



Going Organic



What We Do >> Wildlife-Friendly Gardening > Earth-Friendly Gardening

To some, the idea of organic gardening is simply avoiding synthetic (man-made) fertilizers and pesticides. For many others, it goes further, working with nature to produce a healthy garden by incorporating or mimicking aspects of natural ecosystems and applying other safe techniques to create balance.

WHY GARDEN ORGANICALLY?

Fighting Mother Nature is an uphill battle, which typically leads to an increasing dependence on synthetic fertilizers and pesticides. Not only can this gardening practice be bad for the environment, wildlife and human health, but it can also be expensive and time consuming as nature's garden helpers are driven from the garden through the creation of an unwelcoming environment.

Some overall benefits of organic gardening include

- Methods that help to keep our air, water and soil clean and healthy, which results in...
- A safe garden for our family to enjoy, and also...
- Our wild neighbours, both near and far, benefit, which means...



- We then benefit from wildlife services such as pest management and pollination, plus...
- Garden plants tend to be more vibrant, strong and lush than those grown using other gardening methods.

Ultimately, while there are different degrees of organic gardening, people do it as a natural or conscious reflection of their understanding that we are a part of nature and our existence depends upon a healthy planet. Some people's motivations go further, beyond the desire for our own well-being to the respect and support for the life that surrounds and supports us and all living things on our planet.

Whatever your level of interest, time or resources, read on to see how you can apply some of these benefits to your garden and learn the details of why it is so helpful.

HOW TO GARDEN ORGANICALLY

Organic gardening basically includes

- Building up the soil as it becomes depleted
- Encouraging biodiversity with a variety of plants that are home to a variety of animals
- Creating and maintaining the garden in a manner that supports its organisms
- Dealing with potential and existing problems in a safe and gentle manner, starting with prevention

CARING FOR THE SOIL

The first step in creating a dynamic garden is to create or maintain [healthy soil](#) which serves two main purposes. Good quality soil is teeming with important organisms that break down matter into usable nutrients for plant roots. This biodiversity that exists below ground level is key to growing vibrantly healthy plants. Healthy soil also means its texture reduces or eliminates the need to water your garden.

In nature, nutrients are continually returning to the soil in the form of decaying plant and animal matter. This maintains healthy plants, which are more able to deter and resist pests and diseases, as well as be more robust and look more vibrant.

In our quest to have tidy gardens, we often neglect to give back to the soil or do so with synthetic fertilizers. These products can be too strong and harm beneficial organisms in the soil but can also be too quick a dose for plants, acting like steroids do on humans. They can also harm our waterways, as rainwater carries residue to our groundwater, streams and rivers and ultimately our oceans. This impacts the quality of the water we use for drinking, cleaning and swimming. It also impacts the health of the aquatic life that depends upon a clean, safe habitat.

[Natural fertilizers](#) like compost, leaf mould, aged manure or even nettle tea nourish the soil and therefore your plants without any harm to the surrounding environment. Many are also soil amendments with organic matter (something that was once living), which build up the soil—allowing in air, retaining moisture, which is good for your plants, and preventing runoff, which helps other environments.

[Mulching](#) your garden beds with natural materials like wood chips, straw or leaves will not only suppress weeds, retain moisture in hot weather, prevent soil erosion and maintain suitable

temperatures, but also returns nutrients as they slowly break down.

[Grasscycling](#)—leaving clippings where they lie—will return nutrients to the soil, provided your lawn has sufficient microorganisms to do the job. If not, add a sprinkling of compost once or twice a year to replenish and support these important garden allies.

PLANT IT AND THEY WILL COME

Growing a diversity of plants and plant types such as trees, shrubs, vines, flowering perennials, ferns and grasses will encourage biodiversity above ground level. This myriad of beneficial [insects](#), [birds](#) and [other creatures](#) will use these plants as food, homes or temporary shelter. This habitat will also allow them to feed on species that could be problematic if left unchecked.

It is also helpful to mix them up, as large expanses of a single vegetable crop or flowering plant makes it easier for pests to find and feed.

Incorporate some [regionally native plants](#), as they evolved with other local wildlife as well as the local weather conditions.

CREATING AND MAINTAINING THE ORGANIC GARDEN

Certain practices in creating and maintaining a garden can go a long way to support one's organic efforts. For instance, correctly placing a plant in an area that matches its preferred growing conditions of light, soil and moisture increases the chances of your plant not only surviving but also thriving. In addition to promoting healthy soil, this further minimizes the need for pesticides or synthetic fertilizers, which can negatively impact our environment, near and far.

Another way to garden organically is to pay attention to your plants as you stroll through your garden, keeping an eye out for potential weed-, pest- or disease-related problems. The sooner any challenges are addressed, the easier the solution tends to be.

Prevention can also include removing weeds when they are young and the soil moist, as in the spring or after a good rain, as this makes removal easier. Prevention can also involve removing diseased plant material from the garden or allowing more space between those plants that need plenty of air circulation to keep mildew at bay.

You can take organic gardening a step further and [conserve your water usage](#) with some of the above-mentioned features of mulch and soil amendment, but also with rain barrels, watering plants in the morning and at ground level. You can also add to your plant's health—and save on your water bill as well as minimize negative impacts associated with excessive water usage.

Try your hand at [composting](#) and make your own “gardener's gold.” Look at your lawn and see how much you need for your lifestyle's various activities and then decide which areas you can replace with more natural, life-supporting habitat. This will not only help your garden, but also minimize the resources required in maintaining a lawn. Also, consider how you will maintain the remaining lawn, with the option of not watering it and allowing it to go dormant in the summer (if that is what it would do in your region) and see if it's feasible to use a push mower to keep it trim! There are even varieties of grass that are suited to mowing only once per month.

