J&L Garden Center

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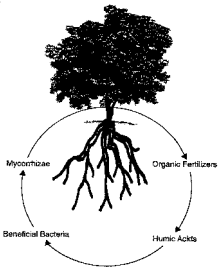
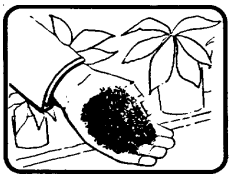
Dr. Earth Organic Fertilizers



Dr. Earth is a company that produces very effective organic fertilizers and incorporates many beneficial bacteria with their fertilizers. The organic fertilizers are derived from fish meal, cottonseed meal, alfalfa meal, fish bone meal, feather meal, soft rock phosphate, kelp meal, and potassium sulphate. With all these sources of fertilizer, the plants benefit greatly. Traditionally, organic fertilizers have been very slow to break down, and it took plants several weeks to start receiving any benefits from the fertilizer. The Dr. Earth company changed this slow process into a faster releasing fertilizer by adding beneficial bacteria to the fertilizer. These beneficial bacteria digest the natural ingredients and release the nutrients in a form that plants can absorb and start to utilize within a few weeks. All of Dr. Earth fertilizers include humic acid, seaweed extract, ecto & endo mycorrhizae, and seven strains of soil building microbes, all of which help improve the soil conditions and help make the plants more vigorous.

Soil Microbes



Good soil is alive, or at least it should be. Good soil contains millions of microscopic organisms that are constantly breaking down organic material into a usable form of food that plants can use. These microbes also help stabilize the soil by physically binding soil particles together, which helps plant roots move through the soil easier, which helps plants grow faster.

A good, healthy soil usually contains at least 10,000,000 bacteria per gram of soil. These microbes help ensure that nutrients are available to plants at a steady rate, when the plants actually need them, not just when you actually apply the fertilizer. As the weather warms, plants grow faster and require more nutrients. Soil bacteria respond to warm weather in a similar manner. Microbes are very active during warm weather, converting organic fertilizer into usable forms of fertilizer for plants. As the weather cools, plants need less food, and so do the microbes, which means the microbes are providing less nutrients in the soil. Any remaining, undigested organic fertilizers, are then held in reserve, within the soil, until the next warm growing period begins, instead of just being washed away in the soil. This is a self regulating cycle that reoccurs every year. The garden soil can build a food reserve in this way.

The importance of microbes is immeasurable. They are essential to the health of all good soils in many ways.

* Beneficial bacteria tend to help decrease the number of unwanted soil pathogens.

* Beneficial bacteria help make plants more resistant to soil diseases.

* Beneficial bacteria form a symbiotic relationship with plants to help increase nutrient and water absorption of the roots.

* Beneficial bacteria help break down organic matter into humus. Humus helps increase the soil's ability to absorb, hold, and release both water and fertilizer.

The more you can do to elevate the level of beneficial bacteria in your gardens, the better your soil will be and the healthier your plants will become. All of Dr. Earth's organic fertilizers contain humic acid, seaweed extract, ecto & endo mycorrhizae, and seven strains of soil building microbes. The fertilizer provides an immediate source of food for these bacteria. The bacteria will begin to multiply and spread into the surrounding soil as fast as the soil conditions allow. The more organic matter in the soil, such as compost, manure, or leaves, the faster the bacteria will multiply and spread.

Remember that your soil is alive. Do not treat it like *'Dirt'*. Learn to work with, and nurture, the biosystem of your soil. If you do, you can feed both the soil and the plants at the same time.

Mycorrhizae

The word 'Mycorrhizae' is derived from two Greek words: ***mykes***, meaning fungus; and ***rhiza***, meaning root. That is just what mycorrhizae are, specialized, beneficial fungi that establish symbiotic relationships with plant roots. It is estimated that as many as 90% of the world's land plants develop some kind of symbiosis with mycorrhizae.

