Parks and Open Space Management

Saskatchewan Parks and Recreation Association Inc.

Tree and Shrub Bed Maintenance Handbook

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Introduction and Disclaimer of Liability for Use of the Document

This Parks and Open Space Management Handbook, provides a description of procedures associated with maintenance activities performed within park settings.

The concept of maintenance standards requires the application of best practices within the local operation system. To assist with the establishment of such standards, this resource provides guidelines to aid staff in addressing their daily management operations. There are, however, situations where the standards outlined may require revision by those staff implementing the procedure, to best meet their needs. Specific site conditions, operating budgets, available human resources, and capacity to offer training associated with the practices outlined in this document may warrant alterations to the procedures.

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Acknowledgments

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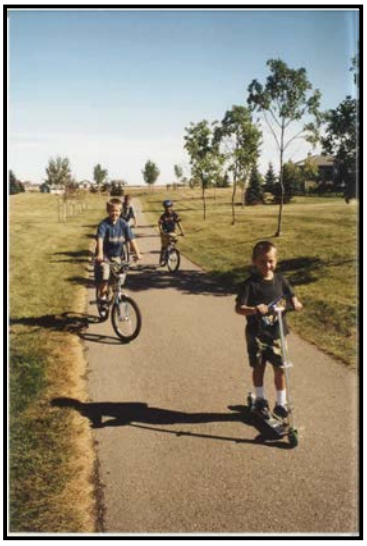


The spring thaw had come early this year and the bike path was buzzing with activity. People were biking, roller-blading, jogging, and walking their pets – all thrilled to finally be able to enjoy some long awaited time outdoors.

Today was your first opportunity this year to get out and actually visually inspect the tree and shrub beds for any damage they may have received over the winter months. So far you had been lucky, there had been only the odd new planting that you tightened the stakes on and adjusted, or in some cases, replaced the protective wrap on the tree trunks.

You also noticed a rabbit out at the sites, but were not surprised as you had seen some of its handiwork on a few of the trees. The only problem is that it's very seldom that there is only one rabbit present.

Some children that were playing on the nearby play structure had seen the rabbit as well and were headed your way. "There's another," an elated voice exclaimed! Caught up in their own excitement, the children began to race after the rabbits, laughing and giggling the entire time.

The man who you had seen the children with at the play structure was now making his way over to where you were standing. “Not only are they keeping the kids busy - I see they are managing to keep you busy too,” he commented. I had just come across a tree that the protective wrap had been visibly damaged by the rabbits. “I’m afraid they will be keeping me on my toes all season long,” you said while starting to replace the protective wrap. “I have seen enough rabbits out here today to keep the kids busy for the rest of the summer,” gesturing towards two others that had appeared out of no where. “Then I guess we will be seeing more of you,” the man said over his shoulder as he joined in with the kids.

Tree and Shrub Bed Maintenance Overview

The community's residents are inspired by your department's beautiful parks and green spaces. As the winters here are so long and cold, once spring arrives, everyone gets anxious to be outdoors.

From spring through to fall, maintaining the tree and shrub beds is a never ending task. There are a number of different things that are done by the department and the efforts are rewarding to everyone that takes the time to enjoy them.

Weeds can cause the tree and shrub beds to become unsightly. Sometimes in the spring and the fall, the beds can be treated with a herbicide application which will kill any weeds that are in the process of germinating. The weeds can be controlled throughout the season by adding mulch to the top of the soil, string trimming the area and / or rototilling.

The most important aspect of maintaining the tree and shrub beds is taking the proper care of the plantings. After all, what would a tree and shrub bed be without the trees and shrubs? Keeping the trees and shrubs disease free and safe from rodents is vital. There are a number of different measures that can be taken; pruning, planting new trees and shrubs, removing any ones that may not have made it through the winter as well as protecting them from rodents and wind damage throughout the year.

Your Day Begins….

Safety Equipment Overview

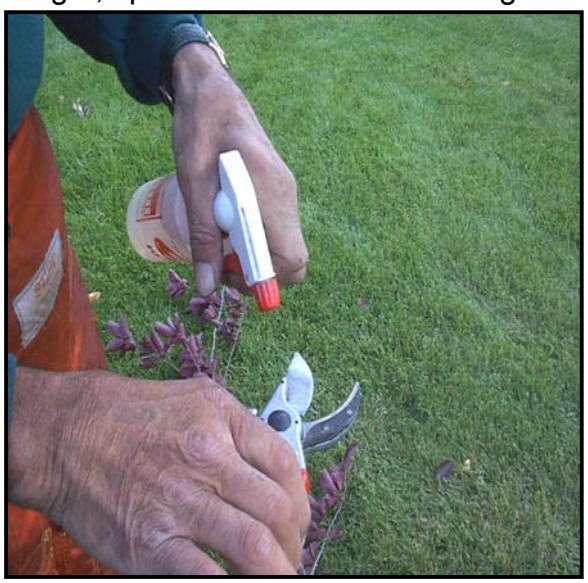
From your experience you know the importance of wearing the correct safety clothing and safety equipment. You recall the standard safety gear used by the workers within your department.

Benefits of Pruning

Pruning is the selective removal of stems and branches without changing the natural form of the tree or shrub. Keep in mind that fast growing deciduous trees or shrubs (trees and shrubs that loose their foliage in the fall) that are in full sunlight can be pruned more than slower growing ones in the shade.

A well-pruned shrub will contain stems of various ages. A healthy shrub with good balance between its top branches and roots will produce three or four new shoots every year.