DEALING WITH PROBLEMS

If you have applied all the prevention ideas above, chances are you won't need to reach for insecticides or herbicides. But if a problem does crop up, try the ideas mentioned below and keep in mind the organic principle to start with the gentlest remedy first.

Deter insects on your crops with floating row covers that are light enough to let in sunlight but prevent intruders from landing on plants. For larger animals, keep them out of certain areas of your garden with fencing. Alternatively, put up deterrents such as pie plates or other objects that can easily blow in a breeze to startle hungry animals. Other deterrents work because of their smell, like a garlic/egg mixture or sweaty clothes which can keep a variety of animals away. Other means of deterring pests (and maximizing nutrients) can be done with the help of companion planting—grouping or pairing plants together to meet nutrient needs and/or repel pests.

Also consider handpicking small bugs or spraying pests with water. If a few goes at this doesn't work and you find that you can't live with the results, add a small amount of mild, environmentally friendly detergent. Keep in mind that many products may say they are gentle, but reading labels and asking questions will help separate the cream from the crop. If that doesn't work, try an organic pesticide or trap, such as beer for slugs. Keep in mind, however, that the cycle of many pests include some temporary damage to a plant, which naturally allows that plant to regenerate later in the season for its own purposes. A little research can go a long way in saving you time year after year with recurring situations.

Our [Natural Insect Control](#) handout, [Problem Wildlife](#) and [Lawn Care](#) sections have lots of detailed information on this.

There are so many ways to work with instead of against nature, and the benefits include a garden that is vital and self-supporting. So why not put a bit of thought into how you build your garden, letting Mother Nature take care of it for you while you sit back and relax?

The Problem With Pesticides

Think of your garden as a small ecosystem — all the living organisms exist in balance. When we introduce pesticides (chemicals designed to kill), we alter this balance in two ways:

First, pesticides often harm organisms other than those targeted as they contaminate the air, water and soil. This can kill off or weaken a variety of important species such as pollinating insects. These beneficial insects are important to the health of our gardens. Pesticides have also been known to reduce the health of other species, such as birds, which generally pick up the toxins through ingesting polluted food. The range of damage can be far reaching as pesticides can travel to distant ecosystems in the air or water.

Second, the very action of pesticides wipes out certain insect or weed populations which removes the food supply for a variety of animals. Butterfly populations dwindle when their food sources disappear through herbicide use. Many birds, frogs, toads, bats, and other animals depend on a good supply of insects to remain healthy – including hummingbirds who need a certain amount of spiders and insects for protein! Why not allow these animals to keep your insect populations under control naturally?



Water Saving Tips



[What We Do](#) >> [Wildlife-Friendly Gardening](#) > [Earth-Friendly Gardening](#)

Water means life to just about every creature on Earth – including ourselves. We use water daily, and clean water at that, for a variety of important purposes. We drink it for our survival and pleasure and we use it to keep our bodies, clothes and homes clean. It's important for a lot of our cooking and baking, for construction and for healing therapies. We also use water for swimming, fishing, canoeing and other fun or relaxing activities that are integral to our well-being. For wildlife, water is critical to maintain certain habitats and the life within them.



But as our demand for this precious resource increases and our clean usable supply diminishes due to drought and pollution, we are all significantly affected.

BENEFITS OF CONSERVING WATER IN THE GARDEN

Save tax dollars

As we lessen our demand for water from towns and cities, we lessen the need for pumping and processing the water both taken and returned to the original source, usually a river. This saves time and materials which can impact our municipal taxes.

Water supply

If you are on a well, using less water will save your water supply, as one never really knows just how much groundwater is flowing and how much our neighbours are consuming.

Helping Wildlife and their Habitats

Conserving water in cities and towns means we take less water from the local waterway which lessens the disturbance on that environment and the life within it.

Using water wisely also means we are gardening in a more ecologically sustainable manner, where your impacts both near and far are as harmless as possible. For instance, minimizing run-off (excess water that the soil can't absorb quickly enough) minimizes sediment and pollutants that can be carried back to our water sources, which can impact a variety of environments along the way.

Indirect benefits

As we help to conserve wildlife and their habitats, we then benefit from the multitude of services provided by wildlife as they help maintain the web of life on this planet. One of the biggest is pollination which creates a large percentage of our food supply. Another is keeping their numbers in check, preventing 'pest' problems.

WATER SAVING TIPS

Thoughtful planning and maintenance help produce a garden that remains vibrant no matter what nature has to offer. Here are some tips to minimize water use:

- Group plants according to their water needs.
- Use [regionally native plants](#) chosen to suit the particular conditions of each area of your property — once established they should require little or no watering. Some plants are especially drought-resistant such as our native grass species.
- Maintain [healthy soil](#) rich in organic matter to retain moisture.
- [Mulch](#) plant beds for better moisture retention. It will also maintain a healthier temperature for plant roots during hot summers, so plants better withstand periods of drought. As a bonus, mulch also prevents erosion and suppresses competing weeds.
- Take advantage of shade as water evaporates less quickly there. Try planting appropriate plants in shaded spots and move potted plants to areas where they will receive more cover.
- Reconsider your need to water the lawn. It may go brown during extreme heat but this is usually a period of dormancy rather than a dead lawn.
- If you feel the need to water your lawn, water more deeply and less often as this encourages grass to develop deep roots and allow the lawn to survive periods of drought.
- Also, consider minimizing lawn areas, to minimize the resources involved in maintaining it. Try xeriscaping (landscaping to minimize watering needs) your property with mulches, ground covers, rock gardens, shrub beds, walkways, a deck or patio.
- Set up a rain barrel to capture rainfall from eavestroughs to use for watering.
- Before watering, consider how much precipitation fell the previous week. Perhaps it was sufficient, eliminating the need for watering altogether.
- Use drip irrigation to provide maximum moisture with minimum waste.
- Water the plants with care to reduce water waste from run-off and to avoid eroding the soil's surface. For instance, watch how the water moves as it lands on the soil. If it rolls off, then water more slowly or with a finer spray to allow it to penetrate the soil. This might be a good spot for [mulch](#) or [amended soil](#), too.
- Water plants at ground level. This will prevent water loss from evaporation and mildew and fungus from developing on foliage.
- Water in the morning. This too helps reduce evaporation and will prevent leaf scorching from water droplets in the sun. Morning watering also gives the plants a chance to dry before night sets in. This helps prevent pests that are attracted to very moist environments, like slugs and fungi.
- For a plant that needs more water, try sticking a water bottle with the base removed into the soil near the plant and water through the top of the bottle. Using this technique, water will be channeled specifically to that plant's root system.



