Ugliest Schoolyard Contest

Schoolyard Maintenance Manual

Originally prepared by Ann Coffey, Canadian Biodiversity Institute. Modified with permission.

Contents

Maintaining Your Greening Project

Once your school has completed all the hard work of transforming the schoolyard, the challenge is to keep the project healthy and well-maintained. Simple maintenance will ensure that your greening effort may continue to grow and thrive, and benefit the children, school, and wider community over the coming years.

There are four principal maintenance activities that require ongoing attention during the growing season - watering, weeding, mulching and pruning. There are also activities that require attention through all four seasons – spring, summer, fall and winter. All grade levels should be able to participate in one activity or another throughout the school year.

Teachers can play a direct role in both promoting and organizing activities in the garden. By using the garden as a teaching tool, teachers and students become more aware of the needs of the plants and can monitor their growth and health, either directly through inquiry or indirectly by using the space.

Hands-on seasonal activities that engage students in watering, mulching, weeding, plant identification, observing plant and animal dependencies, measuring plant growth and picking up litter should be fun and also good learning experiences.

Teachers may want to have their class adopt a group of trees and take on the responsibility for organizing student maintenance activities, seasonal events such as spring and fall clean-up, garden celebrations, infill planting events and other garden enhancements with the help of other staff.

Four Seasons Maintenance

Raise awareness about your greening project, and its benefits and maintenance needs by including information about it in school newsletters, community newspapers, maintenance schedule sign-up sheets, PA announcements, and the school's website.

Ask that PA announcements be made every morning to remind children to be mindful of the trees and other plants, and to let them know about projects being undertaken by different classes.

Divide the greening project into sections so that different classes can "adopt" one or more trees or a garden bed to weed, water and keep free of litter.

Plan seasonal events to encourage educational and social use of the grounds, and to give everyone the chance to contribute towards caring for the trees, shrubs, flowers and vegetable garden.

Spring

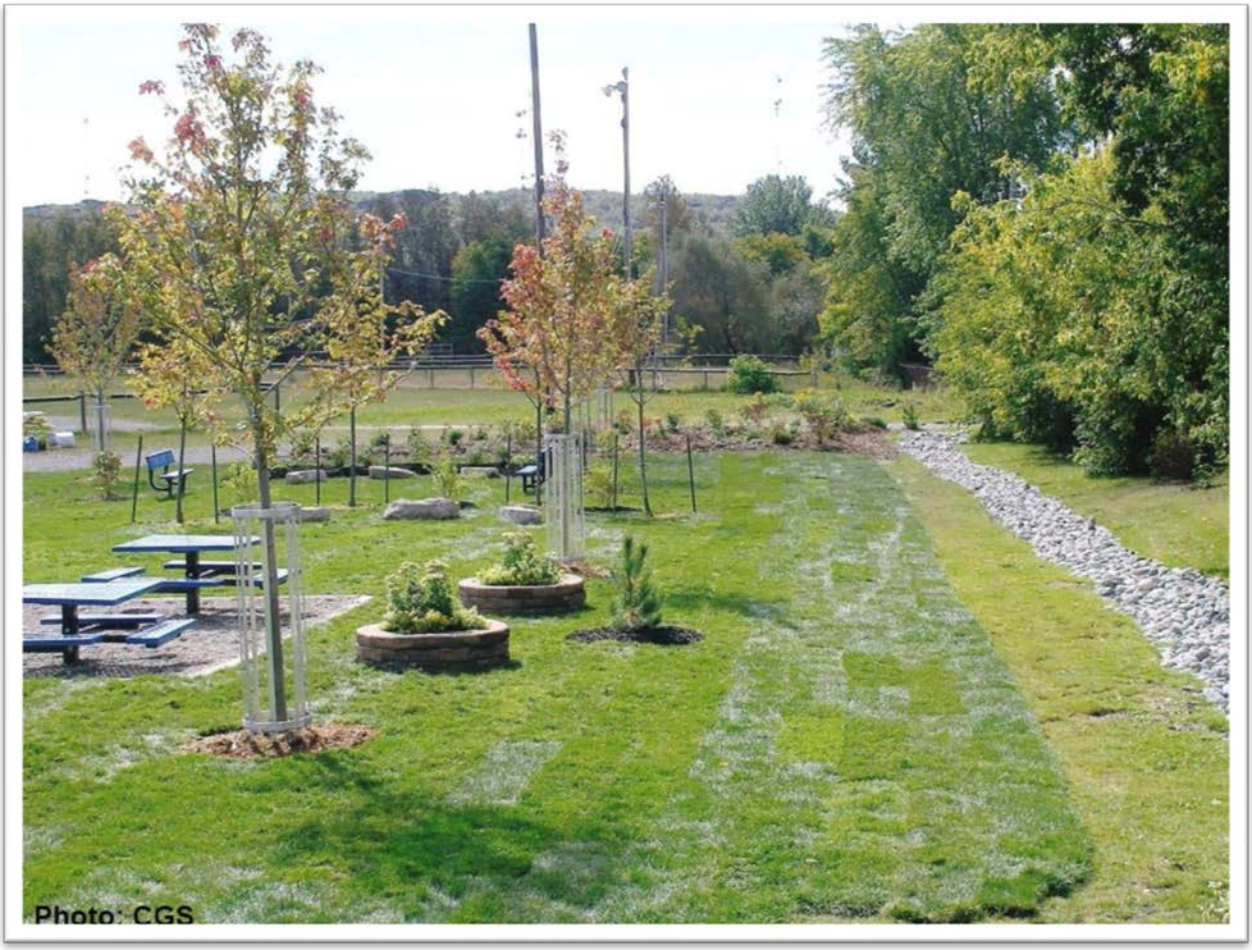
The plants are waking up and it's time to clean up! The following 26 points provide practical maintenance activities for the spring.

