Planting for a Sustainable Urban Neighbourhood

A Guide Toward Action: Sustainable Landscaping

SUN

Sustainable Urban Neighbourhoods

GreenUP

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About GreenUP's Sustainable Urban Neighbourhoods Program

The Sustainable Urban Neighbourhoods program—SUN for short—is a three-year initiative funded by the Ontario Trillium Foundation and led by GreenUP. It offers an innovative and collaborative way to transform the places we live, work, play, and learn, making them more resilient to the impacts of climate change. SUN brings together local residents, municipal staff, community groups, and other key partners to identify ideas and opportunities for change.

Success to Date:

- SUN has worked with community residents, municipal representatives, neighbourhood leaders, and local organizations to plan, plant, and teach towards a more sustainable future for the City of Peterborough.
- The project has seen the planting of over 1,000 square meters of trees and sustainable gardens to demonstrate and inspire further actions, along with the creation of Neighbourhood Action Plans to guide future sustainability projects and priorities that are unique to each neighbourhood.
- A variety of sustainable actions have been identified through the Neighbourhood Action Plans, many of which include gardening.

About This Guide

For gardeners who are just starting out, the idea of planning, planting, and maintaining a garden can be overwhelming. For even the most experienced gardeners, sustainable landscaping practices can be a lot to learn. There are so many options and so much to know!

This resource is designed to get you started and draws on the experience of the SUN team to help support you as you work towards a more sustainable neighbourhood landscape. To demonstrate the possibilities and quick-start the neighbourhood toward sustainable action, SUN has installed **trees, pollinator gardens, rain gardens, food gardens, native species,** and have seeded **drought-tolerant lawns**. We'll talk about each of these options within this guide. Then, we'll walk you through some key questions which will help you to clarify your ideas, the scope of your project, and the characteristics of your yard. You can use these questions to help you work through this guide, or can take your responses to a garden centre where staff should be able to help you choose plants appropriate to your project.

Remember, there is so much to know that we couldn't cover everything in this guide. This is a starting place and we have lots of other great resources to help you take it from here! Check out some of the additional resources mentioned in this guide, and visit our knowledgeable staff at Ecology Park, located at **1899 Ashburnham Drive.** For a complete list of resources used in the creation of this guide, check out page VIII.

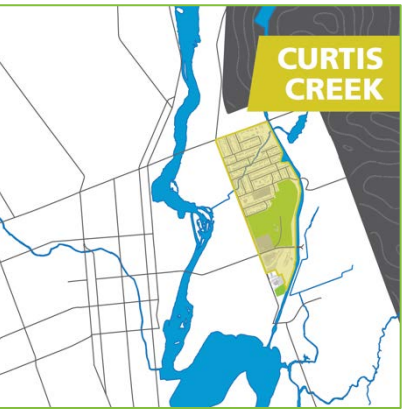
Have you seen a SUN Action Plan?

A SUN Action Plan is a collaborative plan that describes key Sustainability Actions for SUN neighbourhoods! This resource will help you to achieve some of the actions you may have seen in a SUN Action Plan.

SUN Action Plans are available on our website at **www.greenup.on.ca/sun.**

SUN Actions

This guide supports the following actions in the Neighbourhood Action Plans:



East City - Curtis Creek

1a. Re-naturalize and introduce green stormwater management **projects** on properties within the creek's 30m riparian buffer zone.

3a. Increase private property and boulevard **tree planting in areas with low canopy cover.**

3b. Transform lawns and driveways throughout the neighbourhood with **pollinator gardens, rain gardens** and **other green stormwater infrastructure, native species plantings,** and/or **food gardens supported by rainwater harvesting,** depending on resident interest and site suitability.

Kawartha Heights

1a. De-lawn at homes, schools, churches, and businesses in favour of **planting trees** and **installing pollinator, rain, drought-tolerant, and edible gardens.**

1c. Retrofit homes, schools, churches, and businesses for greater sustainability by **improving insulation, installing new windows, installing rain barrels, and more.**

What is Sustainable Landscaping?

Gardens and plants can help to completely transform a space, but did you know that some landscaping is better for the environment than others?

Sustainable landscaping refers to any landscaping that is designed to offset negative environmental impacts. Some examples of sustainable landscaping include pollinator gardens, tree-planting for shade, and construction of rain-water management structures. You can read about all of these strategies and others in this guide.

Sustainable landscaping can reduce your energy bills, prevent flooding, and support biodiversity!

Biodiversity (bi-o-di-ver-si-ty); *noun*

- The variety of life in the world or in a particular habitat or ecosystem

Why is biodiversity important?
An ecosystem with lots of biodiversity can better withstand and recover from environmental shifts. In the face of a changing climate, habitats with more biodiversity are more likely to adapt and remain healthy over time.

How does Landscaping support Sustainability?

All SUN projects were chosen due to their ability to support the development of sustainable neighbourhoods in the face of a changing climate. Scientific evidence shows that climate change is likely to have strong impacts in the Peterborough region, resulting in rising temperatures and more extreme weather, particularly with periods of extreme rainfall and drought. Sustainable landscaping can:

- Create shade, therefore lowering city temperatures and improving energy efficiency,
- Manage rainwater and drought,
- Restore natural habitats, and
- Support biodiversity.

Here is a bit more information on the benefits of sustainable landscaping.

Tree Planting

Imagine yourself outside on a hot summer day under the direct sunlight. Now, imagine you have walked under the shade of a large deciduous tree. Deciduous trees (trees that lose their leaves in the fall and grow new ones in the spring) can have amazing impacts on air temperature and energy efficiency. These trees not only provide cooling shade in the summer, but allow sun to reach and warm buildings in the winter when their leaves have fallen. They are also great for slowing down rain and soaking up water, reducing the risk of flooding, and can even improve property value!

We use a website called i-Tree Design to estimate the impacts of the trees we plant – you can too!

For example, we planted two of these Streetkeeper Honeylocusts at Applewood Park in the Kawartha Heights Neighbourhood. Together, these two trees will intercept 402 gallons of stormwater, and will reduce atmospheric carbon dioxide by 16 pounds this year alone! They will improve air quality by removing ozone, nitrogen dioxide, and airborne particles such as dust, ash, and smoke.

i-Tree Design can be found online at **https://design.itreetools.org/**

Naturalization

Naturalization refers to the removal of invasive species, and their replacement with native species. Native species are any species that evolved in a particular region, which makes them well-suited to the characteristics of that climate. As an example, imagine taking a maple tree and trying to grow it in the Amazon jungle, or in the middle of a desert. It wouldn't be easy to keep that tree alive. By contrast, plants that are native to those regions often thrive without any human care. That is the idea of naturalization. By returning to native plant gardening, we choose plants that are already accustomed to our region's natural seasonal trends, including rainfall, drought, and temperatures. By choosing these plants for our garden, we can dramatically reduce the amount of maintenance we need to do, as well as the amount of resources we need to put into our garden. This can mean less watering, less mowing, and less fertilizing (and less money spent on your garden)!

Native Species	Non-Native Species	Invasive Species
A species that normally lives and thrives in a particular ecosystem. This can include any species that developed with the surrounding habitat over long periods of time.	**A species introduced outside its natural past or present distribution. These include any introduced species that tend not to spread, or that do not cause damage.**	**A non-native species or plant that has the ability to spread, causing damage to the *environment*, the *economy*, our *health*, and *the way we live*.**

An exciting additional benefit to naturalization is support for other native insects and animals, including pollinators. Native animals and insects have evolved to rely on native plants, forming symbiotic relationships over time. Lots of animals rely on native plants for food and shelter.

Rain Gardens

Rain gardens are strategically planned to reduce runoff during heavy rain by capturing and directing rainwater into the ground, naturally. Rain gardens can reduce water pollution and help mitigate flooding. Soil is a natural water filter, so by directing water into the soil rather than into a storm drain, that water can be filtered before returning to source water. This has another added benefit of reducing the amount of water feeding directly into stormwater systems during heavy rain, helping to reduce the risk of flooding, pooling on your property, and the amount of water on your property but also in the neighbourhood.

Did you know that rain gardens can also help reduce mosquito populations in your yard? Because rain gardens are designed to drain completely within 24 hours, mosquitos don't have time to breed the way they would in standing water and puddles.

Rain gardens are very different from water gardens. Water gardens include ponds and are designed to hold water at all times, while rain gardens are designed to drain and direct water into the ground. Most of the time rain gardens are completely dry! Check out the Ready for Rain program for more information on rain gardens: **https://www.greenup.on.ca/program/ready-for-rain-peterborough.**

Pollinator Gardens

Pollinators are any species that transport pollen from one plant to another. This process helps the plants breed to create the next generation of healthy plants. That isn't just for garden flowers – pollinators are essential for growing our food, too. Unfortunately, some of the most common pollinator species, such as bees and butterflies, are increasingly at risk due to loss of food sources, habitat, and the use of pesticides. The creation of pesticide-free pollinator gardens can provide vital food sources and habitat to support the health of pollinator populations.

