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Feeding your soil

Whether it is a lawn, garden, farmer's field or other land such as forests or mine reclamation sites, soil has to contain adequate nutrients for plants or crops to reach their full potential.

Plants consume nutrients as they grow and soil is the only source for the majority of these nutrients. There is a limited supply of nutrients in the soil, so fertilizers, supplements, composts and biosolids can all help to replenish these nutrients.

The first step is to test the soil to determine what nutrients are available and what should be added. The test enables the gardener or agricultural producer to fine-tune soil treatment methods to deliver the right amount of nutrients. The livelihoods of professional landscapers, horticultural growers and agricultural producers depend on a precise balance of nutrients to ensure healthy plants and crops.

A soil test may not always be practical for every homeowner. Fertilizers and supplements sold at garden centres, however, have straightforward directions to estimate the needs of lawns and gardens that should be followed.

Fertilizers

The Department of Agriculture and Agri-Food Canada notes that plants require varying amounts of essential nutrients for healthy growth—nitrogen, phosphorus, potassium, calcium, magnesium, and sulphur—often referred to as macronutrients.

Anyone who has bought fertilizer has seen three numbers in large print on the label. The numbers, such as 27-7-7, denote the percentage of nitrogen, phosphorus and potassium in the product. In addition, micronutrients can be required in very small amounts to ensure optimal plant development. Examples include boron, chloride, cobalt, copper, iron, manganese, molybdenum, sodium and zinc.

New technology is currently being used to manufacture slow-release fertilizers, which release nutrients, primarily nitrogen, slowly throughout the season. In certain circumstances, slow-release fertilizers can have environmental and agronomic advantages such as: increases in crop yield, improvements in the quality of crops, conservation of nutrients in the soil and reduction of time spent in the field.

Supplements

There is a wide variety of products that can improve the way fertilizers work. They include inoculants and wetting agents as well as lime to maintain the pH balance in the soil at a level that plants perform best.





Inoculants are a way for plants to get the most out of whatever nutrients are in the soil or are added to it. Composed from naturally-occurring microbes, inoculants are often applied as a coat on a seed before planting. They assist the plant to extract nutrients from the soil or the air, which makes them grow better.

For example, microbes known as rhizobia attach to the roots of plants and enable them to extract the majority of their nitrogen needs from the atmosphere. This means they require less nitrogen from other sources.

Wetting agents reduce the surface tension of water, allowing it to penetrate and wet the soil more easily resulting in improved distribution of nutrients to plants. They are used in the landscaping industry and on golf courses and athletic fields, and to a lesser extent in the greenhouse and horticulture industry.

Biosolids and compost

Many home gardeners are familiar with compost made from plant waste and leaves. Not only does well-aged compost provide some nutrients, the organic matter improves the condition of the soil so water will percolate through it better and roots will be able to grow. On farms, an application of manure can play a similar role. On other properties such as reforestation or mine recovery sites, composts and/or biosolids can assist in ensuring an adequate level of soil organic matter.

There is growing interest by many municipalities in expanding compost programs to include food scraps and paper. Some estimates suggest that up to 50% of what now goes to landfills could be composted, reducing pressure on landfill sites and offering municipalities a possible income source.

Treating municipal and industrial wastewater to produce biosolids is attracting growing interest from municipalities and some industries such as forest products. Wastewater treatment plants separate solids from the liquid and convert them into a product that can be used on non-agricultural land.

These biosolids contain nitrogen and phosphorus along with some micronutrients and act as slow release fertilizers and soil conditioners. The process allows local governments and industries with organic residuals in their wastewater to create products that reduce human impact on the environment.

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Agriculture and Agri-Food Canada (AAFC) is pleased to participate in the production of this publication. AAFC is committed to working with our industry partners to increase public awareness of the importance of the agri-food industry to Canada. Opinions expressed in this document are those of the Canadian Fertilizer Products Forum and are not necessarily those of the Department.