- Pick up litter
- If orange snow fencing was used to protect the vegetation over the winter it is time to remove it and store for re-use in the fall
- Remove any dead plant material
- Assess plant/tree loss and determine the cause
- Plan to replace lost plants/trees and take precautions to better protect them to prevent future losses
- Prune any damaged branches from trees and shrubs, refer to the pruning section
- Gently loosen any trampled soil around the trees
- Check tree stakes or guards for damage and stability
- Check any ties to make sure they are not too tight
- Check mulch and replenish it if more is required, refer to mulching section
- Make sure mulch is pulled back from the tree trunk
- Check watering schedule
- You may want to set up a rain gauge to help determine watering needs
- Restart watering in May if there is a lack of rainfall
- Learn about your existing plants
- Learn about plants to be planted this year
- Recruit new volunteers for summer maintenance
- Educate maintenance volunteers on which plants not to pull out
- Ask teachers to get their classes involved in preparing and planting the vegetable garden
- Ensure potatoes are planted in a different bed every year
- Plant vegetable plants and seeds
- Check the mural and touch up any areas that were damaged over the winter
- Encourage children to take care of the trees and to report any damage to plants
- Ask parents to donate unwanted, native ground cover plants from their gardens
- Remind children in early morning announcements and prior to recess times to be careful when playing around the trees and gardens
- Ask children to remind each other to take care when playing soccer near the trees

Summer

The following 9 points should help keep your plants alive and thriving through the hot summer months:

- Ask your school board to ensure that mowing contractors stay away from your gardens and spaces around your trees and shrubs, and that contractors pay for any damage they cause
- Ask your principal to speak to the mowing crew directly and tell them to mow outside the mulched area around your trees – some mowers drive into mulch and scatter it which decreases the size of the mulched space every time they mow
- Keep your eye on the weather and monitor watering needs
- Encourage families and others in the community to participate in weeding
- Find former students who are now attending high school and still living in the neighbourhood who might wish to contribute their community service hours to helping to maintain your project
- Prune shrubs over the summer as necessary to maintain sight lines
- Prune any damaged branches from trees and shrubs as soon as possible after damage occurs
- Monitor vandalism and repair any damage immediately
- Report any problems to the custodian and the school board



Fall

When putting your plants to bed for the winter, consider these 16 points:

