

Pesticide Free....

A Guide to Natural Lawn and Garden Care



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The opinions expressed in this document are those of Toronto Public Health and do not necessarily reflect the opinions of those who assisted with this document.



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Foreward

Welcome to the world of natural lawn and garden care – it's good for your plants, your health and our environment. We hope you find this guide helpful to get you started and keep you going on a plan that works for you!

This guide provides practical tips for planning and maintaining a pesticide-free lawn and garden. It also describes specific techniques, tools and products that can be used to achieve the very best results. Detailed information is provided for lawns. The text also deals generally with methods for the care of trees and other garden plants. Since each plant and tree species can have its own unique set of care requirements, we encourage you to consult additional resources. Some useful resources are provided at the end of this guide.

By following the practices described in this guide you should be able to keep your lawn and garden healthy without using pesticides. However, because there are some useful, and very benign, products on the market that can help manage unwelcome visitors in your garden, Chapter 7 of this guide also provides information about pest control products that are permitted for use under the Toronto Pesticide By-law.



What you will find in this guide:

Chapters 1- 4: The “how to” part

These sections introduce the basics of pesticide-free lawn and garden care and ideas for how to plan and care for a natural lawn and garden. Each section concludes with a summary of key points.

Flip to page 19-20 of this guide for handy Spring-Summer-Fall calendars for taking care of your lawns, garden and trees.

Chapter 5: Pest Management

This section describes the typical urban lawn and garden and how to manage common (and some not-so-common) pests, weeds and diseases.

Chapter 6: Troubleshooting

This chapter highlights some of the challenges that may arise when you start a natural lawn and garden program and suggests solutions and tips.

Chapter 7: Your Natural “Toolbox”

This chapter describes the tools and products that can be used as part of a natural lawn and garden program. It describes lower risk pest control products permitted for use under Toronto's Pesticide By-law.

Chapter 8: Let's begin!

Now that you've read about it, here's how to get started. We'll help you with

- 🔍 some Frequently Asked Questions;
- 🔍 questions to ask a lawn and garden care service provider; and
- 🔍 a checklist for natural lawn and garden care techniques.

Note: This guide follows the principle that, with the application of the appropriate horticultural practices, urban lawns and gardens can thrive and be healthy without the use of chemical pesticides. This principle places some “natural limits” on the plants and trees you might choose for your garden. Some non-native trees and shrubs, some flowers and even some kinds of grass may present special challenges to the gardener hoping to see them thrive, pesticide-free, in an urban environment. Readers looking for guidance on caring for non-native or less hardy varieties of plant should ask for advice at their local nursery and refer to other sources of gardening information. Readers interested in Integrated Pest Management may refer to some of the resources listed at the end of this guide.

Toronto’s Pesticide By-law (By-law 456-2003) was passed by City Council in May 2003 and came into effect on April 1, 2004. The by-law restricts the outdoor use of pesticides on public and private property and applies to anyone using pesticides, including homeowners, tenants, businesses and lawn care companies. The bylaw permits the use of pesticides for certain situations, such as to control or destroy a health hazard or an infestation to property. The City does not consider weeds in lawns an infestation because they do not involve an immediate or potential risk of substantial loss or damage. The by-law also allows the use of lower risk pest control products (see Chapter 7 of this guide). For more information on the by-law, visit:

www.toronto.ca/pesticides or
call (416) 338-7600.



Introduction

The benefits of using a pesticide-free (or “natural”) lawn and garden care program are embodied in the saying “Think Globally – Act Locally.” Following the methods of a natural program imparts benefits to the person caring for the lawn and garden, enhances the property being cared for and contributes to the greater well-being of the environment.

For the person taking care of the lawn and garden, the methods described in this guide translate into less maintenance time, fewer resource requirements and a lush and healthy lawn and garden. Cutting your grass less frequently and leaving mulched clippings and leaves on the ground, for example, means fewer hours spent on maintenance and fewer dollars spent on fertilizers and mulch. In the first few years of a pesticide-free maintenance program, there may be a few extra costs as you restore the fertility of your lawn’s soil and experiment with different plants. Once your lawn and garden have achieved a stable, healthy equilibrium your costs should also stabilize and maybe even decrease.

Natural lawn and garden care means less maintenance time, less pollution and lush, thriving green spaces.

1.1 Environmental benefits

The many benefits of a natural approach to lawn and garden care include its positive impact on soil health, microbial life and plant health. The natural approach requires fewer resources than some other kinds of lawn and garden maintenance. For example, synthetic fertilizers and gas-powered lawn care equipment such as mowers and leaf blowers consume fossil fuels. Natural gardening relies less on petroleum-based products, requires less mowing and finds different uses for leaves than blowing them into a garbage bag.

As well, using natural methods to manage urban lawns and gardens promotes biodiversity, reduces sources of pollution and promotes healthy soil and plants. The urban environment as a whole benefits from individuals’ efforts to keep their beautiful green spaces vibrant, alive and thriving.

1.2 An overview of natural lawn and garden care

Over the years, there have been big changes in the way people care for their lawns and gardens and the products, processes and equipment they use.

Before the 1950’s, all lawn and garden care was essentially organic or natural in that individuals used manual techniques and natural materials such as manure from the local farm. The introduction of synthetic pesticides and fertilizers following the Second World War changed how many people cared for their lawns. Today, people are again looking for ways to care for their lawn without using chemical products.

The terms “organic,” “pesticide-free,” “environmentally-friendly” or “natural” can all be used to describe chemical-free lawn care methods. For the purposes of this guide, caring for lawns and gardens naturally means more than just reducing the use of pesticides. Natural lawn and garden care looks at the whole picture and asks questions about which plants to pick, how to cut the lawn to suppress weed growth, how often to water and, especially, how to design your garden. All these elements are important. Each one of them contributes to keeping plants healthy.

The following definition of organic horticulture, adapted from the Society of Organic Urban Land Care Professionals (SOUL) is our starting point for the discussion on how to care for the lawn and garden naturally:

Organic horticulture is the design, installation and maintenance of landscapes that promote and preserve the environmental health of the entire ecosystem. It is dependent on management processes that work with nature to restore, maintain or enhance ecological harmony. Resource additions are limited to those that encourage biological activity, promote biodiversity and are environmentally benign.

“Integrated Pest Management” or “IPM” is a different approach to caring for lawns and gardens, and will not be explored in this guide. While there is overlap between it and natural lawn and garden care, the two methods are ultimately different. IPM is a method followed by professional horticulturists that focuses on managing unwanted plants, insects and diseases in ways that reduces the need to use pesticides. Natural lawn and garden care, on the other hand,

focuses on understanding natural conditions and using cultural practices to create healthy soil, grass, plants and trees. In a natural lawn and garden program, pest control naturally results from healthy lawn and garden techniques. Information about IPM is provided in the “Resources” section at the end of this guide.

1.3 What is a pest?

The Pest Management Regulatory Agency - the federal department that regulates the registration of pesticides for use in Canada – identifies pests on a home lawn as: 1) weeds competing for resources with the grass; 2) insects feeding on grass, garden plants or trees; 3) diseases of the grass or plants and 4) small animals that can damage landscape.¹ This guide acknowledges that while there are a lot of pests that are insects, not all insects are pests. The same is true for plants.

Natural garden care embraces the idea that including a variety of species will make the lawn and garden healthier and better able to fight off problem insects or diseases. For example, it is desirable to have some other plant species as well as grass in your lawn because it makes your lawn more robust. Some insects prefer only certain types of grass species, so a variety of grass and non-grass species in the lawn will make it less likely that an insect will be able to cause serious damage to the lawn. Clover and other low growing plants that blend with the grass are good examples of non-grass species that actually add to the health and vigour of the lawn.

Another concept to consider in a natural lawn and garden is the important role of beneficial insects. Most insects are not pests at all; rather, they benefit your lawn and garden by pollinating plants and feeding on the insects that can cause problems. Beneficial insects should be welcomed into your garden.

Nature provides the elements that make a lawn and garden healthy – understand this, and you take the first important step towards implementing a successful natural lawn and garden program.

Summary – Understanding the Basics of a Natural Lawn and Garden

- The benefits of adopting a natural program include reduced maintenance time, less fertilizer to purchase, lower costs in the long run and healthy soil.
- Environmental benefits include reduced dependence on fossil fuels and an increased naturalization of the urban environment.
- Organic horticulture is the design, installation and maintenance of landscapes that promote and preserve the environmental health of the entire ecosystem.
- Non-grass species that blend well in a lawn and different types of grass will add variety to the lawn and make it more resistant to insect pests and diseases.
- Beneficial insects are an important natural tool for managing insect pests and should be encouraged.



2. Your natural lawn and garden

Your natural lawn and garden may look a lot like your garden looks now. There may be some slight differences in the plants you choose, the height of the grass and the mulch in the garden beds, but mostly you will have a lawn and garden that is beautiful, lush and diverse.

A tour of a natural garden will show a variety of plant species including colourful perennials, annuals, shrubs and trees. Plants will have been selected based on the light, soil and water conditions available. Native species of plants and trees may be plentiful, as they are naturally more resistant to disease and insect problems. There may be a water feature, which in combination with the colourful selection of plants will help attract birds and beneficial insects that help keep nuisance insects away.

The garden beds will be mulched – that is, the bare earth is covered with either organic material like bark chips or leaves or inorganic material like river rock. The mulch helps conserve moisture, prevents soil erosion and keeps weeds from growing in the bare earth. Mulch may also be used as decorative ground cover in areas where plant material does not grow well, under deep shade trees or on heavily traveled paths.

Low maintenance ground covers such as sweet woodruff and pachysandra grow under trees and in shady spots where grass cannot thrive. In the lawn area, there will be a blend of grass species, some clover, perhaps a small number of weeds and the grass colour may show different shades of green. Edges between the grass area and garden beds will use landscape materials like stone to discourage weed growth. The grass itself will be cut to a length of 7.5 centimetres (3 inches) to encourage deep root growth. Deep roots help make grass more naturally resistant to drought and insects. Tall grass blades create shade that inhibits weed seed germination.

There will be no clippings left at the curbside, but rather the mulched clippings will be left on the lawn to return valuable nutrients and moisture back into the soil and to cool the grass in the summer. And in the fall, the leaves will be left in the garden beds as a wonderful source of free mulch or stored by the backyard composter to add to it as required.

A NATURAL LAWN AND GARDEN CONTAINS:

Grass left to grow longer and cut as needed to maintain a 7.5 centimetre (3 inch) length.

Blended grass species and some non-grass plants to add variety to the lawn.

Lightly edged garden borders, perhaps with an edging material like bricks to separate it from the lawn.

Lots of perennials and native plants, selected specifically for light and water requirements.

Garden beds that are mulched with leaves or bark chips.


2.1 Planning for a natural lawn and garden

Natural gardening starts at the planning stage. Everything from selecting the most appropriate plants for the location to the physical layout of the garden is important to growing healthy plants and grass.





An exhaustive treatment of lawn and garden design is beyond the scope of this manual. Fortunately there are many books written on garden design, planting with native species, drought resistant plants (xeriscaping) and low maintenance lawns. Each offers valuable ideas that help create a lawn and garden that will not require pesticides. Many of these resources are listed at the back of this guide.

Before planting grass, plants and trees, consider the following:

- 🌱 Soil is the foundation of your garden. Improving soil quality is an ongoing project for every property. Add organic soil amendments – such as compost – to increase soil organic matter, porosity, air flow, water-holding capacity, and fertility.
- 🌱 Know your property; plant the correct material for the given soil, light and water conditions.
- 🌱 Consider including native plant species in your garden. A native plant will be better adapted to the local conditions and less prone to disease.
- 🌱 Use alternative ground covers in areas where grass may not thrive, such as, for example, under shade trees. Attractive alternatives to grass in these areas are plants such as sweet woodruff or pachysandra or mulching materials such as bark chips.

-  Plant a variety of flowering plants that will attract birds and beneficial insects that are the natural enemies of plant pests.

In addition to soil preparation and plant selection, design ideas also prevent pest problems:

-  Use hard landscape materials like bricks, stones or edging material to separate garden beds from grass. This eliminates the temptation to use herbicides in garden edges.
-  Grass will not grow well under large planters and picnic tables. Put these on patio stones or concrete slabs.
-  Avoid growing grass in very narrow strips that are too small for a lawn mower.
-  Surround trees and shrubs with wells that either have other plant material or mulch. This protects your trees from mower damage (and reduces the amount of grass you have to cut).



2.2 The importance of soil




You need healthy, fertile soil to grow healthy grass, plants and trees. The main challenge for the urban gardener is that the soil under urban lawns often has low organic content.

The key to healthy grass and plants is healthy soil.

An important goal of the natural approach, therefore, is to increase the percentage of organic matter in your soil. Soil is made up of mostly weathered particles of rocks and minerals and between 1 and 15 percent organic matter, which determines soil fertility. Good quality soil is the most important element in a natural lawn and garden.

Organic matter is a combination of living organisms, plant wastes and humus that is critical to growing plants and grass. The amount of organic matter in the soil at any one time depends upon how much new organic matter is produced by natural processes in your lawn and, by the same processes, how much existing organic matter is being decomposed.

Good quality soil:

-  Supports a wide variety of soil life including insects and microorganisms.
-  Produces the nutrients that are necessary for healthy plants and grass.
-  Maintains a structure that allows it to retain water and to provide lots of oxygen.

2.3 Preparing soil for planting

Healthy soil provides the water, air and nutrients needed to grow healthy grass, plants and trees. For grass, the ideal soil is sandy loam with a pH of between 6 and 7. Fifteen to twenty centimetres (six to eight inches) of topsoil are required to grow deep rooted and healthy grass. Unless you are starting from scratch, however, it is unlikely that you have “perfect” soil. Many urban lawns have either compacted clay soil or quickly draining sandy soil with low organic content. You can find the depth of your lawn’s soil by sinking a spade twenty to thirty centimetres (eight to twelve inches) into the soil and measuring the dark topsoil layer.

