

THE EDIBLE GARDEN

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SOIL—THE GREAT PROVIDER

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This is the International Year of Soil. What is soil and why are we giving special attention to it in 2015? Consider the following:

All life on and in the earth depends upon it, directly and indirectly. This very thin and still mysterious layer on the surface of our planet is an active mediator between earth and sky – atmosphere and lithosphere.

Forming naturally, it takes between 500 to 1000 years to create 2.5cm of new soil on the surface of the earth – depending upon geography and weather. Humans are depleting the soil base at a rate much faster than it can be replaced.

The mystery beneath us accommodates a biomass that in terms of volume exceeds all biomass above the surface. Biomass includes all living and decaying plants and animals of the universe both above and below earth's surface. In farming and gardening practices we have only now begun to appreciate the enormity and the importance of this difference.

The population of these underworld creatures includes bacteria, fungi, protozoa, nematodes, arthropods and earthworms. One teaspoon of undisturbed soil can contain from 100 million to 1 billion bacteria. Several metres of fungi can be cradled in a second teaspoon. Of the more visible creatures there can be as many 5 to 30 earthworms in a cubic foot of soil.

Each soil inhabitant has specific roles to play in this vast underground ecosystem. That's what it is – an ecosystem. For example bacteria are decomposers of organic matter, collectors of soil nutrients and fixers of nitrogen. Fungi have similar functions and form mutually beneficial associations with roots drawing important minerals from the soil around them and receiving carbohydrates from plants above. Soil organisms help to form soil aggregates that are essential to good moisture and nutrient retention.

90%+ of us now reside in urban settings – the rest in rural or semi-rural locations. That translates into a human population that is on average no longer in touch with the land that feeds it. This situation is only somewhat mitigated by the many community gardens that now dot cities, and by other developments such as school gardens and shared growing space in backyards. Urban agriculture is no longer a contradiction. In fact a course at Algonquin College instructs in its practices.

Unfortunately most urban biomass in the form of household and garden organic waste still goes into landfill despite green bin and other efforts. In nature this valuable material would be absorbed back into the land to enrich and maintain existing soil. Nature's cycle of replenishment has essentially been broken to the detriment of our soil base.

Those of us who have yards – even small ones, or who live in proximity to community gardens, have viable alternatives to discarding valuable biomass into landfills where it

VERSATILE COLD FRAMES

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Wikipedia defines a cold frame as a "transparent-roofed structure". These mini-greenhouses are versatile. They can be built in different shapes and sizes, filled with a variety of growth mediums and used at least three seasons of the year – or four depending on your Plant Hardiness Zone.



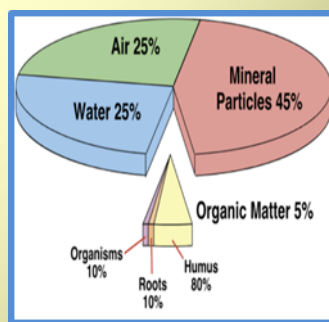
Photo: Gerda Franssen

The additional warmth and wind protection afforded by these structures allows for faster warming of seeds and thus an earlier start for many edibles. We gain as much as a month at each end of the growing season when we use cold frames. Because cold frames are covered, providing protection from late spring or early fall frosts, the chore of covering individual plants with pots or row covers becomes unnecessary.

The cold spell that some seeds need can be provided using our freezers or we can seed outdoors in the fall and let winter provide the cold treatment. In spring seedlings started outdoors are less likely to get spindly – a prob-

serves no useful purpose. We can use our surplus biomass to enrich the soils that we have, whether they be sand, silt, or clay-based.

The options for building and maintaining a soil ecosystem in our own yards are many. In addition to nurturing billions of underground creatures, we need to seek and establish a balance of four factors as illustrated in the pie chart. What the chart tells us is that in order for soil to support growth it must also have a composition based on only slightly flexible percentages of each component in order to function as a healthy and productive ecosystem. Air is as essential to most soil organisms as it is to us. Same goes for water. Lest you think that 25% water is high think about us, 50 to 75% of the human body is water. The mineral portion of the chart is comprised of a mixture of sand, silt and clay. Although the piece of pie reserved for organic matter is a mere sliver it is nevertheless crucial to the good functioning of soil.



Well-balanced soil is 25% water, 25% air, 40+% sand, silt and clay and up to 10% organic matter.

For the home gardener maintaining and improving soil relies heavily on one or more methods of composting. Composters come in all shapes and sizes. Some are veritable works of art and are commensurately priced. Others are strictly functional. The smallest I can think of are the Vermicomposter and the Bokashy kitchen composter.

What follows is a modest catalogue of ways in which to enrich and maintain soil permanently.

STATIONARY COMPOSTERS – These are readily available at various outlets. If there is a handy person in your family they can be built on site.

MOBILE COMPOSTERS - Some are not all that attractive until you fully appreciate what they accomplish. They usually consist of a circle of close-meshed wire to a height of around two feet. The loose ends of the wire can be secured with twist ties.

MANURE TEA – This “tea” is a mix of well-rotted manure steeped in water and used as a power drink for plants.

GREEN TEA – Even weeds can go into green tea as long as they have not gone to seed. That and other organic garden wastes are steeped in water and later served as a nutrient-rich supplement for plants.

LASAGNAS – Lasagnas are a garden version of the Dagwood Sandwich. The site for a new bed is close-mown and often layered with sheets of wet newsprint. Coarse materials are laid down first and then covered with finer compost and additional soil. This method eliminates the need to double-dig.