- Gather seeds from the gardens and store in a cool, dry place for planting in spring, but leave plants with seeds that provide food for birds in winter
- Harvest any of your crops (fruits, veggies)
- Put waste garden plant material in the composter and add a few shovels of good soil to add soil organisms that break down organic waste
- Spread a mixture of mushroom compost and manure on each vegetable bed and dig lightly into the soil
- Spread leaves on beds where you intend to plant squash and tomatoes, but leave beds free of leaves where you want to plant lettuce, radishes and carrots
- Weed the planting spaces around your trees before the leaves fall
- Pile fallen leaves around the trees and shrubs for extra winter protection and to help return nutrients to the soil, and add mushroom compost, worm castings and organic material to help enhance the soil
- Prune any dead or damaged branches
- Plant spring bulbs in places where their new shoots will not be trampled
- Replace the snow fencing around the trees and garden beds if necessary
- Use the gardens for learning about the environment (i.e. research plant material, and its importance to wildlife, first nations and the environment)
- Recruit new volunteers, and inform new parents about the greening project and ask them if they would be interested in participating
- Present at a staff meeting early in the new school year as a reminder to teachers and to inform any new teachers
- Encourage teachers to use the outdoors for teaching the curriculum
- Present at the first school council meeting as a reminder to parents and to inform new parents
- Review the school council's school grounds greening mission statement at the first meeting of the year every year to make new council members aware of the school's commitment to maintaining children's outdoor environment.

Winter

Keep your projects growing in the off season! Winter is a good time for making project enhancements like these described in these 12 points:

- Make outdoor art projects such as murals for installation in the spring
- Make creative signs for your gardens including labels for individual plants
- Seek funding or host your own fundraising event
- Keep parents informed about the project and any future plans
- Ask parents to volunteer to help with art projects, planning and fundraising
- Plan for garden enhancements – seating, bird feeders, planter edging
- Plan for plants to add in the spaces around the trees and between shrubs
- Ask children to report any snow fencing that becomes loose or is flattened by snow or by children at play, and have them help to reattach it to the supports immediately
- Organize watering, weeding, mulching and pruning activities for the new growing season
- It is also a good time for keeping this manual up to date by adding photographs and details of your project as it evolves, including new plants species, recording information about mulch replenishment, outdoor classroom uses, watering and weeding procedures, student involvement, changes in people responsible for project stewardship, such as tree advocates, and reporting to the school council.

Photo: Ann Coffey

Photo: Ann Coffey

- Ask teachers to have children draw pictures to show what they like about their green schoolyard as a reminder. Exhibit the artwork on corridor walls and in classrooms.
- If individual classes adopt one or more trees, hang mounted photographs of adoptees' trees outside their classrooms (as shown above). You could add new photographs every two years so that children can see by how much their trees have grown. This would be a great silent reminder as children would pass by the photographs several times a day.

Tree Supports

While stakes and tree guards are not needed for supporting trees with a trunk diameter of 50 mm (2”) or more, you need strategically placed stakes to support snow fencing or tree guards to keep children at play and mowers away.

Make sure your guards, stakes and ties are firmly in place. The photograph to the right shows where a loose tree guard rubbed against the tree. If damage is severe enough, the tree may need to be removed.

Keep mowers and trimmers away from trees because they can cause a lot of damage to bark. Install stakes and guards to prevent mowers from getting too close. You can also weed out the grass and add a layer of mulch (see section on mulching).

The photo to the right shows a tree ruined by mowers and trimmers hitting the base of the trunk.

Ties

Ties are woven fabric strips (preferred), wires or cords secured through holes in T-posts (metal stakes) and wrapped around the trunk of the tree as shown in the diagram below right. If wire is used, it should be threaded through a short section of garden hose where it touches the trunk of the tree to prevent chafing of the bark as the tree is moved by the wind. Check ties regularly to make sure they are not too tight.