Some aspects of the soil’s quality are out of your control, but, studies have shown that all soils can be improved with the addition of certain materials, a process that is often referred to as “amending” the soil. A soil amendment is different than a fertilizer as it changes the structure of the soil and possibly its pH, but may or may not add to its nutrient content (fertilizers add to nutrient content).

Soil structure is an important part of healthy soil as it influences water flow, nutrient uptake and air flow all of which are necessary for healthy root growth. Examples of soil amendments are limestone, which is used to raise soil pH to the range desired for specific plants and gypsum, which is used to break up hard clay soils. Some amendments such as compost and kelp change both the structure of the soil and add nutrients. Compost is an ideal “natural” amendment as it provides organic matter and improves soil structure in tight clay soils and in loose sands.

To amend the soil in a lawn that is thin and poor, it may be worthwhile to remove the existing grass and start over with at least 15 centimetres (6 inches) of high quality soil. If this is not an option, you can amend the soil of an existing lawn by spreading or “topdressing” the lawn with a one centimetre ($\frac{1}{2}$ inch) layer of organic material such as compost. Topdressing is best applied following an aeration (a process that allows air to get below the ground surface, see Chapter 3), which allows the topdressing material to filter down into the holes. The addition of compost can be repeated yearly and will gradually improve soil quality.

Garden plants and trees also depend on soil quality, so it is important to prepare the soil before planting. First, remove any unwanted weeds by hand in the area of the planting. If there are many weeds and if you have time for a project that will begin in one growing season and end in the next, you can use soil solarization to reduce the number of weeds prior to planting. Soil solarization (see Chapter 3 for details of solarization) is the process of covering an area of garden under plastic sheeting and using the heat of the sun to kill off weeds. However, solarization requires the intense heat of mid-to-late summer to work best. If the weeds are manageable, and you want to plant your garden in the current year, you should remove the weeds by hand.

Once you have removed the weeds, mix amendments in with the soil to a depth of twenty to thirty centimetres (8 to 12 inches) and ideally let the amended soil rest for a week before planting. Since different types of plants grow best in different soil types it is a good idea to research which amendments work best for the plant you are growing.

How much soil do you need?

Soil and soil amendments are sold either in bags or loose in measurements of cubic metres. To calculate how much soil you need for a particular job, determine the size of the area where you are applying the soil by multiplying the length times the width. Then multiply this by the required depth of the soil you are planning to apply.

For example, if you want to add 1.5 centimetres of topdressing, and your lawn is 6 metres wide by 8 metres long, you will need $6 \times 8 \times 0.015$ metres, which is $=0.72 \text{ m}^3$ or approximately three quarters of a cubic metre of soil.

2.4 Planting in shade

In addition to the importance of knowing soil requirements, you need to consider the light conditions necessary to make plants grow. In a natural lawn and garden it is especially important to select plants that are suited to the light conditions on your property.

A relatively common question is how to grow grass in shade. This can be a challenge for grass that normally needs a minimum of four hours of sunlight a day. It is difficult to grow grass under large trees like maples or oaks. The large tree roots take up most of the soil moisture and nutrients and leave little for the grass. Evergreen trees such as pines combine the challenge of shade with acidic soil conditions from pine needles, making it almost impossible to grow grass. Another challenge, common in Canadian summers, is weeks of drought conditions. Combine shade with drought and most grass just cannot survive.

Even when the shade is only modest and there is plenty of water, grass in the shade tends not to be as dense as grass that gets at least four full hours of sunlight a day. Grass in shade should be considered an annual plant and you should overseed the area every year. Techniques for overseeding are described in more detail later. The following are some additional recommendations for growing grass in the shade:

- Purchase a shady lawn mixture of grass seed with a high percentage of fine-leaved fescue.
- Talk to a certified arborist about ways to let in more sunlight by trimming overhead tree branches.
- High cutting (7.5 centimetres or 3 inches) is particularly important to grass in shade.
- When establishing new lawn in shady areas use seed rather than sod. Most sod is made up of Kentucky bluegrass which does not tolerate shade well.
- Consider an alternative ground cover or mulch. There are many books available on planting in shade and many nurseries arrange their plants by the light conditions the plants require.

Summary – Planning for the Natural Lawn and Garden

- The best way to achieve a natural lawn and garden is to design it with consideration to: 1) soil quality 2) selecting the most appropriate plants for the particular conditions of the location and 3) avoiding situations which tend to favour weed and insect infestations.
- Soil can be improved with regular additions of soil amendments.
- Growing grass in the shade is a challenge and you should plan for yearly overseeding or consider an alternative ground cover.
- A natural lawn and garden is beautiful and lush and characterized by a variety of plant species.



3. Natural Care for Your Lawn

When people talk about “horticultural practices” for lawns they are referring to common maintenance activities such as fertilizing, mowing and watering. Pesticide-free lawn care begins with the design (see Chapter 2) and becomes sustainable through maintenance activities. Applying good horticultural practices will allow you to maintain a healthy environment for your lawn and garden and it will be able to crowd out weeds and resist diseases and insects.

Lawns require more than watering and mowing – fertilizing, aerating, seeding, grasscycling and monitoring are all part of a natural program!

It is important to remember that your maintenance routines will be most effective if you respond to what the grass needs. If you manage your lawn according to your schedule, your lawn becomes a “human-modified ecosystem.”³ When you impose your schedule on your lawn, it loses its own natural capacity to cope, and becomes highly reliant on you. But, if you adjust your lawn care schedule to match your lawn’s growth patterns, your lawn will retain its natural vigor. In other words, cut your lawn only when it needs it and leave mulched clippings on the lawn to provide nutrients to the soil. Your lawn retains its natural resilience when you add extra water only when rains are not sufficient. If you do these things, not only will you enjoy a healthier green space around your home but you may spend less time (and maybe even less money) managing your lawn.



3.1 Seeding

In many parts of Canada, the grass species that are grown are called cool season grasses. This means they do most of their growing during the times of cooler temperatures in the spring and fall. Cool season grasses tend to go dormant during the heat of the summer and start growing again with the fall rains. Species of cool season grasses include Kentucky bluegrass, perennial ryegrass, fine fescue and tall fescue.

When you are managing a lawn with natural methods, it is very important to keep the lawn thick. Weed seeds are very opportunistic and will establish themselves wherever bare soil exists. Overseeding (sowing seeds on an established lawn) is one way to make sure that the lawn stays nice and dense from one season to the next.




To prepare a lawn for overseeding, cut it first to help the small grass seeds filter down between the grass blades and come into contact with the soil. It is not necessary to cover the grass seed with soil but it is a good idea especially in areas of the lawn that are particularly bare. Some people like to lightly rake the lawn after overseeding. You can use a broadcast spreader to evenly apply seed to your lawn following the package instructions. Broadcast spreaders are available for rent or purchase at most garden centres. If you don’t have access to a broadcast spreader, sow the grass seed by hand and then rake lightly to even it out. Once you have seeded the lawn it is important to keep the lawn surface moist until the seed has germinated. Depending upon the type of grass seed and weather conditions this may take between 8 and 15 days.

You can seed in spring and fall. Spring seeding is a good idea if you are repairing areas where the grass has died or is thin after the winter and is best done between the end of April and the end of May. However, the very best time to overseed is in the fall, usually in September. This leaves enough time for the grass to germinate before the ground freezes.

The fall is considered the best time to overseed for the following reasons:

- Less competition from annual weeds which are most viable in the spring.
- Young seedlings can tolerate the winter cold but can easily die off in the heat of the summer.
- The ground is warm and the air is cool.
- Fall rains tend to be gentler.

Choose grass varieties that are best suited to your yard:

-  **Kentucky Bluegrass** – grows well in sunny areas
-  **Fescues** – good for partially shady and dry conditions
-  **Perennial Ryegrass** – grows quickly, drought tolerant and pest-resistant






When seeding new lawns or overseeding an established lawn, it is usually recommended to use a high quality blend of grass seed. By using a blend of grass you are introducing a variety of grass types into the lawn which creates a healthier and more naturally resistant lawn. Certain diseases and insects favour certain types of grass. A mixture of grass types will mean that your lawn will be better prepared to recover from any injury. As well, since home lawns are usually a combination of shady and sunny areas, different grass types will be better adapted to the different light levels.

Another benefit of using a blend of grass types is that you can boost the ability of the grass to resist insects. Many fescues and ryegrasses are infected with a naturally occurring fungus called endophytes. Grasses that contain these fungi have shown high resistance to insects such as billbugs, chinch bugs and sod webworms that feed on the blades of grass. Endophytes occur in tall fescue, perennial ryegrass and fine fescue grasses.⁴ These grasses are more vigorous with a greater number of roots making them more drought resistant and particularly well suited for natural lawns.

A cool season blend could contain perennial ryegrass, creeping red fescue and Kentucky bluegrass. You may want to use a blend with no more than 30% Kentucky bluegrass as it requires more watering and fertilizer and is prone to certain diseases and damage by some insects. Grass seed blends are available at most nurseries and garden centres. When shopping for seed, you should always select good quality. Seed that is graded as Canada certified #1 provides assurances about the purity and percent germination rates and is preferable to generic seed or blends that do not list the specific seed ingredients on the package.

3.2 Mowing your natural lawn

In a natural lawn care program, nothing is more important to the health of the lawn than proper mowing. We all may consider mowing a routine task, but remembering the following simple rules will make a big difference:

-  Cut your lawn to a height of about 7.5 centimetres (3 inches). This is especially important in the heat of the summer and for shade lawns. This longer height encourages deep root growth and creates shade that inhibits weed seed germination. The shade from taller grass is very important. Studies have shown that a dense grass canopy mowed at 7.5 centimetres (3 inches) can control crabgrass populations by 30-80%.⁵
-  Cut no more than one third of the grass blade at any one time to avoid removing too much of the functioning green leaf.
-  Keep the mower blade well sharpened to avoid tearing the grass blade. Tearing makes the grass more susceptible to disease.
-  Mulch your clippings and leave them on the lawn. Mulched clippings provide moisture and up to one third of the nitrogen requirements of a lawn.
-  Cut the lawn only when it needs it instead of on a weekly schedule. In the spring, during its high growth phase, the lawn may need mowing every five to seven days. But during the heat of the summer as the grass slows its growth, you may reduce mowing to once every two weeks. Grass growth will slow and speed up as weather dictates, so it is very difficult to predict an exact schedule. However, the fast spring growth that requires weekly mowing usually lasts 6 or 7 weeks. In July and August, you may need to mow your grass only twice a month. Cutting frequency may increase briefly again with the fall rains. Weekly cutting translates to 26 cuts during the typical growing season of May 1 to October 31. The natural gardener can expect to cut the lawn 18- 20 times in the same period – a lot less work for better results!

Mowing your natural lawn can mean less work and better results!

While you may have heard these rules before, they become especially important in a natural program. Short mowing heights are probably the number one cause of weak grass and weak grass provides the best opportunity for weeds to invade your lawn. So if weed control is a concern, set your lawn mower to cut at a height of 7.5 centimetres (3 inches).

Grasscycle

Leave your clippings on your lawn!

Let's look a little closer at the benefits of leaving mulched clippings on your lawn. Not only are you improving the health of the grass when you leave mulched clippings on the lawn, you are doing something good for the environment.

The many benefits of leaving mulched clippings on the lawn include:

- ❏ Mulched clippings "recycle" nutrients back into the soil and can contribute up to 30% of the lawn's seasonal nitrogen requirements.
- ❏ Clippings improve the ability of the lawn to retain water and reduce watering needs.
- ❏ As much as 18% of the garbage that goes into landfills in North America is grass clippings. If you leave your clippings on the lawn, you make an important contribution to solving the waste disposal problem.
- ❏ Leaving mulched clippings on the lawn saves time, reduces water consumption and saves money on fertilizer.

3.3 Watering your natural lawn

A natural lawn program recognizes that water is a valuable and scarce resource, especially in the summer. If you follow the cultural practices in this guide your lawn will naturally have reduced watering requirements, because: 1) Grass cared for naturally is cut long. This encourages deeper roots and improves the grass' ability to access water. 2) The grass in a natural lawn is a blend of grass species, including types that require less water. 3) The mulched clippings – which are 90% water themselves⁶ - have been left on the lawn to cool the crowns of the grass and help conserve moisture.

When it is necessary to water your lawn, the following suggestions will ensure that your watering routine contributes to the overall health of the grass:

- ❏ Avoid watering too frequently. Once a week (and less than that when rains are adequate) should do, as overwatering can cause root death for grass and reduce air in soil.
- ❏ Avoid brief, shallow watering as this can cause shallow grass roots.
- ❏ When watering is necessary, water for at least 1 hour to apply approximately 2.5 cm (1 inch) of water. This ensures soaking of the entire root zone.
- ❏ Water in the morning because evaporation rates are low. Morning watering also limits the time the grass blades are wet and reduces the risk of fungal disease.

Your watering routine is another important weed control tool. Improper watering can cause shallow roots that weaken the lawn and make it more susceptible to weeds. As well, light watering encourages germination of weed seeds at the expense of grass. Make sure that when you do water you keep these suggestions in mind.

Measure the water your lawn is getting — from both rain and your sprinkler — with a simple rain gauge or tuna can. One inch per week is enough!

3.4 Natural lawns in the summer

Cool season grasses will naturally go dormant in the summer. Dormancy is your lawn's self-protection measure as temperatures rise. If lawns have been maintained naturally for years and have long roots, with healthy soil and without thatch, they will tolerate this period for up to 6 weeks without harm.⁷ Healthy lawns will readily green up again with the onset of fall rains.