Companion planting



What We Do >> Wildlife-Friendly Gardening > Earth-Friendly Gardening

To practice companion planting is to create harmony in the garden. Plants which complement each other are placed together, while those that disagree are kept apart. Plants can complement, or help, each other in several ways.



- Some plants grow well together because they don't compete with each other. For example, a shallow-rooted plant would do well beside a deep-rooted plant as they seek nutrients at different levels in the soil. In the same way, a shade-tolerant plant does well in the shadow of a sun-loving plant.
- Certain plants can bolster the growth of nearby plants by improving the nutrients or condition of the soil. Legumes, such as clover, for example, are able to enrich the nitrogen content of soil thereby benefitting neighbouring plants.
- Beneficial insects are attracted by certain plants. Angelica, for example, attracts lady beetles and lacewings, both of which feed on aphids. Beebalm attracts bees. By using these plants to attract beneficial insects, you also improve pollination or control insect pests for adjacent plants.
- Plants can also repel pests or disease through the production and release of chemicals or odours. Chives, for example, repel aphids. If you plant them near your roses, therefore, they can bestow this protection on these blooms.

Consideration of these factors in planning your garden will help you to create a healthy, thriving garden. Your plants will enhance the growth of their neighbours instead of competing with them.

These plants will repel pests:

Plant	Repels	Dislikes

Anise	aphids, cabbage worm	
Asparagus	nematodes	
Beans, castor	gophers, moles	gladiolus, onion, garlic
Beans, green	Colorado potato beetle	gladiolus, onion, garlic
Borage	tomato hornworm	
Calendula	nematodes	
Catnip	cabbage moth, Colorado potato beetle, cucumber beetle, flea beetle, squash bug	
Celery	cabbage moth	
Chives	aphids, mites, rabbits	
Coriander	aphids, Colorado potato beetle	
Dahlia	nematodes	
Dill	tomato hornworm	carrot
Flax	Colorado potato beetle	
Garlic	aphids, borers, gophers, Japanese beetle, mites, rabbits	bean, pea
Geranium	leafhopper	
Horseradish	Colorado potato beetle	
Marigold	aphids, Colorado potato beetle, nematodes, Mexican bean beetle, tomato hornworm, whitefly, cabbage maggot, cabbage moth, flea beetle	
Mint	cabbage maggot, cabbage moth, flea beetles, mice	
Mustard	aphids on cole crops	
Nasturtium	cabbage moth, Colorado potato beetle, squash bug, whitefly	
Onion	borers, mites, rabbits	pea, bean
Petunia	leafhopper, Mexican bean beetle	
Potato	Mexican bean beetle	
Radish	cucumber beetle	hyssop
Rosemary	cabbage maggot, Mexican bean beetle	
Rue	Japanese beetle	basil
Sage	cabbage maggot, cabbage moth	cucumber
Salvia	nematodes	
Soybean	chinch bug	
Spearmint	ants, aphids	
Summer savory	Mexican bean beetle	
Tansy	ants, aphids, borers, Colorado potato beetle, cucumber beetle, cutworm, Japanese beetle, squash bug	
Thyme	cabbage moth	
Tomato	asparagus beetle, cabbage maggot, flea beetle on cole crops	fennel

Soil Care



What We Do >> Earth-Friendly Gardening > Soil Care

Soil is the foundation of any garden and must be attended to as carefully as plant and animal life. Get to know the soil conditions in the different areas of your yard and select plants that prefer each soil type. Better to do the research before you plant than to spend many months struggling to make an unsuitable plant prosper in the wrong soil.

Plants are essential for the welfare of humans, either as a direct food source or indirectly as food for other animals that are important to our survival. Plants can't thrive, however, without healthy soil. The health of the soil, therefore, is of vital importance to our well-being.

A healthy soil is teeming with a great diversity of living organisms. These creatures play pivotal roles in the decomposition of organic matter and the release of nutrients. Insects, fungi, and bacteria provide biological control of plant diseases. In fact, they can help to control human diseases too because many important antibiotics have been developed from soil fungi and bacteria.

Earthworms are an example of a slightly larger soil organism that contributes to both soil and plant health. The activity of earthworms enhances water infiltration rates, soil drainage, water retention, and fertility. The much smaller organisms, however, are still important for influencing water movement on a lesser scale.

Even mammals have a role to play in soil health. Mice, gophers, and other burrowing mammals enhance the health of the soil by cultivating it, letting in water and air, and carrying vegetation down and earth and minerals up.

Many soil organisms depend on the availability of organic matter in the form of plant or animal residues (such as dead stems, leaves, and animal manure) for their sustenance. Soil management practices that ensure a constant supply of organic matter in the soil can help to enhance populations of soil organisms. For example, zero till systems — those that involve planting without cultivating the soil — help to maximize the diversity of soil organisms. On the other hand, practices like excessive tillage, inadequate incorporation of residues, burning and overgrazing are associated with acute losses of soil organic matter.