Drought-Tolerant Lawns and Gardens

Did you know that lawn watering is one of the single highest sources of water use during the summer? With increasing frequency of drought, this is pretty concerning, because we need that water to drink. Thankfully, there are far more drought-tolerant options that are just as enjoyable as common lawns.

Low-water gardening, called xeriscaping (pronounced ZEE-ruh-scaping), calls for the selection of plants that thrive in hot, dry weather conditions. Follow these tips to be Water WISE!

W	**Watering habits**	• Water only when needed. • Water with the rain using a rain barrel. • Water in the morning or evening, at the base of the plant, for several minutes at a time. This allows water to soak into soil, reaching roots.
I	**Inches of Mulch**	• Apply mulch at least 3 inches thick to preserve soil moisture and balance soil temperatures.
S	**Selection and Soil**	• Select drought-tolerant plants. • Be aware of your soil type and how it influences water retention. See page 22 for more information.
E	**Expand**	• Start with a small project and expand your project over time.

Water WISE gardens are characterized by some of the following features:

- Lack of a lawn, opting for the use of native/drought-tolerant plants instead
- A lawn that is mowed higher, de-thatched, and left brown (when needed)
- Use of captured rain water
  (For example, watering with rainwater captured in a rain barrel)
- Use of ground cover/mulch
- Use of efficient watering methods, if watering is required
  (For example, use of drip hoses)
- A tree or two (or more)
- Natural pest control measures (no use of pesticides)
- Other unique measures

Know someone with a Water WISE garden?
Nominate them for recognition at **www.greenup.on.ca/water-wise/**

Food Gardens

Food gardens, whether they consist of fruit-bearing trees and shrubs, or vegetable gardens, can help to support local food security. They also reduce the need for transportation of fruits and vegetables, use of pesticides and herbicides, and support general healthy eating habits!

Planning Activity: Dream Big!

Before you actually start planning your garden, it is important to have a clear idea of what you want from your garden. Remember, you will have to live with your landscape once it is installed. Take the opportunity to create a space you will love! Ask yourself:

- What colours and shapes do I like?
- How do I use my yard? What should my yard feel like?
- What do I want my yard to do?
- What type of gardens am I usually drawn towards? (e.g. cottage style, clean and crisp lines, etc.)

Use this space to sketch a vision for your garden. Once you're finished, turn to the next page to start planning.

Planning Activity: Mapping your yard!

Now that you have an idea of where your garden will be, and how big it will be, you can start creating a map of your garden. Use the grid on the next page to draw your existing yard to scale.

Step 1: Draw a picture of your whole yard, including the fences, buildings, and other permanent structures. Make this picture as closely to scale as possible by measuring your landmarks using a measuring tape.

Step 2: Draw in any existing features (e.g., accessory buildings, water sources, etc.)

Step 3: Draw in the canopy of any trees in your yard.

Step 4: Indicate direction on your map! Which way is north?

Gardening is complex! There are a lot of factors to think about. Be prepared to ask for support if you need it. Do you have a neighbour with a beautiful garden? Ask them what they have planted, and if they can give you any tips. We have wonderful resources in our community and there is a lot we can learn from one another.

Step 5: Indicate the location of your water source. Your new garden will need regular watering. Ask yourself, do I have a water source on my property? (e.g., hose, sprinkler, rain barrel, drip hose, etc.)

Mapping to Scale

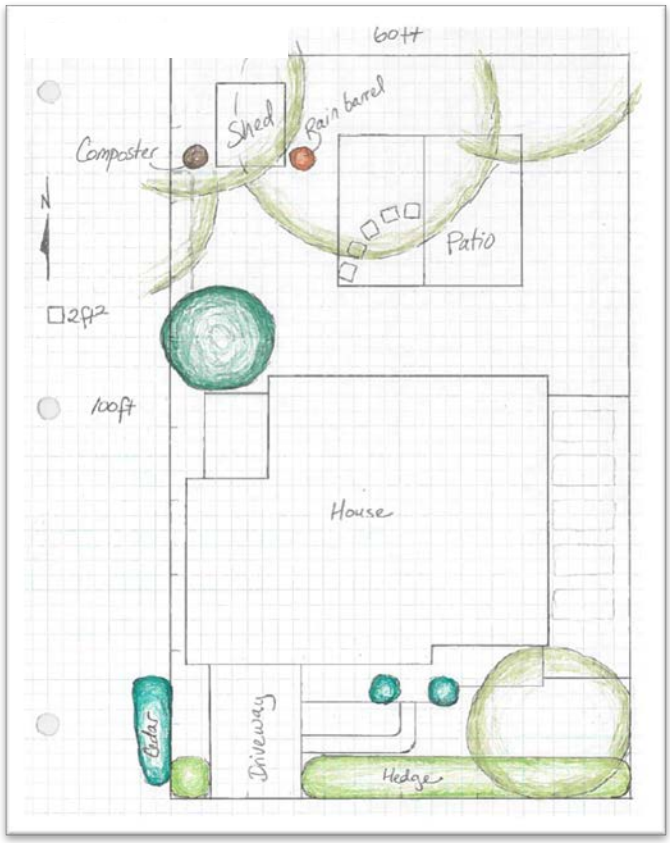
Use these steps to create a scale-diagram.

1. Record measurements of real-world objects that will be included in your design. Identify the **length** and **width** of your property.

2. Decide which way you will draw your property on your chart paper. Count the number of squares on the **length** and **width** of the page. Can you draw your property using one square as one metre (or foot)? If so, you're ready to start drawing!

3. If your drawing can't fit when you consider 1 metre (or foot) to be 1 square on your grid, how much smaller does the diagram need to be?

4. To reduce your scale by one third, divide every measurement by three. To reduce your scale by one half, divide every measurement by 2.



Tip:
You can use Peterborough e-maps to measure your properties boundaries and structures. Search, "Peterborough e-Maps" or view the full web-address in our Additional Resources section to access the resource.

1. Guiding Questions

This section will walk you through a series of questions that will help you think about the type of garden you would like to build, how big it will be, and where you would like to build it. After working through this section, you will be prepared to choose your plants, or to visit a local garden center for more help.

1.1 What is your budget?

Your budget will be a key factor in planning your garden. Depending on the type of garden you are building, you may have different materials to consider. You may also want to consider which work you are willing and able to do yourself, or if there is any work you would like to have done by a professional contractor. The more work you can do on your own, or the more affordable your materials, the less expensive your garden will be overall. **With a larger budget, you can likely accommodate a larger garden, or may be able to hire assistance for labour. With a smaller budget, you may choose to opt for a smaller garden, and may prefer to design and plant on your own.**

Tip:
Many local arborists will provide wood chips at little to no cost to you. If you're sourcing wood chips from an arborist, make sure to ask that kind of wood you're getting. Make sure the chips don't include wood from Black Walnuts or European Buckthorn! Black Walnut trees release a chemical that can kill certain plants, and European buckthorn is invasive!

Here is a rough estimate of some of the expenses you can expect for your garden, based on our experience, plus some other cost considerations that will vary by project:

Item	Typical Cost	Projected Cost
Site visit by a Landscape Designer	Approximately $75 to $150 per hour for a site visit	
Garden design by a Landscape Architect	Roughly $1-2 per square foot in the garden design.	
Sod excavation and disposal	Approximately $192/hour	
Site preparation and hired labour	$100 to $160 per hour + HST	
Triple Mix	$37 + HST per cubic yard of material	
Mulch	$40 + HST per cubic yard of material	
Delivery of triple mix and mulch	Approximately $50	
Tool purchase/rental		
Yard waste disposal		
Hardscaping materials		
Other:		
Plants (Note: Plant prices as follows are according to prices at GreenUP Ecology Park)		
Wildflowers	$5-6 per 4" pot	
Grasses	$5 to $20, depending on species and size	
Shrubs	$10 to $100 per shrub, depending on species and size	
Trees	$80 to $350 per tree (most are $100-125 per tree), depending on species and size	
Edible Plants	Seedlings, available during Spring Plant Sale, $1 to $3 each	

Tip:
Consider asking neighbours and friends if they will be splitting perennials. Many people are happy to share their over-crowded perennial plants and will be able to give you information on the needs of any plants they share.

1.2 How much maintenance are you prepared to do?

Planting is hard work, but can be very satisfying. It can be easy to forget about the amount of work that will need to go into that garden in the future. Sometimes maintenance is necessary to keep your garden healthy. In other cases, your garden will do just fine without much maintenance, but may start to look a little scruffy, or may become less productive over time because of competition between plants.

If you are prepared to do more maintenance, you can likely plant a larger garden. **Consider your budget. With a higher budget, you may choose to hire assistance with maintenance.**

Tip:
For the lowest-maintenance projects, opt for planting trees, shrubs, or perennial plants. Try to avoid annual plants which need to be planted each year.

When planting, we suggest planning for less plants which are spread out. Trees, shrubs, and perennial plants will over time. By filling your garden from the start, you will need to split plants sooner than if you were to leave enough space.