While the process is natural, you want to be very careful with your lawn during this time. Dormant lawns may thin out and be more susceptible to weeds and insect pests. In addition, when lawns turn brown in the summer, it is best that you do not cut them or allow foot traffic on them. These stresses can really harm grass in summer dormancy. It is also important to avoid forcing growth by fertilizing or over watering. To manage summer stress on your natural lawn apply liquid kelp (seaweed). Liquid kelp, in combination with proper watering, will maintain your lawn's health and preserve its density without forcing growth.

If the drought is severe and extends beyond 6 weeks, you can water your lawn to reduce the temperatures near the crown of the grass (the crown is the growing part of the grass plant, situated low on the stalk, close to the soil). If the crown of the plant dies the entire grass plant will die. About 1.5 centimetre (½ inch) of water every two weeks is enough to hydrate the crown without pulling the plant out of dormancy.⁸ Avoid pulling your grass in and out of dormancy as this can severely weaken the lawn.

3.5 Feeding your natural lawn

Healthy soil provides nourishment to grow healthy grass. The soil itself needs to replenish its nutrients so it can continue to keep your lawn healthy. Keeping your soil healthy with the addition of the necessary nutritional elements is called fertilization. All fertilizers provide three main nutrients for the grass, which are listed by percentage weight on fertilizer packages. These are nitrogen (N): which is necessary for stem and leaf growth, phosphorous (P): which promotes root, fruit and flower growth and potassium (K): which assists other nutrients to function well within the plant. The ratios of these nutrients (always in the order of nitrogen first, phosphorous second and potassium third) may appear on a fertilizer package as, for example, 20-10-10.

Fertilizers with ingredients from naturally occurring substances such as vegetable, mineral or animal sources are generally referred to as "organic" or "all-natural" fertilizers. Nitrogen is found in "organic" fertilizers such as manure, by-products of poultry and fish and vegetable sources like alfalfa and soybean by-products. The main source of phosphorous is bone meal. Potassium is derived primarily from potash, wood ashes and kelp. Organic fertilizers also provide micro-nutrients and organic matter, both of which are very important for improving soil structure and quality.

Organic fertilizers have a unique function in the soil as they provide nitrogen primarily in a water-insoluble format. This means that the soil microorganisms must break down the nitrogen to make it available to the plant. This is an important step since it stimulates microbial activity which is good for soil health. In addition, nutrients from organic fertilizers tend to build up in the soil over time and are slowly made available to the grass. This is especially true in healthy soil with adequate amounts of organic matter.

Fertilization is an important element in weed control. If you are not sure what your lawn's fertilizing needs are, you can hire a professional to arrange a soil test.

3.6 When to fertilize your natural lawn

Applying fertilizers at the right time of year will also contribute to overall grass health. If you are using natural, slow release fertilizers usually two applications – one in the spring and one in the fall – will provide all the nutrients your lawn requires. In the spring, your grass is beginning a high growth phase and fertilizing too early tends to promote the top growth of the grass at the expense of root growth. Excessive spring growth can result in weakened roots which are much less drought resistant and are more susceptible to disease. It is therefore important to plan spring fertilization after the first rush of spring growth, usually around mid May.

Resist the urge to fertilize that post-winter lawn unless it really needs it. Fix the bare or thin patches in the spring, focus on other important lawn needs, and save the real feeding until the fall. Your lawn will thank you!

You should apply fertilizer in the fall when the top growth has stopped but while the roots are still collecting nutrients to store for the winter. In many Canadian cities close to the 49th parallel this is during the month of October. For lawns that have been cared for with a natural approach for several years, it is likely that only a single annual application of organic fertilizer will be required. Since natural fertilizers are not fully metabolized in any one year, reserve capacity of nutrients builds up in the soil and can be used in the following year. In addition, in a natural lawn care program, the soil quality is regularly managed with additions of compost and mulched clippings. If you are applying a fertilizer only once, the best time to do this is in the fall. Whenever you fertilize, it is important to always follow the instructions on the package label.

3.7 Aeration and dethatching

You can use techniques such as aeration and dethatching as additional horticultural practices to help keep your soil and grass healthy. Aeration is the process of removing plugs of soil from the lawn. Its purpose is to increase oxygen flow around the root zone of the grass, stimulate microbial activity and to improve soil structure and water flow. Aeration is particularly beneficial for clay-based and compacted soil.

Aeration is best done when the ground is moist in either the spring or fall. It should be avoided in the heat of the summer. Spring aeration should not take place until the ground has firmed up after the winter to avoid damage to new shoots of grass. For lawns where weed management is an issue, fall aeration is a better choice because spring aeration can sometimes stimulate weed seed germination.

Aeration is usually done with a mechanical aerator, which can be rented at many garden centres and tool rental stores. As the aerator moves across the lawn, it removes plugs of soil of approximately 7.5 centimetres (3 inches) in length and deposits these on the lawn. The plugs usually disappear in about a week's time; you can rake them to help break them up and make them disappear faster. Aeration is a technique that is excellent to combine with topdressing, seeding or fertilizing as the holes allow good distribution of the material, which in turn can aid in the repair of any potential damage caused by the aeration process.

Some aerating tools simply poke holes into the ground rather than extract plugs. This method, however, does not really help in improving soil structure – while air circulation is improved around the hole, the soil beneath the hole is further compacted. Aeration is recommended yearly for high traffic areas or for properties that are just starting a natural lawn care approach. On a well-established lawn that has been cared for naturally for some years, it may be beneficial to aerate once every 3 to 4 years.

Dethatching is a process that removes thatch from a lawn. Thatch is a layer of dead and decaying organic matter located where the grass emerges from the ground. If it becomes too thick, it will not break down and forms a dense layer that tends to be impermeable to water. A thin layer of decomposing plant material in a lawn is considered healthy, as it provides protection to the crown of the grass and helps control the temperature of the grass. Some people refer to this thin, decomposing layer as the “mat.” Thatch – not to be confused with “mat” – is a dense layer of more than 1.5 centimetres ($\frac{1}{2}$ inch) that prevents light, water and nutrients from reaching the grass. Sometimes grass roots will grow into the thatch rather than down into the soil. A thick layer of thatch also provides the perfect hiding place for insects like chinch bugs.

Leaving your mulched grass clippings on the lawn will not contribute to thatch unless a severe problem already exists. Thatch primarily results when the organic material collects faster than it decomposes. This situation may occur because some grass species take a long time to break down or because the soil has reduced biological activity (fewer microbes). The cultural practices used in a natural lawn care program – such as using a blend of grass seed, and stimulating microbial activity by using “natural” fertilizers -- will also help to prevent thatch from becoming a problem.

If you have a problem with a thick thatch layer, dethatching is usually recommended in the fall (early September) when there are still about 30 growing days left, to ensure the grass has time to recover. The dethatching process is somewhat hard on the grass and involves the removal of the matted layer of dead and decaying plant material between the growing grass and the soil. This can be done by hand with a dethatching rake (ask at your local hardware store) on smaller properties, or with a power rake on larger lawns. Thatch problems arise when lawns are over-fertilized, over-watered and have insufficient microbial activity in the soil. Natural lawn care methods will prevent thatch from becoming a problem on your lawn.

3.8 Weeds and weed management for your natural lawn

“What is a weed? A plant whose virtues have not been discovered.”

Ralph Waldo Emerson

Where do weeds come from? There are many in the soil under your lawn and garden waiting patiently, as seeds, for the right conditions to start to grow. Buried in the upper layers of the soil is a collection of weed seeds that have accumulated over decades. Weed ecologists call this a “seed bank.” It is the source of all those weeds that spring up so quickly when the soil is left bare. Weed seeds can also travel long distances on the wind, constantly replenishing the seed banks. In addition to weeds that reproduce by seed, there is also a plentiful supply of those that reproduce by roots or stems. Given the extraordinary resources available to weeds to help them keep on coming back, it may not be a realistic goal for your natural lawn and garden to be completely weed-free. Instead, you should manage your lawn in a way that will limit the plant species that you do not want. In the long run this is a more practical approach to weed management.

When managing weeds in your lawn, it is important to remember the benefits of biodiversity. A variety of plant species in your garden will attract beneficial insects, help improve soil quality, provide habitat for birds and butterflies and provide natural resistance to diseases and harmful insects. Nature introduces different species of plants into the lawn all the time. Some you may not want, but others may be a welcome addition to the landscape. Weeds can also give you a clue to lawn problems and what needs adjustment in your lawn care program. Dandelions for example, prefer poorly



fertilized lawns. An increase in their numbers will tell you it is time to feed your soil. Broadleaf plantain prefers thin, compacted areas and helps you identify areas where you may need to aerate and amend the soil.

Managing weeds to limit their appearance in the lawn is best done through preventative practices. If you are concerned about unwanted weeds in your lawn, it is important to take action very early on because natural methods are easiest when weed numbers are low. Weed seeds are everywhere in your soil, and more are coming your way on the wind. Maintaining a strong, dense, healthy stand of grass is the first and best defense against weeds.

All of the practices discussed so far are part of the weed management program in a natural lawn and garden. Proper cutting, watering and fertilizing help you create a healthy soil environment that will support healthy grass. And healthy grass has the competitive advantage to crowd out weeds.







In addition to the horticultural practices, there are also some more direct controls that you can use to limit weeds in the lawn. Hand weeding can be effective at limiting weeds on small urban lots. Weeding tools are described in more detail below. You can also time the mowing of your lawn so that you are cutting it before existing weeds have gone to seed. There are also lower risk pest control products, such as herbicidal soaps, which are permitted under the City of Toronto Pesticide by-law that can be used to kill weeds in certain areas (see Chapter 7).

3.8.1 Soil solarization for weed reduction on your natural lawn

Soil solarization is another technique that can be used for reducing weeds in home lawns. Soil solarization was initially studied by agricultural scientists in Israel⁹ who determined that sunlight can be used to increase soil temperatures enough to kill weeds.¹⁰ The sun's heat is intensified on a patch of ground by covering it with a plastic tarp. Prepare the area by raking to ensure the tarp can be placed close to the ground. A light watering will encourage weed seeds to germinate and increase the crop of young weeds that will be killed off. Place a covering, such as a black plastic tarp, over the area and anchor it at the corners. Leave the covering on for at least 4 weeks of summer sun, after which the cover can be removed and the area prepared for planting.

When you use soil solarization for a weedy lawn, it will kill the grass under the covering along with the weeds. It is therefore a good idea to pick a small, manageable area of lawn that is very weedy and that can be out of commission for most of the season. When the covering is removed you can prepare the area by lightly working in soil amendments and smoothing out the area in preparation for seeding. Avoid cultivating too deeply because you don't want to bring any new weed seeds to the surface. Ideally you can time the soil solarization so that you are using the hot July and August sun for the solarization and then you are ready to reseed in the fall. This method can reduce weed cover on a lawn to levels that can then be handled by routine horticultural practices.

Summary - Cultural Practices for a Natural Lawn

-  Overseeding once or twice a season is critical to keep the grass thick.
-  Proper cutting techniques including long cutting help strengthen grass and allow it to out-compete weeds.
-  Good watering techniques can encourage deep root growth and healthy soil and can condition the lawn for the heat of the summer.
-  Application of fertilizers after spring growth and before frost in the fall adds nutrients back to the soil for healthy grass. A single application in the fall may be all that is needed for a healthy lawn.
-  Aeration and dethatching can be added to the seasonal program as required.
-  Weed management methods include all the horticultural practices plus techniques such as hand weeding, soil solarization and, if necessary, the careful use of lower risk pest control products (see Chapter 7).



4. Natural care for your gardens and trees

Horticultural practices are as important for the long-term health of the plants and trees in your garden as for your lawn. Each species has its own particular requirements for soil type, water and light. The right plant in the right spot almost always thrives. It is worthwhile to research the plant material before you plant as this initial work can save you a lot of problems down the road.

If you have an existing garden, it is worthwhile to learn about the plants and trees in it. To understand what is working and what is not, you should observe the performance of the different plants during the different seasons and keep a journal of ongoing problems. This is a good way to determine if it is appropriate to keep the plant or tree in the garden. A plant or tree that can not survive with good practices alone is probably in the wrong spot. It should ultimately be relocated to a more appropriate spot and replaced with more suitable material that is more naturally resistant to diseases and insects.

4.1 Natural plant and shrub care

Pruning is an important part of plant and shrub care and is performed for both aesthetic reasons and for plant health. Aesthetically, pruning helps shape the plant or shrub and maintain its size. Post-bloom pruning maximizes the blooms for the following season. In addition, you should prune a plant or shrub to remove crossed, damaged or diseased branches which will stress the plant. Pruning also improves air flow through the plant and can encourage better branch distribution which can result in a healthier and more vigorous plant that is less prone to disease.

You also need to consider proper watering for the plants in the garden. Creating a watering schedule for plants is a little more complicated than for lawns because each species has its own unique watering requirements. Garden design books sometimes suggest that plants with similar watering requirements should be placed together to simplify watering plans. Generally speaking you should water newly planted material twice a week throughout its first growing season. Water should be applied to the base of the plant to soak the root zone. Avoid watering that simply wets the leaves. After the first growing season most plants and trees if appropriately placed, should survive on water provided naturally by rain. During drought conditions, however, you may need to water between rainfalls. Alternatively, you may want to investigate xeriscaping, the art of creating gardens with plants evolved to thrive on low water supplies.

While some aspects of soil quality are out of your control, how you “manage” the soil in the garden can help you create good quality soil, which is critical to plant health.

The following are several important horticultural practices that will help you create healthy soil for your garden plants:

Regularly add organic matter

It is beneficial for soil health to add compost to the garden bed at the time of planting and then every year afterwards. Compost is an excellent fertilizer. As well, compost has been shown to help suppress plant diseases and may even provide the plant with improved resistance to various bacteria and fungi.¹¹

Avoid excessive tilling

Tilling the soil, or turning over clumps of soil, is a very popular gardening technique for managing weeds in garden beds but it is generally not recommended in a naturally managed garden. You should avoid tilling deeper than the soil's top two or three centimetres as this

will bring weed seeds closer to the soil surface and encourage germination. Too much tilling can also cause accelerated decomposition of organic matter because of the constant addition of oxygen.¹² It can be injurious to the young roots of new plants and can disrupt the normal allocation of soil life. Many natural gardeners recommend a “no-till” policy in their garden beds. A much more effective technique to consider for weed control in the garden is mulching the bare earth to prevent weed seed from germinating.