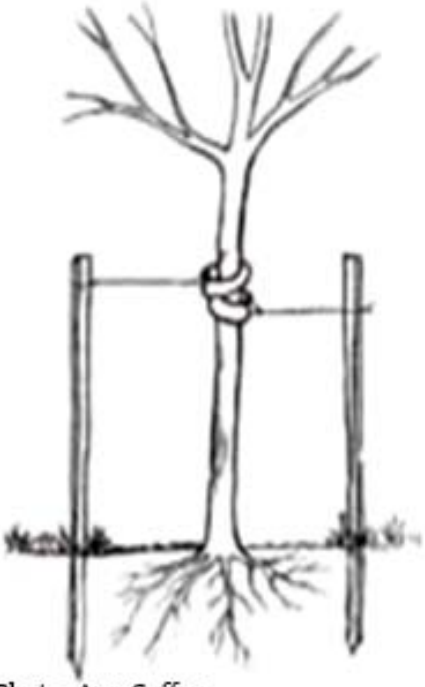


Photo: Ann Coffey

The tie in the photo below was improperly installed, and it slipped to the base of the tree. It became hidden in tall grass and then strangled and killed the tree as the trunk grew in girth.

Watering

Trees need 30 gallons of water weekly for the first two to three years following planting, and during extended dry periods thereafter until they are well established (8-10 years), particularly in hard surface planting, plantings adjacent to hard surfaces such as asphalt, and in sandy soils where water drains away fairly quickly.

If you've planted new trees, they are going to need a lot of care for the next few years until the trees are well established. To care for them better, it is important to organize watering parties over the summer to help ensure not only the survival of your trees, but also healthy growth. The better you look after your trees, the better they will grow and the greater will be the shade they provide to protect your children from the sun's harmful rays.

If trees are not watered during the hot, dry spells that we regularly experience in summer, they can become stressed, stop growing, and go into "premature fall" with the leaves turning brown in August.

Due to the time required to water such a large number of trees, it is best to have 10 families take on the job of watering for one week each over the summer vacation. If you can find 20 families to take responsibility for watering half of your total number of trees for one week each, the time for each family will be further reduced.

Groups of students can water trees during the spring and fall terms. There are many different ways to organize watering activities. For example, you could have each class adopt a number of trees and take on the responsibility for watering them. Perhaps the families of the children in each class could then assume the responsibility for maintaining their children's trees over the summer months.

It is always useful to create watering charts to record when individual trees were watered and for how long, particularly if classes do the watering at different times. If you use the bucket method for watering, classes could also record the quantity provided to each tree. Depending upon how you decide to organize your watering and weeding activities, you could work with teachers and students to design a chart for each class or for each watering team for the spring and fall.

A sample tree watering chart for spring and fall watering is provided on the next page. It has a number of columns showing the location of trees, the tree species planted in each location, the date each tree was watered and the length of time each tree was watered to help avoid over- or under-watering trees.

You will need to create your own watering chart for all of the trees. Depending on how you organize watering, and how many watering teams or classes you involve in May, June, September and October, it would be a good idea to create a column alongside each location to show who is responsible for watering in each location.

A separate watering schedule will be required for the families volunteering to water over the summer vacation to show who will be responsible for each week. The first family to water will need to pass on the faucet key to the next family on the list, so it would be helpful to add a column for entering the names and phone numbers of volunteers.

Sample Watering Chart

Location	Tree Name	Person / Class Responsible	Date Watered	Time Watered or Number of Buckets / Gallons	Verified by:
Sandbox	Little Leaf Linden (2)	Grade 4	Wednesday, May 12	20 minutes	
Butterfly Garden	Red Maple	Grade 3	Thursday, May 13	15 gallons (three 5-gal buckets)	
Butterfly Garden	Serviceberry (2)	Green Thumb Squad	Friday, May 14	15 gallons (three 5-gal buckets each)	

When to water

Trees must be watered from spring to mid-October. Start to water in the spring as soon as the soil begins to dry out and temperatures rise. Depending on the amount of snowfall and spring precipitation, you may need to start watering as early as the middle of April, although mid-May is more likely.

All of the trees must be watered throughout the summer and through to late October. This will ensure the trees have enough water going into the harsh winter months.