Regular maintenance can include:

- ☐ Watering
- ☐ Weeding
- ☐ Deadheading of spent blooms
- ☐ Monitoring for pests
- ☐ Training of vines
- ☐ Edging

Yearly maintenance can include:

- ☐ Laying of fresh mulch in the spring
- ☐ Preparation of non-native plants for overwintering
- ☐ Re-seeding or planting of annual plants
- ☐ Pruning
- ☐ Splitting of perennial plants

Did you know that time in the garden is shown to have health benefits?

Where are you on this scale?

More maintenance

Less maintenance

"I have lots of time and help, so I can keep up with weekly maintenance if I need to. I have maintained gardens before and am confident that I can maintain this garden."

"I enjoy being outside when I have time, but can get pretty busy. I can work on my garden once every other week. I have maintained simple gardens but am still learning."

"I want a nice garden, but I can't manage much maintenance. I can probably work in my garden once a month. I'm new to gardening and have a lot to learn."

"I don't have much time and need to keep things simple. I don't expect to do much maintenance once planting is finished."

1.3 How do you use your yard?

An effectively planned garden can enhance a space and make your yard a more enjoyable place to be. Your plan should reflect not only what you hope your garden will accomplish, but should reflect how you expect to use your yard. Consider high-traffic areas, and space needed for different activities within your yard.

Check out the chart below and read more on ideas for your property. Skip any of the boxes that don't apply to you.

"My yard is a social space where I can spend time with loved ones, friends, and neighbours."

- In your design, make sure you designate a space for social gathering. If you anticipate high-traffic or active social games, you may choose to designate space for this as well.

"My yard is a space where I can relax."

- Did you know that trees can reduce the volume of sound? Lining a property with trees can help to create a quiet haven in the middle of the city! Plus, what is more relaxing than the sounds of birds while sunlight filters through leaves?

"I have a dog that runs around in the backyard."

- Dogs can have very specific needs in a yard, especially if they are sometimes free to explore unsupervised. You might choose to protect your plants from wear and tear using fencing, particularly around flowers and edible plants. This will protect them from damage, but also from dog pee, which can be harmful to plants. You may also consider opting for hardy plants, such as trees, shrubs, and some perennials. Some plants can be toxic to dogs. If you have a dog that tends to eat plants, make sure to do a little extra research to check the plant's toxicity before planting.

"I don't use my yard very often right now, but I would like to!"

- One key question to ask yourself is, why don't I use my yard right now? Think about solutions that would make your yard a more usable space.

"I need lots of space for my kids to play."

- A garden can be an amazing space for outdoor play. Outdoor play is shown to support children's physical and emotional development, attention, and tendencies towards stewardship. All of the gardens included in this document can provide great learning spaces for children! Consider a few of the following features in your design:
  - **Open space** can allow children to run or walk freely, and to play active group games.
  - **Play structures.** To a child, a large fallen log can become a car, a fort, or a mountain. A walk through the garden can be an adventure! Consider opportunities to leave child-friendly trails throughout your garden.
  - **Areas for digging and loose-parts play.** Do you remember making mud-pies as a child? We definitely do! Kids have amazing imaginations. A slice of a log could be a plate or a note-pad, and a stick could be a magic wand or a pen. Leave a few things around to inspire young children's pretend play.
  - **Whenever possible, have your children help you in your garden**. Kids can learn a lot from tending to plants. Gardening can teach empathy and the importance of the relationship between living things.

Tip:
Do you have problems with mosquitos in your yard? Consider planting citronella, lemon balm, catnip, marigolds, basil, lavender, peppermint, or garlic. They are great for deterring mosquitos and can make your yard a far more enjoyable space.

Are you familiar with the Pathway to Stewardship and Kinship Document?
The Pathways document provides recommendations for age-appropriate activities known to encourage children to be future stewards. These activities may give you ideas for your garden design.

The document is available at www.campkawartha.ca/pathway-to-stewardship/

1.4 What do you want your landscape to do?

Now that you have a sense of your needs for your yard, you can think about what job your garden will do. Read below for information on solutions to common property challenges.

Check out the chart below and read more on ideas for your property. Skip any of the boxes that don't apply to you.

What if I want to do more than one of these things?
To simplify your planning, it is easiest to plan for one BIG goal. However, it is exciting to know that many plants can support multiple goals. As an example, lots of drought-resistant plants also support pollinators!

"My yard can be very wet and sometimes it floods. I want to manage rain water better so my yard isn't so muddy."

- Oh, no! Flooding isn't fun! Luckily there are several landscaping options that can help you manage rain water on your property, including rain gardens, infiltration trenches, and dry wells. The SUN team has installed some rain gardens, so we have focused on those in this guide. If you would like more information on infiltration trenches or dry wells, check out some of the additional resources mentioned on page IX of this guide. These are some of the more labour-intensive landscaping projects, and we'll talk about them in more detail a little later in this guide. **Read more about rain gardens on pages 6, 17, and 21.**

"My yard gets a lot of direct sunlight in the summer and can be very hot. I want to create more shade to reduce the temperature in my yard."

- Did you know that a single tree can help lower the temperature of your yard, and can even lower your energy bill? By shading your home, trees can reduce solar heating of your home, resulting in lower energy demands for air conditioning! This benefit is even greater if your tree also shades your air conditioning unit. **Read more about tree planting on pages 5 and 17.**

Kawartha Heights Action 1C

Curtis Creek Action 1A

Curtis Creek Action 3A

Have you considered installing a rain barrel?

Rain barrels can reduce the amount of water that reaches your yard during a rain storm. They can also store rain water to use for watering later. Rain water is also healthier for your plants compared to tap water, because it is full of dissolved nutrients!

The Peterborough Utilities Group offers a $25 subsidy for customers who are interested in purchasing a rain barrel. Are you a PUG customer? Drop by the GreenUP Store & Resource Centre to purchase a discounted rain barrel and receive your instant rebate.

"I want my garden to support biodiversity."

- There are lots of ways that a garden can support biodiversity. A diverse selection of plants provides biodiversity on its own, but there are also other ways your garden can help. Careful gardening can support many things, like insects and microorganisms in the soil, pollinators and animals that rely on plants for food and habitat, and can even improve water quality and healthy fish populations! Consider planting a pollinator garden, relying on compost and no-till gardening methods, and keeping insect and animal habitat spaces in your yard. **Read more about pollinator gardens on pages 7, 18, and 21, or about naturalization on pages 6 and 17.**

"I want to grow my own food."

- Growing your own food can be rewarding and is a great way to stay healthy. There are lots of options for fruits and vegetables you can grow on your property, whether you plant in the ground, or containers. To get started, think about what types of fruits and vegetables you like to eat. Start with a small garden and a few plants, and gradually increase the size of your garden to meet your needs. **Read more about food gardens on pages 7 and 18, and check out our list of beginner-friendly vegetable plants on IV.**

"I am building or updating my garden and want to make sure I am using native species."

- Native plants are those plants that have evolved in this region. Because they have adapted to this climate over time, they require less water and less maintenance. Native plants can be highly drought-tolerant, making them a great choice for low-water gardens. Planting native species can also help to support biodiversity and health of native species populations! **Read more about naturalization on pages 6 and 17.**

"My grass always dies in the summer because of drought. I would like to find some options to make my lawn a more enjoyable space in the summer. "

- Did you know that more water goes to lawns in the summer than to any other source? There are several things you can do to have a more water-wise lawn. Most lawns consist of a type of grass called Kentucky Bluegrass. This grass isn't native to Ontario, and as a result it tends to turn brown in the summer. It isn't dead, just dormant! It will survive and turn green again once watered if you choose to let it remain dormant for the summer. Consider over-seeding your lawn with a drought-tolerant grass species, white clover or white yarrow. Both options require less water than a traditional lawn, and white clover is actually nitrogen fixing and can add nutrients to your soil! **Read more about drought-tolerant lawns and gardens on pages 7 and 18.**

1.4.1 Specific Considerations for Different Types of Gardens

Different gardens have different specific requirements. The section below details some important considerations for **tree planting, rain garden, pollinator garden, food and vegetable garden designs, naturalization,** and **low-water lawns.**

Tree Planting

Trees can grow quite large, and can develop extensive root systems. If the locations for trees are not planned carefully, they can actually cause damage to house foundations, and underground pipes and wires. Before planting, make sure you request information on the location of underground structures and utilities by contacting Ontario One-Call online at **www.on1call.com** or by phone at **1-800-400-2255**. Trees should be planted **at least** 1 metre (3 feet) away from underground structures, and 3 metres away (10 feet) from the foundation of buildings.

Rain Gardens

Location, location, location! The area for an effective rain garden must be selected carefully. Is there an area of your yard that floods or becomes saturated often? This is probably your best spot! Look for low-lying areas where water naturally flows. Think about where water is coming from, and where it is going. Remember, your rain garden will help more water soak into the ground. To ensure that your rain garden doesn't accidentally lead to basement flooding, construct your rain garden at least 3 metres (10 feet) away from the foundation of buildings.

Before digging, make sure you request information on the location of underground structures and utilities by contacting Ontario One-Call online at **www.on1call.com** or by phone at **1-800-400-2255**.