Use mulch to prevent erosion and to provide a habitat for beneficial organisms

Mulch is any covering applied to the soil that prevents light from reaching weed seeds. There are a variety of organic and inert mulches. Organic mulches include leaf mold, hay, cocoa bean husks and bark chips. These have the added advantage of providing humus to the soil as they decompose. Leaves are high-quality organic mulch and have the additional advantage of often being available on-site so there are no additional costs or resources required to add them to gardens. Organic mulches vary in their speed of decomposition and ability to retain heat and moderate temperature. Inert mulches include river rock or gravel which are particularly suitable in locations where permanent weed control is required and where little planting is planned. There are a wide variety of mulches now available and your selection may depend upon the purpose the mulch will serve.

Mulching garden beds is highly recommended as it helps the plants to retain moisture, reduces soil erosion, suppresses weed growth, and insulates the soil, providing a good thermal layer of protection during winter freeze and thaw cycles. When you apply organic mulch such as pine or cedar chips, cocoa mulch or leaf mold, use a generous 7.5 centimetre (3 inch) layer. Mulch should be kept back from plant stems and tree trunks. A “leg up” from a layer of mulch could encourage animals to chew on tender tree bark. Too much mulch up against a plant stem could encourage rot.







Use a variety of plants to encourage diversity in soil microorganisms.

Finally, consider a variety of plant species in the garden. Not only will this add interest to your garden, but diversity means that you will be creating a welcoming environment for a wide variety of beneficial insects and micro-organisms.¹³ All these living things contribute to the vibrancy and health of your garden.

4.2 Natural tree care

Trees are an important part of the urban landscape. Ninety percent of Ontario’s urban forest is comprised of trees on private property¹⁴ so how you care for your trees is extremely important. Trees, because of their impact in the garden, the time it takes them to reach maturity and the costs of replacing them, require ongoing monitoring and routine care to ensure their health.

Insect and disease problems on trees in urban gardens usually are the result of stresses on the tree. For example, trees can be stressed when:

-  they are planted without regard for how suitable they are to the location;
-  the type of tree planted is susceptible to insects;
-  they are damaged from lawn equipment or the surrounding soil is compacted by construction equipment;
-  the populations of naturally occurring beneficial insects that keep pests in check have been altered;
-  they are impacted by pollution from salt and herbicides around trees¹⁵; and
-  impervious surfaces near trees limit access to water.¹⁶

If you want naturally healthy trees, you need to protect them from these stresses. In addition, you should routinely check them for broken or dead branches and storm or insect damage to prevent even more serious problems. If you see a problem, call a certified arborist for a full diagnosis.

Pruning to remove dead and crossed branches is an important part of tree care. Some trees should be pruned only when dormant because fresh pruning wounds can leave them vulnerable to insects such as the Elm Bark Beetle or diseases like Oak Wilt. Only a certified arborist should prune your trees.

The principle of deep watering to encourage deep roots holds true for trees just as for grass and plants. During drought conditions, for your trees, you should apply a low pressure watering with a soaker hose once a week for about 2 hours. Trees that have been planted within the past four years tend to have limited root zones and are particularly at risk from drought stress. These younger trees should get special attention in your watering schedule and may require low pressure watering 3 or 4 times per week during a drought.

Most mature trees do not require any fertilization and the general natural lawn fertilizer you apply will provide all the necessary nutrients. Young trees will benefit from feeding in the spring and/or fall. In addition, you should plan on yearly

additions of compost and organic mulch around the root zone of the tree.

Tree trunks and roots are also at risk of damage from lawn mowers or construction equipment. You can protect your trees by creating wells around them and by avoiding mowing right up to the trunk. If construction is taking place on your property, rope off areas where tree roots lay to protect them from compaction from heavy equipment.

4.3 Leaves ...the all-purpose miracle garden product!

Leaves are probably the most undervalued resource in the urban garden. For many people, leaves signal the unpleasant fall chore of raking and bagging. However, leaves can be used in many wonderful ways around the garden. One of their most useful forms is leaf mould, also known as composted leaves.

You can make leaf mould by simply placing leaves collected in the fall in a dark plastic bag with a shovelful of dirt. By the time spring comes around the leaf mould will be ready to use. Leaf mould is an excellent soil amendment. You can add leaf mould to the soil to lighten up clay based soils or you can use it as highly nutritious mulch around new plantings. Both healthy leaves as they fall from the trees and leaf mould are excellent garden mulch for shrubs and trees (leave a little space between the mulch and the tree trunk). A 7.5 centimetre (three-inch) layer of leaves placed in garden beds is a free and readily available source of garden mulch.

New research also indicates that mulched leaves -- as long as they are not too thick -- can be left on the lawn over the winter without any problem. Studies conducted at Michigan State University indicate that you can just leave the tree leaves on the grass and mow over them with a mulching mower when you cut the lawn. It is recommended that you also apply a nitrogen fertilizer at the time of mulching to encourage breakdown.¹⁷

Leaves can also be collected and stored by the backyard composter. A good mix of food scraps from the kitchen and leaves provide the ideal balance of nitrogen and carbon for successful composting. Even during the winter, when the compost freezes, it is a good idea for you to continue to add leaves so that the composter will start "cooking" properly again in the spring.

If you use the leaves in your garden in these ways, you save the time of raking and bagging them, you save the costs of buying mulching material and soil amendments and you add to the life and vibrancy of your natural lawn and garden.

Summary - Natural Garden and Tree Care

- Proper plant selection and placement is the important first step in creating a garden of plants and trees that can be cared for naturally.
- Keeping plants and trees free of debris and diseased material is an important part of regular care.
- Proper pruning and watering are critical horticultural practices for plants and trees.
- Adding compost and mulch around plants and trees is beneficial to their health.
- Leaves are a beneficial and free resource that can be used throughout the garden.

4.4 A calendar of natural lawn care

Part of caring for your natural lawn and garden is accepting that each year will bring its own particular weather, insects and other unique seasonal conditions. Because of these seasonal variations, your lawn may look somewhat different from one year to the next. This is perfectly natural. If the differences are due to weather or other temporary cycles, patience is the best response. It is not uncommon for one season's challenges to go away as the weather changes. Bothersome insects one season become the food source for beneficial insects the next. In other cases, such as when

unwanted weeds are moving in or your grass is dying, you may need to adjust your natural program with the addition an aeration, some extra topdressing or a little hand weeding.

Regardless of the season's characteristics, however, there are some important practices that should be followed every year. These simple practices in combination with proper mowing and watering techniques will let you create a lawn that is healthy and vibrant. With just a little help from you, your lawn will be able to cope, season after season, with whatever Mother Nature has to offer.

EARLY SPRING	SPRING	SUMMER	FALL	LATE FALL
Late April to Early May	May and June	July and August	Late August to Late September	Late September to November
<ul style="list-style-type: none"> ➤ Repair areas of winterkill, but avoid working on a wet lawn ➤ Rake the lawn to remove debris and any brown patches ➤ Apply organic soil amendments: topdress and overseed ➤ Monitor for weeds and spot hand weed ➤ For larger areas of annual weeds, consider soil solarization in July or August ➤ Sharpen lawn mower blade ➤ Raise mower height to 7.5 cm (3") 	<ul style="list-style-type: none"> ➤ Fertilize after first burst of grass growth ➤ Aerate lawns new to a natural approach, add topdressing or fertilizer ➤ Identify weeds and hand weed as necessary ➤ Cut lawn before weeds go to seed ➤ Monitor for grub activity in dead patches where grass easily pulls up ➤ If you have grub damage, repair areas and ensure proper cultural practices are followed 	<ul style="list-style-type: none"> ➤ Dormant lawns may naturally turn brown during heat of the summer – see Chapter 3 for further maintenance details ➤ Avoid cutting the lawn during drought ➤ Keep foot traffic off the lawn if it is dormant ➤ Apply liquid kelp to help manage summer stress ➤ Water the grass every 2 to 3 weeks during an extended drought ➤ If you have a lot of weed cover, now is to the time to start solarization ➤ Check for signs of chinch bug damage. If you have damage, repair and ensure proper cultural practices are followed 	<ul style="list-style-type: none"> ➤ Overseed the entire lawn ➤ Repair damaged areas with a seed blend high in endophytic grass seed ➤ Monitor for insect damage when lawn greens up with fall rains ➤ Aerate in combination with seeding or topdressing ➤ Apply nematodes if grub damage has not been managed with cultural practices ➤ Seed and water solarized areas 	<ul style="list-style-type: none"> ➤ Apply final late fall fertilization to prepare grass for the following spring ➤ Clean and winterize lawn equipment ➤ Leave mulched leaves on lawn with mulched clippings from final cut

4.5 A calendar of natural garden care

It is very important that you have an understanding of the plants in your garden and their specific care requirements. Each plant requires unique horticultural practices including pruning and watering. Understanding the specific

requirements of garden plants will go a long way toward successful gardening. There are some general practices that will benefit all plants and should be part of a natural garden care plan.

SPRING	SUMMER	FALL	WINTER
<ul style="list-style-type: none">➤ Cut back dead plant material on perennials➤ Prune roses to improve air circulation and remove winter kill➤ Add a fresh 5 cm (1 to 2 inch) layer of compost on all garden beds➤ Remove any large, wet clumps of leaves and add to composter➤ Plant new material by the end of May➤ Apply mulch to new plantings➤ Trim evergreens after spring growth to maintain shape or size	<ul style="list-style-type: none">➤ Deadhead (remove the dead flowers from) any plants which are enthusiastic spreaders➤ Prune any plants which are growing fast to encourage good air circulation➤ Monitor garden for weeds, remove from beds and replenish mulch➤ Monitor for garden pests and check gardening reference resources to help identify problem insects and beneficial insects.	<ul style="list-style-type: none">➤ Divide any perennials which have outgrown their space➤ Mulch beds➤ Cut back roses to 1/2 their height➤ Remove any plants that were poor performers and note in journal for future planning➤ Leave the leaves in the garden for winter mulch or by the composter so fresh compost will be ready for spring	<ul style="list-style-type: none">➤ Prune shrubs and small trees when branching structure is easy to see➤ Make notes about spring planting plans

4.6 A calendar of natural tree care

The calendar for tree care, as for plants and shrubs, is highly dependent upon the tree species and unique seasonal conditions. In some cases, it will be necessary to call in a certified arborist

for an exact diagnosis of the situation and to make care recommendations. However, you are in the best position to monitor and observe tree performance throughout the season and to ensure proper horticultural practices are being followed.

SPRING	SUMMER	FALL	WINTER
<ul style="list-style-type: none">➤ Monitor for pests - this tends to be the most active time for insect damage➤ Remove any tent caterpillar nests➤ Check with arborist if large trees require pruning to remove dead or damaged branches or to allow more sunlight on your lawn	<ul style="list-style-type: none">➤ Ensure that trees, especially young ones, are properly watered during drought➤ Protect tree trunk and roots from summer construction activity and lawn equipment	<ul style="list-style-type: none">➤ Inspect for insects such as fall web worm➤ Let fallen leaves collect around base of tree to protect tree roots	<ul style="list-style-type: none">➤ Avoid piling snow containing salt shoveled from driveways on root zone of trees➤ New tree plantings over 3 metres tall can be staked. Remove stakes when roots become established in about one year

5. Pest Management... the Natural Way

Urban lawns still feature grass more than any other plant, but more and more are taking on a naturalized look. Usually an urban lawn will have a main area of grass with garden beds combining annuals, perennials, flowering shrubs, evergreens, ornamental grasses and trees. There is a definite trend towards more drought tolerant and disease resistant varieties. Most local garden centres now carry these plants.

Gardeners add plants to their gardens that provide year round interest in terms of colour, form, fruit or flower. Water features are becoming more common and butterfly gardens are particularly popular. Perennials, ground covers and mulching materials are also more often seen in the landscape. An increasingly common sight is homes whose entire front lawns have been replaced with mixed gardens.

In southern Ontario gardens, magnolias and flowering apples are popular choices for ornamental trees. Commonly seen evergreens include cedars and spruce. New tree plantings indicate a trend away from particular tree species, such as Austrian pines, that tend to be more susceptible to problems.¹⁸

The following section describes natural ways to address common pests, including weeds, insects and diseases, on lawns, plants and trees. You may also wish to consult an expert for advice. For weeds and insects common to lawns, photos are provided to aid in identification.



For other pests described in this guide, the following resources provide more detailed photos and information:

OMAF 1996. Publication 162 *Diseases and Insects of Turfgrass in Ontario*
<http://www.gov.on.ca/OMAFRA/english/crops/pub162/p162order.htm>

Government of British Columbia *Integrated Pest Management Manual for Home and Garden Pests in BC*
<http://wlapwww.gov.bc.ca/epd/ipm/docs/envirowe/default.htm>

University of California – Agriculture and Natural Resources Program *The UC Guide to Healthy Lawns*
<http://www.ipm.ucdavis.edu/TOOLS/TURF/> and
<http://www.ipm.ucdavis.edu/index.html>

5.1 Common lawn and garden weeds

Weeds may appear in both lawns and gardens. Many weeds do not tolerate mowing and appear only in the bare soil of a garden bed. Garden weeds can be managed by hand weeding and mulching.

The seed bank – the thousands and even millions of seeds in soil – makes the most of every opportunity to start to grow. The plants that we call weeds are aggressive, opportunistic, fast-growing interlopers that favour disturbed earth. If you have bare patches in your lawn and exposed soil in your garden hardy, unwelcome plants with names like redroot pigweed, lamb's quarters, corn spurry, chickweed, creeping Charlie and mallow will appear.