Mycorrhizae penetrate root tissue, surround the root mass, and extend far into the surrounding soil of the plant's roots. The fungus mycelia (roots) are especially effective in capturing nutrients from the soil, particularly nitrogen and phosphorus. The fungi consume the nutrients and they generously share the results with the roots of the host plant. In return, the host plant provides the fungi with photosynthesized nutrients from leaves, including sugars and carbohydrates.

Mycorrhizae also act as important soil binding agents. Their countless long filaments, called hyphae, tend to accumulate in the soil over a period of time and they can persist in the soil for months, or even years. The larger soil particles, particularly the sand-sized soil particles, tend to be held together by these hyphae. The hyphae have sticky surfaces from the sugars that the bacteria produce and release. In addition, the tips of hair roots also secrete a sticky substance. Together, these two sticky substances enable the filamentous hyphae to strongly adhere to the soil particles. They physically bind and mesh them together to form tiny, semi-stable aggregates. This aggregate structure increases in the root zone, which encourages further root growth, which in turn stimulates more mycorrhizae.

Mycorrhizae help plants to absorb nutrients and assists plants in drought tolerance. Mycorrhizae also helps to create an ideal garden soil structure; a soil that drains, breathes, and retains an optimum moisture level.

Humic Acid

Humic Acid comes from the highly compressed and biodegraded remains of ancient plants and animals. Over millions of years, plant and animal remains were converted into complex organic molecules and minerals. When this material is applied to soils, it helps the soil to promote better plant growth and productivity - naturally. Humic acid helps chelate and improve the effects of many fertilizers. Humic acid also helps the soil retain the nutrients, which provides a *'timed release'* fertilizer, making plants healthier. Healthy plants are often less susceptible to insect and disease problems, which is a beneficial side effect.

Besides enhancing the capacity to hold and exchange mineral nutrients with plant roots, humic acid also promotes greater absorption and utilization of nutrients applied to foliage. Humic acid is totally organic and high in carbon. Humic acid can buffer chemicals and fertilizers, preventing phytotoxicity and *'burning'*.

Humic Acid can help restore your soil to a living system of energetic biological activity and help maintain your soil's natural cycle. Humic acid helps to increase nutrient uptake, helps to improve drought resistance and helps to improve seed germination. Humic acid increases the availability of nutrients already contained in the soil, and to those nutrients being added. Humic acid should be used in addition to fertilizer, not in place of it.

Good soil fertility is not the result of just adding chemical nutrients and organic materials to the soil. Instead, good soil fertility is the result of the correct combination of nutrients, organic matter, microbial activity, and other 'critters' living in the soil. Soil scientists report that good soil is alive - truly and literally alive. What's more, they contend that no amount of *"plant food"* will give the equivalent results of a fertile soil, without giving attention to the humus-forming and plant-supporting microbes. In essence, many experts are saying that "the plant eats what the microbes give it."

Seaweed Extract

Dr. Earth fertilizers contain an abundance of seaweed extract. Seaweed contains a complex range of biological stimulants, nutrients, and carbohydrates. Seaweed, in itself, is not a plant food, rather it is classified as a *'bio-stimulant'*. Seaweed extracts have been proven to accelerate the health and growth of plants. Seaweed extract stimulates beneficial soil microbial activity and mycorrhizae growth, particularly around the feeder roots, which results in a substantially larger root system. The beneficial bacteria 'mycorrhizae' improves the plant's ability to form healthier, stronger roots, which in turn helps the plant resist insects and diseases in a more natural way. Because the root system is larger, and grows deeper into the soil, seaweed extract indirectly helps in the overall drought resistance of the plant, and the ability to physically resist certain types of root diseases.

Seaweed extract enhances photosynthesis by helping to increase the plant's chlorophyll level. Seaweed extracts contain natural growth regulators such as gibberellins, cytokinins, and auxins. These growth regulators are found in very small quantities, but it only takes a very small amount of these plant growth regulators to help stimulate new plant growth.