An annual spring pruning is a good thing – as long as it's done right. Before you begin to prune, study the plant to determine its natural form, growth rate, habit of growth, height, spread and time of flowering.



You can remove dead, diseased or broken branches from trees or shrubs at anytime. In fact, if the tree and shrub is diseased, the sooner the better. This will stop it from spreading to neighboring trees and shrubs. If the branch is diseased, remember to rinse your pruning tool with a disinfectant (for example, methyl hydrate or a 5% bleach solution) after every cut you make with the pruning tool.

If it is an *Ulmus* (Elm), *Malus* (Crabapple) or *Prunos* (Chokecherry, Amer Cherry etc.) species, spray tools after every cut.

Benefits of Pruning Continued…

When trees and shrubs are thinned the following occurs:

- ☑ Light is allowed into the center of the plant, which stimulates new shoot development.
- ☑ More flowering wood is developed throughout the tree or shrub.
- ☑ Increased air circulation within the plant discourages certain pests.
- ☑ The size and the shape of the tree or shrub is easier to control.

Pruning Tools

You should use different types of pruning tools depending on the size of the branch you want to cut. Here are the different tools you use when pruning:

Hand Pruner

You use the hand pruner (or hand secateur) for cutting small branches that are no larger the then 3/4" in diameter. When using a hand pruner, you always position it so that the wider blade is on top and narrower blade is below. You find that this method works best because you can apply more pressure with your fingers than with your thumb, and you always want the most pressure to go to the wider blade for easier pruning.

Lopping Shears (Loppers)

You use the loppers for branches that are no bigger than 1" to 1 ½" in diameter. The long handles enable you to prune hard-to-reach branches.

Curved Saw

Use the curved handsaw for pruning tight branches that are growing close together or once branches are over 1 ½" thick.

Pruning Tools Continued...

Power Pole Pruner

You use the power pole pruner for branches that are 1 ½” to 4” in diameter and for ones that are difficult to reach from the ground with the previous tools mentioned.

Chainsaw

You use the chainsaw for branches and trunks that are 4” or larger in diameter. As a rule of thumb, you would use the chainsaw for branches that are too large for any of the other pruning tools previously mentioned.

Power Pole Pruners and Chainsaws

The power pole pruner has a gas-powered engine at one end of a telescoping pole and a 12-inch chainsaw at the other end. It's capable of cuts up to 20 feet off the ground. Despite the dangers associated with power tools, this power pole pruner is still safer than using standard chain saws or climbing up trees or ladders to be able to prune the branches

Having operated a chainsaw on various occasions, you're aware of how important it is to follow the safety procedures when using this equipment.

Because the chainsaw is the most dangerous pruning tool to use, when operating it you always wear the following safety equipment:

Safety Procedures

When you are using the power pole pruner and the chainsaw, there are important procedures you must follow to ensure your own safety and the safety of others:

☑ When starting, always make sure that the equipment is firmly set on the ground.

When cutting with the power pole pruner:

☑ You need to be very careful of your assistant and any other people that may be around. Because of the long handle it would be difficult to cause harm to yourself, but not someone else!

When cutting with the chainsaw you always:

☑ Keep your chainsaw below your shoulders so that you never lose control of it.

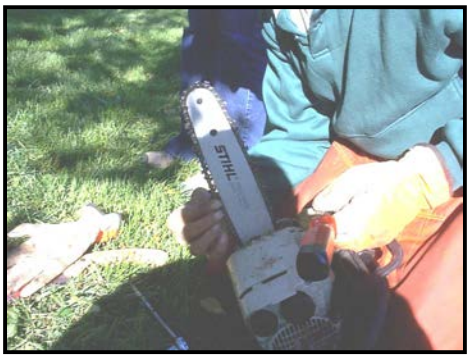
☑ You always make sure bystanders and other crew members stay at least 1 meter or more away. Your assistant is responsible for removing all the cut branches you saw off so that you don't trip over any of them.

☑ You keep both hands on the chainsaw at all times.

☑ You never use the chainsaw on anything other than wood because the machine is not designed for cutting anything else.

Safety First!

You always make sure that the chain is not too tight, or else the chain may break. You also make sure that the chain is never too loose, otherwise it may fly off the chainsaw. Ideally, you want between 2 to 3 teeth of play at all times.



Pruning Basics

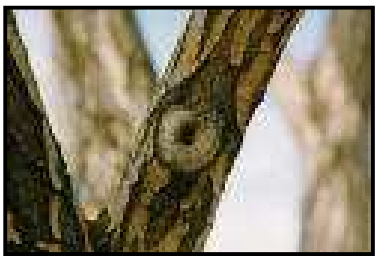
Removal Cut

This cut is used to remove an entire twig, branch or limb back to its origin. The cut thins out the tree and allows more light in.

A Proper Cut

At the base of every branch is a collar that contains a chemical zone which prevents the spread of decay to the trunk.
Make the cut just outside the branch bark collar (the swollen area where the branch meets the trunk). The branch bark collar contains chemicals that speed the formation of callus tissue that seals the wound. When decay develops in a branch, it moves down the branch until it reaches the protective chemical zone. Once there, it stops and a callus forms after the branch is removed.

An Improper Cut



Don't cut too close to the trunk. This makes the surface area of the cut too large and will take longer to heal. As well, if you cut to close you will penetrate the inside of the bark on the tree trunk which in turn will delay the sealing of the wound and cause unnecessary stress to the tree.

And, while it's important not to cut too close to the trunk, you don't want to cut too far away from the trunk either. This will leave an ugly stub, which can cause decay back into a larger branch or stem and rot or decay can set in. It also can give insects or disease an entry point. The wound cannot seal until the stub is removed.