Next, you will need to think about how water will get to your rain garden. Will the water be directed into the rain garden from your downspout? You may need to build an infiltration trench to direct the water where you would like it to go.

Once you have answered these questions, you are ready to begin drawing out your rain garden. You will want your rain garden to be shaped like a bowl, with the deepest point in the middle. Plants placed in this deepest part of your rain garden should be well-suited to a wet environment. Place drought-tolerant plants around the outside of the garden. After heavy rainfalls, you will probably find that your rain garden fills with water for a little while. That means it is doing its job! The water should drain after about a day, and should be dry most of the time.

For a more comprehensive guide on the design and installation of rain gardens, we recommend you check out *The Blue Thumb Guide,* and *Greening your Grounds.*

See more information on these and other resources on page VIII.

Naturalization

As we discussed earlier in this guide, native plants have grown in this region and are much better suited to survive and thrive in this climate. Naturalization is the process of removing non-native species to replace them with native species. Naturalization can be undertaken anywhere, but is considered most important to counter the spread of invasive species. Check out page VII for a list of plants considered invasive in the Peterborough area, and go to **www.invadingspecies.com** for more information on how to remove various invasive plant species.

Pollinator Gardens

Pollinator gardens can be beautiful, made up of an assortment of wildflowers and shelter-plants. Here are a few things to think about in ensuring a successful pollinator garden!

Use a variety of plants

- It is best if plants bloom at different times of year, grow to different heights, and are a range of colours. **Did you know** that butterflies tend to be most attracted to warm colours such as pinks, reds, yellows, oranges, and purples? Bees are more attracted to cool colours such as purples, blues, and violets.

Plant in a sunny area

- Butterflies get energy from the sun. It's really common to find them spreading their wings in sunny areas for warmth. Pollinator gardens in sunny areas will be more pleasant spaces for passing butterflies that need a rest.

Arrange plants in clusters rather than individual

- Clusters of plants are more likely to catch a pollinator's attention than individual plants.

Avoid the use of pesticides

- Bees and butterflies are incredibly sensitive to pesticides. Pesticides are one of the biggest causes of pollinator declines! Research also shows that use of pesticides can lead to worse infestations of plant pests over time. If you allow a few leaf-eating insects to stick around, nature will keep them in check. Plus, you'll be helping to maintain a safe space for pollinators!
- If you're having a big problem with pests, consider installing a bird house or bat box on your property to attract natural insect predators.

Provide water using a pollinator bath

- Pollinator baths can be very easily constructed to provide drinking water for pollinators. Add some stones and water to a shallow bowl, and place it in your garden near your pollinator plants.

Drought Tolerant Lawns

As one option, you might consider over-seeding your existing lawn with a drought-tolerant grass species. The most commonly used grass species, Kentucky Bluegrass, is native to very wet regions. As a result, this grass needs a lot of water to stay green! As we discussed in the *naturalization* section on the previous page, there are other native grass species that are better accustomed to our local climate. When choosing grass seed, try to avoid blends that include Kentucky Bluegrass, looking instead for blends that include Fescue, Zoysia, or St. Augustine grasses.

Are you open to an alternative to grass? Our favourite lawn-alternative is White clover. White clover is low-growing, lush, and soft. It is hardy enough to mow, drought-tolerant, and nitrogen-fixing. It even develops small white flowers in the spring which support pollinators!

Food Plants and Vegetable Gardens

If you would like to grow food plants in your yard, there are two ways to do so. One strategy is to plant edible perennials, which include things like herbs, rhubarb, raspberry and blueberry bushes, asparagus, or fruit trees.

As another option, you might consider creating an annual vegetable garden. Vegetable gardens require lots of sun, watering and good soil. We've helped to prepare some vegetable garden sites, but the real experts are our partners at Nourish. Check out the Nourish website for more information on vegetable gardening, community gardens, and Nourish workshops! Go to **www.nourishproject.ca** for more information.

Tip:
Don't expect immediate changes. Plants take patience, and these projects take time.

Planning Activity: Outline your Garden

Return to your yard design from the previous Planning Activity, completed on pages 9 and 10. Now that you have answered all of the key questions, you can add an outline of where your new gardens will be located. Using a pencil, outline where your gardens will be. Then, keep your design nearby to help you work though the next section of this guide.

2. Choosing Plants

Each plant has unique characteristics and needs. Some requirements to consider include amount of sunlight, moisture, and soil quality. Before choosing plants for your garden, determine the characteristics of your site. Some plants support pollinators, are drought-tolerant, are suitable for rain gardens, or are salt-tolerant, which is important for planting near roadways. **Check out our plant selection guide on page I for information on the needs and characteristics of many different native plant species.**

Tip:
GreenUP Ecology Park specializes in the sale of native species ideal for the projects detailed in this document. Ecology Park is located at **1899 Ashburnham Drive** in Peterborough.

2.1 Sun and Shade

Different plants thrive with different amounts of sunlight and shade. Some plants need a lot of sunlight, while others can't survive the heat! Once you have decided where you would like your gardens to be, you need to figure out how much sun plants will get in those areas. You can also plant under trees where you know it is shady – but make sure to select plants that thrive in the shade.

South-facing gardens will get the most sunlight throughout the day, while **north-facing** gardens will get far less sunlight. Think about where shadows are cast by buildings and trees on your property. The website https://sollumis.com/ will help show you where the sunlight will be on your property.

Full-sun: These plants need at least 6-8 hours of direct sunlight per day during the summer. Plant them on a south-facing side of your home, in places that are not shaded throughout the day.

Partial-sun or Partial-shade: These plants need 3-6 hours of direct sun per day. Plant them on a west or east facing side of your home in places that are not shaded throughout the day. These plants can also do well in the shade of tree canopies, if the tree allows some sunlight to filter through.

Full Shade: These plants can only tolerate up to 3 hours of direct sun per day. They are susceptible to hot, dry conditions.

What is the difference between partial-sun and partial-shade?

If a plant is listed as partial-sun, it prefers sun to shade but doesn't need a full day of sun to thrive. These plants will do better in sunny areas that get shade later in the day. If a plant is listed as partial-shade, it needs some sunlight but will fare better in cool areas, especially during the heat of the afternoon. Partial-shade plants will thrive on the east-side of buildings which are shaded from the afternoon sun.

2.2 Drought-Tolerance

Drought-tolerant plants are an ideal choice for areas in direct sunlight that experience high temperatures and fast draining soil. These plants are well-suited to surviving for long periods of time without water, once established.

2.3 Support Pollinators

Plants that support pollinators have brightly coloured and often large, attractive flowers. Pollinator plants are typically best suited to planting in direct sunlight. They may or may not also be suitable for rain gardens or drought-tolerance. Some plants that support pollinators can also be drought-tolerant and/or can be used in rain gardens, depending on the species.

2.4 Plants for Rain Gardens

Plants that are used in rain gardens are selectively chosen to be able to tolerate very wet conditions for short periods of time, while also being able to survive through long periods of drought. This characteristic is ideal because of rain gardens' tendency to fill with water during heavy rain, and for water to drain slowly over the course of about a day. In dry conditions, well-chosen rain garden plants should be able to survive without watering.

2.5 Salt Tolerance

Salt-tolerant plants are ideally-suited to growing in road-side areas which can accumulate high concentrations of salt throughout the winter. Consider selecting salt-tolerant plants for along roadways and along paved pathways, sidewalks, or driveways.

2.6 Soil Moisture, Nutrient Retention, and Acidity

Different types of plants have different levels of tolerance for wet or dry soil, soil acidity, and different nutrient demands. The type of soil in your garden can give you a hint as to the levels of moisture and nutrients in your soil. Check out the table below for information on the characteristics of your soil.

Interested in amending your soil to improve moisture retention and nutrient quality?
Check out the section on **Fertilizers and Compost** on page 27.

Soil Type	Characteristics
Sandy	Dry, gritty, and warms quickly in the spring. Water drains quickly, resulting in low nutrient quality. If you have sandy soil, consider installing a drought-tolerant rain garden.
Silty	Fine sand that does not drain well and tends to compact easily. Moderate nutrient quality.
Clay	Dense soil that warms slowly in the spring. It can have excellent water retention, but tends to be susceptible to evaporation in times of drought. Tends to have excellent nutrient qualities. If you have clay soil, we do not recommend installation of a rain garden.
Peat	High in water content and rich in nutrients. An acidic soil that is often used to supplement soil for plants that thrive in acidic conditions.
Loam	Often considered the best soil for gardening. It contains a balance of three soil types: sandy, silty, and clay. Holds lots of water and nutrients, but drains well, allowing air to move freely between soil particles.