The use of pesticides can seriously harm soil organisms. Other soil contaminants, such as heavy metals, can also have negative effects on soil organisms, even at levels considered safe for humans. Organic farming practices, on the other hand, enhance populations of soil organisms.

Despite their importance, very little is known about most soil organisms. In fact, it has been estimated that as little as five percent of micro-organisms have ever been described. However, by ensuring that your soils receive enough organic matter by adding material such as [compost, shredded leaves, or composted manure](#), you can ensure that your garden's soil supports a healthy population of soil organisms. And you'll be rewarded with healthy plants.





Mulching

[Home](#) [What We Do](#) >> [Earth-Friendly Gardening](#) > [Mulching](#)

Each year, nature provides a blanket of mulch which many gardeners treasure. Read on to discover the benefits of mulching, how to apply it and various types of organic mulches to choose from.

The Benefits of Mulch

This layer of mulch has many functions. It serves to suppress weeds, retain moisture, moderate the temperature of the soil, reduce compaction, decrease competition from other plants, improve soil structure, and provide nutrients to the soil. In our home gardens we remove debris to maintain an aesthetically pleasing appearance; however, this layer of organic matter is an important component in our gardens and can be left in place or replaced with organic mulch.

SUPPRESSING WEEDS

A five-to-eight centimetre (two-to-three inch) layer of mulch will prevent light from reaching the soil surface. This will stop small weeds from emerging and prevent weed seeds from germinating. Weeds that germinate on the surface of the mulch are easily removed by hand. Some weeds, such as dandelions and thistles, have enough energy in their roots to push through a layer of mulch. Ensure that these types of weeds are removed entirely before placing mulch on a bed.

RETAINING MOISTURE

Applying mulch to a bed is an effective way to conserve water. It acts as a barrier, reducing evaporation from the soil surface. Research indicates that five centimetres of bark reduce moisture loss in summer by 21 percent. Due to its structure, mulch will also assist with the infiltration of water into the soil, thereby helping to prevent run off and splashing of water during heavy rain.

MODERATING SOIL TEMPERATURE

Tiny root hairs are necessary for the absorption of moisture and nutrients. By preventing extreme daily fluctuations in soil

temperature, mulch protects these sensitive root hairs from injury in the heat of the day. In the fall, a layer of mulch will help to retain ground heat that has penetrated deep into the soil, which will encourage root growth longer into the season.

REDUCING COMPACTION

Foot traffic in a garden will cause compaction around the root zones of plants. This reduces growth by limiting air exchange, water infiltration, and percolation. As the air pockets in the soil are compressed, the water-holding capacity of the soil is also reduced. Water will pool at the soil surface, further preventing air exchange. Compacted soil also makes root extension very difficult. A layer of mulch helps to reduce compaction by limiting the need for foot traffic due to a decreased need for weeding and by absorbing some of the compaction.

REDUCING COMPETITION

It's beneficial to place a ring of mulch around newly planted trees or shrubs. Turf and weeds compete with plants, robbing them of nutrients and water. Ensure that the mulch ring is between five and eight centimetres thick and roughly the size of the root system below it. It takes three to seven years for a plant to become fully established. Reducing the competition around the plant will accelerate this process. Continue to increase the size of the mulch ring each year until the plant is well established. A mulch ring around a tree or shrub will also prevent damage caused by lawn mowers and trimmers.

IMPROVING SOIL STRUCTURE

As organic matter decomposes it turns into humus. Humus acts like glue, holding together soil particles to create crumbs. The formation of crumbs improves soil structure. Improved soil structure allows for proper air exchange, water infiltration, and percolation.

PROVIDING NUTRIENTS TO THE SOIL

When mulch is placed in the garden it continues to decompose. As microorganisms break down the organic matter, essential plant nutrients are released into the soil. However, some materials actually rob the soil of nitrogen as they decompose. Microorganisms in the soil use up nitrogen as they consume the carbon in the organic material. As a result, nearby plants suffer from nitrogen deficiency. This deficiency is temporary. When the mulch has fully decomposed the nutrients are released back into the soil. Adding partially decomposed mulch and additional nitrogen fertilizer can prevent this condition. Grass clippings, blood meal, or poultry manure can provide the additional nitrogen required.

Applying Mulch

When placing mulch in your garden it is important to consider the texture of both the soil and the mulch. If a layer of mulch is too thick it may prevent air and water from reaching the soil. Air and water are important both to the roots of the plant and the microorganisms found within the soil. Heavy clay soils are not well aerated due to the small amount of

pore space. Coarse mulch should be placed on clay soils in a layer no thicker than five centimetres. Sandy loam soils have larger pore spaces that allow for more aeration. A thicker layer of mulch with a fine texture can be added to a depth of eight centimetres.

Soil with a layer of mulch on top takes longer to warm in the spring. The layer of mulch also prevents water from evaporating. When adding mulch to a bed, wait until the soil temperature increases.

It is important not to place mulch against the base of trees, shrubs, or herbaceous plants. Mulch can provide a home for rodents that may chew on the base of plants causing severe damage and even killing the plant. Also, mulch retains moisture and heat, which will damage the base of the plant. Keep mulch 15 centimetres away from the base to prevent any problems.

Mulch decomposes as it ages; therefore it will need to be replenished from time to time. How often will depend on the type of mulch being used. Try to keep the layer five to eight centimetres thick throughout the season.

In the long run, mulching your flower and vegetable beds can save you a lot of time. It can drastically reduce the amount of time you spend weeding and watering. It also looks good and prevents soil from splashing onto your flowers when it rains.

Types of Organic Mulches

BARK

Bark provides an attractive type of mulch with good longevity, but if bark is not partially decomposed it may cause a nitrogen deficiency. Some species of trees, such as hardwoods, have bark that decomposes much slower than other species. Bark is relatively inexpensive and can be purchased in bags or by the yard from most garden centres or landscape supply companies. Bark is effective in reducing compaction and is not easily blown by the wind.