Pruning Basics Continued...

Here are the basic steps to follow when using a removal cut on a large branch, usually with a saw.

1. Make a shallow cut on the underside of the branch, about 4” or 5” from the trunk.

2. You can cut off the branch starting on the top side about 2” to 3” from the initial cut. When the weight of the unsupported branch causes it to fall, the initial cut keeps the bark from peeling down the side of the trunk.

3. Now you can make your final cut and remove the remaining stub. Make this cut just outside the branch bark collar, the slightly swollen area where the branch and trunk are joined together.

Pruning Basics Continued...

Heading Cut

This cut is made anywhere on a twig, between two nodes, or on branches or limbs. By using this cut to prune the trees you are encouraging growth below the cut and the result will be a fuller tree.

Proper Cut

To make a proper cut, make the cut about 1/4” above a bud. You choose a bud facing the direction you wish the new growth to follow, and angle the cut in the same direction.

Improper Cut

When cutting back stems, you avoid making the cut halfway between buds. This leaves a long portion of the stem to wither and die which is unsightly and invites insects and disease.

Pruning Deciduous Trees and Shrubs

Deciduous trees and shrubs are ones that lose their foliage in the fall. The best time to prune deciduous trees and shrubs is in the dormant season or following a growth flush, after leaves harden and turn dark green in the summer. Light pruning (removing less than 10% of the foliage) can be performed at anytime. If pruning in the summer, limit this to removal of dead wood, broken branches, diseased branches or rejuvenating plants. Pruning at this time allows the trees and shrubs to begin healing early in their growth cycle. Ideally, a light pruning is done every year and is necessary to control the size, maintain an attractive shape, promote vigorous growth and to bring about flowering wood.

Maple, Poplars, Willows and Birch trees are the exceptions to the early spring pruning rule. If these kinds of trees are pruned in the early spring they will leak high amounts of sap. The best time to prune them is in the mid to late summer. In addition, due to Provincial Regulations you are not allowed to prune Elm trees between April 1- August 31.

Pruning Shrubs

The idea is to groom the shrub to curb unruliness, not to change its appearance. When you are done pruning, a properly shaped shrub should look essentially the same, only neater. Older, established shrubs occasionally need reshaping. A neglected, overgrown shrub may come back to life if old, woody stems are cut down to the base allowing younger stems to take over. Remember, if you are pruning a flowering shrub this may delay flowering for a year.

The following are steps to follow when pruning shrubs:

1. You always cut back diseased, weak or broken stems to healthy wood.
2. Remove any dead branches, making sure not to leave a stub that unwanted insects could make their new home in. You can prevent these insects from doing that by making the cut as cleanly as possible against the remaining branch or right down to the ground.
3. In addition, remove branches that are growing over walkways that might impede traffic or just be generally dangerous.

Stub Removal

When a branch breaks off in the wind, or is cut too far from where it joins the tree, a stub remains. This dead piece of branch will prevent a protective callus from closing the wound and will provide an entry point for rot, decay, insects and disease. Once decay sets in, moisture and rot can take over. When you come across stubs like this, they should be removed.

Discolored wood in a stub shows the damage a tree has sustained as rot has spread through it. When cutting off an old stub, be careful not to cut into the swollen callus tissue forming at the base of the stub near the branch bark collar. It's needed to seal the wound. The picture on the left shows a tree that has had a stub removed properly.

Decay and rot is not the same thing.

Decay is the disintegration of wood tissue.
Rot is the disintegration and decomposition of plant tissue accompanied by discolouration.

Sucker Removal

As a survival instinct, some trees produce suckers (which are shoots that come up from the base of the trunk or root). When this happens, multiple stems grow instead of just a few main healthy ones and this causes the tree to become more prone to storm damage.

The shape of the tree becomes unnatural if suckers are allowed to grow more shrub like. Suckers at the base of the trees should be pruned as close to the ground as possible. This is common with Schubert Chokecherry, Poplar and Linden trees.

Pruning Cedars and Junipers

Cedars and junipers fall into the evergreen category because they maintain their foliage throughout the year. The cedars and junipers that are planted really do not require that much care. They should be allowed to grow in their natural state, so only prune dead and/or overhanging branches off these.

It is important to note that most evergreens cannot replace lost growth the way a deciduous plant can. So while other shrubs and trees might be able to outgrow an overzealous pruning, evergreens can suffer permanent damage. For example, evergreens tend to have wide angled branches. Removing an entire branch often leaves unattractive gaps, which is why you only do this when absolutely necessary.

Diseases

You know that if you don't remove dead or diseased branches, the disease and decay can spread to other parts of the tree. Three major tree diseases that are a growing concern include:

Dutch Elm Disease

This disease blocks water from reaching the branches and leaves of a tree. It's caused by a fungus that is most often carried by the elm bark beetle, a tiny beetle that breeds under the bark. Trees that are infected with Dutch Elm Disease show these symptoms:

- Their leaves wilt on one or more limbs,
- Their leaves turn yellow in the spring or summer, and
- Their leaves turn brown in late summer or autumn and don't fall to the ground.

If you notice these symptoms on an elm tree, report them to your supervisor so arrangements can be made to have the tree checked for Dutch Elm disease.

Diseases Continued...

Black Knot Disease

This fungus causes Black Knot disease in plum, chokecherry and cherry trees. The first symptoms are small, light brown swellings on the current or last season's growth. These swellings may be difficult to see and often go unnoticed. The disease becomes evident only after the knots enlarge and become olive-green with a velvety texture. Soon after the knots enlarge and become darker, by fall they appear as black hard knots. These hard, coal-black knots are especially noticeable when all the foliage is gone and the trees are bare. The knots will continue to grow until they encircle the branch and kill it. The fungus will live in the knots during the winter months and will be the prime source for new infections the next spring. It is spread by wind, rain and insects through infection of injured branches.