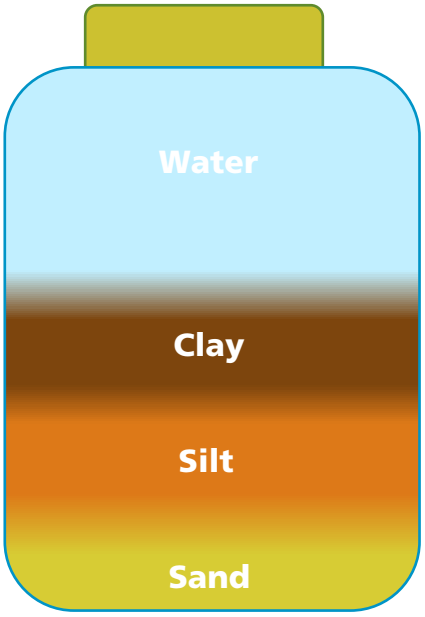
"**Otonabee loam is the most common soil type in the Peterborough region** (Gillespie and Acton, 1981, as cited in AECOM, 2010). **Otonabee loam is a well-drained soil that allows for a high degree of water infiltration, which should limit runoff** (Gillespie and Acton, 1981, as cited in XCG Consultants, 2009).

There are two easy ways to determine your soil type:

The Jar Test

- What you will need:
  - A jar with a lid
  - A soil sample, enough to fill the jar half full
  - Clean water

- Instructions:
  1. Fill the jar about half way with your soil sample.
  2. Fill the jar with water, then seal the lid.
  3. Shake the jar, then set it aside.
  4. Allow the soil to settle. When the soil has settled, you should see clear layers. Each layer is a different type of soil. Once settled, the bottom layer will be **sand**, the next layer will be **silt,** and the top layer will be **clay.**



Professional Soil Composition Testing

Unlike the jar test, professional soil testing can tell you if you have acidic soil. Most garden centres will provide this service. You can also purchase a do-it-yourself kit at most garden centres.

Planning Activity: Mapping your Plant Layout!

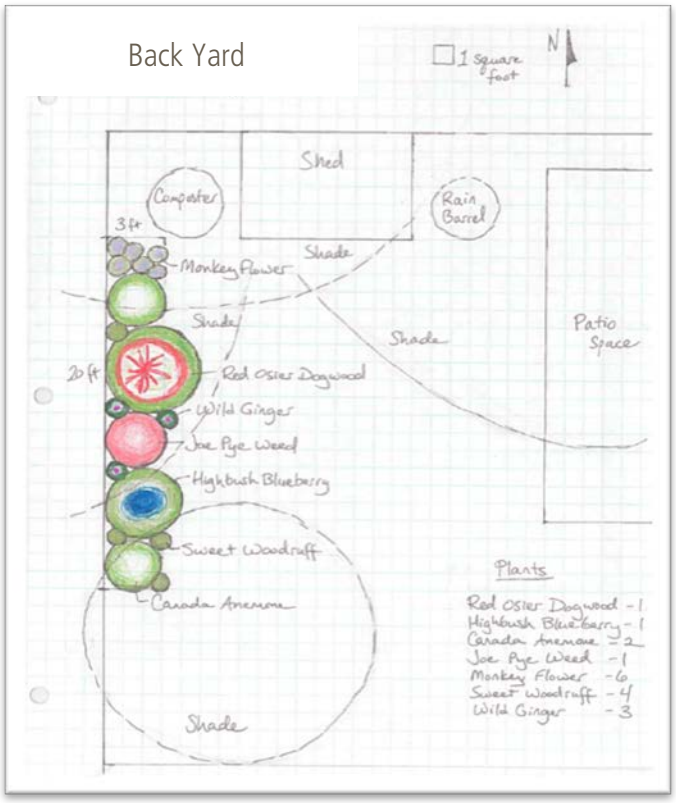
Now that you have a design of your yard, and have an idea of the type of garden you will be planting, the characteristics that your plants will need to have, and what plants should go where.

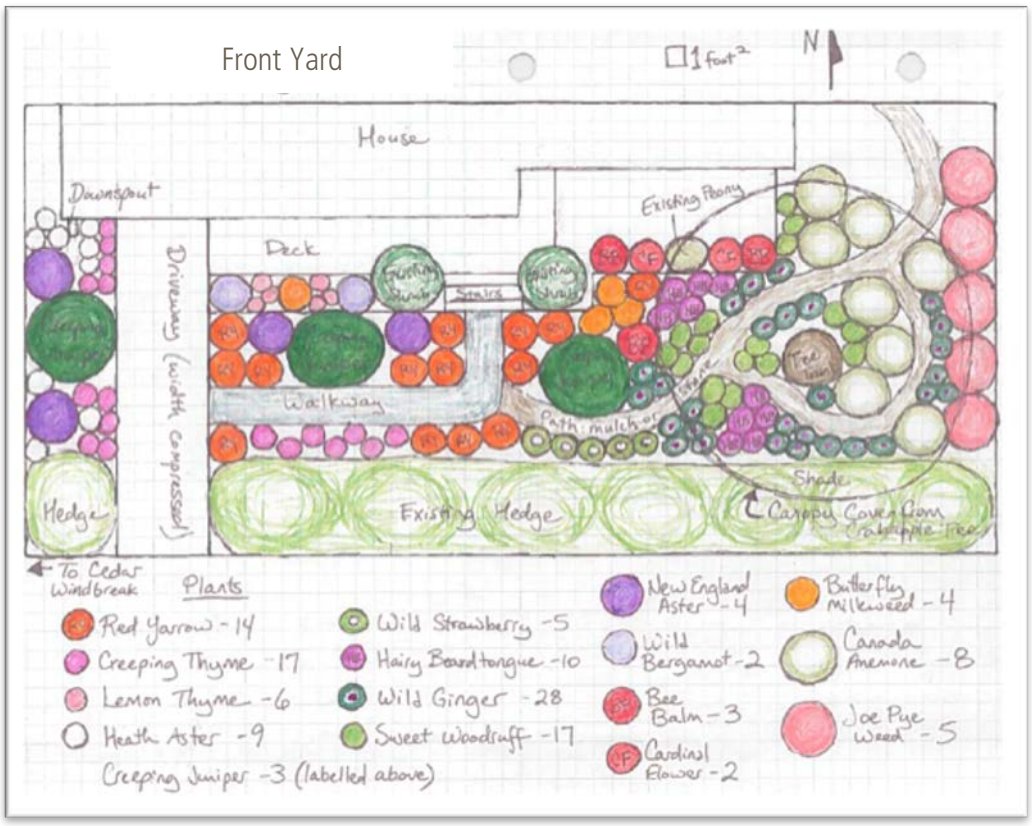
Take out your yard design!

Step 1: Draw a close-up of your garden site. Make sure this drawing is still to scale. This will help you determine how many plants you will need within your garden.

Step 2: Choose your plants! What types of plants are suitable for the type of garden you would like to plant, and the characteristics of your planting site?

Step 3: Add your plants to your garden design. Space plants according to their **spread**. Spread refers to the diameter (the distance from edge to edge) that a plant will take up once it is full grown. As an example, in the example diagram below, Joe Pye weed has a maximum spread of 1 meter (3 feet), so the diameter of the circles in the diagram is 1 meter (3 feet) to scale. Creeping juniper has a spread of 1.5 meters (5 feet), so the diameter of the circles in the diagram is 1.5 meters (5 feet) to scale.





TIP:
It is a good idea to fill in taller or larger plants first, and to plan to have these plants at the back of your garden. This will tell you how much space you have left for smaller plants, and will make sure you can see them in your garden! **Remember to consider recommended spacing of plants.**

3. Installation

Now that you have a clear design for your garden, you are ready to prepare your garden for planting. The information in this section will help you in your next steps.

3.1 Locating Underground Infrastructure

Almost all properties have some underground infrastructure, whether that includes wires, pipes, septic tanks, or wells.

It is mandatory to contact Ontario One-Call to request information on the location of underground infrastructure before you dig. You can complete a request for information online at **www.on1call.com**, or by phone at **1-800-400-2255**. Plan to contact Ontario One-Call at least 7 days before digging.

Here is some of the information you will want to have on hand when you call:

- Will you be digging by hand, or using machinery?
- How deep will you be digging?
- Where will you be digging?
- What road intersection is the closest to the property in question?

If you are submitting your request online, you should plan to upload a photo of your scaled design.

3.2 Removing Sod

If you are planting a garden in a space that is currently covered with sod, there are several options for steps you can take to convert existing sod to a garden site.

Option 1. No-Dig Gardening

No-dig gardening, also referred to as sheet-mulching, is usually used to prepare an area for new planting. Instead of using leaves or mulch, sheet mulching begins with damp cardboard or newspaper. The cardboard serves a similar purpose to dark tarps used in solarizing, preventing sunlight from reaching plants underneath. This approach is often used to remove areas of grass for the planting of a garden, or to plant on top of existing grass. Because cardboard is made of organic material it breaks down just like leaves or wood chips and can provide nutrients to your garden.

Fall Leaf No-Dig Garden Bed Recipe

1. Mow the lawn to a short height.
2. Mark out the outline of the bed with string.
3. Lay carboard or 5 sheets of layered newspaper.
4. Water the cardboard or newspaper.
5. Lay an inch layer of chopped leaves.
6. Sprinkle the lawn clippings on next.
7. Lay a 4-6cm thick layer of compost.
8. Top with a 2cm thick layer of chopped leaves, enough to seal in the compost layer.

