

MAINTAINING YOUR
**Pollinator
Habitat**



A GUIDE FOR COMMUNITY GROUPS AND GARDENERS



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How Do I Use This Guide?

This guide is designed to assist with maintaining a pollinator habitat. Pollinator habitats can include:

- Small scale pollinator gardens, such as those found in backyards, schools, churches and businesses.
- Large natural meadow restoration sites.

From weeding to watering, this guide will provide you and your group with the know-how and advice to maintain healthy and beautiful pollinator habitat.

Learn about:

- Tasks to maintain pollinator habitat
- Choosing the right plants
- Disease control
- Winter maintenance
- Enhancing existing pollinator habitat

Pollinators Need Our Help!

Did you know that approximately 75% of flowering plants depend on pollinators, including most of our fruits and vegetables? Canada is home to over 1000 species of pollinators, but these populations are threatened, partially due to urban development and the resulting fragmentation and depletion of natural areas. Without pollinators we would lose foods including apples, blueberries, strawberries, peaches, chocolate, almonds and pumpkins.

By creating a pollinator habitat, you have taken an important step in protecting local pollinator species, and healthy, local food production for generations to come. Your site is home to a wide variety of pollinators like hummingbirds, butterflies, moths, bees, flies and beetles. The native plants in your pollinator habitat provide the nectar, pollen, larval food and shelter that these pollinators need to survive.



By creating a pollinator habitat, you have taken an important step in protecting local pollinator species

Getting Started

Step One - Complete the Team Task Table

Taking care of pollinator habitat, on either a large or small scale, requires ongoing teamwork! To help your team get organized use the Team Task Table in Appendix 1. Share the tasks and time commitments and work together to align your volunteers with the things they like to do!

As your volunteers change over time, just reassign the tasks and “Keep on Growing”.

Step 2 - Record the Details

The most important step in creating a maintenance plan for your pollinator habitat is to record the details. Refer to the Details Sheet in Appendix 2 and record as many details as possible about your pollinator habitat site. This information will give you a reference point for future planning.

Step 3 - Complete the Habitat Log

For areas in shared spaces, including a school yard, church or community centre, it's important to keep records of the original site design and any maintenance activities that have occurred. Good record keeping will ensure that the overall vision for the pollinator habitat is not lost as responsibility for the site is passed from one person to another.

See Appendix 3 for Habitat Log sheets that you can photocopy and update as your site evolves.

Step 4 - Record your Pollinator Plant List

It's important to keep track of the plant species and their location. This will help you identify weeds, allow you to document which plants are thriving and which plants are struggling. You can record the location of plants on your Habitat Log (Appendix 3), or use weather-proof plant tags to mark locations within the site.

Simple Steps to a Healthy Pollinator Habitat

At the onset of each season, take a walk through the site. Note its general condition and any outstanding maintenance required. Take photos before, during and at the end of the growing season to help record your progress. Inspect all tools and equipment to ensure they are in good shape and ready to use for the upcoming season.



Native plant, blue vervain

Native Plants

The soil and climate of a region in large part determine the plants and animals that naturally exist there. These species are referred to as native. By definition, a native plant is one that occurs naturally in a particular region, without human intervention. In other words, these are the plants that were growing here prior to the arrival of European settlers. Southern Ontario has its own collection of native species that have evolved together over thousands of years. Native plants are vital to creating a natural, sustainable landscape. They provide food and shelter for native insects and wildlife, and are perfectly suited to our local growing conditions.

Water Requirements

In the summer months when school is out and community groups do not meet regularly, it is important to make sure that a plan is in place for watering. In general, the native plant species used in most pollinator habitats do not require watering once established. However, new growth (first 1-3 years) will need a bit of help, as will all vegetation during periods of extreme drought.

Here are some tips for optimizing water use.

- **Water early in the morning.** In the morning, less water evaporates and more water is taken up by the plants, making it available to them during the hottest part of the day.