PINE NEEDLES

Pine needles are attractive, resist compaction, and decompose slowly. They are not readily available for purchase; however, they can be taken from beneath pines found on your own property at no cost. Pine needles will acidify the soil in time (this is a long process if the soil in your area is naturally alkaline).

WOOD CHIPS

Both fine and coarse textured wood chips can be purchased, though fine textured mulches decompose at a greater rate and more frequent applications will be required. Coarse textured mulches may be considered less aesthetically pleasing. Wood chips can be obtained from municipalities for little or no cost. You may also need to provide additional nitrogen to prevent depletion in the soil.

SHREDDED LEAVES

Leaves have a pleasing appearance and can be shredded with a composting mower or lawn mower and added to the garden. Shredded leaves decompose quickly, however, and must be replenished regularly. While leaves are available at no cost, they may cause a nitrogen deficiency. Whole leaves should not be added as they tend to mat and block water from infiltrating the soil. Well-rotted leaf mulch is perhaps the best mulch, providing nutrients as it breaks down into beneficial humus.

STRAW

Straw has a coarse appearance that may be undesirable for some and will require frequent applications. Straw is inexpensive mulch that is ideal in vegetable gardens: while it provides the benefits of other mulches, it also keeps the fruits and vegetables clean. Note that nitrogen should be added to prevent depletion of this nutrient and that straw may carry weed seeds.



Natural Amendments and Fertilizers



What We Do >> Earth-Friendly Gardening > Compost and Other Natural Fertilizers

The most beautiful plants are typically the result of wonderful soil. Among the best and least expensive ways to achieve rich, productive soil is to use natural amendments and to supplement your plants with a natural fertilizer when necessary.

A soil **amendment** is a substance used to improve the soil's structure. As an added bonus, amendments help retain moisture and nutrients in the soil and fertilize plants. A **fertilizer** is meant to feed plants directly. If your soil is properly amended, you may find little need for fertilizers.

Using natural amendments and fertilizers over synthetic ones is beneficial for a few main reasons. With natural fertilizers, nutrients are released slowly and steadily, and the nutrients that do not get taken up by the plant help to enrich the soil and improve its texture, whereas a synthetic fertilizer is likely to quickly leach through the soil and find its way into our water and air supplies. Another major benefit of using natural amendments and fertilizers is that they enrich the community of living soil organisms, unlike synthetic ones, which tend to disrupt the community and compact soils. It is also of note that any fertilizer or amendment in too high a concentration can be harmful to – however, you are far less likely to burn your plants with natural dressings.

APPLYING AMENDMENTS

You'll want to work any amendment into the top layer of soil using a shovel where possible. Take care not to turn the amendment too deeply in the soil; otherwise the nutrients will migrate south, out of the root systems' reach. Alternatively, you can channel the amendment into rows. Create furrows that are about 12 to 14 centimetres deep, add your amendment of choice and plant directly on top so the root system can draw directly from the good stuff below. If your garden is established apply the same concept, but dig the furrows between plants.

Here are a few excellent natural amendments to try:

[Compost](#) or [worm castings](#) ensure that nutrients are slowly and gently released into the soil. These amendments are top in terms nutrients and improving soil quality and texture.

Manure is another great amendment choice. It is easy to use and provides a well-rounded source of nutrients. If you're getting manure from a local farmer, be sure to ask if it is well aged, as fresh manure is nutrient rich making it

too harsh for plants. If the manure is fresh avoid applying it to plants straight away, this especially applies to manures that break down quickly like sheep or chicken waste.

Green manure involves growing a nutrient-rich crop plant and working it into the soil once the leaves have matured but before the plant goes to seed. This process returns nutrients to the soil and helps improve the soil's texture. Green manure, also called cover crops, is especially wonderful for vegetable gardens or for conditioning soil before establishing any garden. Clover, wheat, rye, fava beans and vetch are all popular choices for cover crops.

Seaweed is a great soil conditioner; it is comparable in nutrient content to cow manure and is rich in potash. Seaweed should be worked into the soil (it can become sticky if left on the surface) or added to your compost pile. If you do not have access to the fresh stuff, you can purchase it as seaweed meal or calcified seaweed.

Leaf mould consists of partly composted leaves. It can be used as a mulch or worked into the top layer of soil to improve texture and humus content. It is very effective at holding moisture. Making leaf mould with a black plastic garbage bag is easy. Just poke a number of holes in the side of the bag and pack in the leaves; add water if the leaves are dry and again if they become very dry throughout the summer. You'll have a finished product in one to three years, depending on what type of leaves you use.

APPLYING FERTILIZERS

With the exception of liquid fertilizers and any specific directions discussed below, the following fertilizers can be broadcasted over the soil. This means you evenly spread them across the bed and mix them into the top 10 to 15 centimetres of soil. Broadcasting is best done before planting in early spring. For established beds, these fertilizers can be applied as a side-dressing, worked into the top few centimetres where possible.

Try any of these natural fertilizers to suit your needs:

"Black tea" liquid fertilizer, also known as manure tea or compost tea, is a great nutrient-rich way to water your plants. Simply add any kind of manure or compost to a bucket of water and let it sit for a day. Strain out the solids, and you will be left with a brew that will make things grow. There is no need to be precise, but generally you can use about 1.5 kilograms of manure in 20 litres of water. Dilute this until it is much lighter in colour, like a weak cup of tea. Use the tea to water soil near the base of plants and avoid pouring it directly on foliage and stems.