To help control this disease, branches with knots are pruned at least 4" below any visible swelling. This is very important because the fungus extends out into the branch further than the actual knot itself. Diseased branches and knots should not be left at the pruning site; instead they should be disposed of by burning them.

Diseases Continued...

Fireblight Disease

This disease mainly attacks fruit trees, such as apple and pear trees, and members of the rose family. This disease is spread by wind, rain and insects. It causes blossoms and fruit to shrivel and blacken. This disease also makes leaves look as though they've been scorched by fire, hence the name Fireblight.

Infected branches should be pruned 8" to 10" below any visible infected branch. This bacteria also extends into the wood further than the infected area that you see.

Black Knot and Fireblight need to be reported to your supervisor, who in turn can determine what form of pest management may be applied or information can be recorded for future reference.

If you run into other insect or disease problems they should be inspected, reported and recorded for future reference.

Disinfecting Your Pruning Tool

Remember it is extremely important to disinfect your pruning tool when pruning a diseased tree or shrub. This will help avoid infecting other parts of the plant, as well as other trees and shrubs.

One way of disinfecting your pruning tool is to rinse (or spray) the tool with methyl hydrate or a 5% bleach and water solution after every cut you make.

Planting Shrubs

Planting trees and shrubs benefits the environment because they provide shelter and filter the air by absorbing carbon dioxide and releasing oxygen.

There's an old saying that it's better to put a 10-cent plant in a dollar hole than a dollar plant in a 10-cent hole.

In most cases, you should dig a hole that is twice as wide as but no deeper than the root ball. One exception is when planting in heavy clay or compacted soil, dig a hole three to four times wider than the root ball to loosen the soil and encourage roots to spread out.

If you've never planted a tree or shrub before, relax. Keep in mind that trees and shrubs are sold in three different ways:

- ☑ Container grown specimens can be of any size.
- ☑ Smaller specimens are often sold bare-root.
- ☑ Larger specimens are often balled-and-burlapped.

Container Grown Plants

Trees and shrubs are planted in the same general way with a few variations depending on how they have been grown or dug.

1. You water the plant generously just before planting. This will make it easier to slide the root ball out of the container.
2. To help remove the plant, you hit the sides of the container with the palm of your hand, rotating the container as you go.
3. Then you hold the container in place with your feet, while gripping the base of the plant and gently pull until the root ball comes free. For larger containers, you enlist someone's help, or use a heavy-duty knife or razor to cut the sides of the container.
4. Once the plant and container are separated, you inspect the root ball. If you see a mass of swirling roots, you cut through the mass to allow the roots to spread out rather than allowing them to circle the base of the plant. You use sharp clippers to cut four shallow ridges about 1/2" deep down the length of the root ball; spacing them evenly around the root ball. This helps to eliminate girdling and encourages new root growth out from the cut areas.
5. You then take a dandelion weeder, screwdriver, or similar tool and scrape the sides of the root mass to free up the roots.

Container Grown Plants Continued…

6. Now the plant is ready to be added to the bed. Your hole will be dug according to the size of the root mass as was discussed on the previous page.
7. Always remember to use the same soil you remove when backfilling the hole and pack the soil with your feet. You have to resist the urge to add any additional nutrients to the soil. Adding nutrients to the soil encourages the roots to remain in that “comfort” zone rather than seeking moisture and nutrients elsewhere.
8. Thoroughly water the new tree or shrub that you have planted.

Balled and Burlapped Plants

If planting this form you follow the same steps that you learned with regards to the size of hole you would require for the plant.

1. Your plant will have burlap protecting the root mass of the plant. Burlap that is made of natural fibers can be left on the root ball if the sides are pulled down as far as possible. This allows the roots to spread without waiting for the burlap to disintegrate and is especially important if you're dealing with treated burlap. In any case, you always untie the rope that holds the burlap in place. You don't allow any portion of the burlap to remain above ground, as the fabric will draw moisture out of the planting hole.

2. Always remember to use the same soil you removed when backfilling the hole and pack the soil with your feet. You have to resist the urge to add any additional nutrients to the soil. Adding nutrients to the soil encourages the roots to remain in that "comfort" zone rather than seeking moisture and nutrients elsewhere.

3. For large balled plants, you fill the hole 2/3 of the way to the top, then add water to settle the soil before you fill the remainder of the hole. Then you hold the tree upright while packing down the soil around the base with your foot. Next you build a saucer-shape basin of soil at the base of the plant to collect water.

Bare Rooted Plants

Bare-root seedlings dry out quickly so the roots should be soaked for a 24 hour period prior to planting and kept covered with water until the hole is dug and ready for the plant.

1. The hole should be wide enough to accept the roots when they're spread out. Build up the soil in the center of your soil so that you don't end up planting your tree or shrub too deep.

2. You snip off any roots that are broken or that are a great deal longer than the root mass. Then you spread them out on the mounded soil. The base of the tree (where the trunk starts to taper out into roots) should be at ground level.

3. Remember to backfill the hole with the same soil you dug out when you were preparing the hole.

Watering Shrub Beds

In irrigated turf areas the tree and shrub beds may get watered by turf sprinklers, but this is not enough for newly planted trees and shrubs. Any new plantings should be recorded and then they can be added to the list for the water truck to come out and water on a regular basis.