Rain Barrel



Garden Mulch



Soaker Hose



- **Get a rain barrel.** Collect rainwater from the roof of a nearby building or shed into a rain barrel by directing the downspout of your eavestroughs into the rain barrel. This is a great, natural source of water for your plants.
- **Use a soaker hose.** Soaker hoses can be attached to rain barrels or to the garden hose. Drip irrigation is a more efficient method of watering than a sprinkler because it delivers the water directly to the roots where it's needed.
- **Watch the weather.** Plants will need more water in the first growing season when they are establishing a root system. New plants need about 2.5 cm (1 inch) of water per week, including rainfall. Measure the rainfall using a rain gauge (available through your local municipality or any garden store) to ensure you are not overwatering. One good soak per week is better than frequent light sprinklings because it encourages deep roots which are more drought resistant.

Controlling Weeds

An ounce of prevention:

- **Remove seed sources of undesirable plants.** Hand-pull or clip back the seed heads of weed plants before they go to seed. This will slowly remove the seedbed of weeds from the area, inhibiting weeds from coming back in future years. Don't put any weeds that are about to go to seed in the compost.

A pound of cure:

- **Hand-pull weeds.** Make sure to pull weeds out from the roots by pulling from the base of the plant. Weeding after a rain storm is easiest as the ground will be softer. A trowel can be used to loosen the soil to remove well-rooted weeds.
- **Apply soap and vinegar spray.** Spraying unwanted plants with a soap and vinegar solution is an easy, non-toxic way to eliminate weeds (2 parts vinegar, 1 part dish soap, 2 parts water). Just make sure to avoid other plants when using it – it will kill any plant it hits!



Leaf cutter bee - Credit: Rob Cruickshank

Insects are your friend!

Insects are a normal part of any pollinator habitat and some cosmetic damage to plants can be expected. Remember that you are trying to attract pollinators to your garden! In fact, insect damage may be from desirable pollinator species, like the leafcutter bee that cuts pieces of leaves to use as 'baby blankets' for their young.

- **Smother the problem.** For larger areas of weeds, spread thick dark plastic (heavy duty plastic bags or landscape fabric) over the ground. This works best if the coverings are put down in the early fall and left until you are ready to plant in spring. Leave for at least two months to kill weeds properly.
- **Consider leaving certain 'weeds'.** So-called weeds like golden rod, Queen Anne's lace, yarrow and common milkweed are highly beneficial to insects, so unless they are taking over the area, try leaving them in your garden.

Fall and Winter Activities

Most people tend to tidy their flowerbeds in the fall for the winter. Insects need protection for overwintering, and by clearing out your pollinator habitat before the snow flies, you may be inadvertently wiping out all the beneficial insects you've been trying to attract.



Winter residents using your pollinator habitat:

- Toads and newts like to spend the cold winter months under pots, stones and logs.
- Frogs are more likely to be found under piles of leaf litter.
- Ground beetles remain active throughout the winter, and can be seen foraging around leaf litter and around flower beds.
- Ladybugs overwinter in large clusters on dead plant stems found in sheltered parts of the garden.
- Garden spiders usually overwinter as eggs – either in the ground or on dead plant stems.

What you SHOULD do with your pollinator habitat this fall:

- Consider new features or changes to the area. Look back over your records to see what worked well, and what hasn't been as successful as you had hoped.

- If you are thinking of expanding the area, this is the time to do it. See page 11 for details on adding more space to your pollinator habitat.
- If you're looking to add some new elements to your pollinator habitat, fall is one of the best times to plant trees and shrubs. Ensure that the newly planted trees and shrubs will not shade out your sun-loving pollinator species as they grow. Plant trees and shrubs towards the north-east edge of your site.

What you SHOULD NOT do with your pollinator habitat this fall:

- Avoid disturbing the soil, or digging in flower beds, as this will disturb overwintering insects.
- Do not remove dead plant material – it provides shelter for overwintering pollinators and food sources for birds. If you feel the urge to tidy up, use burlap twine to create neat bundles of standing plant material.
- Do not remove fallen leaf matter – either let it lie where it falls, or rake it up and scatter it over your garden beds to create an insulating layer of mulch.
- Avoid pruning trees or shrubs – not only will this remove the new buds that have already formed for spring growth, it will also remove many of the berries and seeds that serve as food sources for birds over the winter.