Fish emulsion liquid fertilizer is a good source of nitrogen, phosphorus and other nutrients needed in trace amounts. It is a reasonable all-round fertilizer, though it lacks calcium. If you have fish scraps and a large property, take the scraps and add them to a screen-covered bucket of water. Assign this to a far corner of your yard to sit for two or three months, beware that it will be quite smelly! A layer of oil will form over the water and the rest will sink to the bottom. Harvest the oil and store it in a container with a tight lid. To water with this, Marjorie Harris proposes a mix of ONE cup of oil to about 20 litres of water.

Blood meal is good source of fast-acting nitrogen that will not add bulk to your soil.

Hoof and horn meal are high in nitrogen and do not readily burn plant roots since they are slow releasing. For best results, mix these with sawdust, which binds nitrogen.

Bonemeal is a great source of slow-acting phosphates and of nitrogen too; however, you'll want to consider that dogs may find the bonemeal enticing and may dig up your beds.

Fish meal is a slow-acting nitrogen source. It also supplies phosphorus, calcium and other micro-nutrients. Bury this fertilizer several centimetres into the soil so it will not be dug up by clever animals like skunks or your pets.

You can even try burying your meat and fish scraps near mature plants, but again, be sure to dig fairly deep so animals are not lured by an easy meal.

Oyster and bivalve shells are made of calcium carbonate which is strongly alkaline and can be used to neutralize an acidic soil. Some garden centres sell ground oyster shells but you can use anything left over from your dinner. Bury rinsed (to remove excess salt), crushed shells of crab, lobster, oysters, etc. in a marked spot in your garden. They will decompose after about three weeks, at which point you can dig the spot up and spread the broken shells around.

Alfalfa meal is simply ground-up alfalfa that provides nitrogen and releases some phosphorus and potassium as well. It also has a plant hormone that may increase growth.

Soybean meal is best used on acidic soils to feed plants nitrogen. It is slow acting and lasts all season, but take care not to overuse it as it can cause root burn, overstimulate growth and emit a foul smell.

Wood ashes from fireplaces and woodstoves contain calcium carbonate which is great for neutralizing an acidic soil; they also provide a source of phosphates and potash. You'll want to be sure that no garbage was burned in your ash supply. Wood ashes are best applied to sandy soils. Avoid using them on clay soils, germinating seedlings and plants that thrive in acidic soils.

Rock or mineral fertilizers are great at providing many trace elements but it is best to also include some organic matter with nitrogen for a more well-rounded fertilizer. The greatest advantage to applying rock fertilizers is that they have staying power, lasting from five to 10 years. You can typically find these at garden centres. Here are a few examples:

- **Phosphate rock** is recommended for a soil severely depleted in phosphates. It slowly releases phosphate, as well as boron, zinc and nickel all needed in tiny amounts for plant health. Rock phosphate should be used sparingly. Follow the package recommendations as to not disrupt the soil's microbial community and create a build-up of salts.
- **Granite dust** is a wonderful source of potash and also has some trace elements. Its chief advantage is that it won't affect the pH of the soil.
- **Potash rock** contains potassium and many other trace minerals. Apply it right on the soil with some organic materials, any fruit or vegetable scraps you might add to your compost will do the job.


For soils lacking in calcium with no need for pH alteration, try **gypsum**. Gypsum is calcium sulphate, so some sulphur will be added to the soil as well. It can also improve the aeration of clay soils.

Calcitic or dolomitic **limestone** can alter the pH of an acidic soil, owing to its calcium carbonate content. Use limestone if you need to sweeten your soil (make it more alkaline).

Sulphur is used to increase the soil's acidity; however it may not be of any use on very alkaline soils. It takes about three weeks in the soil for the sulphur to be converted into a useable form. It must be converted to sulphuric acid by soil organisms for plant uptake. For best results, add some compost to help the process along.

Epsom salts are ideal if your soil is lacking magnesium and sulphur. If this is the case, give seeds a germination boost by sprinkling about a cup of salt over a nine square-metre area before planting. For established plants, water with a mixture of 30 grams of the salt to about four litres of water, once a month or more. At this application rate, there is no need to worry about build-up in the soil.

Vermicomposting

 [What We Do](#) >> [Earth-Friendly Gardening](#) > [Compost and Other Natural Fertilizers](#)

Composting with the help of worms is a practice known as vermicomposting and is a useful spin on the typical methods of composting. Read on and discover the benefits of vermicomposting, how it can be done and the different ways to use the finished product.

BENEFITS

As with [composting](#), the benefits are numerous. It is a great way to deal with some of your kitchen scraps and get rich soil conditioner for your plants in no time. In the big picture, it reduces waste that would normally decompose at a much slower rate and contribute to the production of harmful leachates and greenhouse gases in a landfill.

Composting is a natural ecological process that you can speed up under the right conditions of oxygen, moisture, nutrients and soil organisms (like worms!). In vermicomposting, red wiggler worms take care of a bulk of the work. Bacteria, microscopic fungi and other soil animals also play an important role in producing extraordinary compost. Although traditional compost is a great fertilizer, studies have shown that vermicompost has a higher concentration of plant-available nutrients including nitrogen, phosphorus and potassium. You can use vermicompost to attain healthy plants without any need for synthetic fertilizers. Vermicompost also has an increased ability to hold moisture; it releases water more slowly, reducing watering needs.

A vermicompost does not require a lot of space; it can be done indoors and should not emit foul odours if it is well maintained. If you have limited space or wish to compost hassle free in wintertime, this method may appeal to you. You'll appreciate it if you want results quickly, if you are curious about soil ecology or are fascinated by worms. Vermicomposting is also a great experience for children—they'll get a thrill handling the worms and a front-row seat to see how waste breaks down and cycle in the natural world.



MATERIALS AND SET-UP

Though it does require some commitment, once you've established an initial set-up, the process becomes easy.