Weeds in your garden can be pulled out by hand. Keep the layer of mulch thick to deny light to seeds in the soil.

Weeds in the lawn may also be pulled by hand or dug out with a tool. Drop some grass seed and top dressing in the hole left behind. A description of the most common lawn weeds and the practices for managing them follows.

Dandelions are perennial weeds that reproduce by seed. Their bright yellow flowers make them probably the best recognized of all lawn weeds. When the weed matures, the dandelion flower turns into a puff ball of seed that is easily carried in the wind. Once the seed head is gone the leaves are much less noticeable. Dandelions have a long single taproot that allows them to search for nutrients deep in the soil. This is why dandelions are commonly seen in lawns with thin grass and poor fertility.



Dandelion

Dandelions in a lawn will be crowded out by a thick, healthy stand of grass. Slicing off the leaves or repeated mowing, especially before they go to seed, will limit their spread. Digging out the root to ten to fourteen centimetres (4-5 inches) will eventually kill them.

Broadleaf plantain is a common perennial lawn weed that reproduces by seed. It has a characteristic rosette pattern of leaves with long flower spikes. Broadleaf plantain is usually found in low quality, compacted lawns



Broadleaf Plantain

and may be seen near driveway and walkway edges that get a lot of foot traffic.

Plantain can be removed with a hand weeder. In areas where there are a lot of these weeds, relieve compaction with aeration and then add organic matter and grass seed. If the area is always subject to foot trampling you may also want to consider placing some hard landscape material such as gravel or stone.

Black medic is an annual lawn weed that reproduces by seed. It has small compound leaves having 3 oval leaflets, very similar to clover, and a thin taproot. What distinguishes black medic are small, nearly spherical clusters of yellow flowers and small clusters of black coiled seedpods.



Black Medic

Black medic can form dense patches as its wiry stems trail along the ground. This weed does not blend as well with the lawn as does its cousin, white clover. It can be an aggressive spreader especially in dry sunny locations. Identifying the weed early will allow it to be weeded out of the lawn before it spreads. Fall overseeding when the weed is less vigorous can also help prevent its reappearance.

Crabgrass is an annual weed that sprouts from seed in late May to early June. Two varieties of crabgrass grow in Ontario, large and smooth crabgrass. Crabgrass is probably the most common grass-like weed, with wide blades and a coarse bunch-like

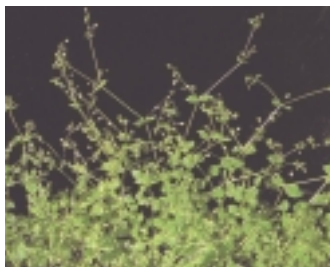


Crabgrass

appearance in the lawn. In late summer it produces hundreds of seeds on finger-like seed heads that over-winter in the soil and germinate the following spring. Crabgrass is typically seen in clusters on lawns that are thin and undernourished.

Crabgrass does not tolerate shade. Studies have shown that by increasing grass height, enough shade is created at the soil surface to keep the weed from sprouting. Keeping your grass thick with fall overseeding will also help control crabgrass.

Chickweed is a low growing winter annual. A winter annual is a plant that germinates from seed in the fall and then grows fall, winter and early spring. In the early spring it produces seed and then the plant dies in late spring. Chickweed spreads in a lawn with creeping above-ground stems that produce roots where they touch the ground. Its leaves are small and it produces a small white flower with five petals. Chickweed prefers moist shaded areas with thin grass but it can also tolerate sunny areas. Chickweed is a rather inconspicuous weed and in a thick lawn will have limited spread. It is one of those weeds that can blend in well with grass to provide some biodiversity.



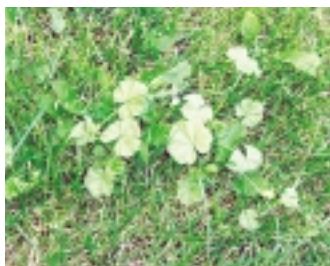
Chickweed

Creeping Charlie is also called ground ivy and is a low-growing, creeping perennial weed. Its distinctive characteristics include square stems that set up roots at every node, oval shaped leaves and a noticeable mint-like odour. It has trumpet-shaped blue-violet flowers that appear on erect branches. Creeping Charlie thrives in moist, shady areas of the lawn and garden, but will also invade sunny areas if the lawn is thin. Prevention is key for the management of this weed. Remove it from garden beds by hoeing or digging it out. If you don't want it in your lawn, make sure it is removed from garden beds.



Creeping Charlie

Mallow may be either an annual or biennial weed that reproduces by seed. Mallow has kidney to round-shaped leaves that are more than 2.5 cm (1 inch) in diameter and it produces a white or slightly pink flower. Mallow has a long taproot that allows it to withstand drought. Mallow is frequently found in newly seeded lawns or lawns that are thin, stressed or have poor fertility. It can be removed with hand weeding and new growth can be prevented by following good horticultural practices.

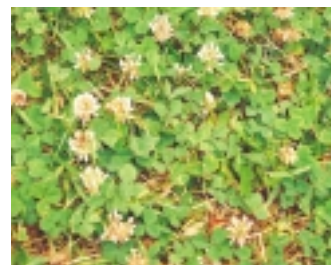


Mallow

5.2 Clover

Sometimes considered a weed (on golf fairways for example), clover is a non-grass species that is definitely not considered a weed in a natural lawn or garden. In fact, clover, especially Dutch white clover when it is mixed in with grasses, is a wonderful plant for a natural lawn.

Clover is a perennial that spreads through the lawn with creeping stems. It tends to stay green all season long with less watering, is soft to walk on, tolerates mowing and can fill in thin areas of a lawn.



Clover

A member of the legume family, clover enables soil bacteria to take nitrogen from the air and convert it into nitrogen in a form that the whole lawn can use. In a flower or vegetable garden, clover may be grown as a cover crop or living mulch that is particularly well suited to suppress weed growth.

In the lawn, clover first makes its appearance as dark patches or "blooms" but eventually blends in with the grass. Clover seeds can be introduced into a seeding mix for both overseeding and new lawn establishment. The seeds are quite small and you can use between 2 and 8 ounces of clover seed per 1,000 square feet depending upon how much clover you want in the lawn. If you do see clover in your lawn and garden and do not want it, it is best to remove it completely by digging it out because any stems left behind will set up roots and continue to spread.

5.3 Managing insects

You may be concerned about insects that feed on your plants or chew on grass roots, but most insects in the garden actually do no harm. Instead, they feed on and destroy the real insect pests. Pesticide-free lawn and garden care begins with an understanding of the important role of beneficial insects. Insect pests in an urban environment are naturally kept in control by predators and parasites. These should be actively encouraged in your garden. Common beneficial bugs around the garden include the praying mantis, the earthworm, which enriches and aerates the soil, lady bugs that prey on aphids, and ground beetles that feed on caterpillars and other soft-bodied larva.

5.4 Common urban lawn insects

There are insects that can cause damage to the roots, crowns or blades of the grass depending upon the lifecycle stage of the insect, time of year and quality of the lawn. Usually the damage is seen as a dying area of grass with characteristic brown patches. It is very important to diagnose the problem accurately since dog spots, over fertilization and diseases can all create the tell-tale brown patches. Identifying the insect and the damage it is doing is important before deciding upon a specific course of action. The most common insects of home lawns are:

Grub is a term used most often to refer to the larval (juvenile) stage of one of three beetle species: the European chafer, June beetle or Japanese beetle. It is in its grub stage that these insects do the most damage by feeding on grass roots. This can cause the grass to die. Because the feeding insect larvae have destroyed the roots, the grass pulls back easily. The grubs of all these beetles appear as white, C-shaped larva with tan heads and 6 legs.



A typical grub

Depending upon the species of beetle, the grubs most actively feed on grass roots in the fall. Some may also feed, to a lesser degree, in the spring. Animals digging in search of grubs to eat can also damage a lawn. The defense against grubs in a natural lawn care program is long rooted, healthy grass and an environment with lots of natural predators. If you can not control grubs with cultural practices alone, nematodes have proven effective when properly applied. Raking the area, topdressing and reseeding can repair grub damage.

Chinch Bugs are small insects that grow to about 4mm in length. When they first hatch they are red but darken as they mature.

Chinch bugs have piercing mouth parts and feed on the crown and stem of grass, sucking out the sap from the plant. Chinch

bugs thrive in dry weather. Damage to lawns is always more severe in hot, dry summers. The injury appears as irregular sunken patches of dead grass and is usually noticed in August. Chinch bugs like to hide in thatch and prefer sunny, dry areas that are poorly watered. A good horticultural program with thatch reduction, aeration, and proper fertilizing will go a long way to preventing problems with chinch bugs. Research has also shown that overseeding with grass that contains endophytes (see Chapter 3: "seeding") offers some resistance to chinch bug feeding.



Typical chinch bugs

Leatherjackets are a relatively new insect problem on southern Ontario lawns. The leatherjacket is the larva of the European Crane Fly, a flying insect that looks a lot like a very big mosquito (unlike mosquitoes, crane flies do not sting).

Leatherjacket larvae are grey-brown in colour, legless, tubular in shape and are mostly seen under the soil surface. They primarily feed on the roots and crowns of grass in spring (April and May), but will also come to the surface and feed on stems and grass blades. Leatherjackets can seriously damage a lawn when they are present in large and the lawn is already thin or under stress from drought or poor soil. Birds looking for leatherjackets to eat may also damage a lawn. A thick, healthy natural lawn should be able to withstand a moderate population of leatherjackets. If additional control is required, nematodes have been proven effective.



Leatherjacket larva
(shown next to dime to illustrate size)

5.5 Common garden insects

In your garden, insects tend to bother plants that are susceptible to that particular insect or are in some other way stressed, damaged, or poorly cared for. Insects can cause a range of effects from making holes in leaves, stunting new growth, causing wilting or other blemishes and possibly even killing the plant. Some of the more common pests in urban gardens are described below.

Aphids are commonly found around the home garden on a wide variety of plants and shrubs. They are small, soft-bodied, six legged insects that use piercing mouth-parts to feed on plant juices. Aphids are often found in large numbers, usually on young leaves at the tips of branches. Aphids will not kill a plant, but they can interfere with plant vigour and growth. Aphids can also spread diseases between plants. Fortunately, there are many natural predators of aphids that help control them. These include the lady bug, small wasps and lacewings. You can attract these beneficial insects with a garden rich in pollen and nectar producing plants. Aphids can often be effectively removed with a strong blast of water or with insecticidal soap. Always follow label instructions.

Scale is another sap-sucking insect that comes in a wide variety of species and can be found on many different host plants. The insects look like stationary bumps on the stems of plants. The bumps are actually an insect under the protection of a small shell. In large numbers, scale can cause leaves to yellow and twigs to die. A common host plant for scale is the euonymus. Beneficial insects such as ladybugs and parasitic wasps are natural enemies of scale. Scale can be controlled by scraping them off the stem or pruning out heavily infested branches. Dormant oil is also effective at controlling scale if applied before the growing season. Always follow label instructions.

Slugs and snails are nuisance pests in the home garden. Both are in the mollusk family and slugs differ from snails in that they lack an external shell. These pests are most active at night and favour cool, damp locations where they feed. They prefer to feed on certain species of vegetable plants and succulent foliage. They cause damage by chewing holes in the leaves. These pests are best managed by a multi-level approach that includes avoiding certain plants, setting slug and snail traps, attracting predatory beetles into your garden and making the area less inviting. For example, using drip irrigation techniques, avoiding night watering and pruning to increase air circulation have been found to reduce humidity levels and discourage their presence. Products containing ferric phosphate, a low-toxicity product that does not harm pets or wildlife, may be used, according to label instructions, to control slugs and snails in your natural garden.

5.6 Common tree insects

Some of the more common insect pests of trees are described below. It's wise to consult a certified arborist if you suspect problems with your tree.

Gypsy moth larvae, which are dark caterpillars, can defoliate trees and where large populations exist, successive years of extreme defoliation can result in the tree's death. There are a number of natural parasites and predators of the moth. Birds, beetles and ants find gypsy moth caterpillars delicious. Pheromone traps will lure male gypsy moths to an untimely end and biological controls such as *Bacillus thuringiensis* (Bt.) will kill gypsy moth larvae. Always follow label instructions.

Leaf Miners are the larva of several species of insects that bore through leaves and feed on the chlorophyll between the upper and lower leaf surfaces. The result is a characteristic clear tunnel or "mine" in the leaf where the green chlorophyll has been eaten away. Leaf miners can attack a wide variety of trees. In southern Ontario, birch trees are susceptible to leaf miner infestations. Leaf miners have many natural predators including ants, flies, lacewings and birds. Small numbers of the pest can also be handled by removing infested leaves, using sticky traps for the adults or applying horticultural oils. Always follow label instructions when using these products.

Scale, as described earlier in the section on plants is also a relatively common pest on trees including magnolia, yew, oak and pine. Stressed plants that are over fertilized or in the wrong location are most susceptible. Horticultural controls include physical removal of the scale, deep watering, mulching with an organic mulch and encouraging natural predators like ladybird beetles and parasitic wasps. Dormant oil sprays may also be used. Always follow label instructions when using these products.

Aphids are also a nuisance insect on trees. They cause damage by sucking fluid from the leaves and stems of maple, oak, pine and walnut trees (among others). Damage can be seen on leaves and new growth, although it is rarely severe on a mature tree. Aphids can be removed with a strong blast of water from a hose. Insecticidal soap, products containing pyrethrins and diatomaceous earth may all be effective against aphids, but should be used only if the water blasts do not work. Always follow label instructions when using these products. Encouraging natural predators is also helpful.

Tent Caterpillars are commonly found on fruit and shade trees throughout North America. The caterpillar larvae feed on the leaves of trees and can do a fair amount of damage. The caterpillars can slow growth and can cause death after successive years of serious defoliation. Large populations of

caterpillars can also be a nuisance in and around the home. Characteristic signs of tent caterpillars are their silken tent on branches where they congregate in early spring, a cocoon spun in June and a cylindrical egg mass laid in late summer. Physical removal of the egg masses or nests is a control option for the home gardener. Tent caterpillars also have many natural predators including birds and wasps.