Seasonal Maintenance:

Use the following calendar as general guide for seasonal maintenance.

SPRING	SUMMER	FALL	WINTER
<ul style="list-style-type: none"> • Mow area, rake, cut back dead plant material and add them to the composter • Remove any large, wet clumps of leaves and add them to the composter • Visually check for wildlife habitat or pollinator species that may have overwintered (<i>Make sure not to disturb these sites!</i>) • Stake off areas to avoid pedestrian traffic (<i>if necessary</i>) • Add a fresh layer of mulch or compost to garden beds • Plant new species • Divide and replant perennials which have outgrown their space • Water new plants during dry periods (pg. 6) 	<ul style="list-style-type: none"> • Remove weeds from the garden, replenish mulch as needed • Monitor the weather and water the garden regularly during dry periods • Monitor and treat for diseases (<i>Appendix 4</i>) • Prune or thin any plants which are growing fast to promote good air circulation 	<ul style="list-style-type: none"> • Remove weeds from the garden, replenish mulch as needed • Divide and replant perennials which have outgrown their space • Leave dead plant material and leaf matter where possible • Remove plants that performed poorly and note them down in the notes section (<i>Appendix 2</i>) • Prepare new beds for spring planting (pg. 11) • Plant trees and shrubs if they are part of your plan • Check equipment and repair as necessary 	<ul style="list-style-type: none"> • Make notes about spring planting plans • Review plant progress and notes made throughout the growing season

Seasonal Maintenance: *Meadow Restoration Areas*

In large-scale meadow restoration sites, there are additional steps that should be taken in early spring to maintain a healthy, functioning ecosystem.

Fire is a natural part of meadow ecology, and introducing a controlled burn to your meadow restoration area can ensure long-term success. Controlled burns help by removing dead plant material, reducing weeds and warming the soil. It is important to note that controlled burns should only be done by a professionally trained team, with the permission of the appropriate authorities. Where burning is not an option, mowing is a good alternative. After the area has been mowed, be sure to gather the cut material with a rake and place it in your composter.

Expanding Your Pollinator Habitat

To expand your pollinator habitat, the soil must be free of grass and weeds. To do so, smother the grass in late fall with black plastic, old carpets, plywood or a thick layering of leaves or wet newspaper. Leaving this cover over the area throughout the winter will leave you with a clean area for planting. In the spring, before planting, remove the plastic (or other material used) and lightly cover the area with mulch to keep moisture in and discourage weed growth.



Size Doesn't Matter

Pollinators do not use size as their guide ... they use smell and colour as indicators. Meadow plants can be placed in small or large garden plots, flower pots or window boxes. By planting a variety of flowers, with a range of colours, flower sizes, and bloom times (spring through fall), you will succeed in attracting a wide range of pollinator species, and ensure a continuous supply of food for both the larval and adult forms of these important insects.

It's always a good idea to stake and mark the area when expanding your pollinator habitat - It will be a signal to others that a new natural space is being created.

When expanding your pollinator habitat, it is also important to make note of any invasive species that are present. By persistently hand-pulling new growth of invasive species, such as thistle and garlic mustard, the plant will be put under stress and over time will die-out. Where weeds are dominant, regular applications of a vinegar-based spray to kill new green growth, along with hand-pulling, will help you manage the problem.

For more information on invasive species, see our online resource "A Quick Reference Guide to Invasive Species" at www.trca.on.ca/yards under the Resources heading.

Right Plant, Right Place

The key to maintaining a healthy pollinator habitat is starting with the right plant in the right place. When bringing a new plant species into your pollinator habitat, always check the growing requirements on the plant tag to ensure it is adapted to the climate, light and soil conditions of your site. Native plants have evolved over thousands of years in response to the local climate, and in association with other native species. Native plants are the ideal choice for your pollinator habitat. Please refer to www.trca.on.ca/yards under the Resources heading for a list of suggested native plants for your pollinator habitat.



