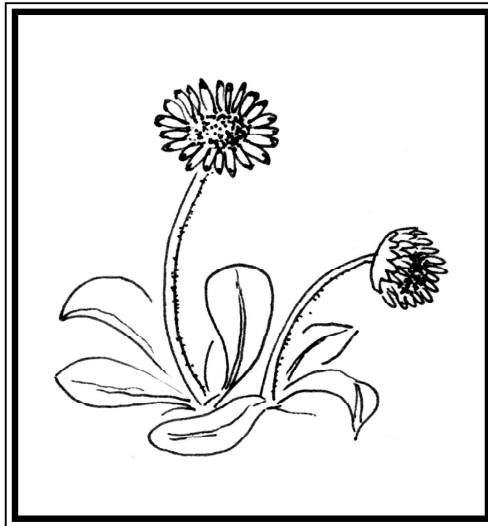
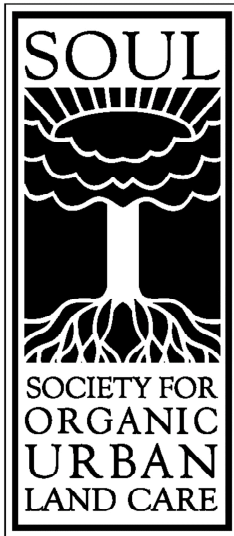


Products for Organic Gardeners

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SOUL Mission:

"To support our communities in their transition to organic practices".

Our Goals:

- To foster and promote the practice of organic land care.
- To provide opportunities for education in all aspects of organic land care.
- To establish and promote guidelines, standards and specifications for all aspects of organic land care.
- To establish procedures for certification of organic land care practitioners
- To establish and develop a means for the exchange of information and ideas between the public and the organic land care industry.

Please join us - we need your support!

We welcome all landscape professionals and members of the public who support and practice environmentally sound land care

Introduction

In organic gardening, one of the most important concepts is to feed the soil, rather than the plants, or more accurately, to feed the soil dwelling organisms. The emphasis is on mulching and recycling all organic matter in place (leaves and grass clippings), and on actively supporting a diverse population of microorganisms to convert this material into plant food. In organically managed ornamental gardens and lawns, an elegant and self-sustaining balance of nutrient cycles will establish that needs very little input.

During the transition to organic practice however, or in landscapes where large amounts of plant material are routinely removed by harvesting, nutrient amounts and ratios can be expected to be unbalanced, and soil biology to be damaged. This is especially the case where landscapes have been maintained with conventional management practices that included synthetic fertilizers and pesticides. In these situations some products can help to re-establish the balanced soil, but these products are very different from conventional fertilizers.

Several of the most important products are not fertilizers at all. Instead, they are concentrated forms of some of the beneficial microorganisms necessary for healthy soil. This booklet will discuss the main three: compost tea, effective microorganisms and mycorrhizal fungi.

In terms of fertility amendments, products used in organic gardening tend to have a wide range of nutrients in an ideal balance, whereas chemical fertilizers tend to offer very concentrated (and often toxic) forms of just a few nutrients. The booklet will discuss some options available to organic gardeners, such as kelp, fish, rock dust and several more.

It is important to note that organic gardening is not driven by products. They are not always necessary, but can often be useful, particularly in our transition to organic practices. Our main focus should still be on providing organic matter to the soil and proper watering.

Compost Tea

What is it?

Compost tea is brewed to extract and multiply the microbes present in a small amount of healthy compost. It is not a fertilizer or pesticide, but rather a microbial inoculant that is particularly useful where large quantities of good compost are unavailable. Its purpose is to increase biodiversity in the soil and also on plant surfaces, a vital factor for beautiful and healthy plants.

Where can I get it? Or how can I make it?

At present, in the Victoria area, there is no commercial source of compost tea. However it is easy and inexpensive to make your own.

There are many specialized commercial compost tea brewers available for purchase, mostly over the internet. Many gardeners also report great success using a simple homemade brewer made from a 5-gallon bucket, an aquarium air pump, and some plastic air tubing.

Start out with non-chlorinated cold water. Rain water or well water is ideal; let tap water stand overnight. Then add a few handfuls of good compost. It is important to use only the best quality, mature, aerobic compost. Avoid foul-smelling, anaerobic compost as it contains the wrong kind of microbes. To feed the microbes as they multiply, stir in some un-sulphured organic molasses and add some rock dust, kelp meal, and/or sea minerals.

Then insert the aquarium pump and tubing to supply oxygen to the microbes. This is necessary in order to prevent anaerobic conditions that will kill the beneficial microbes and favour harmful ones. If you want to make sure, you may add some beneficial fermenting microbes (EM), which outcompete the plant-feeding microbes in low-oxygen environments, but if you keep the mix well aerated it isn't

necessary. Let the mixture brew at room temperature for 24 to 48 hours maximum. Then use your compost tea right away.

How do I use it?

Compost tea can be poured onto the soil or applied with a watering can to garden beds, lawns, and planter boxes. It can also be sprayed directly onto plant foliage where the microorganisms colonize the leaf surfaces and outcompete plant-feeding microbes, such as black spot on roses. Success is best if foliage is sprayed early on, when young new leaves are emerging.

