

SOIL

A Vital Natural Resource

Soil, the essential life-supporting bridge between the rock below and the life above, plays an important role in the health of our planet. We depend on soil for food and fiber. Soil absorbs waste and recycles it into nutrients. It is a reservoir for water and building materials and a home for insects and animals. The management and conservation of the world's soils are critical to feed our ever-growing population and can help to create environmental stability.

The Living Soil



Food and fiber

Only 5% of Canada's vast terrain is suited to agriculture, and much of this area is threatened by soil degradation, urbanization and other land uses.

D. Acton
The Health of our Soils



Soil flora and fauna, seen and unseen, devour organic residues, degrading and synthesizing them.

Soil flora (Plant life)

Plants store the sun's energy and carbon dioxide from the air and transfer them to the soil to be absorbed by other organisms.

Living roots physically mix the soil as they push through transferring air, water and nutrients.

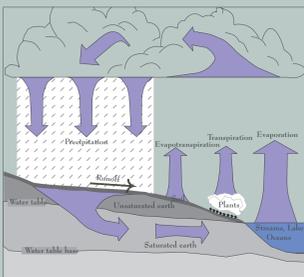
Roots grow and die, supplying food and energy to the soil fauna and microflora.

Microflora, microorganisms like bacteria and fungi, are responsible for 80-90% of the total soil metabolism. They breakdown plant residues, feces and dead animals. Soil organic matter is created and essential nutrients are transformed and released, only to be used again.

Microbes can cause diseases, such as tetanus, or bring us cures like penicillin and streptomycin.

Water

Soils hold and purify life-giving water.



Science of Food and Agriculture, 1983



Ned M. Seidler
National Geographic Society

Habitat for animals and insects

Soil provides a home for many biological species. The soil's condition is directly related to its capacity to support life within it.



Soil fauna (Animal life)

Gophers, moles, shrews, ground squirrels and rats burrow and mix the soil as they tunnel.

Earthworms eat their way through the soil, processing plant tissue and soil particles through their bodies. Their channels provide a mechanism for air and water circulation, moving vital nutrients throughout the soil.

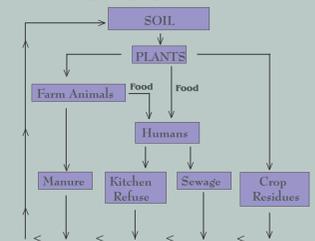
Ants forage widely, moving earth and improving porosity for air and water.

Mites, nematodes, springtails and woodlice feed on decaying plant tissue, physically tearing it and making it easier for the microorganisms to work.

Animals and insects themselves become food sources for predators and parasites living in the soil.

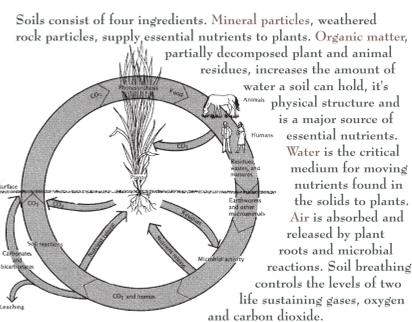
Waste management

Soil naturally recycles organic waste for plant use. Applying waste to the soil provides beneficial chemical nutrients and improves the soil structure, while eliminating dumping in landfill sites.



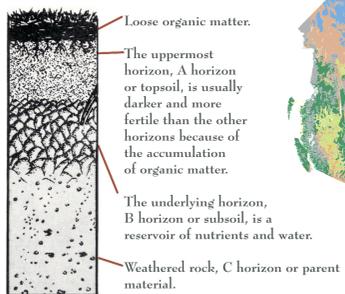
Soil - the difference between survival and extinction!

John W. Doran, Timothy B. Parkin
Defining and Assessing Soil Quality



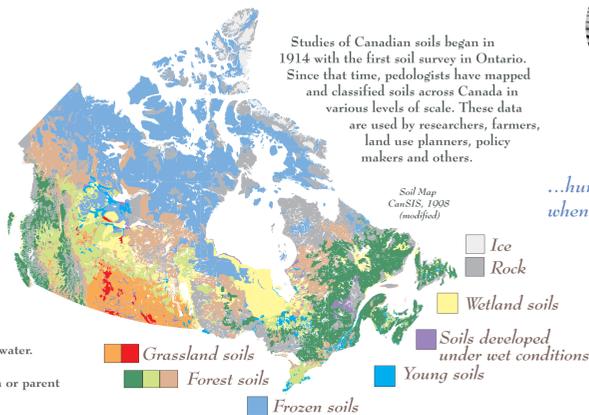
The Nature and Properties of Soils, 1990

Soils are formed by climatic factors, organisms, relief and water acting on geological materials.



Canada's Soils

Studies of Canadian soils began in 1914 with the first soil survey in Ontario. Since that time, pedologists have mapped and classified soils across Canada in various levels of scale. These data are used by researchers, farmers, land use planners, policy makers and others.



...let but the naked soil be exposed to the elements-how soon and how tragic the loss.

Exposed grass roots (TUCN, 1980)

J.A. Tinsford
Our Soil and Water

Agriculture and Agri-Food Canada is committed to conserving soil resources. The maintenance and improvement of our soils depend on selecting appropriate land use and management practices.

...human activity has its best results when carried out according to nature's rules.

J.E. Dorman
AAFC, Lethbridge, Alta.

Soil and global warming

Wetland and frozen soils act as carbon sinks, slowing global warming, by inhibiting the release of CO₂, a greenhouse gas, to the atmosphere. Protecting these soils are critical.



Soil, vital to all of us, is self supporting in its inherent environment. Once we break ground and use the nutrients to grow food, we disturb its natural state and balance. Better knowledge of soils and their interaction with the world around us helps us to develop management strategies which nurture and conserve soil resources. Society should acknowledge and support farmers/land owners who practice conservation. We must accept our humble place on this earth and respect the power it holds and the life it sustains.