Water all the trees every week even if there are a few showers. Showers only wet the surface of the soil and a lot of the moisture evaporates very quickly when it is warm or windy (the wind dries a lot of moisture out of the soil).

If you are unsure about whether a tree needs water, pull back the mulch in a few spots on the sunniest side of the tree and check to see whether the soil beneath it is dry. You can also dig gently into the soil with a trowel to test for moisture content.

If it rains “cats and dogs” — solid heavy rain — for four or more hours during the week, you will not need to water at all.

Remember! You want the water to soak down to the deepest roots and into the surrounding soil.

When to water	Amount of water using hose method	Amount of water using bucket method	Frequency
May to August	30 min.	30 gal	every week
September to October	30 min.	30 gal	every 2 weeks

The Hose Method

Water every tree for about half an hour directly from the hose. Where you have two trees growing together in the same planting space you can use a sprinkler to water them both at the same time and leave the sprinkler on for an hour. Be sure that the water is falling into the planting space. On your "Tree Watering Chart", mark the date you watered each tree and the length of time it was watered.

The Bucket Method

Trees need water! From May to August every one of your trees needs 30 gallons of water every week. From early September to mid-October, every tree needs 30 gallons of water every two weeks. The Bucket Method is a good choice because of these eight points:

- It conserves water
- It offers an easy way to measure how much water trees are receiving
- It is efficient for groups of trees that are within reach of a garden hose and planted fairly close together
- There is no cost to the green team since the pails are readily available
- The technology is simple and makes watering manageable for students
- Students can adopt this practice as part of their tree stewardship program
- The system is simple, fun for students, and can easily be taken on by clubs or classes
- It offers a teachable opportunity to discuss water conservation and tree stewardship.


Photo: Ann Coffey

Use five-gallon buckets for watering. You can use one, two or three buckets per tree. Have someone drill two quarter-inch holes in the bottom of each bucket to allow for slow flow. If you have more holes the water will drain out too quickly and run off instead of slowly soaking into the soil.


Photo: Ann Coffey

It takes about two minutes to fill a five-gallon bucket with a garden hose, and about three minutes for it to empty, so over the course of five minutes, five gallons of water soak into the soil.

Weeding

Weeding is therapeutic for some and a big chore for others. However, it is essential to keep on top of it or your project could quickly become an unsightly weed patch. Removing weeds as they appear takes less time and energy than pulling out overgrown weeds and hauling them away in wheelbarrows.

A weed is a plant that is unwanted or growing in the wrong place. This means that any plant can be considered a weed somewhere! Weeds are often the first plants to move in and take over disturbed land. While many invasive weeds are non-native, some native species can also be aggressive. Many non-native weeds are non-invasive and non-aggressive. A weed in your vegetable garden will almost always be undesirable, but the same weed may be desirable if it is growing around your trees.

Many weeds are very desirable since they are extremely hardy and can withstand the fairly harsh conditions of most schoolyards. Weeds can also withstand a little trampling much better than garden perennials. A good healthy patch of desirable weeds around your trees as shown in the photo to the right is not only attractive and useful to wildlife but it also shades the soil and helps to prevent moisture loss. As well, it helps to prevent undesirable weed seeds from reaching the soil and taking root.

If you do not have problematic weeds in your yard now, you could have them at some point because seeds are transported from one place to another by wind, birds and animals and can also be carried on our clothing. Refer to the Invasive Weeds section to find out about common undesirable weeds that you will need to either remove or keep under strict control.

Method

Follow these eight steps when weeding:

- Gently pull out the entire plant, roots and all
- If the weed does not come out easily, gently loosen the soil with a pitch fork and try again
- Weed regularly (every two weeks or weekly during the growing season)
- Weed before the plant produces a seed head to prevent seeds from spreading
- Dispose of young weeds (without seed heads) in the compost, and mature weeds in the garbage (weed seeds can survive the composting process)
- Never dispose of weeds in a natural area
- Always weed thoroughly before adding mulch - you can spread a layer of newspaper 20-40 pages thick over the planting space to help kill any remaining grass roots, and then place mulch on top. The newspaper biodegrades, so you may have to add a new layer every year or two when you replenish the mulch.
- Some tree species produce suckers from the base of the tree - when weeding prune off the suckers