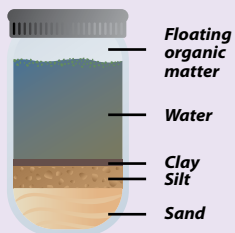
Soil

There are three general types of soil: clay, silt and sand. A simple test to determine what type of soil you have is to follow the jar test in figure 1 below.

The majority of pollinator plants are best-suited to growing in well-drained, sandy soil. Sandy soils drain quickly because the larger particles create larger air spaces which allow water to move quickly. If you have a high percentage of clay or silt in your soil, you may need to add some sand.

Toronto and Region Conservation uses a thin (6-8 inch) layer of brick sand in their meadow restoration sites. Brick sand is finely crushed stone with a small proportion of organic material. Then a border is created using cedar posts to prevent foot traffic over the newly planted area. Brick sand, or similar mixtures, can be found by inquiring at your local nursery. The sand should be lightly mixed into your existing soil.

Figure 1 - Soil Jar Test



1. Collect your soil sample.
2. Spread soil out on an old cookie tray to dry. Once dry, sift it through a collander or remove small stones and roots and break up any lumps.
3. Fill a jar halfway with the sifted soil and then fill it completely with water. Put the lid on the jar and shake well.
4. Place the jar in an undisturbed area and compare the results to this diagram.
5. If you see mostly sand in your jar, you have sandy soil. If you see mostly clay in your jar, you have clay soil. If you see equal amounts clay, silt and sand in your jar, you have loamy soil.

Enhancing Your Pollinator Habitat

Labeling Your Plants

If you label your plants, it will make it easier to remember what you've got next spring.

Ways to label your plants:

- Use an ordinary tongue depressor and write on it with a permanent marker.
- Metal stakes, made with pliable metal, can be written on.
- Use a wooden stake (or ordinary stick with the bottom sharpened). Write directly on the stake or attach a small piece of wood for a larger writing surface.
- Painted rocks can also make great plant labels.
- Depending on your budget, you might consider using a sign shop to have signs printed on metal or coroplast.



Interpretive signs are also an excellent way to draw attention to your pollinator habitat, spread the message about the importance of pollinators and even attract volunteers. You may also consider certifying your area as a Monarch Waystation or "Pollinator Friendly" site and display the accompanying sign. Check out the links in the Resource section for details.

Water Features

Water is an essential part of pollinator habitat. Butterflies require drinking water and birds use water for bathing and drinking. Tips for creating pollinator friendly water

Avoid Standing Water

Mosquitoes use large areas of standing water as nesting areas. Mosquito larva require at least seven days of undisturbed water to complete their lifecycle. Change the water twice a week to prevent mosquito breeding and avoid introducing diseases such as West Nile Virus to your site.



features include:

- Leave small depressed areas free of vegetation and mulch so that water can gather to form small puddles.
- Set out a small saucer or bowl with water and add sand and rocks. This is a great alternative to mud puddles for butterflies.

Shelter and Nesting Site

No pollinator habitat is complete without shelter and nesting sites. Features that can be added to any site include:

- Shrubs, tall grasses and low-growing plants.
- Bundles or patches of fallen branches and brush.
- Small patches of bare ground for ground nesters.
- Nests for native bees (see the link in the Resources section to learn more).



Native bee nest



Photo courtesy of Victoria McPhail

Ground Nesting Bees

Ground nesting bees are solitary and seldom, if ever, sting. Consider skipping the mulch in some areas of your garden and leaving bare patches of ground for ground nesting bees.

Congratulations!

By creating and maintaining your pollinator habitat you are part of a continent-wide movement to protect pollinators. To learn more about pollinators and pollinator conservation in Canada and North America visit the links in the Resources section.