HUGELS – Hugels have long been in use in European countries. They are similar to lasagnas but can take even coarser material in their base layers. They are now becoming known and more popular in North America. The Indore system as used in China and India for centuries is another version of layering.

SHEET COMPOSTING – This practice is a slim version of lasagnas and hugels and involves laying garden wastes directly on the ground and then covering them with black landscape fabric until they have broken down.

TRENCHES – The use of trenches is convenient when dealing with difficult soil situations. Trenches can accommodate raw or finished compost. If compost is raw trenches need to be left fallow for a year.

For additional information I refer you to our book review—Composting in Canada which is full of practical ideas and excellent illustrations. It is the loving work of a gardener who is dedicated to preserving our most valuable natural resource –SOIL- in every way possible.

lem with some indoor starts. Hardening off, the process of getting plants used to the sun, is achieved more naturally and with less moving containers back and forth.

When the first group of plants has been transplanted into summer plots we can refill frames with seeds that lend themselves to succession planting. Some examples are bush beans, radish, lettuce and green onions. However there’s nothing to prevent us from using frames as mini gardens for the whole season.

Do you like experimenting with cuttings? Have you ever tried replanting a piece of tomato vine up to its neck in soil? Try it, water it faithfully and see what happens!

VISIONS OF COLD FRAMES

There are many ways and many reasons to put together a cold frame. They can be built for beauty, style, permanent or temporary use, or for multiple uses over time. What follows are general guidelines for anyone interested in these yard additions – front or back.

Frames work best if tops are angled slightly toward winter sun. You can cut slanted sides or, as an alternative, mound soil to make the back edge of frames sit slightly higher than the front.

Frames are a fine way to recycle untreated scrap wood. Or you can choose cedar boards, logs, hay or straw bales, bricks, stone, Lexan, or concrete. Additional heat control can be had using black containers of water in corners or berms at the outer sides.



Photo: Gerda Franssen

- Adding fresh organic matter (compost) or planting green manures (cover crops) feeds the soil microbes.
- A layer of organic mulches helps keep the soil moist, moderates temperature fluctuations as well as providing food allowing the microbes to function optimally.
- Too much cultivation can disrupt desirable microbial activity.
- As can the application of herbicides, pesticides, fungicides (“-cides”), toxins and fertilizers .
- The association between fungi and plant roots is symbiotic. In exchange for carbohydrates from the plant mycorrhizal fungi provide access to water and minerals from a greater area. This improves plant resistance to disease, parasites, nutrient deficiency, drought and metal toxicity.
- Over 90% of plants depend on mycorrhizal fungi to survive.
- Mycorrhizal fungi are also involved in allelopathy , where chemicals from one plant inhibit the growth of another.

BOOK REVIEW

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COMPOSTING FOR CANADA

by Suzanne Lewis

Lone Pine Publishing; ISBN 978-1-55105-843-6

This little book is a veritable treasure trove of practical advice to gardeners who are interested in “growing” their own soil.

It is easy to use. The Table of Contents is so detailed that an index is almost not needed. However, if I have any criticism at all it is the lack of an index. I find indexes very useful.

It is inexpensive. At \$18.95 plus tax it is a bargain and it is authored by a Canadian and printed in Canada.

It is concise. Lewis packs a great deal of detailed information into a mere 160 pages, information that is amply supported with colorful illustrations and excellent charts.

It is easy to read. It feels like the author is actually talking to us as she explains the rationale for creating compost and incorporating it into our gardens at regular intervals.

Lewis leaves us with no excuses. She documents and illustrates a wide range of composting methods so that even gardeners with postage stamp sized lots can indulge in producing their own pot of black gold.

She is practical. Most of the methods she espouses are economical and easy to install.

Composting for Canada is the best little reference book on soil building and maintenance that I have ever come across. Every gardener can benefit from the information and instruction that it so capably provides.

Watch for *Trowel Talk* the Master Gardeners of Ottawa Carleton electronic monthly gardening newsletter available on the 15th at <http://mgottawa.mgoi.ca/>

Visit the Almonte online community newspaper ‘The Millstone’ - <http://millstonenews.com/> - for a column by David Hinks of the Ottawa Carleton Master Gardeners; under the Gardening tab

Master Gardeners of Ottawa-Carleton and Master Gardeners of Lanark County are member groups of Master Gardeners of Ontario Inc., a registered charity with the mission of providing gardening advice to homeowners. The Edible Garden logo was created by Jon Last (jonlast13@rogers.com)

With a minimal set of tools you can put together a sturdy box. With the help of friendly associates at local lumber outlets boards can be cut to your particular specifications, and while you’re there you can purchase screws and four steel corner brackets to hold them together.

I don’t agree with glass covers for frames. Accidents do happen. It’s safer to use Plexi-glass or Lexan. Whatever is used must be strong enough to support thick insulation through winter including that provided by nature - a heavy layer of snow.

We’ve already talked about soil in **Soil the Great provider**. However you’re safe to start with your own compost and/or commercial bedding mixes. Start with materials you already have, check your budget and then let your imagination and your muscles get to work!

Cold Frame Crops to Sow in Late Winter:

Arugula	Green onion
Broccoli	Kale
Beets	Lettuce
Cabbage	Radish
Chard	Spinach
Chinese cabbage	



Two Lasagna beds
Photo: Edythe Falconer

Need help?

Telephone Help Line: - Contact us Wednesday and Thursday 1–3 pm (all year) at: 613-236-0034 -

Ottawa E-mail Help Line- monitored daily: mgoc_helpline@yahoo.ca

Lanark E-mail help Line: lanarkmg@gmail.com