Ideally, no-dig garden is done in the fall so that materials have an opportunity to decompose over the winter. Over time, all of these materials will break down into a humus-filled soil. To plant, create a hole just big enough for the plant going into it. Place the plant in its hole, and fill the hole with compost. You only need enough compost to stabilize the plant. The plant can grow well in this pocket, and will help to continue to break down the organic material you have added!

Option 2. Solarizing

Solarizing is used when you want to completely start fresh. This is a longer-term process, but is low-intensity and can leave you with healthy and nutrient filled soil. All you need is a large dark-coloured or clear tarp which you will build into a low tent over the area you plan to have your garden. A dark coloured tarp works by preventing sunlight from reaching the plants. In contrast, a clear tarp will retain heat, increasing the temperature and causing plants to overheat. This solar tent should be put up early in the spring before the growing period starts, and should stay up for at least 6-8 weeks, although longer is better.

For an even simpler approach, combine solarizing and a simple no-dig garden design. In the example shown below, we solarized the planting site for 8 weeks using opaque tarps. Then, we covered the site with a layer of wet cardboard to prevent growth of any grasses or weeds that may have survived the solarizing process. Finally, we covered the cardboard with a layer of triple mix, followed by a layer of mulch. Small plants were planted into the triple mix layer, which was deep enough for their roots to form. To plant larger plants, we dug through the layer of cardboard to plant into the underlying layer of soil.

Option 3. Manual Sod Removal

If you prefer to remove sod yourself, you can do so manually using a shovel and a little muscle. Make sure to wear closed-toed shoes for this work! Healthy sod can have strong root systems which can make it difficult to remove. To make the removal easier, wet the sod before digging, then use a spade or sod lifter to remove it.

Sod lifter
Photo courtesy of Lee Valley

Rototiller
Photo courtesy of Nwdata

Option 4. Roto-tilling

A rototiller is a machine with spinning metal blades which can be used to turn soil. This can help to break apart sod, to mix and aerate soil. Most hardware stores and rental centres will have rototillers available for short-term rent.

Before using your rototiller, make sure to read all instructions, and to take all safety precautions outlined by the rental company. Before bringing your rototiller home, make sure you have a thorough understanding of operating instructions.

Option 5. Hire a Landscaper

This strategy is the easiest, and the most expensive! Most landscaping companies offer services for sod-removal and other site-preparation. Make sure to get multiple quotes, and ask for references or photos of other work done by your prospective landscaping company.

Here is some information you should have available when you contact a landscaping company:

- The surface area of the sod you would like removed (in square feet or square metres)
- Any characteristics of the site that are important to know (e.g., hills, stumps, etc.)
- How will the landscaping company access the site?

Here are a few questions you may want to ask prospective landscaping companies:

- How much do they charge?
- Will they contact Ontario One-Call for you?
- How long will they be on site?
- Do they have insurance?

3.3 Fertilizer and Compost

Nutrient-rich soil is vital to the health and growth of most plants. Fertilizers are substances that can be added to soil to improve nutrients in the soil. Fertilizers can be either organic or inorganic. The two types of fertilizers have different benefits and considerations. Used correctly, fertilizers can have dramatic benefits for the growth of plants.

Organic Fertilizers

Organic fertilizers contain only plant or animal-based materials, such as manures, leaves, and compost. Nutrients are released slowly as materials are broken down by organisms in the soil. In addition to nutrients, organic fertilizers can include beneficial bacteria and fungi, supporting whole-soil biome health. Organic fertilizers can support overall plant and garden health. They are more forgiving than inorganic fertilizers, though it is possible to add too much at once. The SUN team uses organic fertilizers exclusively due to their benefits and lower risks.

Inorganic Fertilizers

Inorganic fertilizers are chemically manufactured. They are nutrient-rich substances added to soil to feed plants and, if used correctly, can have dramatic benefits for the growth of plants. When using fertilizers, it is important to follow instructions on packaging closely. If too much is used, it can disrupt immediate and surrounding ecosystems, upset healthy soil bacteria and even poison nearby water sources.

3.4 Planting

To ensure the success of your flowers, make sure to prepare your planting site in advance to reduce competition with other plants. If you can, plant established seedlings rather than seeds. Adult plants will be able to compete with other plants and will be more likely to survive. We also recommend planting in either the spring (between Victoria Day in May until the end of June) or in the fall (September through mid-October).

Before you begin planting, lay out all of your plants according to your garden design, remembering to account for the spread of plants at full size. This will allow you to see your complete garden design before putting plants in the ground. Once you are happy with your garden's appearance, you are ready to plant!

Plant your seedlings one at a time to minimize the amount of stress from transplanting. Begin by digging a hole about the size of the pot the plant came in, paying particular attention to the depth of the plant. After digging the hole, massage the plant's pot to loosen the plant from its pot. Then, place the plant into the soil and carefully fill in any empty space around the plant, pressing soil down around the plant's roots to stabilize the plant and remove any air pockets. The soil from the plant should be level with the ground. The plant should be upright, and secure. Don't forget to water your plant deeply, immediately after planting!

3.5 Mulch

Mulch has many benefits. It helps your garden stay healthy, look clean, and can even limit the amount of maintenance you need to do! Here are some of the benefits of mulch:

- Protects the soil from compaction and erosion caused by rainwater.
- Helps to trap moisture in the soil, reducing the need for watering.
- Maintains an even soil temperature that can help plants overcome changes in the environment throughout the year.
- Limits growth of weeds that can affect plant growth.
- As organic mulch decomposes, it replenishes vital nutrients in the soil.

Organic mulching requires the layering of organic material on the surface of the garden. You can think of it almost like composting right in the garden! Many people choose to purchase commercial mulches made from wood chips for their gardens. These materials can give your garden a nice finished appearance. But, there is something else you can use that is much more cost-effective! In the fall when you rake your leaves, instead of sending them to a green-waste centre, add those leaves to your garden! Those leaves can provide valuable nutrients for your garden, and can protect plants under the snow in the winter. We recommend mowing leaves first to partially break them down, rather than using whole leaves. Layer leaves until they are about 7cm (2 inches) thick.

Tip:
For annual vegetable gardens, use straw, shredded leaves, or shredded newspaper which all support a bacteria-dominant environment favourable for growth of vegetables.

As a general rule, we try to avoid the use of dyed mulches. While the dyes used are natural, they are unnecessary additives and we prefer to avoid them. Natural cedar is one of the best mulches you can get, and is even able to deter pests!

Tip:
Lay mulch before planting. By laying mulch in this order you will be stepping on mulch rather than soil while you are planting. This will help to avoid soil compaction.

4. Maintenance

The maintenance of a garden is an ongoing task that can be very rewarding. You can expect to complete regular maintenance including watering, additional mulching, and weeding to keep your garden healthy and attractive. Maintenance is especially importance in the first 3 to 5 years after installing your garden.

4.1 Watering

Every garden will need regular watering until it is established. Young plants and transplants will need more water than established plants. Be sure to plant in the spring or fall when temperatures are cooler so less water will evaporate before penetrating into the soil. A good rule of thumb is watering once per day for the first month, any day when there isn't rain. Then, for the first year, you will want to water at least once per week, if it hasn't rained. You will know your garden needs water when you see dry, cracked soil, or wilting plants.

Tip:
To water new trees, consider using a watering bag. These bags are placed around the bottom of young trees. They don't just water your tree – they protect it from damage until it is established!

When you water, water deeply. You should be watering slowly and long enough that water can soak several inches into the soil to reach roots. Consider using a drip hose connected to a rain barrel. **Rain barrels connected to downspouts can be used to capture rain water that falls on your roof, saving it for later watering.** Rain water has important dissolved nutrients that can help your plants grow. Treated tap water doesn't have these nutrients.

Do you have a watering source?
Your plants will need lots of water for the first year after planting. Do you have a convenient way to water your new garden? Consider installing a rain barrel or a soaker hose to make maintenance easier. Rain barrels are connected to downspouts, allowing them to capture rainwater that falls on your roof.

4.2 Mulching

Over time, mulch will decompose. That's a good thing! Decomposing mulch adds valuable nutrients to your soil. To maintain the protective properties of your mulch layer, you will want to top it up periodically. There is no clear timeline for when mulch should be replenished – this timeline depends entirely on the rate of decomposition of your mulch. You might need to add mulch each year, or may be able do so only every two or three years. Observe your mulch layer and add more mulch when you feel the layer has become less than 7cm (2-3 inches) thick.

4.3 Weed Removal

The mulch in your garden should reduce weed growth, but it is unlikely to prevent weeds completely or indefinitely. Learn to recognize the plants that you chose for your garden so you can differentiate them from weeds. You wouldn't want to remove your carefully-selected plants! Your planting plan/garden design will help you identify what you planted, and help you figure out which plants are weeds.

To remove weeds, carefully loosen soil holding the plant in the ground, and pull the plant out of the soil by the bottom of the exposed stem. Be careful to remove as much of the root as possible, and to dispose weeds in yard-waste bags to prevent re-growth.

4.4 Pest Management

Insects are a diverse and vital part of our ecosystem! It's true, some of them can hurt your plants, or are just plain annoying! But Mother Nature has established an amazing balance that existed long before humans created pesticides.