Appendix 1. Team Task Table

Be sure to make a photocopy before filling this in so you can update it as your group evolves.

TASK NAME	JOB DESCRIPTION	SEASONS & TIME COMMITMENTS	TEAM MEMBERS (Insert Names)	# OF VOLUNTEERS NEEDED
<i>Team Leader</i>	Keep files and records in order Maintain team task table and maintenance logs Communicate with the team	Annual or bi-annual updates of paper work Commitment of 1-2 days per month		1-2 team leaders and an alternate member who also has a copy of and access to files and records
<i>Bookkeeper</i>	In charge of funds and donations	1-2 days per month		1
<i>Equipment Keepers</i>	Check that tools are put away and working properly Tool inventory Check with the other teams to find out what tools are needed Repair or replace signs	Check tools once a week from May-October Inventory tools once per year		2-3
<i>Early Bird Watering Team</i>	An early bird (or a small group) who can arrive early to water the site Check rain gauge and watch the weather	Once a week to every other day from June to August		1-10 people depending on your watering method and the size of your site (more people if hauling water)
<i>Water Keepers</i>	Maintain rain barrels and other watering equipment	1-2 days per month		2

TASK NAME	JOB DESCRIPTION	SEASONS & TIME COMMITMENTS	TEAM MEMBERS (Insert Names)	# OF VOLUNTEERS NEEDED
<i>Weed Warriors</i>	Pull weeds In charge of composting Aren't afraid to get dirty!!	Once a week from May to October		From 2-20 depending on the size of your site and age of the volunteers
<i>Soil Doctors</i>	Mulch plants Fix soil problems Visit garden centres for advice and supplies	Once in spring and fall After any new plantings		2-5 depending on the size of your site
<i>Plant Detectives</i>	Check for insect damage and plant diseases Use the tables and advice from a garden centre to diagnose and treat problems Divide or thin plants that are overcrowded or have outgrown their space	Once a week from May to October		2-5 depending on the size of your site
<i>Habitat Helpers</i>	Create mud puddles or baths for butterflies Make bunches of branches and brush, and place them in the site Install and monitor bee nests	3-4 times per month from May to October		1-5
<i>Winter Workers</i>	Make a plan for next spring Get new beds ready Plant trees/ shrubs (if applicable)	2-3 days per month from October to April		2-10 depending on your spring plans and the size of your site

Appendix 2. Pollinator Habitat Details Sheet

The first step in creating a maintenance plan for your pollinator habitat is to record the details. Use the following section to record as many details as possible about your site. This information will give you a reference point for future planning.