Compost tea works best when combined with biostimulants such as liquid kelp, fish, humic and fulvic acids, and organic molasses. Applications can range from daily to once or twice a year, but preferably, compost tea would be applied in smaller, regular doses, such as monthly or even weekly. Due to some of the microbes' sensitivity to heat and sunlight, it is best applied early in the morning or in the evening.

Because of its incredible biological diversity, well made compost tea can be used to revitalize soils whose microbial populations have been reduced or destroyed through poor soil management and the use of pesticides and synthetic fertilizers. While not usually necessary on an ongoing basis, compost tea is a valuable product during the transition to organic practices. It would be a good idea to learn a bit more about the brewing process by consulting the resources below.

More information:

- *The Compost Tea Brewing Manual, \$40: www.earthfort.com/shopexd.asp?id=18*
- *All about compost tea: www.soilfoodweb.com/03_about_us/approach.html*
- *Compost tea brewing, Catherine Dale: www.organiclandcare.org/education/free.php*

EM - Effective Microorganisms

What is it?

Like compost tea, EM is not a fertilizer or pesticide but a microbial inoculant, specifically designed to introduce beneficial microbes to our plants and gardens. Though the name “EM” may be unfamiliar, chances are you are already using some of these microbes if you make your own sourdough bread, yoghurt, wine, or beer. Similarly, you may have smelled EM at work in the typical brewery-type odour of leaf mould.

EM is a collective name for fermenting microbes such as lactic acid bacteria and yeast. Fermenting microbes have the unique ability to thrive not only at normal oxygen concentrations, but also in completely anaerobic environments, and in between (they are also called “facultative anaerobes”). They occupy a unique and diverse ecological niche in the soil and on plant surfaces, and produce many important substances such as vitamins, antioxidants, hormones, enzymes, lactic acid, alcohol, and even antibiotics.

These organisms coexist in mutually compatible relationships, with beneficial effects for the whole soil ecosystem of a garden. Unlike compost tea, an EM preparation is not so much meant to supply large numbers of microbes, but is rather used for their synergistic interactive functions. They help with germination, plant establishment, flowering, fruit production and yields; improve soil quality and compete with soil borne plant feeding microbes; and increase the efficacy of organic matter as it is converted to plant food.

Research on EM is carried out across Asia, notably in Japan, where many different EM preparations are widely used in agriculture, horticulture, and also for human consumption. Now the many unique benefits of EM are being recognized worldwide.

Where can I get it?

EM is available from “The Organic Gardener’s Pantry” (see resources below). You can use it right out of the bottle or you can “activate” it. Activation is an easy process that involves mixing the EM with molasses and water and fermenting it for 3-5 weeks. The primary reason it is done is to increase the amount of EM by 20 times in order to cover more area. Alternatively, you can buy it already activated at a lower price than the regular EM. They are both used in the same way.

How do I use it?

Like compost tea, EM can be applied to the soil or directly onto lawns and garden plants. The EM or activated EM is mixed with water in a watering can, sprayer, or irrigation system. As for compost tea, non-chlorinated water is best. Rain water or well water is ideal; let tap water stand overnight. Due to some of the microbes’ sensitivity to heat and sunlight, EM is best applied early in the morning or in the evening.

EM works best when combined with biostimulants such as liquid kelp, fish, humic and fulvic acids, and organic molasses. Preferably, EM would be applied in smaller, regular doses, such as monthly or even weekly. At minimum, it should be done once in the spring and once in the fall.

Sources and more information:

- *The Organic Gardener’s Pantry, Phil Nauta: www.gardenerspantry.ca*
- *Comprehensive web site: www.eminfo.info*

Mycorrhizal Inoculum

What is it?

Mycorrhizal spores, also called mycorrhizal inoculum, are the propagative structures of mycorrhizal fungi. The vast majority of plants form mutually beneficial relationships with mycorrhizal fungi in the soil. These fungi wrap themselves around fine root hairs and often grow right into the root and even into cells. Instead of damaging the plant, however, mycorrhizal fungi protect roots from predators, help them absorb certain nutrients, especially phosphorus and micronutrients, and also greatly increase the plant's capacity for water uptake. In return, the plant provides the fungi with carbohydrates. This unique symbiotic arrangement is profoundly important for healthy attractive garden plants and lawns.

Mycorrhizal fungus populations will need to be re-established in some situations where they are suppressed or non-existent. These include compacted, waterlogged, or tilled soils; soils that were chemically managed using pesticides and synthetic fertilizers; newly established landscapes with imported, manufactured topsoil, as well as most potting mixes. Because mycorrhizal fungi require a living plant partner, they do not exist in compost, compost tea, or EM preparations.

In the long run, it will be necessary to remedy a situation that has led to the fungi's decline (for example, fix insufficient drainage or stop tilling), otherwise the benefits of reintroducing them will be short lived.

Where can I get it? Or how can I make it?