Galls are soft non-uniform growths appearing on various locations on a tree. The gall itself is actually swollen plant tissue that forms in response to a variety of insects, fungi and bacteria. The shape, location and characteristics of the gall can often provide a clue as to its specific cause. Most galls do not cause serious harm and do not require any treatment. Proper watering and use of organic mulches can help prevent their appearance. If galls are present, prune infected branches to improve the tree's appearance and to limit their spread.



5.7 Lawn diseases

Diseases (fungal infections) are rare on home lawns. When they do appear it is usually a result of weather conditions such as high humidity, hot temperatures or lots of rain. Lawns that have not been receiving proper care and are compacted, over fertilized or over watered may also be susceptible to some of these diseases. Lawn diseases are best prevented by adding soil amendments, promoting air circulation and by keeping lawn mower blades sharpened. Diseases will often self correct with changes in the weather but if the problem persists, the affected areas can be repaired by raking out the damaged grass, aerating, topdressing and overseeding.

Diseases are difficult to diagnose: if you suspect you have one on your lawn, check with a professional. Some of the more common lawn diseases are described below.

Fairy Ring is a dark circle of grass with mushrooms growing on the outer ring – is caused by a kind of fungus called basidiomycetes. The term "fairy ring" comes from a superstition that the mushrooms growing in a circle represent the path of dancing fairies. When you see a mushroom growing in a lawn, you are only seeing a small part of the fungus that also grows underground as a thread-like mass called mycelium. The grass inside the fairy ring is often a darker green than the rest of the lawn due to extra nitrogen that is available where the fungal mycelium has died.

Mushrooms can be temporarily removed by regular mowing or raking. Since fairy rings are most visible in low fertility conditions, you can mask the fairy rings by improving your soil's nutrient level with natural fertilizers.

Necrotic ring spot creates rings of brown grass in your lawn. The grass dies and can be easily pulled out as the fungus destroys the roots and crowns of the plant. In Ontario, Kentucky bluegrass lawns can be prone to necrotic ring spot. The disease is more prevalent where the grass suffers from a weakened root structure. The disease will spread more aggressively in cool wet weather. If your lawn has a blend of grasses including Kentucky bluegrass, fine fescue and rye grass, it will be more resistant to this disease.

Powdery mildew appears as a dusty white coating on grass blades. Infected blades are more susceptible to other diseases and may eventually die. Powdery mildew is primarily a problem on Kentucky bluegrass. The fungus grows best in areas of high humidity, low light and poor air circulation and is more common in spring and fall. Over fertilizing can make the condition worse. Proper fertilizing and the other practices described in Chapter 3 plus a blend of grasses in your lawn will reduce the chance of powdery mildew becoming a problem.

Snow mould is a disease visible in the spring after the snow melts. It appears as irregular patches of grass that have a bleached or reddish appearance. The fungus germinates under the cover of snow, infecting the grass. Snow mould can be prevented by minimizing lawn thatch and by a late fall cut after grass growth stops. If snow mould is present, rake the area to encourage it to dry, overseed and lightly fertilize the damaged area.

Leaf spot occurs in warm weather and is easily recognized. Spots on the leaves develop purplish-red to purplish-brown borders and brown centers. Leaf Spot can cause your grass to die in irregular patches measuring in size from several centimetres to many square metres. Excess thatch, heavy nitrogen fertilizing, too much shade and mowing too short are conditions and practices that promote leaf spot. A natural lawn care regimen should prevent leaf spot from ever being a problem on your lawn.

Rust appears as orange powder on the leaf blades late in the fall and the grass may take on a discoloured appearance. Cool nights with lots of dew will help the spread of rust disease. Rust is a condition of slow grass growth brought about by summer dormancy or poor soil quality. Improving soil nutritional content, or just waiting for the weather to change, will manage rust on your lawn.

5.8 Garden and tree diseases

There are a wide variety of plants and tree diseases. Their occurrence can vary from year to year or return in cyclical patterns. The more common diseases, described below, will very often damage the appearance of the plant but not cause serious harm. It is wise to address the problem quickly, however, as these diseases can reduce vigour and make the plant or tree more susceptible to other problems.

Powdery Mildew is a common disease in the home garden and affects a wide range of plant and tree species. The disease is caused by a fungus that tends to thrive when the days are hot and humid and the nights are cool. It appears as a white coating on the leaves of the plant and, while it may be unattractive, rarely harms the plant. Pruning to improve air circulation and ensuring the plant is properly watered are important preventative cultural practices.

Black Spot is a common problem in the home garden and is frequently seen on roses. Black spot will arise under damp conditions and can be managed with horticultural practices. The plants should be properly pruned and well spaced to encourage good air flow. Water the plants by soaking the soil and avoid getting water on the leaves. Any badly infected plant parts should be pruned and discarded. Adding compost to the soil has also been known to help suppress fungal disease. Along with these practices, products containing sulphur as their active ingredient may be used to prevent black spot on roses. Always follow label instructions.

Diplodia Tip Blight can be a problem for pine trees introduced into areas where they do not normally grow. In southern Ontario, for example, Austrian Pines are susceptible to tip blight. The disease affects new growth. The first sign is browning at the tip of the pine's branches. The disease can cause the death of the current year's growth and can ultimately kill the tree. The fungus usually takes hold in trees that are suffering from stress due to drought, root restriction or other planting site problems. Cultural practices such as proper watering and removing restrictions on the tree's roots should help increase the tree's resistance to the disease. If the disease is established, pruning out infected areas will help reduce spread.



6. Getting started on your natural lawn care program

“Going natural” may not be a big change for your lawn. On the other hand, it may be quite a switch for you to use slow-release fertilizers only once or twice a year and to pull your weeds out by hand. Most lawns respond well to the natural approach. Topdressing, aeration, and mowing high when your lawn needs it, are all very good for your lawn and will improve its vitality. For lawns that have received little care in the past, using the cultural practices described in this guide will result in healthy grass and plants.

You will need to monitor your lawn to assess how it is responding. In some cases you may want to adjust your horticultural practices. Weeds, for example, can show where your soil has problems and may provide a clue as to what is missing in the program. Most of the time your healthy lawn will be able to naturally respond to challenges and the problems will go away on their own.

On occasion there are some additional challenges for lawns new to a natural approach. If your soil is poor or shallow, if the roots of your grass are not deep, if you are starting with a lawn heavily infested with weeds or if the soil is low in microbial activity, there may be a few extra steps to take before your lawn reaches a healthy equilibrium.

As you start your new natural lawn care program, your lawn may look less uniform than it did before – there will be some variations in colour and texture, especially if you have introduced non-grass species such as clover. For some lawns it may take more than a single growing season to completely establish soil fertility and strong, deep grass roots. But, if natural practices are consistently followed, all lawns will respond and be lush, vigorous and healthy.

6.1 Troubleshooting - Challenges for your natural lawn

The biggest challenge in building a natural lawn is simply the time it takes to build up the nutrients and microbial life in the soil to provide the foundation for dense, deeply-rooted grass. Other common challenges are described below:

Problem:

The grass is not thriving in certain areas

Solution:

Grass that has been planted in less than ideal growing conditions may die in a natural program. This is an ideal opportunity to replace the grass with a more suitable ground cover. If the grass dies under a maple tree, for example, it should be replaced with a shade loving ground cover or decorative mulch. If weak, shallow rooted grass begins to die, overseeding with a blend of grass and horticultural practices that encourage deeper root growth (infrequent deep watering) will help.

Problem:

Unwanted weeds are beginning to appear in the lawn.

Solution:

In most naturally cared-for lawns a small number of weeds will appear. Some non-grass species such as clover bring a healthy diversity to the lawn. Depending upon the species, your cultural program can be adjusted with the addition of aeration and extra overseeding or changing the height of the mower. Hand weeding can also be extremely effective at managing weeds when their numbers are low.

Problem:

Weeds cover almost half of the lawn.

Solution:

Where poor soil or lack of care have caused grass to die back and leave bare spots, weeds move in with astonishing speed. In these cases, completely renovating the lawn with new topsoil and seed will provide the quickest way to get a healthy lawn with few weeds. If you have a lawn that has received little care and has lots of weeds, hand weeding, aerating and

seeding will work to eventually improve the grass density. This may take several years. Solarization, which uses the heat of the sun to kill the weeds (see Chapter 3), followed by reseeding in the fall, can also be effective at reducing weed percentages.

Problem:

Insects are causing damage to the lawn.

Solution:

Insects are rarely a problem on natural lawns because beneficial insects are allowed to thrive and a natural equilibrium is established in the insect population. Monitor your lawn regularly to catch insects early and to determine if insect populations have reached levels where lawn damage may occur. If an insect becomes a problem, the species must be correctly identified and practices adjusted to ensure healthy roots, limited thatch and the addition of resistant grass species. If the insect has done its damage and moved on, this is a good time to add soil amendments and reseed. If necessary, low toxicity pesticides such as soaps (for chinch bugs) and nematodes (for lawn grubs) as biological controls may be used. Always follow label instruction when using these products.

6.2 Challenges for your garden and trees

There are also some challenges that affect garden plants and trees when starting a natural approach. Soil quality is just as important to plants and trees as it is to lawns. If you are trying to prevent the occurrence of insects and diseases naturally, you must remember to work on improving soil quality in garden beds and around the root zone of trees. You should plan to add compost regularly.

The addition of nectar and pollen plants will attract beneficial predator insects to the garden. Proper pruning and watering techniques must also be included in the overall plant health plan.

You may find that certain plants and trees have problems when you start a natural program. But if you stick with the program for several years, you will find with time improved soil fertility and improved plant vigour from good watering and pruning practices. It may still be the case that a plant or tree is just not in the right place. For these troubled plants, you may want to consult with a horticulturist or arborist about a more suitable replacement.

6.3 Finally....spread the word

In addition to applying all the technical aspects of a natural program, another important element for success is to ensure that everyone involved in the property is informed of the new program. Those involved can include homeowners, property managers and in the case of commercial buildings, the tenants and guests. The list of people involved may include the weekly gardener, landscape designers, landscape architects and arborists.

Since the techniques and outcomes of a natural lawn and garden program are different than traditional approaches, it is important that everyone involved in property care knows about the new program and understands the new protocols. For example, if the homeowner is using proper watering techniques but forgets to tell the gardener to increase the height of the mower to three inches, the lawn care program will not be as successful. It is especially important during the first few stages that everyone involved understands that there may be some short term challenges.

If the natural lawn and garden program is on a commercial property with lots of tenants and visitors it is a good idea to spread the news with posters, newsletters and tenant meetings so that everyone is aware of the new program. As well, signage indicating that the grounds are being cared for “naturally” is an excellent way to promote the new program and let others share in its success.

Finally, don't forget to tell your neighbours. Whether on your home lawn and garden or at your place of work, this is your opportunity to set an example and to help others understand your experiences.



7. Your Natural “Toolbox”

The best “tools” for taking care of lawns and gardens naturally are the practices described in Chapters 3, 4 and 5. If you are planning to start these practices you will need to make sure that you have the necessary lawn and garden equipment. This chapter includes information about the lower risk pest control products that are permitted under the Toronto Pesticide By-Law.

7.1 Mechanical tools

The most important tool for a gardener is a well-sharpened mulching lawn mower. For smaller lawns, modern versions of push mowers are also now available and offer the benefit of not needing gasoline to operate. These push mowers are particularly advantageous in a natural program as the motion of the cutting edge of a push mower produces a clean scissor cut, making your grass less susceptible to disease. Many push mowers are adjustable, so ensure that you raise the cutting edge to 7.5 cm (3 inches).

For weed management, hand weeders come in a variety of shapes and sizes but all are fundamentally designed to loosen and remove as much of the root as possible. Some weeders can be attached to your garden hose and use a high-pressure stream of water to help loosen deep tap roots.

There are also tools that use heat to kill weeds. Some use a flame that causes the sap to expand and rupture the plant cells; others use a propane heating element to create infrared heat to burn the weed. Home use models that work with a portable propane tank are available at garden centres. In general, these devices are rated at about 50% as effective as chemicals. This means that it may take twice as long to kill the weed. Repeat applications may be necessary. Effectiveness is also dependent upon the size of the weed. It is often recommended that heat treatments be used on young weeds.

A well cared-for pruner is a valuable tool for removing dead, damaged or crossed branches. Gardening tools should be kept well-sharpened to avoid ripping branches. They should be cleaned after use and disinfected with rubbing alcohol if used to cut out diseased branches.

7.2 Natural lawn & garden care and the Toronto pesticide by-law – using lower risk pest control products

Under a natural program virtually all urban weeds and insects eventually respond to horticultural techniques, with perhaps the exception of wasp or hornets nests, or certain tree insects and diseases. If you follow the practices described in this guide, you may never need to use any pesticide product on your lawn and garden. However, the Toronto Pesticide By-law permits the use of certain lower risk pesticide products that can be part of a natural program. Some possible uses for these permitted pesticides – many of which are called biopesticides – are described below and also summarized in a handy table.

Before you reach for any product to address a problem, consider what conditions are contributing to the condition and how you can fix them with horticultural practices.

Always follow proper decision-making steps before using any pesticide product. Try hand weeding, overseeding and soil amendments first and make sure that you correct any conditions that may have caused the pest to be a problem in the first place. If these have failed to resolve the problem, or if you are starting with a badly infested property and you decide to use a pest control product, make sure you have the right product for the right pest. Use only as much product as is necessary to fix the problem and then apply horticultural practices (see Chapter 3) to keep your lawn and garden healthy. If you choose to use a product, always read the label first. Carefully follow application instructions and observe all safety precautions when using these products.