Group Name: _____

Site Name: _____

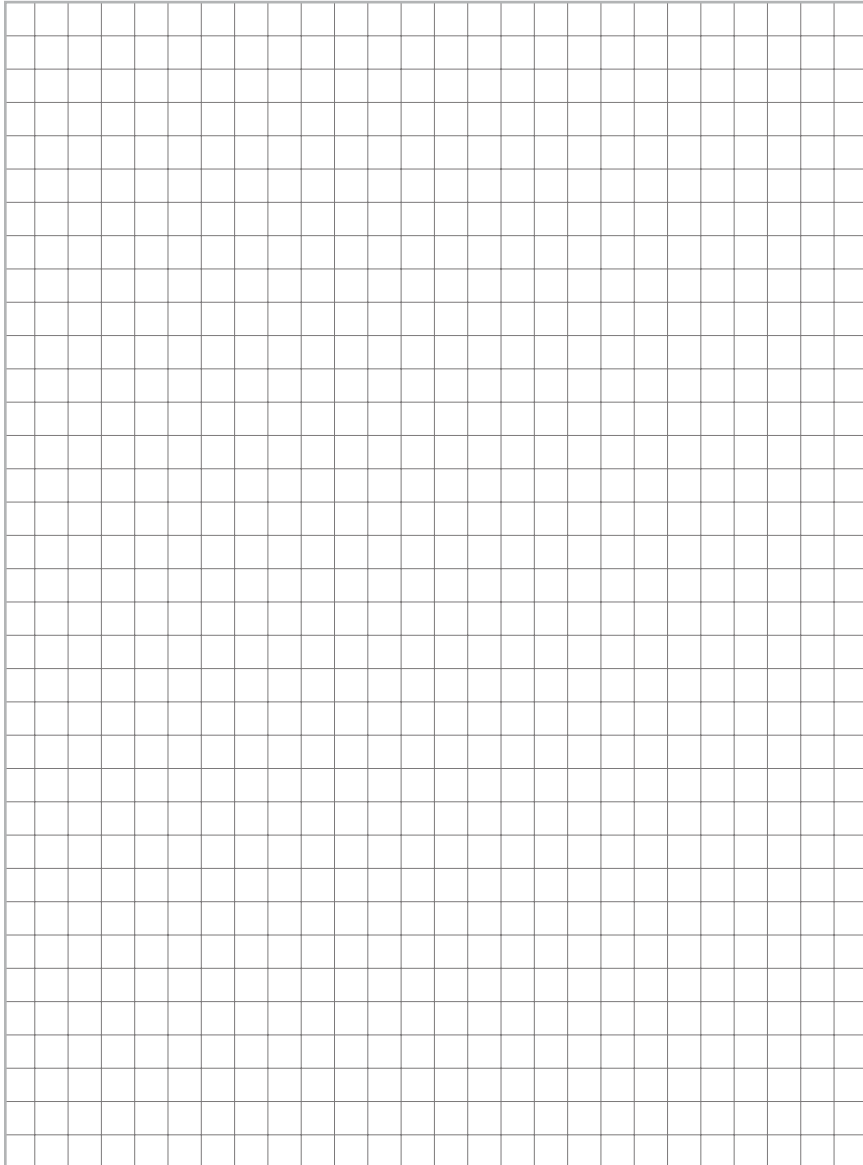
Location: _____

Year Installed: _____

Habitat Notes:

Appendix 3. Habitat Log

Using the space below, sketch out your pollinator habitat site. Record the location of key features, hardscaping (rocks, pavement, picnic tables, etc) and plant beds. It's a good idea to re-sketch your space every couple of years to record any changes to the layout.



Appendix 4. Controlling Diseases

Prevention is the best measure for plant diseases. Before treating a disease, you must identify it correctly. To help identify the disease, it is helpful to know what the healthy plant looks like in all seasons. The internet is a great source of photographs and information on plants. Plant diseases are generally caused by environmental factors like pollution and soil compaction. Fungal diseases like cankers and rusts, bacterial diseases like wilts and blights, and viral diseases can be spread from plant to plant by humans, insects or wildlife.

DISEASE	DESCRIPTION	TREATMENT
<i>Bacterial Wilt</i>	Plants wilt, recover and then wilt again, before turning yellow and dying. Affected plants have stems that ooze a slimy liquid.	There is no effective treatment. Affected plants must be destroyed. Avoid contaminating other plants by washing hands and tools thoroughly before handling other plants.
<i>Black spot</i>	Tiny black spots with rims of orange or yellow on leaves (most often roses). Leaves turn yellow and may drop. It is caused by humid weather combined with lack of air circulation and/or sun and aggravated by overcrowding.	Remove affected leaves and spray remaining leaves with insecticidal soap or a liquid sulphur spray. Repeat regularly throughout growing season. Avoid overwatering. Plant native varieties.
<i>Blight</i>	Sudden wilting or browning of leaves or buds that fail to open. There are various types of blight that affect different flowers and vegetables.	Remove flowers promptly since blight multiplies in old blooms. Water early in the day as wet conditions promote blight. Try sulphur or copper-based fungicides.
<i>Grey mould (Botrytis blight)</i>	A fuzzy, grey mould, often accompanied by brownish, spongy patches on leaves and flowers. While it looks unsightly, it usually doesn't kill the plants.	Good air circulation.
<i>Fusarium Wilt (damping-off disease)</i>	Mostly a problem with vegetable seedlings. Causes stems to shrink inwards and turn black, the plant then wilts, keels over and collapses.	There is no effective treatment. Effected seedlings must be removed and destroyed immediately. To prevent spread, use sterile potting medium for seedlings, keep tools clean, provide space between seedlings to ensure good air circulation around them. Look for "VF" on seed packets to buy resistant seeds.