In moderation, it is possible to collect mycorrhizal fungi from the wild. Soil from healthy grasslands naturally contains the right type of fungus for lawns, while soil from natural forests supplies what's needed for trees and shrub beds. It can be as easy as bringing a few handfuls to your garden. But mycorrhizal inoculum can also be purchased from commercial suppliers, and there are a variety of products for different applications. It is important to use the fungus type that matches the host

plant.

Mycorrhizal inoculum usually comes in powdered or in granular form. As living organisms, the spores have a finite life span, need to be stored cool and dark, and must be used by the “best before” date. In the Victoria area, mycorrhizal inoculum can be purchased under several different brand names at some garden centres or directly from The Organic Gardener’s Pantry.

How do I use it?

To be effective, the inoculum needs to be brought into direct contact with plant roots. It is therefore best to incorporate it into the backfill of a planting hole, or to rub it onto the rootball immediately before planting. Also, encourage your nursery to inoculate the stock they propagate. Vastly better growth and transplanting success will be the result. Mix inoculum into the topsoil before putting down lawn seed or sod. For established lawns, it is best to apply inoculum after aerating, so it reaches the root zone quickly.

Mycorrhizal inoculum is very sensitive to sunlight and if possible should be used on a cloudy day or in the evening. Finally, as with using compost tea, it helps to add biostimulants such as liquid kelp, fish, humic and fulvic acids, and organic molasses.

Sources and more information:

- *The Organic Gardener’s Pantry, Phil Nauta* www.gardenerspantry.ca
- *Mycorrhizal Applications, Inc., Mike Amaranthus:* www.mycorrhizae.com

Full Spectrum Fertilizers and Biostimulants

What are they?

Full spectrum fertilizers supply a broad range of nutrients, many of which are usually called micronutrients (a term that can be misleading because even though plants may only require minute amounts of these elements, their continuous supply is vital to plant health). One advantage of these fertilizers lies in their ease of use. Even if accidentally over-applied, it would be hard to cause serious damage, as would be the case with many synthetic fertilizers or lime. At the same time, full spectrum fertilizers provide far more balanced nutrition than chemical fertilizers, often containing all of the 60+ elements plants require for optimum health.

Biostimulants are substances that enhance plant growth and development, but not so much because of their nutrient content. In fact, they are often applied in such small doses that the response cannot be attributed to nutrients alone. These products often contain additional substances such as plant hormones, humic acids, amino acids, vitamins, and enzymes. It is these extra characteristics that place them into the biostimulant category. Some products, such as kelp and fish, fit into both the full spectrum fertilizer and biostimulant categories. From here on, we will just refer to all products in these categories as organic fertilizers.

Common organic fertilizers include kelp products, ocean-derived minerals, fish products, humic acids, rock dusts and organic seed meals. Below is a brief description:

It is no coincidence that several of the best organic fertilizers come from the sea. Our oceans contain a vast amount of nutrients. Kelp, for example, contains over 70 minerals and is an excellent source of cytokinins and auxins, both plant growth hormones. It also contains vitamins, natural chelating agents, and amino acids. Other ocean-derived mineral products, also known as sea minerals, often contain over 80 trace minerals and active organic substances. A good quality fish fertilizer has oils, amino acids, vitamins, hormones, enzymes, and a wide array of minerals. Some of these products are often spiked with chemicals, so it is important to find a

source that is organic.

Humic and fulvic acids are important chelators, taking minerals from the soil and combining them into organic compounds, making them more available to plants. They also tie up toxins, making them less available to plants, and significantly increase the water-holding capacity of the soil.

Rock dust is a fine powder, generally from glacial or volcanic rock sources. Research on the benefits of rock dust has been done for over 60 years, with astounding results. The dust contains a wide array of minerals. It can be broadcast over the lawn and garden or even better, mixed into compost.

Organic seed meals such as alfalfa, canola, flax, and soybean often contain a wide array of minerals, depending on how they were grown and processed. We must make sure they are from organic sources, otherwise they will have been treated with chemicals and are probably genetically modified, which is another major issue we face these days.

Where can I get them? Or how can I make them? And how do I use them?

Kelp can be collected from the beach in moderate amounts and placed right on top of the soil in the garden. There is no need to wash off the seawater, which in itself acts as a supplier of a full range of nutrients. Its salt content is so low that it does not cause harm. In fact, watering the garden with ocean water in small amounts will also provide nutrients. Humic acids will be present in well-made compost.

Many of the other products mentioned above are available in some garden centres or from The Organic Gardener's Pantry. They should be used as per the instructions on the label, or according to the supplier's recommendations.

Many of these products come in varying qualities and some may contain added chemicals that make them prohibited for use under organic standards. It is impor-

tant, therefore, to look past terms such as “natural” and “organic-based” to see what is really in there. If in doubt, buy products that are certified organic. Both the SOUL Organic Standard and the OMRI listings can provide guidance as to which substances are acceptable in organic practice.

Sources and more information:

- *SOUL Organic Land Care Standard: www.organiclandcare.org/standards/index*
- *OMRI Organic Materials Review Institute: www.omri.org*
- *The Organic Gardener’s Pantry, Phil Nauta: www.gardenerspantry.ca*