The Worms

Eisenia foetida, the red wiggler (also known as red worm, compost worm, manure worm or red wriggler), is the best choice for your vermicompost bin. They will gorge on your scraps and are happy to stay within the confines of your bin, unlike the nightcrawlers (*Lumbricus terrestris*) commonly seen after a deep rain. Nightcrawlers prefer to feed in deeper layers of the soil, whereas red wigglers typically remain near the surface, feeding in leaf litter and on manure piles.

Healthy red wigglers will produce many offspring quickly. They are hermaphroditic, meaning they contain both female and male sex organs, and although they cannot reproduce on their own, they all have the capacity to lay cocoons and fertilize them. If you notice small yellowish grains in your compost, these are the cocoons. On average, each one will hatch out three worms, though it is often more. It takes about six weeks for the young worms to reach sexual maturity and begin to breed. This means the number of worms in your bin can double in just a few months. Given their reproductive rate, one of the easiest ways to obtain worms to start vermicomposting is from someone who already has an established bin. If this is not an option, you can usually purchase them from fishing bait shops or online.

The Bin and Its Components

Almost anything can be used as a bin; a great inexpensive choice is an opaque plastic lidded storage bin. Another popular choice is a blue recycling bin, which some municipalities equip with a lid. The worms do not like sunlight, so avoid any transparent materials even though you may be tempted to watch your worms at work. A lid is important to help prevent fruit flies and other pests from hovering over your compost. If you prefer to recycle, an old shipping crate or even a drawer no longer in use can serve as a bin. However if you choose wooden material over plastic, be aware that it will break down more quickly from moisture. If you are not keen on a do-it-yourself project, many complete kits can be purchased from locals easily found online, green community centres or sometimes even through your municipality.

A well-aerated bin is crucial to the success of your vermicompost; for this you'll need to drill several holes in the lid. This not only provides air, but also helps manage any excess moisture or humidity. Approximately 10 to 12 holes with a diameter of roughly one centimetre will be sufficient. If you're up to another step, or find yourself repeatedly dealing with soggy compost, drill holes on the bottom of the bin to allow water to drip out and collect. Add a piece of screen to line the bottom of your bin to contain the compost and prevent any worm escapes. As a side note, red wigglers will not try to escape unless the conditions in the bin are less than favourable. (See the Challenges and Solutions section below if this is happening to you.) Now, set up a small stand on which to place your bin so that a tray can be put beneath to catch any dripping water. You can dilute this water and use it as a fertilizer before your compost is even ready.

Finding Your Optimal Bin Size and Worm Quantity

Generally, a bin with a larger surface area is preferred over a deep container. This reasoning is based on the worms' behavioural biology. They are epigeal, which means their activity is generally above ground within the leaf litter. Scraps spread out over a larger area will be processed more quickly than if the materials were buried within a deep bin.

Choose a bin to suit the amount of scraps your household produces. You can have as large of a bin as you like, keeping in mind that a large bin will become quite heavy if you need to move it. General guidelines from Environment Ontario are as follows: One to two people will likely need about half a kilogram of worms in a bin that is 30 centimetres high by 45 centimetres in length and 60 centimetres wide. Two to three people might use one kilogram of worms in a bin that is 30 centimetres by 60 centimetres by 60 centimetres. While a larger family

of four to six people will could need one to two kilos of red wigglers and a bin that is 30 centimetres by 60 centimetres by 105 centimetres.

To be sure of the quantity of worms you'll need, keep your food scraps aside and weigh them each day for a week or two to get a good sense of how much to feed these voracious creatures. The red wiggler will eat the equivalent of its own body mass each day; however, only half of that comes from the food scraps; the other half is from the bedding. For example, 450 grams of worms can process 225 grams of your food scraps in a day. This is variable of course, so adjust the feedings according to your worms' appetites and you learn as you go.

A Spot for Your Bin

Consider where you'll keep your bin. Common places include the kitchen, often under the sink, in the garage or in your bathroom. The worms will be happiest between the temperatures of 17°C to 22°C, but they can do well in much cooler or warmer temperatures. You can even keep your worm bin outdoors on a balcony or in a shady spot in your yard, though it must be brought back inside for the cooler months, once the temperature dips below 4°C. If you would rather keep your vermicompost outside year round, you can build an insulated outdoor enclosure out of wood. Use an insulating Styrofoam material and monitor the temperature if you can. Although the worms can withstand cooler temperatures, they will probably reduce their activity and feeding levels, so you may have to adjust the feedings accordingly.

The Bedding

In any compost pile, you need to balance the nitrogen to carbon ratio. Since most of the added scraps are fresh and rich in nitrogen, you will need to make sure the bedding is high in carbon.

Bedding is the medium the worms live in and also serves as part of their diet. It should be moist, but not soggy wet. After an initial watering, you likely won't need to add much water because the decomposition process usually provides sufficient moisture. You eventually may need to add dry bedding materials to the bin as needed.

The bedding should be relatively light in texture so that the worms can easily move about. Great bedding choices include leaves, which can be collected in the fall, coconut husk sold as "coir," straw chopped up finely, peat moss and shredded paper or cardboard. Avoid any glossy or heavily coloured paper, though greyscale newsprint is fine as nowadays it contains mainly vegetable-based inks—double check your paper to be sure. It is best to create a mix of these substrates, for example, one part shredded and soaked newspaper to one part coir or one part leaves to one part peat moss. Use three or four different materials if you can. As a final step, add a few fistfuls of sand or potting soil to the bedding, which the worms ingest and store in their gizzard to help with digestion.

FEEDING YOUR WORMS

Typically, feeding the worms one to three times a week is sufficient. In between feedings, you can store your scraps in a container with a tight lid. Letting the scraps sit for a few days before feeding them to the worms allows for a good buildup of microbial activity on the surface of the scraps; this is what the worms actually consume. For the same reason, when building your initial set-up, you may add the bedding and the scraps days before adding the worms. The amount of scraps you add is dependent on the number of worms and the size of your bin, as mentioned earlier.