Resources

Plants for your Garden

How to Select and Buy Native Plants - City of Toronto: Urban Forestry
www.toronto.ca/trees/pdfs/Fact_2_How_to_Select_and_Buy_Native_Plants.pdf

100 Easy-to Grow Native Plants for Canadian Gardens
Lorraine Johnson, 2011. Random House of Canada

Healthy Yards Program – Toronto and Region Conservation
www.trca.on.ca/yards

Native Plant Database – Evergreen
www.nativeplants.evergreen.ca

Water Efficient Plants Section Guide – York Region: Water for Tomorrow
www.waterfortomorrow.ca/en/athome/landscapedesign.asp

Fusion Landscaping – Region of Peel: Water Smart Peel
www.peelregion.ca/watersmartpeel/residents/fusion-landscaping/index.htm

Water

Wise and Effective Use of Water in Your Organic Garden - Toronto Master Gardeners
www.torontobotanicalgarden.ca/mastergardener/PDFs/WaterUse.pdf

Water Efficiency: An At-Home Guide – York Region: Water for Tomorrow
www.waterfortomorrow.ca/en/athome/inthegarden.asp

Rain Barrels – Region of Peel: Water Smart Peel
www.peelregion.ca/watersmartpeel/residents/rainbarrels.htm

Soil

Improving Soil Organically - Toronto Master Gardeners
www.torontobotanicalgarden.ca/mastergardener/PDFs/ImproveSoilOrganic.pdf

*The Online Gardener's Handbook 2010, Chapter 3:
A Word about Soil Testing* - OMAFRA
www.omafra.gov.on.ca/english/crops/gardbk/gh-ch3-4testing.htm

Backyard Composting – York Region
www.york.ca/services/garbage+and+recycling/backyard+composting.htm#where

Gardening... make the mulch of it! – City of Toronto
www.toronto.ca/compost/mulch.htm

Composting in Peel – Region of Peel
www.peelregion.ca/pw/waste/compost/index-compost.htm

Pest and Disease Control

The Organic Gardener's Handbook of Natural Pest and Disease Control: A Complete Guide to Maintaining a Healthy Garden and Yard the Earth-Friendly Way
Bradley, F.M., Ellis, B.W., and Martin, D.L. 2010. Rodale Organic Gardening Books

Controlling Pesticides without Pesticides: A General Overview
City of Toronto, Go Natural Fact Sheets.
www.toronto.ca/health/pesticides/pdf/gardening_insect_control_general.pdf

Controlling Plant Diseases without Pesticides
City of Toronto, Go Natural Factsheets.
www.toronto.ca/health/pesticides/pdf/gardening_plant_diseases.pdf

Organic Gardening Factsheets - Toronto Master Gardeners
www.torontobotanicalgarden.ca/mastergardener_factsheets.shtml

Organic Gardening Toolbox - Foodshare.
http://foodshare.net/toolbox_roots-rooftops-Organic.htm

Garden Certification and Signage

Pollinator "Friendly Garden" Certification
<http://ento.psu.edu/pollinators/public-outreach/cert>

Monarch Waystation Program
www.monarchwatch.org/waystations/

Native Bee Nests
www.fws.gov/pollinators/pollinatorpages/yourhelp.html#bee

Additional Resources

Pollination Canada, www.pollinationcanada.ca

Canadian Pollinator Protection Initiative, www.pollinator.ca

Pollinator Partnership, www.pollinator.org

Monarch Watch, www.monarchwatch.org

The Xerces Society, www.xerces.org



Stewardship
AT TRCA

 Toronto and Region
Conservation
for The Living City