line antifreeze works well) between each cut. This will minimize the spreading of disease.



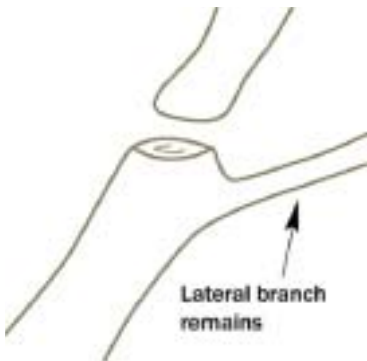
- The use of pruning paint or similar products to seal a wound is not recommended.
- Heavy pruning or removal of large limbs should generally only be done when the plant is dormant, either before the leaf buds swell in spring or after the leaves have dropped in fall.
- Some plants like lilacs and fruit trees flower on old wood. Minor pruning on these plants can be done once they have finished flowering. This will ensure that they will flower the following year.
- Minor pruning on conifers should be done after the buds have broken. The general rule with conifers is to prune the new growth tips in mid-June around Father's Day.
- Any diseased, broken, dead or structurally unsound branches should be removed immediately.
- Remove any competing suckers or stem sprouts as they appear.



When removing a branch, the final cut should be made just outside the branch collar.



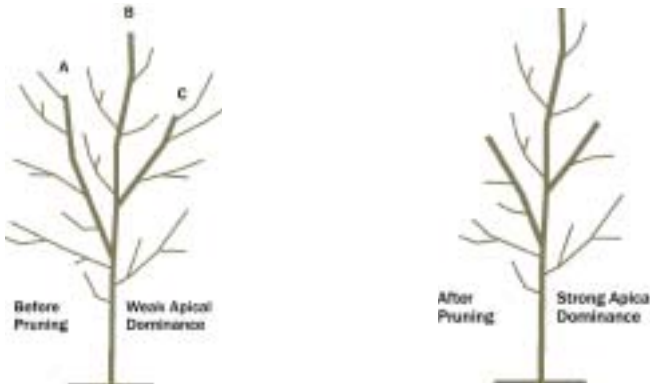
Large limbs should be removed using the three cut method to reduce damage to the main stem.



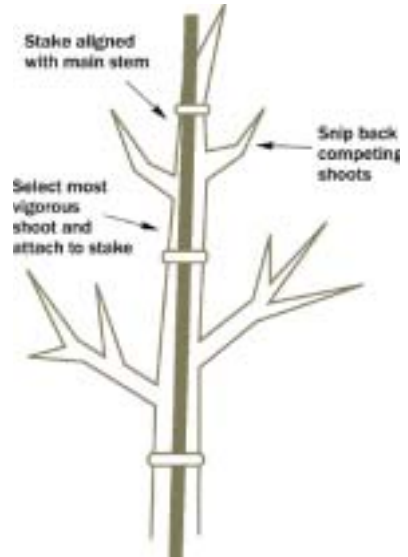
To reduce the length of a branch, the cut should be made at a lateral branch large enough to have apical dominance.

Apical Dominance

Apical dominance refers to a condition where the terminal bud inhibits lateral branch growth on the same stem. Apically dominant stems are also called 'leaders'. The tree on the left has three leaders which gives the tree an overall weak apical dominance. This condition should be resolved by pruning the competing leaders as in time this tree may become structurally weak. The tree on the right has been pruned and now has only one leader, giving the tree strong apical dominance. This tree will be much more structurally sound when mature compared to the tree on the left.



When establishing a new leader on a conifer, select the largest, most vigorous shoot and attach it to a small stake aligned with the trunk. If there are only two shoots, the smaller one should be removed. If there are more than two shoots, the smaller ones should be clipped back, so they do not compete with the new leader. The support should be removed in the next growing season.



- How a tree responds to pruning will vary depending on its species and age. Generally, fast growing species and younger trees will respond the quickest.
- Trees should be pruned when young so they can grow into the desired shape.
- Old trees should only be pruned to remove dead, damaged, or diseased branches, or pruned to preserve structural integrity.

LONG-TERM MAINTENANCE

- Water trees regularly for at least two years after planting (some may require three to four years).



- Remove support stakes after the first growing season and if necessary after two years. Protective staking can remain indefinitely but should be checked frequently and adjusted to fit the growing tree.



INTERNET RESOURCES

Manitoba Hydro

www.hydro.mb.ca

City of Winnipeg – Forestry Branch

www.city.winnipeg.mb.ca

Coalition to Save the Elms

www.savetheelms.mb.ca

International Society of Arboriculture

www2.champaign.isa-arbor.com/

Tree Canada Foundation

www.treecanada.ca

Tree Pruning info:

<http://hort.ifas.ufl.edu/woody/pruning/>

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