Note: The “active ingredients” of the permitted products are described below. These are not necessarily the brand names of the products. Carefully read the product label – the active ingredient appears besides the word “Guarantee” on the front label.

Horticultural Vinegar (acetic acid)

Horticultural vinegar works as a contact, non-selective herbicide. It will kill a wide variety of weeds but will also kill grass and plants. To avoid contact with desirable vegetation it is best to use this product for weeds that are growing in sidewalks, driveways and patios. The product is most effective if applied in the spring when annual weeds are small.

Horticultural vinegar has concentrations of acetic acid higher than in household vinegar and it has been found to be 80-100% effective at killing annual weeds including ragweed, chickweed, lamb's quarters and black medic. Horticultural vinegar is also able to suppress top growth in the following perennial weeds: dandelion, plantain, wild carrot, and quack grass. Horticultural vinegar products with acetic acid concentrations greater than 5% can be caustic and should be handled with appropriate precautions. Always follow label instructions.

Herbicidal and Insecticidal Soaps

Herbicidal soaps are also non-selective and will kill grass as well as weeds. As is also the case with horticultural vinegar, they are best used on weeds in driveway cracks and patio stones. They contain fatty acid salts which break down into carbon dioxide and water. This low toxicity herbicide works by disrupting plant cell membranes and is most effective on annual weeds including redroot pigweed, lamb's quarters, corn spurry, mustards, chickweed and round-leaved mallow. Herbicidal soaps provide suppression or top kill of some perennials including plantain.

Best results are achieved when soaps are applied in early spring/summer to young actively growing weeds less than 13 cm (5 inches) tall. The weeds should be sprayed until the foliage is completely wet. Browning of foliage usually occurs within 1-2 days. Applying the herbicidal soap on a hot day may speed up its effectiveness. It is also better to apply it when rain is not expected for at least 24 hours. Repeat treatments may be required every 2 to 3 weeks to control weeds. Always follow label instructions.

Soaps have also been used for hundreds of years to control insects. The active ingredient in insecticidal soaps is the potassium salt of fatty acids which are similar in structure to liquid hand soaps. The soaps work by disrupting the function of the insect's cell membranes. Soaps can be mildly irritating to skin and eyes but generally are not toxic to humans and do not persist in the environment. Insecticidal soaps are effective at controlling pests on plants and trees including aphids, mealy bugs, spider mites, whitefly, soft brown scale, psyllids, rose or pear slugs and earwigs.

Insecticidal soaps work by direct contact and should be sprayed directly onto the insect. Repeat applications every 4-7 days for 2 to 3 weeks may be necessary to control certain pests. Soaps should be applied in the early morning hours or in the early evening to encourage slow drying. Once the soaps have dried, they cease to be effective against insects. Insecticidal soaps can be toxic to some plants and you may want to test it on small areas before widespread use. Always follow label instructions.

Sulphur

Sulphur is a naturally occurring element that controls fungi by binding with fungal spores to prevent their germination. Sulphur is used to control black knot, black spot, powdery mildew, rusts, leaf spots, apple and pear scab and russet and rust mites.

Sulphur is used on the foliage of vegetables, roses, flowers and fruit trees. Product labels need to be carefully followed as sulphur products can be toxic to some plants.

Sulphur is sold as ready-to-use and concentrated liquids, dusts and wettable powders. It should not be used within 30 days of an application of dormant or summer oil spray (see below) and not applied in temperatures exceeding 24° C. Always follow label instructions.

Diatomaceous Earth

Diatomaceous earth is made from crushed fossils of freshwater organisms and marine life. Each particle has sharp edges that cut the waxy coating of insects which causes them to die. Diatomaceous earth is useful in garden beds and is effective on many domestic crawling insects including ants, caterpillars, cockroaches, crickets, earwigs, fleas, potato beetles, silverfish, and slugs.

Diatomaceous earth can be applied with a hand duster or powder duster or sprinkled. To avoid inhaling powder, wearing a protective mask and goggles during application is recommended. It is best to coat the whole plant and sprinkle the diatomaceous earth around the base of plants to discourage pests. Repeat applications may be necessary especially if application is followed by a heavy rainfall. Always follow label instructions.

Horticultural Oil

The horticultural oils of today can be used to control a variety of soft-bodied pests of woody trees and plants. Most oils work by suffocating the insect. They also disrupt feeding by insects such as flea beetles, whiteflies and aphids without actually killing them. Oils are nonselective in liquid form and will kill beneficial insects. Once the residue has dried it becomes non-threatening.

Horticultural oils are effective on insects of plants and trees including mites, scales and leafrollers. Dormant oils are usually applied during March and April. Oils should not be applied when temperatures are excessively high or below freezing. There are different types of horticultural oils and the appropriateness for use with specific plants or trees should be checked prior to use. Always follow label instructions.

Nematodes

Nematodes are microscopic-sized worms that feed on the larvae of soil dwelling pests including the larval stages of

Japanese beetles, June beetles, masked chafer beetles, wireworm, armyworm, cutworms, and root weevils. They are living organisms, referred to as “biological controls,” and they must be kept refrigerated prior to use. (Those who do not relish the idea of purchasing a “bag of worms” should not worry – nematodes are too small to see and generally come packaged as dry granules, which upon watering release the worms into your lawn).

Nematodes work by entering the insect’s body and then bacteria is released from the nematode’s gut which multiplies and works quickly to kill the pest insect. Results usually occur within 72 hours of application. Nematodes are harmless to plants and animals and can be applied to lawns, flowers and vegetable gardens.

Nematodes are applied with a watering can or hose-end sprayer, ideally when the soil is wet such as after a rainfall or following a soaking of the lawn. Nematodes’ effectiveness is reduced with exposure to sunlight so they should ideally be applied on overcast or rainy days and not during the heat of the day. In the Toronto area, the best times to apply nematodes are in the spring through early summer and then from mid August through to mid October. Always follow label instructions.

Bacillus Thuringiensis (Bt.)

Bacillus Thuringiensis (Bt.) is another biological control. It is a naturally occurring bacteria found in the soil and when ingested by an insect, it paralyzes the digestive tract and causes the insect to starve to death within 2-5 days. *Bt.* is highly specific and only affects susceptible species of insects. It is used to control insects on plants, trees and vegetables.

Bt. is sold in liquid concentrate or powder form. To use, it is diluted with water and applied with a sprayer. *Bt.* should be applied only when target pests are identified and only in dry conditions. Always follow label instructions.

Boric Acid (Borax)

Boric acid is manufactured from Borax, which is a white powder mined from deposits in the earth. Boric acid attacks the nervous system of insects and also acts as a drying agent making it effective in controlling such pests as carpenter ants, cockroaches and silverfish. Boric acid is available in several formats including dust form and enclosed with bait in a trap.

If kept dry, boric acid dust has a long residual effect and remains toxic to insects until it is removed or washed away. Boric acid should not be applied around trees and shrubs and other growing plants and should be kept out of the reach of children. Always follow label instructions.

Ferric Phosphate

Ferric phosphate is a compound containing iron, which is commonly found in soil. It effectively controls slugs and snails. After ingesting bait containing ferric phosphate, slugs and snails cease feeding and crawl away from plants to die within 3-6 days.

Granules should be scattered evenly on the soil between plants and it is best applied to moist soil in cloudy conditions or in the evening. If necessary, granules can be reapplied every two weeks. Caution should be taken not to apply to foliage or plant parts. Always follow label instructions.

Pyrethrins

Pyrethrin is the active ingredient extracted from pyrethrum daisies. It is used for broad-spectrum control of crawling and flying insects. Pyrethrin is a nerve toxin and is effective against a wide range of insects including: aphids, caterpillars, flea beetles, leafhoppers, beetles, thrips, spider mites, stinkbugs, whiteflies, boxelder bugs, ants, cockroaches, earwigs, fleas, flies, mosquitoes, gnats and yellow jackets.

Pyrethrins are sold as read-to-use liquids, liquid concentrates and dusts. They should not be applied when temperatures exceed 32 degrees Celsius and ideally should be applied in the evening or on a cloudy day when there is no wind to avoid drift. While there are some exceptions, pyrethrins are generally not toxic to plants. They are moderately toxic to mammals and can cause allergic reactions in humans. As with all products, application instructions should be carefully followed.

Corn Gluten Meal

Corn Gluten Meal is a herbicide that can control crabgrass and dandelions in your lawn. A by-product of corn extracted in wet-milling processes and used as animal feed, Corn Gluten Meal has been sold in Canada for the past five years as a natural fertilizer. Only recently has it become available as a herbicide.

Corn Gluten Meal prevents the germination of dandelion and crabgrass seeds that may be present in your lawn – the seeds that you can’t see but may be waiting in your lawn to become full-grown weeds in the near future. It does not control established weeds. It can be applied in early spring and/or early fall. Because it kills plant seeds, Corn Gluten Meal should not be applied on newly-seeded grass or sod. It is recommended to wait four to five weeks following overseeding before applying this product. It works best when used in combination with sound lawn maintenance approaches, such as those discussed in this guide. Always follow label instructions.

Pest Control Products Permitted under the Toronto Pesticide By-law (As of July 2004)

Permitted Product	Health Canada Registered Uses*
Soap	Insecticide or Herbicide <ul style="list-style-type: none"> Control insects such as aphids, mealybugs, spider mites, whitefly, soft brown scale, psyllids, rose slugs (sawfly larvae), pear slugs, earwigs, caterpillars, leafhoppers, beetles and elm leaf miners on houseplants, vegetables, fruits, shrubs, trees or greenhouse plantings. Some formulations kill moss on roofs, walks, woodwork, stucco, fences, lawns and in greenhouses. Used in flea soaps.
Mineral Oil (Dormant or Horticultural Oil)	Insecticide <ul style="list-style-type: none"> Controls insects such as scale insects, red spiders, mealybugs, whitefly, leaf rollers for fruit trees, ornamentals, roses
Silicon Dioxide (Diatomaceous earth)	Insecticide <ul style="list-style-type: none"> Controls insects such as beetles, leafhoppers, vine borers, fruitworms on fruits and vegetables Controls aphids, chafer beetles on roses and flowering plants Indoor and outdoor control of ants, cockroaches, spiders, bedbugs, crickets, wasps, fleas, earwigs, slugs and crawling insects
Bt (Bacillus thuringiensis) nematodes or other biologicals	Bt – biological insecticide (larvicide) <ul style="list-style-type: none"> used primarily against leaf-chewing larvae (caterpillars) of lepidopterous species (butterflies, moths) can be used against mosquitoes and blackflies Nematodes – insecticide <ul style="list-style-type: none"> for control of grubs on lawns (primarily May/June Beetle and Japanese Beetle larvae) Other biologicals <ul style="list-style-type: none"> a wide range of organisms (including birds, bats, fungi, etc.) can control insects and plant diseases in a lawn or garden
Borax / boracic acid / boric acid	Insecticide <ul style="list-style-type: none"> used for outdoor control of ants and indoor control of cockroaches, ants, fleas, carpet beetles and silverfish.
Ferric phosphate	Insecticide <ul style="list-style-type: none"> outdoor control of slugs and snails
Acetic Acid (Horticultural vinegar)	Herbicide <ul style="list-style-type: none"> for non-selective spot treatment of broadleaf and grassy weeds in and around the garden, on patios, sidewalks, driveways, under fences
Pyrethrum or pyrethrins	Insecticide <ul style="list-style-type: none"> controls insects such as aphids, flies, mosquitoes, leafhoppers, earwigs, beetles on flowering plants, ornamentals and vegetables
Fatty Acids	Insecticide / Herbicide <ul style="list-style-type: none"> Insecticidal Soaps are made from the potassium salt of fatty acids. These control insects such as aphids, mealybugs, spider mites, whitefly, soft brown scale, psyllids, rose slugs (sawfly larvae), pear slugs, earwigs, caterpillars, leafhoppers, beetles and elm leaf miners on houseplants, vegetables, fruits, shrubs, trees or greenhouse plantings Formulations made exclusively from fatty acid have non-selective herbicidal properties. Can control weeds in and around the garden such as lamb's quarters, red root pigweed, chickweed and moss on roofs, walks, woodwork, stucco, fences, lawns and in greenhouses.
Sulphur	Insecticide / Fungicide <ul style="list-style-type: none"> Controls insects, mites and diseases (black spot, powdery mildew, rust) on fruit trees, vegetables, shrubs, roses and ornamentals
Corn Gluten Meal	Herbicide <ul style="list-style-type: none"> For inhibition of seed germination of dandelion and crabgrass on lawns Prevents the growth of weeds from seeds but does not kill established weeds.

* Health Canada's Pest Management Regulatory Agency (PMRA) approves specific products for specific pests and specific areas. This table is not intended to describe all approved uses for products containing the "active ingredients" – consult the product label for detailed information and use directions.

Source: Pest Management Regulatory Agency ELSE Database <http://www.eddenet.pmra-arla.gc.ca/4.0/4.01.asp> as of July 2004.

8. Let's begin!

The following section provides some tools to get you off to the right start...

8.1 What to ask a service provider

Homeowners may hire for regular maintenance programs or for special projects a professional lawn and garden care service provider. How the service provider answers the following questions will help you test the professional's commitment and ability to provide natural lawn and garden services.

Ask your Designer:

- How will you prepare the garden beds for planting?
- Will the plant material include native species or ornamentals?
- Where will you purchase the native plants?
- Will mulching be included in the design?

Ask your Gardener:

- Will you adjust the cutting schedule to the growth rates of the lawn as it changes over the season – for example, cut less in the summer when growth slows?
- Do you have a mulching mower and will you leave the grass clippings on the lawn?
- Will you avoid tilling the garden beds?

Ask your Lawn care company:

- Will your program include overseeding and aeration?
- What kind of seed blend do you use?
- Will you provide the name of the fertilizer used?
- What methods will you use to manage weed growth?