Tips

Four weeding tips to help make the process easier:

- Include weeding in curriculum activities that identify and examine plants, their growth habits, characteristics and plant and animal interdependencies
- You can pull weeds out of the ground more easily when the soil is damp after watering or a rainfall
- Have separate containers for collecting mature weed plants with seed heads
- Have enough tools and gloves available and accessible for all to participate

Invasive Weeds

You will need to educate weeding teams on the aggressive invasive species that are likely to be found on your school site. They will need to be able to tell the difference between the weeds that must always be removed and those that are desirable and should be retained.

The best way to deal with aggressive invasive weeds is to learn to recognize them and remove them before they have a chance to develop a large root system or go to seed. Buy good weed and wildflower identification books for your school library such as these three suggestions:

- Weeds of Canada and the Northern United States, Lone Pine Publishing and The University of Alberta Press, ISBN 0-88864-311-X
- The Audubon Society Field Guide to North American Wildflowers, ISBN 0-394-50432-1
- A Guide to Field Identification of Wildflowers of North America, Golden Press, ISBN-13 978-0307636683

We also recommend you check out the “Grow Me Instead **-** A Guide for Northern Ontario” document from the Ontario Invasive Plant Council website (http://www.ontarioinvasiveplants.ca/index.php/gardenersandhorticulturalists).

Once you can identify a weed, type the common or scientific name followed by “images” into your web browser. You should be able to find photographs that show plants in various stages of growth. Plant ID books and other resources often only show the mature plant in flower but you will need to identify emerging plants in the spring so that you can remove them before the roots develop to the point where they are hard to pull out. You can also simply enter the name to find out information about the plant and its growth habits, in addition to photographs and drawings of the whole plant and the plant parts.

Identifying Weeds

As you identify invasive, thorny, prickly, stinging or poisonous weeds that must be removed, make a binder of the plant leaves, flowers, seeds, berries and roots to help weeding teams easily identify them. You can press soft parts such as leaves and flowers, and keep dried roots, berries, seeds and flower heads such as thistles and burs that are too coarse to press flat in clear zip-lock bags. This would be a great hands-on project for the plant identification curriculum!

You can also take photographs of the plants and plant parts, label them and keep them in the binder as well to help with identification. Make a similar binder for the wild plants you want to retain.

Take photographs where desirable wild plants are growing in the spaces around the trees for weeding teams to use as a reference (see photo on previous page). This will help to prevent over-enthusiastic team members from pulling out desirable wild plants.

When you are organizing weeding activities, consider having a specialist such as a field naturalist or a member of the Sudbury Master Gardeners or Horticultural Society come to the school to help you identify the plants you must remove from the grounds.

Remember that the size of a plant can vary considerably depending on growing conditions. For example, Lamb's Quarters can be anywhere from six inches (15 cm) to six feet (1.7 m) high, and the leaves half an inch (1.2 cm) to two inches (4.8 cm) across. Even a common dandelion when growing in rich soil can turn into a monster!

This huge dandelion was found cohabiting with an obliging shrub, which camouflaged it so well that it escaped the weeding team's notice for several weeks!

Remember! Don't put weeds with seed heads into your composter. Seeds can survive in the compost and can then be spread to wherever you apply it.

Weeding Around Trees

This photograph shows severe damage caused to the base of the trunk by mowers and weed trimmers repeatedly hitting the bark. Many trees in urban environments die from this damage. This fact underscores the importance of removing grass and weeds from around the tree to deter the use of weed trimmers, and also the need to install protective barriers to keep children at play well away from the trees.

Mulch

Supplying mulch around the base of trees is a great way to care for your trees and improve health. Mulch insulates the soil helping to provide a buffer from heat and cold temperatures as well as retains water to help keep the roots moist. Mulch also keeps weeds out, prevents soil compaction and reduces lawn mower damage.