Try to learn to tolerate leaf-eating insects. They will attract predatory insects which will keep the leaf eaters in check! If you use pesticides, the leaf-eaters will rebound more quickly because they reproduce faster. You could potentially create a bigger problem!

If you're having a big insect problem, here are a few natural options that might help.

- Consider installing a bird or bat house. Birds and bats feed on insects and can really help balance insect numbers.
- Select some of the many plants that can deter pests and attract beneficial insects! As an example, lemongrass and citronella plants are known to deter mosquitos from your property, and are a natural alternative to insecticides. Plants like yarrow, dill, cilantro, and parsley attract ladybugs, which love to eat aphids!
- Manage leaf-eating insects, such as aphids, using a mixture of castile soap dissolved in water. Castile soap is non-toxic and biodegradable, and is a great option for deterring leaf-eating insects. Apply the mixture to plants using a spray bottle whenever you find the pests have returned.

4.5 Splitting Perennial Plants

Over time, perennial plants will spread to take up more space in your garden. Eventually, you will recognize that it is time to remove some of your perennials to make space for continued growth, and to maintain a clean and polished garden appearance.

Before removing any perennials, plan which perennials you will remove, and which you will leave. As an example, you may decide to remove half of the plants of a particular type, and may plan to remove them from the left side to create symmetry.

You will also want to decide if you intend to transplant what you have removed. If you are not concerned about transplanting, you do not need to quite as careful to preserve the plants you are removing. If you do intend to transplant your perennials, you will want to be careful around the stem, and will want to preserve the roots as much as possible.

Carefully dig around the plants to avoid damaging those you intend to leave intact. Carefully remove selected plants, and if transplanting, place them in a planting pot. **Give away split perennials to neighbours or friends, or transplant them elsewhere on your property!** If you are not transplanting, dispose of plants in a yard-waste bag or chop them up and add them to your compost pile.

5. Enjoying your space

Now that you have installed your garden, it is time to enjoy your space! Gardening can have many benefits not only for the aesthetics of your property or for the environment, but also for your general health and well-being. A garden can be a rewarding ongoing project that can be an expression of you and your family. A garden can be your canvas, and you can add new plants each year, expanding your garden and testing new things. Have fun with it!

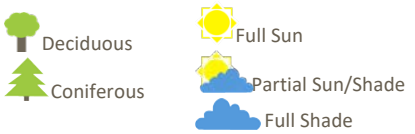
I. Plants for your Garden

The plants in this list are all native species that are adjusted well to Ontario's climate. Some specifically support pollinators (P), or are well suited to a rain garden (RG) or drought-tolerant garden (DT), and others are salt tolerant (ST). Most species have multiple benefits! Each of these plants is available at GreenUP Ecology Park.

How to use this table:

1. Narrow the list to plants that meet your sun and shade needs.
2. Narrow the list further to plants that meet the needs of your sustainability projects.
3. From that shortened list, choose plants that appeal to you.
4. Make note of the height and spread of your chosen plants.
5. Add tall plants to the back of your garden first. Then add shorter, but wide plants. Finally, add your smallest plants.

   Note: When adding plants to your diagram, draw them to scale according to their spread.



Common name	Latin name	Height	Spread	Light needs	DT	P	RG	ST
Grasses								
Big bluestem	*Andropogon gerardii*	1.25-1.75m	0.5-1m		✓		✓	
Bottlebrush grass	*Elymus hystrix*	1m	0.25m		✓		✓	
Canada wild rye	*Elymus canadensis*	0.5-1.5m	0.5-1m		✓		✓	
Indian grass	*Sorghastrum nutans*	1-1.5m	0.25-0.5m		✓		✓	
Little bluestem	*Schizachyrium scoparium*	0.5-1.25m	0.25-0.5m		✓		✓	
Side-oats grama	*Bouteloua curtipendula*	0.5-0.75m	0.5m		✓		✓	
Switchgrass	*Panicum virgatum*	1-2m	0.5-1m		✓		✓	
Groundcover								
Bearberry	*Arctostaphylos uva-ursi*	0.25m	1-2m		✓	✓		
Beebalm	*Monarda didyma*	0.5-1.25m	0.5-1m		✓	✓	✓	✓
Foamflower	*Tiarella cordifolia*	0.25m	0.25-0.5m				✓	✓
Wild geranium	*Geranium maculatum*	0.5m	0.5m		✓		✓	
Wild ginger	*Asarum canadense*	0.25m	0.25-0.5m		✓	✓	✓	
Perennial flowers								
Black-eyed Susan	*Rudbeckia hirta*	0.5-1m	0.25-0.5m		✓	✓	✓	
Bloodroot	*Sanguinaria canadensis*	0.25m	0.25m			✓		
Butterfly milkweed	*Asclepias tuberosa*	0.25-0.75m	0.25-0.5m		✓	✓		✓
Wild columbine	*Aquilegia canadensis*	0.25-0.5m	0.25-0.5m		✓			

Common Name	Latin name	Height	Spread	Light needs	DT	P	RG	ST
Cardinal flower	*Lobelia cardinalis*	0.5-1.25m	0.25-0.5m			✓	✓	
Culver's root	*Veronicastrum virginicum*	1.25-2.25m	0.5-1.25m		✓	✓	✓	
Cup plant	*Silphium perfoliatum*	1.25-2.5m	0.25-1m		✓		✓	
Dense blazing star	*Liatis spicata*	0.5-1.25m	0.25-0.5m		✓		✓	
False solomon's seal	*Maianthemum racemosum*	0.5-1m	0.5-0.75m		✓			
Great blue lobelia	*Lobelia siphilitica*	0.5-1m	0.25-0.5m			✓	✓	✓
Grey-headed coneflower	*Ratibida pinnata*	1-1.5m	0.5m		✓	✓	✓	
Heath aster	*Symphyotrichum ericoides*	0.25-1m	0.25-0.5m		✓			✓
Helen's flower	*Helenium autumnale*	1-1.5m	0.5-1m			✓	✓	
Ironweed	*Veronia noveboracensis*	1.25-1.75m	1-1.25m		✓		✓	
Marsh marigold	*Caltha palustris*	0.25-0.5m	0.25-0.5m			✓	✓	
Pearly everlasting	*Anaphalis spp.*	0.25-1m	0.25-0.5m		✓	✓		
Prairie smoke	*Geum triflorum*	0.25-0.5m	0.25-0.5m		✓			
Purple coneflower	*Ecinacea purpurea*	0.5-1.5m	0.25-0.5m		✓	✓		
Showy tick trefoil	*Desmodium canadense*	0.5-1.5m	0.25-0.5m		✓			
Swamp milkweed	*Asclepias incarnata*	1-1.5m	0.5-1m			✓	✓	
Turtlehead	*Chelone glabra*	0.5-1m	0.5-0.75m			✓	✓	✓
White beardtongue	*Penstemon digitalis*	1-1.5m	0.5m		✓	✓	✓	
Zig-zag goldenrod	*Solidago flexicalus*	0.25-1m	0.25-1m		✓	✓	✓	✓
Vines								
Virginia creeper	*Pethenocissuc quinquefolia*	10-15m	1.5-3m		✓			✓
Trees								
Alternate leaf dogwood	*Cornus alternifolia*	4.5-7.5m	6-10m		✓			
Balsam fir	*Abies balsamea*	30m	6-7.5m		✓			
Black cherry	*Prunus serotina*	22m	10m		✓	✓		
Bur oak	*Quercus macrocarpa*	18-24m	18-24m		✓	✓		
Choke cherry	*Prunus virginiana*	6-9m	4.5-6m			✓		
Eastern hemlock	*Tsuga canadensis*	30m	7.5-11m			✓	✓	
Eastern redbud	*Cercis canadensis*	6-9m	7.5-11m			✓	✓	
Hackberry	*Celtis occidentalis*	12-18m	12-18m		✓	✓	✓	

Common Name	Latin name	Height	Spread	Light needs	DT	P	RG	ST
Red maple	*Acer rubrum*	12-18m	12m		✓	✓		
Red oak	*Quercus rubra*	25m	16m		✓	✓		✓
Red pine	*Pinus resinosa*	25m	10m		✓			
Serviceberry	*Almelanchier sp.*	4.5-7.5m	4.5-7.5m			✓		✓
Silver maple	*Acer saccherinum*	25m	16m		✓			
Sugar maple	*Acer saccharum*	30m	15m			✓		
Tamarack	*Larix laricina*	20m	9m		✓			
White birch	*Betula papyrifera*	15-21m	7.5-15m		✓	✓		
White oak	*Quercus alba*	15-25m	15-25m		✓	✓		✓
White pine	*Pinus strobus*	30m	10m		✓			
White spruce	*Picea glauca*	25m	5m		✓			
Shrubs								
Bayberry	*Myrica spp.*	1.5-3m	1.5-3m		✓			✓
Common elderberry	*Sambucus canadensis*	1.5-3.75m	1.5-3.75m		✓	✓	✓	
Creeping juniper	*Juniperus horizontalis*	6-8ft	6-24inches		✓			✓
Fragrant sumac	*Rhus aromatica*	0.5-2m	1.75-3m		✓	✓		✓
Grey dogwood	*Cornus racemosa*	3m	2.5m		✓			✓
Nannyberry	*Viburnum lentago*	4.25-5m	2-4m		✓			
New jersey tea	*Ceabithus americanus*	1-1.25m	1-1.5m		✓			
Ninebark	*Physocarpus opulifolius*	1.5-2.5m	1.25-2m		✓		✓	
Pasture rose	*Rosa carolina*	0.25-0.5m	1-2m		✓			
Red osier dogwood	*Cornus sericea 'Isanti;*	1.25-1.5m	1.25-1.5m		✓		✓	
Snowberry	*Symphoricarpos*	1-2m	1-2m		✓		✓	✓
Spice bush	*Lindera spp.*	2-4m	2-4m				✓	
Swamp rose	*Rosa palustris*	1-2m	1-2m			✓	✓	
Winterberry	*Ilex verticillata*	5.5-7m	3-3.75m		✓		✓	✓
Witch hazel	*Hamamelia spp.*	4.5-9m	4.5-7.5m				✓	

II. Plants for Your Food Garden

The following plants are food producing. This table gives you information on the plants' characteristics, needs, seed-starting dates, and suitability for container gardening, where applicable.