8.2 Frequently Asked Questions

1. *I think I have grubs – what should I do now?*

There's a good chance that you're asking the question because you've seen brown patches of dead-looking grass on your lawn, or animals have been digging up chunks of your grass for a nighttime meal. First, determine if grubs are the cause. Grass damaged by root feeding insects will pull back easily. To check for grubs, cut three sides of a square of grass roughly 0.3 metres (12 inches) with a sharp knife and pull the grass back.

It is possible to inspect for grubs before you see damage. You can check your lawn for the presence of grubs in the early part of August. The grubs, if you have them, will be big enough to see, but too small to have done any damage. Cultural practices alone are often sufficient to handle grub problems. However, if grub damage persists, nematodes can be applied (according to directions), followed by topdressing and reseeding.

Secondary damage caused by animals digging in the lawn can be repaired by raking away any dead material, tamping down the grass, topdressing and reseeding.

2. *What kind of grass should I use?*

A high quality blend of grass species is always recommended – usually a combination of fine fescues, perennial ryegrass and Kentucky bluegrass. Look for blends with no less than three, and perhaps as many as five different grass species, including species with natural resistance to insects and drought. Check the package information to ensure you are purchasing the right mix of grass types.

3. *Which is better for renovating a new section of lawn – seed or sod?*

Re-sodding is a good choice if you need thick green coverage fast. But, sod raises at least two issues for the natural lawn. The first is that most sod is 100% Kentucky bluegrass. This means it is not suitable for areas receiving less than four hours of sunlight every day. If you do place sod in shade, make sure it is adequately fertilized and watered and overseed the area every fall. Second, just about any sod you purchase will have been treated with herbicides. Watch it carefully for weed infiltration and other signs of poor soil.

4. *I have lots of weeds, what should I do?*

Weeds that have been established in a lawn for a long time will be slowly crowded out with hand weeding, overseeding, aerating and topdressing. Typically lawns that have been neglected respond well to a good horticultural program. Proper cutting, watering and fertilizing are the best weed control approaches. If weeds appear in the second or third year of a natural program, extra steps may be required. Focus on the weeds that strongly disrupt the look of the lawn such as dandelions, plantain and black medic. Hand weeding and preventing the weeds from going to seed can help limit them while horticultural practices will rejuvenate the soil. If weeds are spreading from your garden bed onto your lawn, spread mulch under the garden plants to suppress weed seed germination.

5. *When is the best time to fertilize?*

In most Canadian cities the best time to fertilize is fall, from late September to mid November. If a spring feeding is desired this should be after the natural growth of the lawn slows, usually during the month of May. Mulched grass clippings add about 30% of nitrogen requirements and therefore can reduce fertilizing needs.

6. *What do I do with dying patches of grass?*

Patches of dying grass can arise from problems for the whole lawn (such as grubs or disease) or from a more isolated problem (such as dog urine or salt damage). The solution for most of the isolated problems is to rake up the damaged grass, topdress and re-seed the area. Most lawn disease (fungus) problems are caused by and will be resolved with changes in the weather. The treatment for lawn grubs is described above. If the problem does not respond to horticultural practices, consult a professional for a diagnosis.

7. *If the lawn is seriously infested, wouldn't it be easier to just spray a pesticide?*

This is only a short-term solution and seriously undermines your natural program. While this may appear to be an appealing solution for a very weedy or insect infected lawn or garden, it does not address the conditions in your lawn or garden that attracted pests in the first place. If you are committed to a natural lawn care program, it is much better to deal with any challenges following the recommended cultural practices. If grubs have destroyed a lawn, then it is a perfect time to add soil and reseed with a good blend – including insect-resistant species of grass. If the weeds have taken over, consider killing off the weeds in the worst areas under a thick layer of mulch for the summer and reseed in the fall. In cases where the lawn is more than 40% weeds, cultural practices may take too long to bring weed populations to a more acceptable level. In these cases it may better to completely rejuvenate the lawn by removing the top layers of soil and plant material and replace with healthy, new topsoil and seed.

8. *What do I do about mushrooms?*

Mushrooms are the reproductive (fruiting) structures of some kinds of fungi. Most fungi in lawns are beneficial because they decompose organic matter, releasing nutrients for plant growth. Mushroom-producing fungi are not necessarily disease producing and are more of a lawn nuisance. Removing them will limit the spread of spores. Mushrooms can be associated with fairy ring and buried organic material as well as with poor drainage or overwatering. Thatch removal and aeration may reduce this kind of fungal growth in a lawn.

9. *How can I take care of my roses?*

When planting roses, select resistant varieties, leave lots of space between plants and give them plenty of compost. Roses need to be pruned back in the spring. If black spot appears, remove any infected leaves. If necessary, you may treat your roses with products containing sulphur. If aphids are the problem and they persist after they have been blasted with water from the garden hose, you may want to try a lower risk pest control product containing an insecticidal soap, pyrethrins or diatomaceous earth. Always follow label instructions.

10. *How can I keep my annuals looking good without a dose of 20-20-20 synthetic fertilizer?*

Try one of several available types of fish emulsion fertilizers and start the annuals out each year in a bed of fresh compost. You can diversify your annual garden by including colourful perennials. This will contribute to soil health as well.

11. How can I prevent my Magnolia and euonymus from becoming infested with scale?

Apply a dormant oil spray in the early spring. Add lots of compost to the soil around these plants. Monitor the plants for signs of scale and hand pick or scrape scale off the magnolia and use a tooth brush on the euonymus scale.

12. The large trees on the property don't look healthy. What should I do?

It is first worthwhile to determine if the problem is a serious threat to the tree or mostly a cosmetic problem. If you are concerned about the health of a tree, call in a certified arborist for an exact diagnosis.

The Asian Long-horn Beetle is a new tree and forest pest found in September 2003 in northwest Toronto and Vaughan. This species, accidentally introduced to southern Ontario where it has no natural predators, poses a serious threat to Toronto's urban forest. It is very important that this insect be controlled and eradicated. Visit www.toronto.ca/trees for photos to assist in the recognition of this tree killing insect and for important information about what to do if you see one.

Two common diseases of urban trees do not require any treatment. Anthracnose is one of these. It affects a wide variety of trees including maple, oak and ash. It is a common disease caused by a fungus that overwinters in infected twigs and fallen leaves. Infection on newly emerged leaves and shoots begins in early spring during cool and wet weather. Although it can cause complete leaf loss in the spring, trees usually recover by producing new leaves. The disease does not cause permanent damage to the tree. However repeated leaf loss year after year can weaken trees and predispose them to other pest problems.

Also characteristic in the City is tar spot on maples, a black spot that can cover the leaves. The spot is caused by a fungus that rarely causes any serious damage to the tree but can cause the tree to lose its leaves earlier than would be normal. The fungus can overwinter on the fallen leaves. Fallen leaves with anthracnose and tar spot are suitable for composting in your backyard or through the City of Toronto leaf composting program.

8.3 Checklist

The following checklist reviews step-by-step the horticultural practices that will create a healthy natural lawn and garden. Give yourself one point for each Yes ("Y"). Record your score and see the comments at the end of the checklist.

1. Know your property

I know the property's shade, water and use characteristics.	Y	N
I know about the plants on the property.	Y	N
I know which plants are thriving in the garden.	Y	N
I record what I know about the property in a garden journal that includes a map of my garden plants and the trees on the property.	Y	N

SCORE:

2. Design plans

I consider who uses the property and how before designing my garden (see above).	Y	N
I consider the best location to plant grass to avoid areas where grass would naturally have difficulty growing.	Y	N
I have researched plants to select the ones that will do best in my garden.	Y	N
I have picked plant and tree species that are most naturally resistant to disease and insects.	Y	N
I avoid design situations that encourage weed growth (such as leaving bare earth under a deck without a weed suppressing mulch).	Y	N

SCORE:

3. Soil management

I regularly add compost as a topdressing to the lawn and to garden beds.	Y	N
I mulch bare garden earth to prevent soil erosion and weeds from moving in.	Y	N
I replenish the mulch every fall.	Y	N
I avoid excessive tilling in garden beds.	Y	N
I include a lot of different plants to encourage diversity in soil micro-organisms.	Y	N

SCORE:

4. Lawn overseeding

In the spring I check for dying grass and repair it with overseeding and topdressing.	Y	N
I use a blend of seed types (fine fescues, perennial ryegrass and Kentucky bluegrass).	Y	N
I include endophyte-enhanced seed in the seed blend.	Y	N
I use an alternative to grass (ground covering or mulch) in areas where grass does not grow well.	Y	N
I overseed the entire lawn in the fall.	Y	N

SCORE:

5. Grass cutting

- I cut the grass according to its growth habit and no more than 1/3 of its height at any time. Y N
- I set the mowing height for grass at 7.5 cm (3 inches). Y N
- I use a mulching mower and leave clippings on the lawn. Y N
- I keep the mower blade sharp to ensure a clean cut. Y N

SCORE:

6. Watering

- I select grass, plants and trees in consideration of low watering requirements. Y N
- I water based on need and not on a fixed schedule. Y N
- When I do water the lawn, I water for at least 1 hour to encourage deep roots and I use a water gauge to ensure that 2.5 cm (1 inch) has been applied. Y N
- When I water plants and trees I soak the soil and not the leaves. Y N
- I water newly planted plants and trees more frequently, especially during drought. Y N

SCORE:

7. Fertilizing

- I apply natural fertilizers. Y N
- When I fertilize in the spring, it is after the lawn naturally greens up. Y N
- I apply a fall fertilizer to encourage the storage of nutrients over the winter. Y N

SCORE:

8. Compaction and Thatch Management

- I aerate clay-based soil yearly or at least once every three years. Y N
- I aerate in spring or fall to avoid damaging the grass during the hot summer months. Y N
- If my property is weedy, I aerate in the fall to discourage weeds from germinating. Y N
- I monitor the lawn for thatch. Y N
- If there is more than 1.5 cm (1/2 inch) of thatch, I dethatch in the fall. Y N

SCORE:

9. Weed Management

- I accept some non-grass species as part of a healthy, diverse landscape. Y N
- I hand weed as necessary. Y N
- In my garden beds, I do not till the earth so new weed seeds are not brought to the surface. Y N
- I place mulch in the garden beds to suppress weed growth. Y N
- I double check that the lawn is being properly watered, cut and fertilized to ensure a healthy and naturally weed resistant lawn. Y N

SCORE:

TOTAL SCORE: _____

If your total score is 20 or less (50%), you should review the guide and add some steps that are missing. Look to the sections of the checklist with lowest scores as the place to begin. If your score is 20-30 then your natural lawn and garden program is on the right track. If you scored higher than 30 (75% or more) then you should be enjoying your natural lawn and garden and sharing your know-how with neighbours, friends and family!

Even a high score, however, does not replace the time it takes to change over to a natural approach. For properties new to a natural approach, maintaining a high score for at least 3 years may be necessary. The best way to achieve and maintain a healthy lawn and garden is to follow the recommended horticultural cultural practices year after year.

This guide is one of many City of Toronto resources that can help you go pesticide-free. Need more information?

Toronto Health Connection (Pesticide by-law info)
416-338-7600

Lawn Improvement Helpline (tips on lawn care, composting, etc)
416-397-LAWN (5296)

www.toronto.ca/pesticides



Glossary

Aeration – The process of removing plugs of soil with a mechanical tool to relieve compaction in the soil, to improve the flow of oxygen and water and facilitate root development.

Annuals – Plants that live for only one growing season.

Beneficial Insects – Insects and bugs that contribute to ecosystem health and feed on problem insects.

Biodiversity – The variability among living organisms including diversity within species, between species and of ecosystems.

Biopesticides – certain types of pesticides derived from such natural materials as animals, plants, bacteria and certain minerals.

Cultivar – A commercially cultivated variety of a plant species.

Deadhead – To remove old flowers from a plant.

Decomposition – The breakdown of organic materials by biological activity to a stable form of compost.

Defoliation – The loss of leaves or foliage on a plant or tree.

Detatching – Removing dead and decaying organic matter that has formed a dense layer of material on the surface of the soil.

Ecosystem – a community of organisms interacting with one another and with the chemical and physical factors making up their environment.

Endophyte – a fungus naturally found in many fescues and ryegrasses that contributes to the grass' resistance to some insects.

Groundcover – Low growing plants that cover the soil and help prevent erosion. Often discussed as an alternative to grass.

Grub – The larval stage in a beetle's life. Grubs live in the soil and eat the roots of grass and may cause grass to die.

Humus – Organic matter that has been decomposed to the point where the original organic matter is no longer recognizable. Humus provides many benefits to the soil and plant life.

Infestation – the presence of pests in numbers or under conditions which involve an immediate or potential risk of substantial loss or damage

Mulch – A soil covering that prevents the growth of weeds, retains moisture and provides protection from extreme temperature changes. Grass clippings, leaves, bark chips, straw and river rock can all be used for mulch.

Native species – Plants that are indigenous to a particular geographical region and occupy a niche in the local ecosystem. Their adaptation to the local climate, soil and insect and plant populations increases their ability to thrive.

Nematodes – Microscopic worms that are harmless to the soil and people but are effective as a biological control for a range of soil-dwelling insect pests such as lawn grubs.

NPK – The three main nutrients found in a fertilizer: nitrogen, phosphorous and potassium.

Overseeding – Applying a suitable blend of grass seeds to an existing lawn to replenish grass cover to create thick grass that will crowd out weeds.

Perennial – A plant different from an annual plant (that lives only one year) or a biannual plant (that lives two years) that lives for many years.

Phytotoxic – Toxic to plant life and causes plant injury.

Summer dormancy – The natural process by which grass temporarily stops growing and turns brown as temperatures rise during the summer.

Topdressing – Adding organic material such as compost to the surface of the soil to improve soil structure and nutrients.

Solarization – A process designed to kill weeds by using the sun to heat soil to extreme temperatures, usually under plastic sheeting.

Xeriscaping – Landscaping design with water conservation in mind that uses drought-resistant or drought-tolerant plants.





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