Weeds or unwanted grass should be removed 1 to 3 meters from the base of the tree prior to mulching. Cover the area with natural mulch such as wood chips or bark pieces to a depth of 5 to 10 cm within the circle, keeping the mulch away from the trunk of the tree. Piling mulch up against the trunk creates a mulch "volcano" that can be detrimental to the health of your tree.

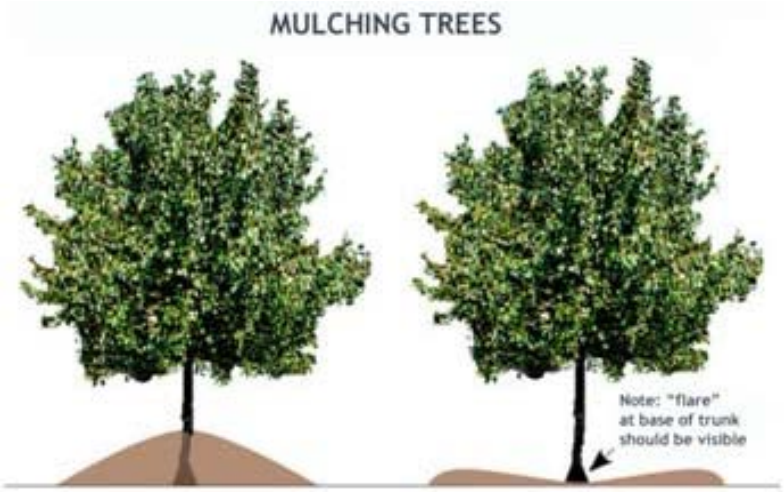


Photo: MadisonTree Care and Landscaping, Milford, Ohio

Mulch Volcano

A mulch volcano is created when a layer of mulch is applied thickly around the base of a tree and hilled up against the trunk, forming a mound or "volcano." A layer of mulch spread over the root zone is of great benefit to a tree. However, too much of a good thing in the wrong place has entirely the opposite effect on a tree and can in fact kill it.

The photograph to the far right of a cut-away shows trouble brewing inside a volcano as moisture held against the bark by mulch invites decay and disease to attack the tree. It also creates an ideal environment for fungal and canker growth in the trunk, which eventually leads to the death of the tree.

Roots are vital for delivering water and nutrients to the tree, and they also store food and provide support; therefore, any damage to the roots affects the whole tree. When a tree's root collar (the area where the trunk meets the roots) is buried by the surrounding soil or mulch, it is very susceptible to soil-borne pathogens. Buried collars also promote the growth of stem girdling roots.


Photo: Redwood Barn Nursery, Davis, California

Stem Girdling Roots

Stem girdling roots are roots that grow up into soil or mulch piled up above the root collar to eventually encircle the trunk. As though decay and disease brewing in the mulch volcano were not already enough, the mulch also creates a perfect environment for the development of these girdling roots which, instead of growing down into the soil, grow up into the mulch and encircle or girdle the trunk. As the roots grow thicker and the tree grows, the roots encircling the trunk prevent it from increasing in girth where they press against it. If these roots are not removed, they can eventually strangle and kill the tree.

This image (top left) shows a stem girdling root growing in mulch piled against the trunk at the time of planting. To prevent your trees from being strangled by girdling roots, keep the mulch pulled back from the trunk by about 30 to 45 cm. Note the injury to the side of the trunk caused by the girdling root (top left side of the image). On some species of trees, girdling roots cause the bark to die above the root.

The next image shows the trunk of the tree following removal of the girdling root. The indentation made in the trunk by the root is clearly visible. The trunk below the indentation and also the root system can now expand normally, and the injury to the bark can begin to heal. It is a good idea to conduct a root collar inspection annually to make sure there are no girdling roots starting to develop around the base of your trees.

Roots should grow away from the trunk and not in a circle around it. When you do a root collar inspection, look out for roots that are growing in a curve close to the trunk, embedded in the trunk, or crossing over main roots at the base of the trunk. Roots encircling or touching the trunk can reduce the flow of water, nutrients, and sugars to the tree and also damage the bark.

