

Composting Builds Healthy Soil

Soil Degradation

Hundreds of thousands of tonnes of compostable materials are dumped each year into our landfills. Handling organics in this manner is extremely wasteful, if not absurd. Organic materials become an environmental hazard in a landfill. Water that comes in contact with acids formed during decomposition dissolves heavy metals and other hazardous compounds to form a very toxic leachate. Leachate can travel into nearby surface and ground water, causing serious pollution. (Please note: at Pidgeon Lake Landfill and at the Campbell River Landfill we have 20 monitoring wells around the perimeter of the site, which are checked regularly. They achieve the Canadian drinking water standards in everything but turbidity).

Organics are completely reusable and can produce a valuable natural fertilizer, and soil amendment – humus - that can be returned to the earth. In Canada topsoil disappears twice as fast as new soil is formed. In the past 40 years or so, over 1/2 the organic matter in prairie soils has been lost. At this rate, within the next 50 years Canada will have no top soil. Worldwide, 24 billion tonnes of topsoil are lost every year. At the same time the population of the earth is increasing by 95 million people each year.

“The soil is a living, breathing firmament, in which the primary event taking place is the breakdown of organic matter and the release of plant nutrients. Ultimately humans, forests, farms, all rely upon the soil organisms for life. Yet almost everything humans do to the soil kills soil organisms. Pesticides and fertilizers poison them; turning soil upside down during cultivation exposes them to predators or dangerous rays of sunlight. Constantly removing organic nutrients via food harvesting, but never returning organic wastes to the soil, starves them. Growing the same crop again and again in the same soil seriously impoverishes the supply of nutrients. Flooding, fires, soil compaction by heavy machinery, and contamination by all kinds of pollutants kill their home.”

“The first rule of ecology is that everything is connected to everything else, and so when any one component changes, everything else changes in response, even if only a tiny bit. Getting in touch with the “soul of soil” is a crucial first step toward honouring our oneness with all living creatures and helping the long process of repair that a new biological era will require.”
(The Soul of Soil - by Joe Smillie and Grace Gershuny)

Soil degradation is a serious problem, and not just for farmers, food suppliers, or Third World governments. There are implications for the urban dweller too, such as:

- Erosion of stream and river banks, ravines, and bluffs.
- Degradation of healthy soil needed to sustain parklands, urban forests, lawns and gardens.
- Mismanagement of local soils (e.g. topsoil bulldozed for new housing developments).
- Weakening of the urban eco-system by the use of chemical fertilizers, herbicides and pesticides.

Building the Soil

Composting supports the natural system of soil building. In nature, the primary event taking place in the soil is the breakdown of organic matter (i.e. composting) and the release of plant nutrients. As a Master Composter you will need to know a few basics about the benefits of composting.

Compost prevents erosion

Really fertile soil is very resistant to erosion as it is firmly bound together by its organic content.

Compost absorbs water well: 100 lbs. of compost will absorb 195 lbs. of water. Fertile soil which contains high amounts of organic matter gently soaks up great quantities of water from a heavy rain. Where there is little humus in a soil, rain splatters onto the hard soil surface, churning up soil particles and forming muddy drops of water. These drops run over the soil surface, carrying away valuable soil particles. This is how erosion begins.

The considerable run-off from poor soil that occurs during a heavy rainstorm can result in flooding. Instead of building dams to manage our water perhaps we should be building healthy soil.

Compost prevents drought

Compost soaks up great quantities of water and stores it as a film on tiny soil crumbs, called aggregates. During long rainless periods, plant roots can seek out and absorb the water that is stored on these soil aggregates.

Compost contains nutrients

Compost is rich in naturally occurring nutrients. They are released into the soil slowly, at a rate that parallels a plant's ability to take them up. Chemical fertilizers "dump" nutrients into the soil and since plants are unable to use much of the fertilizer, the excess leaches away. Fertilizer companies have tried to develop time-released chemical fertilizer products to reproduce compost's built-in "nutrient storehousing" ability. With steady additions of compost, the reserves of nutrients in the soil get built up to the point where little fertilizer of any kind may be needed. Since the plants we eat change nutrients in the soil to a form we can use in our bodies, it is to our benefit to see that soil nutrients come from a natural source like compost rather than chemical fertilizers, which may be contaminated by the industrial process.

Compost stores minerals

Tiny particles of humus (called colloids) have a negative charge and so attract positively charged elements such as potassium, sodium, calcium, magnesium, iron, and copper. Colloids have a remarkable capacity to hold these minerals. In humus-poor soils, however, minerals are easily dissolved and carried away by water. A soil to which a soluble mineral fertilizer has been added loses not only the added

minerals, but quite a bit of its own reserves, too. This is because the humus itself is burned away by the excess chemical fertilizer, leaving the soil poorer than before and less able to hold minerals.

Compost neutralizes toxins in the soil

The organic acids in humus form stable complexes with elements such as aluminum and iron, thus "locking up" these toxins in a form unable to harm plants. Heavy metals are also fixed in stable complexes and are relatively unavailable for plant uptake.

Compost extends the growing season

Because it makes soil darker, compost allows soil to absorb more heat from the sun, resulting in earlier crops.

Compost stimulates plant growth

Compost improves assimilation of vitamins, vitamin-analogs, and oxygen in plants. Compost stimulates the development of micro-rhizomes, which are symbiotic fungi that interact with plant roots to improve uptake of vital plant nutrients.

Compost enhances the colour of plants

The pigments that make up chlorophyll and the colour of flowers and fruits are manufactured from substances in soil and air. A soil rich in compost allows plants easy access to these elements.

Compost is vastly superior to chemical fertilizers

Plants need far more than a few isolated chemical elements. They take nourishment through extremely complex biological processes. Some experts have said that vegetables grown with chemical fertilizers lose the power to reproduce over a period of years.

Compost does not use up precious energy resources

Chemical gardening depends extensively on energy reserves. For an average 110 lbs. of nitrogen fertilizer per acre used on corn crops in the U.S. an equivalent of 42 gallons of petroleum is used up.

Compost is pollution-free

About 35% of chemical nitrogen and 15-20% of phosphorus and potassium that is put onto the land is lost because people apply these chemicals in amounts greater than can be used by plants or soil. This excess chemical material is leached out during a rain, resulting in serious river, lake and ground-water pollution.

Compost improves "soil structure", permitting better air entry, and water infiltration

A hard clay soil will become more porous and crumbly with the addition of compost. It will absorb water, and allow air to penetrate. A sandy soil will be bound together by compost particles, allowing the soil to retain moisture and nutrients.