The plants should not be fertilized their first year. They are already under a lot of stress and if you start to encourage them to grow faster with fertilizer it adds more stress to the planting.

New plants should be watered by the water truck for the first three years after they are planted. They are then fertilized in year two and three with a 20-20-20 mixture that can be premixed in the tank.

After the plantings are established, the watering they receive from the turf areas along with our natural rainfall may be enough for these plants to survive.

Keep off all pathways with the water truck. They are not strong enough for the weight of the truck and you will cause damage to the pathway.
Avoid driving over irrigated areas to prevent damage to the turf.

Protecting Our Trees

Rodents

During the winter, voles, mice and rabbits can injure the trunk and twigs of young trees by feeding on the bark. The damage they cause may permanently disfigure or even kill a tree. Young and thin-barked trees are most vulnerable to animal damage.

Where required, tree trunks can be protected from the damages of voles, mice and rabbits by placing a white wrapper cylinder or plastic drainpipe around the trunk. It should extend 2" to 3" below the ground for mice control and 18" to 24" above the anticipated snow line for rabbit control. This protective ring should be removed each spring, or at least checked, to ensure that it does not hinder the tree trunk as it grows.

You can protect shrub beds from rabbit feeding by fencing the beds with chicken wire. Remember to check fenced areas to ensure a rabbit has not gained entrance and is trapped inside.

Where large numbers of plants need protection, screening may be too expensive or time consuming. A repellent spray or pellets may provide some help. Remember that a repellent is not a poison; it simply makes the plant undesirable through taste or smell.

Remember, protecting young trees before they are damaged is the key. Little can be done after rodents have chewed the bark off all the way around the trunk of the tree!

Protecting Our Trees Continued...

Tree Wells

A tree well is a raised ring of soil formed around the edge of the root ball to create a basin that can be filled with water. It also helps to avoid damage from mowers and string trimmers.

Tree wells provide additional benefits. These include improving the plant's health and development by reducing competition presented by grass and weeds that grow around the base of trees and from reduced soil compaction caused by mowing equipment. It also reduces the requirements for controlling the growth of weeds and turf around the base of trees.

Some trees, usually on major arterial roads, also get a tree ring. Tree rings are used to collect and slowly release the water, which allows it to soak in the soil better.

Once the rings have been on the young trees long enough, usually a couple of years, they should be removed and moved to some newly planted trees.

Protecting Our Trees Continued...

Tree Stakes

Staking is done at the time of planting to help stabilize the tree from the effects of strong Saskatchewan winds. The purpose of staking is to lessen the movement of the root ball. Proper staking should allow the tree to sway in the wind.

The most common mistake is improper staking at the time of planting. Most trees over one inch in trunk diameter should be braced with stakes to hold them upright. Staking should occur low on the tree trunk, about 1/2 - 2/3 the height of the trunk. Staking higher on the tree prevents natural movement of the tree resulting in the tree becoming dependant on the stake. Trees that are stake dependant will develop weakened trunks and have slowed root development. Trees with weakened trunks will not be able to support the weight of the tree canopy, thus it can simply fall over or break off.

Staking is not permanent. Another common problem is leaving the braces on too long. Staking should only be in place for the first few growing seasons. After the second or third year, the stakes should be removed. Leaving the stakes in place longer develops a weaker tree. Once again, the tree becomes stake dependent and damage can occur during periods of high winds or heavy ice or snowfall.

Protecting Our Trees Continued...

Tree Stakes Continued...

From your experience you know that a stake is used to support a tree – not straighten a crooked one.

Here are the steps when installing or re-installing vandalized tree stakes:

1. Using the staking tool you will pound the metal stakes into firm ground – not through the root system of your planting. Make sure that one of the stakes is on the northwest side of the tree to protect it against our famous northwest Saskatchewan winds and the second stake on the southeast side.

2. Once the tree stakes are in place you can loop the guy wires around the trunk of the tree about 1/2 – 2/3 the way up the tree. From your experience you know the importance of slipping the guy wires through a piece of rubber hose before you tie them around the tree trunk. This will prevent the guy wire from coming in direct contact with the tree trunk and causing any damage.

Protecting Our Trees Continued…

Tree Stakes Continued….

3. Use your pliers to twist the wires together at the metal stake and leave a little slack in the wires.

4. Pull one of the wires over top of the other creating a circle in the middle that you are able to insert the handle of your pliers through. Once you have one handle through the circle, hold the other handle of the pliers and twirl the pliers around. This will cause the guide wire to twist and become taut.

Protecting Our Trees Contined...

Small Tree Removal

Sometimes trees and shrubs are slow to leaf in the spring so don't be too hasty to remove the plant. Occasionally though, one of the new plantings does not make it. It could be because of a number of different reasons; weather, rodents or neglect on your behalf. Whatever the reason, the dead planting must be removed to ensure the safety of the other trees and shrubs in the bed. Removing the dead plant also helps us in the continuing efforts to keep the tree and shrub beds attractive looking.

If it is determined that the planting is in fact dead, it can be removed by simply cutting the trunk or shoots off at ground level. Identify and document these locations. When the trees are removed, the tree location should be mapped, and the species and number removed noted. This information can be documented and used for reference when determining whether or not to plant a new tree.

Weed Control

Although there is no easy way to eliminate weeds, there are a few techniques you can use to reclaim your turf, or at the least, limit hostile takeovers.

Mulching

In nature, soil is always protected by a covering of organic material. Layers of leaf litter in the woods, and blankets of waving grasses on the plains prevent erosion and absorb rainfall. A layer of organic mulch provides similar protection to soil that isn't covered by plants. In shrub beds, it forms an attractive cover that discourages weeds.