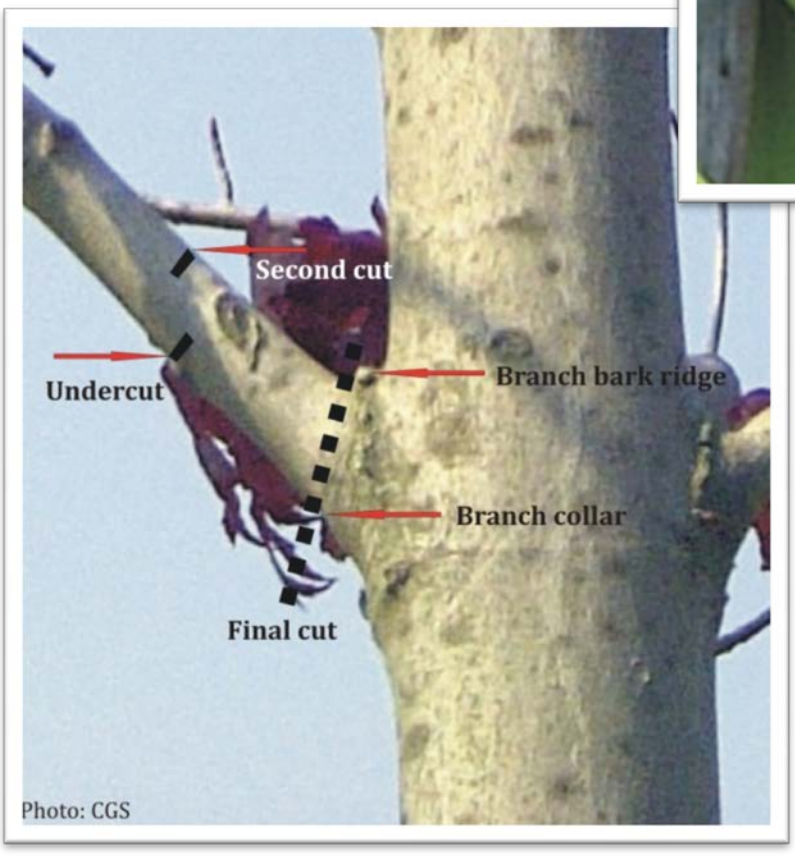
If the diameter of the girdling roots is less than one-third that of the trunk, and if the roots can be removed without damaging the trunk, they can be carefully cut and removed with a hand saw, hammer and chisel, or reciprocating saw. If the roots are larger or difficult to access, professional help to excavate them is advisable.

If your trees were improperly mulched, perform a root collar inspection to be sure there are no girdling roots, and then ensure that proper mulching takes place thereafter.

Pruning

Dead, diseased, broken or damaged branches, along with stubs and suckers, may be removed at any time of the year. So prune any of these branches as soon as possible to eliminate any further damage or stress to the tree. However, maples should not be pruned in the spring when the sap is running. It is advisable to seek assistance from local naturalists, Sudbury Master Gardeners or Sudbury Horticultural Society members to teach your group how to prune properly and when to prune. Garden nursery staff may also be a good resource to contact. The last thing you want to do is make things worse for the tree since pruning inevitably damages the tree. When done properly however the wounds will heal over quickly and completely and reduce the risk of rot caused by invading micro-organisms.

Three stage pruning is recommended for branches larger than 4 cm to prevent bark tearing. Cut the underside of the branch 30 to 45 cm from the branch collar, cutting only one-third of the way through the branch. Then make a second cut on the top side of the branch 5 cm beyond the first cut. The remaining stub can then be safely removed by cutting from the outer edge of the branch bark ridge at the top of the branch to the outer edge of the branch collar on the underside of the branch.



When trimming back a twig (3 cm or less in diameter) or a branch, cut it on a 30° angle, a few millimeters above a lateral bud. The angle of slant should be away from the bud.

Tips

- Call in a professional for large branches
- Make sure your pruning tools are sharp and disinfect them when you are done to prevent the spread of any plant diseases
- Pruning is best left to adults as tools are sharp and precision cuts are very important
- When pruning branches over your head, wear a hard hat for protection

Accessible version available upon request.
This document is available in French.

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