	Distance between plants	Indoor seeding date	Outdoor transplanting	Outdoor seeding	Suitable for container gardening	Notes
Fruits and vegetables						
Beans	10-15cm			Mid May-Early June	✓	Pole varieties require a frame or trellis to support sprawling growth.
Beets	7.5-10cm			Early May		
Bell Peppers	45-60cm	Early May	Late May		✓	
Carrots	2.5-5cm			Mid-April	✓	Grows quickly, can be planted throughout the growing season for an ongoing crop.
Corn	25-40cm			Late May		
Cucumbers	7.5-10cm	Mid-April	Early June		✓	Produces crop throughout the growing season. Should be grown on a trellis.
Garlic	5-10cm			Late Oct. – Early Nov.		Plant from garlic cloves in the fall and harvest the following summer, in July
Kale	20-30cm			Mid-April - June		Can be seeded at any time during the growing season to ensure harvesting into the winter.
Leaf Lettuce	5-7.5cm	Early April	May		✓	Remove developed leaves as needed, but leave the plant intact for continued production. Sow every couple weeks in the spring for continued harvest.
Onions	10-15cm			Late April		Leaves can be harvested and used throughout the growing season. Remove only what you will use to leave the plant intact. Onions develop under the soil and will no longer produce once removed.
Peas	2.5-5cm			Early-Mid April	✓	Requires a frame to support sprawling growth. Not tolerant of extreme heat.
Potatoes	20-30cm			May		Potatoes develop under the soil from the eyes of old potatoes. Top up soil as they grow. Once dug the plant will no longer produce.
Pumpkins	150-200cm	Late April	Late May - Early June			

	Distance between plants	Indoor seeding date	Outdoor transplanting	Outdoor seeding	Suitable for container gardening	Notes
Radishes	1.25-10cm			Late March-Early April	✓	Grows quickly, can be planted throughout the growing season for an ongoing crop.
Strawberries	50cm		Mid-May – Early June			Strawberries propagate through runners. Once established, one plant can spread into many. Consider planting one plant, and then tend to the runners to help the plant spread. Strawberries are perennial.
Tomatoes	60-90cm	Late March	Mid-May – Early June		✓	Requires a trellis or other structure for support. May require pruning throughout the growing season.
Watermelons	1.5-2m	Late April	Late May – Early June			
Fruit-bearing trees and shrubs						
Black Raspberry	1-1.25m		Mid-May – Early June			
Chokecherry	1.25-1.75m		Mid-May – Early June			
Common Elderberry	1.5-3.5m		Mid-May – Early June			
Highbush Blueberry	1.25-1.75m		Mid-May – Early June			Requires acidic soil, and multiple varieties for good pollination.
Nannyberry	3m		Mid-May – Early June			
Wild Red Raspberry	1.25-2.5m		Mid-May – Early June			Spread aggressively. Be sure to cut back and dig out unwanted suckers.
Wintergreen	1m		Mid-May – Early June			
Herbs and Spices						
Basil	30cm	Mid-March – Early April		Late May – June	✓	Annual
Chives	45cm	Early – Late March		Late April – May	✓	Perennial
Cilantro	15cm			Late May – June	✓	Annual

	Distance between plants	Indoor seeding date	Outdoor transplanting	Outdoor seeding	Suitable for container gardening	Notes
Dill	30cm			Late April – May	✓	Annual
Fennel	45cm	Mid-late April		Late May – June	✓	Annual
Lovage	90cm	Mid-March – Early April		Early May		Perennial.
Mint	45cm				✓	Perennial. Spread aggressively. Plant in containers if you don't want it to spread.
Oregano	45cm	March		Late May – June	✓	Tender perennial, can overwinter in the Peterborough region if planted in the ground.
Parsley	1.25-1.75cm	Late Feb. – Mid March		Late April – May	✓	Biennial.
Rosemary	125cm	Early – Late March		Late May – June	✓	Tender perennial.
Sage	75cm	March		Early May	✓	Perennial. Can overwinter in the Peterborough region if planted in the ground.
Savory	15cm	Mid-March – Early April		Late May – June	✓	Annual.
Sorrel	30-45cm	March		June		Perennial.
Thyme	15-30cm	March		Early June	✓	Perennial. Can overwinter in the Peterborough region if planted in the ground.

III. Invasive Species! Do Not Plant!

Invasive species are species that did not originate in the place where they grow today. There are many species of plants, insects, and animals in Canada today that did not originate here. Most of those were brought here form Europe, either by accident or on purpose.

Most of these species are called "non-native" which means they aren't from Canada. However, some are considered *invasive* which means they didn't come from here AND outcompete native species. Invasive species can spread quickly and wipe out native species entirely!

Amur honeysuckle

Autumn Olive

Bells honeysuckle

Black dog-strangling vine

Common barberry

Dog-strangling vine

English ivy

European fly honeysuckle

European water chestnut

Goutweed

Hydrilla

Japanese barberry

Japanese knotweed

Miscanthus

Morrow honeysuckle

Multiflora rose

Norway maple

Oriental bittersweet

Parrot feather

Periwinkle

Phragmites

Russian olive

Tartarian honeysuckle

For more information on invasive species, visit Ontario's Invading Species Awareness Program website at **www.invadingspecies.com.**

IV. Additional Resources

Arbor Day Foundation. www.arborday.org

City of Guelph. **Pollinator-friendly plants.** https://guelph.ca/living/house-and-home/healthy-landscapes/landscape-planning/sample-garden-designs/recommended-plants-pollinator-garden/

City of Peterborough. **e-Maps 2.0**: Keep Exploring Peterborough! www.ptbo.maps.arcgis.com

City of Peterborough. **Rethink the Rain.** https://www.peterborough.ca/en/city-services/stormwater.aspx

Chan, D.S. and Raine, N.E. (2018) **Creating Pollinator Habitat on Farms in Ontario.** Available at: https://farmsatwork.ca/sites/default/files/Fact%20Sheet%20%232%20Creating%20Habitat%20for%20Pollinators%20on%20Ontario%20Farms.pdf

Gardenia: Creating Gardens. www.gardenia.net

Grow Me Instead (2017) A guide for southern Ontario: Beautiful Non-Invasive Plants for your Garden.

Invasive Species Awareness Program. www.invasivespecies.com

Lakehead Region Conservation Authority: Rain Garden Plants. https://lakeheadca.com/application/files/3914/3871/7004/plantsforrain-garden.pdf

Missouri Botanical Garden. www.missouribotanicalgarden.org

Nourish. www.nourishproject.ca

Otonabee Region Conservation Authority. www.otonabeeconservation.com

The **Old Farmer's Almanac.** https://www.almanac.com/

Peterborough Pollinators. www.peterboroughpollinators.com

Schmidt, R., Shaw, D., and Dods, D. (2007) **The Blue Thumb Guide to Raingardens:** Design and Installation for Homeowners in the Upper Midwest. A Guide for Planting Zones 3, 4, and 5.

Sheridan Nurseries (2019) **Drought-tolerant plants.** http://www.sheridannurseries.com/garden_tips/general_gardening/drought_tolerant_plants

Sustainable Peterborough. www.sustainablepeterborough.ca

Three Rivers Rain Garden Alliance (2009) www.raingardenalliance.org

Toronto and Region Conservation Authority. **Greening your Grounds: A Homeowners Guide to Storm water Landscaping Projects.** *available at the Peterborough Library

Questions? Contact us at:

T: (705) 745 – 3238
F: (705) 745 – 4413
E: heather.ray@greenup.on.ca

Sustainable Urban Neighbourhoods Website:

www.greenup.on.ca/sun

Mailing Address:

Sustainable Urban Neighbourhoods
C/O GreenUP
378 Aylmer Street North
Peterborough, Ontario
K9H 3V8