Mulch acts as a blanket by preventing light from reaching weed seeds. At the same time, it holds moisture for your plants and provides nutrients for your soil as it decomposes and helps conserve water by absorbing rainfall and preventing runoff. Soil covered by a layer of organic mulch stays damp much longer between rains or waterings because the mulch blocks evaporation.

A layer of organic material 3" to 4" thick protects the soil against compaction from the harsh effects of heavy rain. It improves soil by blending valuable organic material into its top layer as the mulch gradually decomposes.

Over time, weed seeds blow in on top of the mulch and weeds may need to be handpicked or hoed from the mulch. The mulch will decay over time. New mulch will need to be added periodically. Mulch should be kept 6" away from the tree trunk and should not be thicker than 4".

Rototilling

Weeds love open soil. As you may have already learned, rotoilling is an effective method of controlling weeds in the tree and shrub beds. Remember to stay relatively shallow when you are tilling the soil, (as a rule not more than 2" to 3"), or you will cause root damage to the plants. This is especially important for conifers because their fine root hairs (feeder roots) are in the upper 6" of the soil. Rototilling too much can cause a breakdown in soil structure and lead to erosion of the soil. Stay 2 – 3 feet away from tree trunks to reduce feeder root damage.

String Trimming

Typically, it takes two to four more cultivations per year to effectively control weeds by rototilling. The exact number depends on weather, soil fertility and type of weeds. If weeds get too tall in the tree and shrub beds you may need to string trim them to keep the bed from looking unsightly between rototillings.

Herbicide Application

Sometimes in the spring and fall pre-emergent herbicide, (pre-emergent means that it kills the weeds as they germinate), can be applied to the tree and shrub beds, but must be applied by someone who is licensed for using pesticides. This helps to control weeds in the beds, but the product can only be used on certain plant species and they only control certain weed species. Depending on those circumstances, other weed control methods may still need to be used along with this method. Applicators should be familiar with MSD sheets and the product data sheets for each product they use.

At The End of The Day

Your shift is nearing the end and you take a moment to reflect back on your day. Again, from the corner of your eye you see a rabbit. You silently wonder to yourself if it is the same one that the kids were chasing this morning. You're not too concerned about it, there are more where it came from. You know that you have done your part; after all, your entire day was spent ensuring that all of the plantings in the tree and shrub beds were protected from these rabbits…among other things. You are confident that none of the trees and shrubs in the beds that you work so hard to maintain is going to be anyone's next meal.

Tree and Shrub Bed Maintenance – Job Aid
Power Pole Pruners and Chainsaws

The power pole pruner has a gas-powered engine at one end of a telescoping pole and a 12-inch chainsaw at the other end. It's capable of cuts up to 20 feet off the ground. Despite the dangers associated with power tools, this power pole pruner is still safer than using standard chain saws or climbing up trees or ladders to be able to prune the branches.

Having operated a chainsaw on various occasions, you're aware of how important it is to follow the safety procedures when using this equipment.

Because the chainsaw is the most dangerous pruning tool you use, when operating it you always wear the following safety equipment:

Tree and Shrub Bed Maintenance – Job Aid
Safety procedures

When you are using the power pole pruner and the chainsaw there are important procedures you follow to ensure your own safety and the safety of others:

- When starting, always make sure that the equipment is firmly set on the ground.

When cutting with the power pole pruner:

- You need to be very careful of your assistant and any other people that may be around. Because of the long handle it would be difficult to cause harm to yourself but not someone else.

When cutting with the chainsaw you always:

- Keep your chainsaw below your shoulders so that you never lose control of it.
- You always make sure bystanders and other crew members stay at least 1 meter or more away. Your assistant is responsible for removing all the cut branches you saw off so that you don't trip over any of them.
- You keep both hands on the chainsaw at all times.
- You never use the chainsaw on anything other than wood because the machine is not designed for cutting anything else.

You always make sure that the chain is not too tight, or else the chain may break. You also make sure that the chain is never too loose, otherwise it may fly off the chainsaw. Ideally, you want between 2 to 3 teeth of play at all times.

Tree and Shrub Bed Maintenance – Job Aid
Removal Cut

This cut is used to remove an entire twig, branch or limb back to its origin. The cut thins out the tree and allows in more light.

A Proper Cut:

At the base of every branch is a collar that contains a chemical zone which prevents the spread of decay to the trunk.

Make the cut just outside the branch bark collar (the swollen area where the branch meets the trunk). The branch bark collar contains chemicals that speed the formation of callus tissue that seals the wound.

When decay develops in a branch, it moves down the branch until it reaches the protective chemical zone. Once there, it stops and a callus forms after the branch is removed.

Here are the basic steps to follow when using a removal cut on a large branch, usually with a saw.

1. Make a shallow cut on the underside of the branch, about 4” or 5” from the trunk.

2. You can cut the branch off starting on the top side about 2” to 3” from the initial cut. When the weight of the unsupported branch causes it to fall, the initial cut keeps the bark from peeling down the side of the trunk.

3. Now you can make your final cut and remove the remaining stub. Make this cut just outside the branch bark collar, the slightly swollen area where the branch and trunk are joined together.

Tree and Shrub Bed Maintenance – Job Aid
Heading Cut

This cut is made anywhere on a twig, between two nodes, or on branches or limbs. By using this cut to prune the trees you are encouraging growth below the cut and the result will be a fuller tree.

A Proper Cut:

To make a proper cut, make the cut about 1/4” above a bud. You choose a bud facing the direction you wish the new growth to follow, and angle the cut in the same direction.