Keep in mind that the smaller the size of the food scraps, the more rapidly they'll break down. Try to feed in a different area of the bedding each time; devise a rotation and stick with it to get even quicker results. Be sure to cover the food scraps with some bedding to discourage pests.

Food scraps to include:

- Fruit and vegetable scraps
- Coffee grounds and tea bags
- Plant trimmings

- Finely crushed egg shells
- Unprocessed hair (chopped finely so the worms do not become entangled)

Problem items:

- Meat and fish
- Dairy products
- Onions or garlic
- Oils and fats
- Sauces, dressings and vinegar
- Salts (If you have a water softener, do not use this water in your bin.)
- Pet and human waste

You'll want to avoid the listed problem items because they are either bad for the worms or will rot if not eaten quickly, resulting in an unpleasant odour that will attract fruit flies and house flies. Take care to moderate the amount of citrus fruit peelings and coffee grounds that go into the bin due to their acidity. Limit potato peelings as well, because they can take a while to decompose. It is best to feed your worms a good variety of food scraps in order to maintain the pH balance of the bin and to allow for healthy worms. Adding crushed eggshells every week or so will not only help balance the pH level of your bin but also provides the worms with the calcium needed to produce cocoons.

If you like, you can include cooked pasta, rice, bread and beans that do not have any added salt, oils, sauces or dressings on them. However, adding these carbohydrates will require extra monitoring to verify that they are being processed quickly enough.

HARVESTING THE FINISHED PRODUCT

You should have a finished product approximately every three months. The compost is ready when it is more or less uniform in colour and texture. It will look like a dark, crumbly soil. This finished vermicompost is mainly composed of worm castings (worm waste) and some partly decomposed materials. The more worm castings you see, the more processed the scraps are and the more urgently you'll need to harvest the compost. Large quantities of finished castings are detrimental to the red wigglers' health. Rest assured that the castings are non-toxic for people and pets. They can be safely handled with bare hands, even for children.

There are a couple of main approaches to harvesting vermicompost. If you can afford to wait for a bit, simply swipe the finished compost toward one side of the bin and add fresh bedding and lots of scraps to the other side. The worms will slowly move toward the fresh food source on the opposite side. This generally takes four weeks; you can then scoop out the finished product from the side the worms have vacated. For a hands-on approach that is a little more labour intensive but will get you compost faster, place the contents of the bin on a tarp or newspaper. Then either shine an artificial light source on it or allow the sunlight to hit the pile and wait a few minutes. The worms will move down and away from the light source, allowing you to skim off a worm-free layer of the compost. Repeat this process until you've harvested most of the castings. Be sure to keep aside any young worms and cocoons (they look like little yellow grains of rice) if you want your colony to grow. Prepare your bin with fresh bedding and lots of food scraps and then return your worms back to their home.

MAKING USE OF THE CASTINGS

Here are a few suggestions for putting the compost to good use:

- Mix it with soil for starting seeds or for potted plants. Using just one part compost to 10 parts soil will give you optimal results; this is only a 10% mix. You can add more if you like; however, using more than two parts vermicompost to five parts soil (a 40% mix) may do more harm than good.
- To use this compost in your vegetable gardens and flower beds, simply place it between plants and gently work

it into the soil.

- Use it for your transplants. Add some to the bottom of the hole you have dug before transplanting.
- Spread it beneath your trees and shrubs to give them an extra boost.
- Sprinkle it on your lawn for naturally healthy grass.
- Make a compost tea by adding roughly $\frac{1}{4}$ cup of vermicompost to two litres of water and let it sit for a 24-hour period. Mix this solution every once in a while. Use it for watering plants and spraying on leaves.

If you end up with more compost than you can handle, give some away and become a favourite neighbour or friend.

CHALLENGES AND SOLUTIONS

Don't let the following challenges prevent you from enjoying the benefits of vermicomposting. Remember that your compost bin contains its very own mini ecosystem and may fall out of balance on occasion. Just know that with a bit of patience, balance can easily be restored. The following is a list of common gripes and how to deal with them:

“I have fruit flies.”

Your worms may have more food than they can process, or the scraps were not sufficiently covered. To remedy this issue, bury the food scraps, cover the castings with wet newspaper and top it off with dry material. You will also want to moderate feeding.

“I see other creatures among the worms.”

Again, remember you have created an ecosystem in your compost bin. It is normal to see other invertebrates move in and help out with the breakdown process. Don't be startled if you see white pot worms, tiny mites, sow bugs, springtails or even centipedes and millipedes. Leave them be in your bin to do their job.

“My worms are trying to escape.”

One of three issues may be at play. The compost is finished and the castings are now toxic for the worms. Alternatively, the pH may be too low, or the contents may be too wet. The wisest move is to harvest the bin and start fresh with new bedding. If your batch is too acidic, you can try adding alkaline materials such as finely crushed eggshells. If your contents are too moist, see the next complaint.

“My bin is really wet and leaky.”

Perhaps you are feeding the worms too much. Remove the lid, mix the castings and scraps around to provide oxygen, add some dry bedding materials and adjust feedings.

“My compost seems dry.”

Simply sprinkle some water over the castings.

“My bin smells bad.”

There may be too much food and not enough worms to process it. Either remove some of the food or add more worms.

“I smell ammonia.”

There are likely too many fresh scraps, which release the nitrogen that produces the smell; you'll need to add carbon-rich materials like those of the bedding.

“I smell sulphur.”

The bin is possibly too moist and isn't getting enough oxygen. To remedy this, add dry materials like leaves and newspaper to create a layer at the bottom of your bin, then add some more bedding to the compost, give it a stir and reduce feeding for a while.