Improved cold tolerance, disease resistance, micro nutrients, growth hormones and microbial stimulation are just a few of the many benefits that seaweed extract provides.

Chemical vs Organic Fertilizers

Plant roots do not know the difference between chemical fertilizers and organic fertilizers. Plants can only absorb nutrients in one form, ***(Cation)*** whether they come from an organic fertilizer or from a chemical form of fertilizer.

Two of the many differences in these two types of fertilizers is the speed in which they become available for plants to absorb them, and in the length of time they remain in the soil for plants to utilize them.

Chemical fertilizers are usually in a form that plants can readily absorb. Plants will respond to these types of fertilizers within a matter of a few days to a few weeks.

Organic fertilizers are usually in a form that plants cannot use until the nutrients are broken down into another form - usually by bacteria - that plants can absorb. Plants usually respond to organic fertilizers very slowly. It can take several weeks, to several months, for plants to be able to use the fertilizer, unless the correct microbes are readily available in the soil. Most soils do not naturally have these microbes available in large quantities, so organic fertilizers are usually very slow to start working. However, once the organic fertilizers start to break down they stimulate the microbes to multiply faster, so the process does start to speed up.

This slow releasing process does have a good benefit. It prevents organic fertilizers from washing away as quickly as chemical fertilizers. Organic fertilizers can stay in the soil for several months, or years, until the conditions are right for them to be broken down and to be absorbed by plants.

Because chemical fertilizers are in a usable form as soon as they are applied, they dissolve in water readily, and can be washed away quickly, unless the soil has plenty of organic material that will hold them in place longer.

Definitions

Symbiotic - A relationship between two dissimilar organisms that mutually benefit both organisms.

Mycorrhizae - An fungus that has a symbiotic relationship with plant roots.

Ecto Mycorrhizae - A fungus that attaches itself outside of the root cell, outside the plant.

Endo Mycorrhizae - A fungus that attaches itself inside the root cell, within the plant.

Phytotoxic - Any substance that kills plant cells or tissues.

Mycelia - Appendages on fungus that absorb nutrients, similar to roots in plants.

Bio-Stimulant - A product that stimulates microbe activities.

Pro-Biotic - It literally means 'for life'. It is anything that stimulates new microbial growth. It is opposite of Anti-biotic which means 'against life'. Anything that kills microbial growth.

Gibberellins - Growth hormones that regulate cell enlargement and internode elongation. It makes plants grow taller, or longer, but not necessarily faster.

Cytokinins - Growth hormones that promote growth by rapidly speeding up cell division.

Auxins - Growth hormones that allow cell walls to stretch, especially during cell division.

Cation - Pronounced *'Cat Ion'*. This is the positively charged form of an element. The cation of Iron is Fe++, the cation of Magnesium is Mg++. This is the form of an element that plants can absorb and utilize.

Chelate - The process that help keeps fertilizer elements in a usable form that plants can absorb and utilize.

Benefits of Dr. Earth Fertilizers

* Contains organic fertilizers that introduce primary and secondary nutrients in the soil.

* Contains Humic acid that provides a carbon source and a nutrient rich diet for beneficial bacteria in the soil. Humic acid helps them propagate and it enhances the habitat for mycorrhizal fungi.

* Contains beneficial bacteria that helps break down nutrients in the soil. They make nutrients more available to the root system.

* Contains Mycorrhizae which attaches to the plant's roots. Mycorrhizae help the root system absorb and store soil nutrients, and water, more efficiently.

Much of the information in this handout is taken from articles in the Dr. Earth Organic Gardening Guide.

Dr. Earth Products

* Dr. Earth products are all People and Pet safe.

* Dr. Earth uses new technology to combine several products that help each other be more efficient than they would be by themselves.

Fish Bone Meal - 2.5lb box

* Fish Bone meal infused with seven strains of beneficial soil microbes.