An Improper Cut:

When cutting back stems, you avoid making the cut halfway between buds. This leaves a long portion of the stem to wither and die which is unsightly and invites insects and disease.

Tree and Shrub Bed Maintenance – Job Aid
Pruning Shrubs

The idea is to groom the shrub to curb unruliness, not to change its appearance. A properly shaped shrub should look essentially the same, only neater, when you are done pruning. Older, established shrubs occasionally need reshaping. A neglected, overgrown shrub may come back to life if old, woody stems are cut down to the base allowing younger stems to take over. Remember, if you are pruning a flowering shrub this may delay flowering for a year.

The following are steps to follow when pruning our shrubs:

1. You always cut back diseased, weak or broken stems to healthy wood.

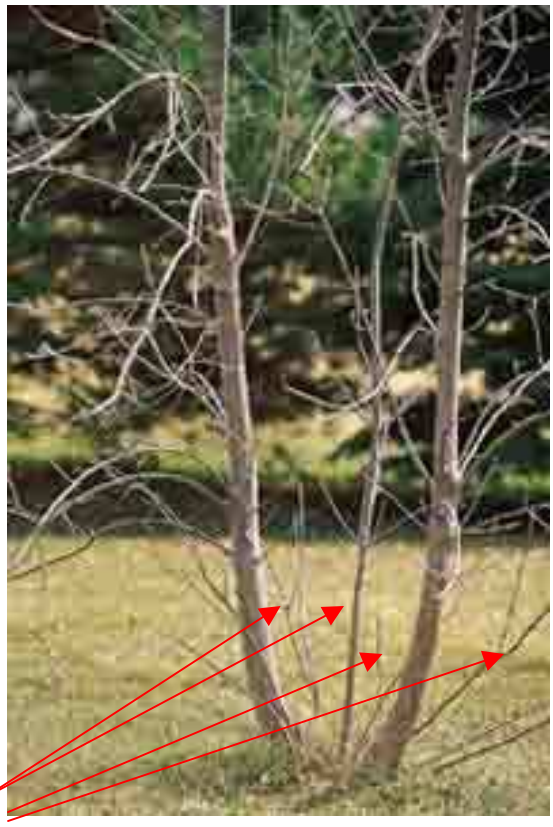
2. Then remove any dead branches making sure not to leave a stub that unwanted insects could make their new home in. You can prevent these insects from doing that by making the cut as cleanly as possible against the remaining branch or right down to the ground.

3. In addition, remove branches overgrowing walkways that might impede traffic or be dangerous.

Tree and Shrub Bed Maintenance – Job Aid
Sucker Removal

As you know, as a survival instinct, some trees produce suckers (which are shoots that come up from the base of the trunk or root). When this happens, multiple stems grow instead of just a few main healthy ones and this causes the tree to become more prone to storm damage.

The shape of the tree becomes unnatural if suckers are allowed to grow more shrub like. Suckers at the base of the trees should be pruned as close to the ground as possible. This is common with our Schubert Chokecherry, Poplar and Linden trees.



Tree and Shrub Bed Maintenance – Job Aid
Stub Removal

When a branch breaks off in the wind, or is cut too far from where it joins the tree, a stub remains. This dead piece of branch will prevent a protective callus from closing the wound and will provide an entry point for rot, decay, insects and disease. Once decay sets in, moisture and rot can take over. When you come across stubs like this, they should be removed.

Discolored wood in a stub shows the damage a tree has sustained as rot spreads. When cutting off an old stub, you're careful not to cut into the swollen callus tissue forming at the base of the stub near the branch bark collar. It's needed to seal the wound. The picture on the left shows a tree that has had a stub removed properly.

Decay and rot is not the same thing.

Decay is the disintegration of wood tissue.
Rot is the disintegration and decomposition of plant tissue accompanied by discolouration.

Tree and Shrub Bed Maintenance – Job Aid
Pruning Cedars and Junipers

Cedars and junipers fall into the evergreen category because they maintain their foliage throughout the year. The cedars and junipers that are planted really do not require that much care. They should be left to grow in their natural state. Only prune dead and/or overhanging branches off these plants.

It is important to note that most evergreens cannot replace lost growth the way a deciduous plant can. So while other shrubs and trees might be able to outgrow after overzealous pruning, evergreens can suffer permanent damage. For example, evergreens tend to have wide angled branches, and removing an entire branch often leaves unattractive gaps, which is why you only do this when absolutely necessary.

Tree and Shrub Bed Maintenance – Job Aid
Diseases

Dutch Elm Disease

This disease blocks water from reaching the branches and leaves of a tree. It's caused by a fungus that is most often carried by the elm bark beetle, a tiny beetle that breeds under the bark. Trees that are infected with Dutch Elm Disease show these symptoms:

- Their leaves wilt on one or more limbs,
- Their leaves turn yellow in the spring or summer, and
- Their leaves turn brown in late summer or autumn and don't fall to the ground.

If you notice these symptoms on an elm tree report them to your supervisor so arrangements can be made to have the tree checked for Dutch Elm Disease.

Disinfecting Your Pruning Tool

Remember how important it is to disinfect your pruning tool when pruning a diseased tree or shrub. This will help avoid infecting other parts of the tree or shrub, as well as other trees and shrubs.

One way of disinfecting your pruning tool is to rinse (or spray) the tool with methyl hydrate or a 5% bleach and water solution after every cut you make.