Kelp Meal - 2lb box

* Cold water Norwegian Kelp infused with seven strains of beneficial soil microbes.

Feather Meal - 3lb box

* Feather meal infused with seven strains of beneficial soil microbes.

Dr. Earth Organic Fertilizer Blends

* A superior blend of alfalfa meal, fish bone meal, feather meal, mined potassium sulphate, soft rock phosphate, humic acid, seaweed extract.

* Contains seven champion strains of soil building microbes.

* Contains both ecto and endo mycorrhizae.

Organic 2 - Starter Fertilizer - 4lb & 12lb.
Organic 3 - Rose & Flower Fertilizer - 4lb & 12lb.
Organic 5 - Tomato & Veg. Fertilizer - 4lb & 12lb.
Organic 7 - All Purpose Fertilizer - 4lb & 12lb.

Dr. Earth Super Natural Lawn Fertilizer

* A superior, homogenous blend of fish meal, fish bone meal, feather meal, potassium sulphate, seaweed extract, mycorrhizae and beneficial soil microbes.

* Helps control thatch buildup.

* Provides nutrients at a steady rate for up to three months.

Organic Lawn Fertilizer - 18lb bag.

Liquid Fertilizers

Liquid Houseplant Fertilizer - pint bottle

* An all-purpose organic fertilizer for use on all plants including fruits, vegetables, trees, shrubs, vines, flowering ornamentals, container plants, and lawns. It is designed to enhance plant growth and correct micronutrient deficiencies. It contains growth enhancers that will stimulate root growth, flowering, regrowth of stressed plant parts. It will improve fruit set and reduce transplant shock.

Seaweed Concentrate - pint bottle

* A liquid organic 29% seaweed plant food for use on all plants including fruits, vegetables, trees, shrubs, vines, flowering ornamentals, and container plants. It contains over 70 naturally occurring major and minor nutrients, amino acids, vitamins and growth promoting substances which enhance plant development, increases crop yields, improves drought resistance and helps with stress recovery.

Pro-Active Insect Sprays

* Environmentally Safe

* A superior blend of rosemary oil, cinnamon oil, clove oil, garlic extract, coconut oil, mineral oil, wintergreen oil, safflower oil, molasses and water.

* Controls aphids, leafhoppers, many beetles, caterpillars, whiteflies, mites, scale, and many other insect pests.

* Kills insects quickly, results can be seen immediately, or within several minutes.

* Repels Insects up to 14 days after application.

The dynamics of the essential oil blend, garlic extract, and other inert ingredients, are designed to work synergistically. This product kill insects within minutes and it also has the ability to repel insects for weeks. It effectively controls a broad spectrum of insects through several active killing agents recognized by the EPA. The active ingredients have also demonstrated effective repelling properties known to detract insects from attacking plants, naturally.

Dr. Earth insecticides contain the most dynamic combination of active and inert ingredients designed to kill and control plant destroying insects without harming the environment. The insecticides have the ability to not only control insects but they also help to quickly rejuvenate plant growth. Both fertilizer and growth enhancers have been added. Most importantly, the ingredients produce visible results. They quickly kill insects plus show a visible rejuvenation of damaged plants. This concept has not been explored until now. Dr. Earth does it again.

Rose & Flower Insect Spray - 24 ounce Ready To Use.
Fruit & Vegetable Insect Spray - 24 ounce Ready To Use.
House & Garden Plant Insect Spray - 24oz Ready To Use.

Superactive Inoculant - 1/4 ounce size.

* A Bio-active blend of seven strains of beneficial soil microbes infused with seaweed extract, whey protein, and corn sugar.

* Excellent for legume seeds, (peas & beans).

* Benefits many other types of flowers, trees and shrubs.

Dr. Earth Company has more items available than are listed in this handout. These are just the products that J&L Garden Center will be stocking in 2005. More products and larger sizes will be added as customers request them.