Tree and Shrub Bed Maintenance – Job Aid
Diseases

Black Knot Disease

This fungus causes Black Knot Disease in plum, chokecherry and cherry trees. The first symptoms are small, light brown swellings on the current or last season's growth. These swellings may be difficult to see and often go unnoticed. The disease becomes evident only after the knots enlarge and become olive-green with a velvety texture. Soon after the knots enlarge and become darker, by fall they appear as black hard knots. These hard, coal-black knots are especially noticeable when all the foliage is gone and the trees are bare. The knots will continue to grow until they encircle the branch and kill it. The fungus will live in the knots during the winter months and will be the prime source for new infections the next spring. It is spread by wind, rain and insects through infection of injured branches.

To help control this disease, branches with knots are pruned at least 4" below any visible swelling. This is very important because the fungus extends out into the branch further than the actual knot itself. Diseased branches and knots should not be left at the pruning site; instead they should be disposed of by burning them.

Fireblight Disease

This disease mainly attacks fruit trees, such as apple and pear trees, and members of the rose family. This disease is spread by wind, rain and insects. It causes blossoms and fruit to shrivel and blacken. This disease also makes leaves look as though they've been scorched by fire, hence the name Fireblight. Infected branches should be pruned 8" to 10" below any visible infected branch. This bacteria also extends into the wood further than the infected area that you see.

Black Knot and Fireblight need to be reported and documented for future reference and pest management.

If you run into other insect or disease problems they should also be are to be reported and documented for future reference and pest management.

Tree and Shrub Bed Maintenance – Job Aid
Container Grown Plants

Trees and shrubs are planted in the same general way with a few variations depending on how they have been grown or dug.

1. You should water the plant generously just before planting. This will make it easier to slide the root ball out of the container.
2. To help remove the plant, hit the sides of the container with the palm of your hand, rotating the container as you go.
3. Then hold the container in place with your feet, while gripping the base of the plant and gently pull until the root ball comes free. For larger containers, enlist someone's help, or use a heavy-duty knife or razor to cut the sides of the container.
4. Once the plant and container are separated, inspect the root ball. If you see a mass of swirling roots, cut through the mass to allow the roots to spread out rather than allowing them to circle the base of the plant. Use sharp clippers to cut four shallow ridges about 1/2" deep down the length of the root ball; spacing them evenly around the root ball. This helps to eliminate girdling and encourages new root growth out from the cut areas.

5. Then take a dandelion weeder, screwdriver, or similar tool and scrape the sides of the root mass to free up the roots.
6. Now the plant is ready to be added to the bed. Your hole will be dug according to the size of the root mass.
7. Always remember to use the same soil you remove when backfilling the hole and pack the soil with your feet. You have to resist the urge to add any additional nutrients to the soil. Adding nutrients to the soil encourages the roots to remain in that "comfort" zone rather than seeking moisture and nutrients elsewhere.
8. Thoroughly water the new tree or shrub that you have planted.

Tree and Shrub Bed Maintenance – Job Aid
Planting Balled and Burlapped Plants

When planting this form use the steps that you learned with regards to the size of hole you would require for the plant.

1. Your plant will have burlap protecting the root mass of the plant. Burlap that is made of natural fibers can be left on the root ball if the sides are pulled down as far as possible. This allows the roots to spread without waiting for the burlap to disintegrate and is especially important if you're dealing with treated burlap. In any case, always untie the rope that holds the burlap in place. Don't allow any portion of the burlap to remain above ground, as the fabric will draw moisture out of the planting hole.

2. Always remember to use the same soil you removed when backfilling the hole and pack the soil with your feet. You have to resist the urge to add any additional nutrients to the soil. Adding nutrients to the soil encourages the roots to remain in that "comfort" zone rather than seeking moisture and nutrients elsewhere.

3. For large balled plants, fill the hole 2/3 of the way to the top, then add water to settle the soil before you fill the remainder of the hole. Also, hold the tree upright while packing down the soil around the base with your foot. Next you build a saucer-shape basin of soil at the base of the plant to collect water.

Tree and Shrub Bed Maintenance– Job Aid
Planting Bare Rooted Plants

Bare-root seedlings dry out in a flash so the roots should be soaked for a 24 hour period prior to planting and kept covered with water until the hole is dug and ready for the plant.

1. The hole should be wide enough to accept the roots when they're spread out. Build up the soil in the center of your soil so that you don't end up planting your tree or shrub too deep.

2. Snip off any roots that are broken or that are a great deal longer than the root mass. Then spread them out on the mounded soil. The base of the tree (where the trunk starts to taper out into roots) should be at ground level.
3. Remember to backfill the hole with the same soil you dug out when you were preparing the hole.

Tree and Shrub Bed Maintenance – Job Aid
Tree Staking

From your experience you know that a stake is used to support a tree – not straighten a crooked one.

Here are the steps when installing or re-installing vandalized tree stakes:

1. Using the staking tool you will pound the metal stakes into firm ground – not through the root system of your planting. Make sure that one of the stakes is on the northwest side of the tree to protect it against our famous northwest Saskatchewan winds and the second stake on the southeast side.

2. Once the tree stakes are in place you can loop the guy wires around the trunk of the tree about 1/2 – 2/3 the way up the tree. From your experience you know the importance of slipping the guy wires through a piece of rubber hose before you tie them around the tree trunk. This will prevent the guy wire from coming in direct contact with the tree trunk and causing any damage.

3. Use your pliers to twist the wires together at the metal stake and leave a little slack in the wires.

4. Pull one of the wires over top of the other creating a circle in the middle that you are able to insert the handle of your pliers through. Once you have one handle through the circle, hold the other handle of the pliers and twirl the pliers around. This will cause the guy wire to twist and become taut.