

Soils in Manitoba

Decomposition of plant and animal bodies and their waste products in soil allows matter to be used again and again by living organisms. In this way, soil serves as an important link between the living and nonliving worlds.

Soils are made up of different compounds. Rocks are eroded by rain or wind and are broken down by physical or chemical processes to form tiny mineral particles. The sizes of the mineral particles are important in determining the characteristics and classifications of soils.

- Clays have the finest particles, the largest total air space, and the ability to soak up and hold much water.
- Sands and gravels have the largest particles and large pores, but less total air space. They hold little water and allow water to pass through easily.
- Loams have particles of intermediate size and space. They can hold water more easily than sands and gravels.

Irregular spaces between the mineral particles allow atmospheric gases, water, and water vapour to enter the soils. Atmospheric gases include oxygen, carbon dioxide, and nitrogen.

The decaying organic matter within the soil is added over many thousands of years. This organic matter provides many nutrients for plants and is responsible for aerating and loosening soil and helping with water absorption.

Also present in “dirt” are millions of living organisms. Bacteria, fungi, protozoans, and larger organisms are instrumental in determining the characteristics of soils.

Soil Zones

A soil zone is an area of relatively uniform soil colour and composition. In Manitoba, provincial soil maps generally identify from three to five soil zones. The soil zones shown on the Soil Zones of Manitoba map on the following page include:

- Bog and subarctic
- Peat and podzolic
- Lime-rich Forest (grey)
- Grey brown
- Black soils

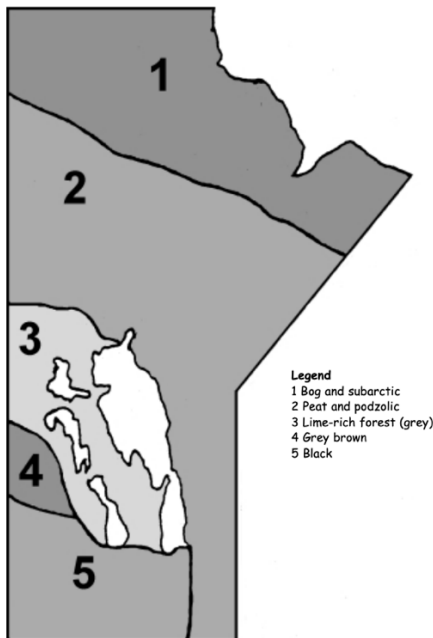
Brown soil zones are found in warmer and drier regions that may experience drought. Lack of moisture is usually the main factor limiting crop production. This short grass prairie soil zone has less organic matter than black soils. It has lower than average provincial yields and a higher chance of crop failure.

Black soil zones are much more favourable to good crop production. They are found in areas with slightly cooler temperatures and more effective moisture levels. This tall grass and parkland prairie soil zone has more organic matter than brown or grey soil zones.

Grey soil zones experience less decomposition of plant matter. This soil type is located farther north, where cooler temperatures result in increased soil moisture. These higher moisture levels leach minerals and nutrients out of the upper layers at a faster rate. As a result, the grey topsoils tend to be more shallow and less fertile than black or brown soils.

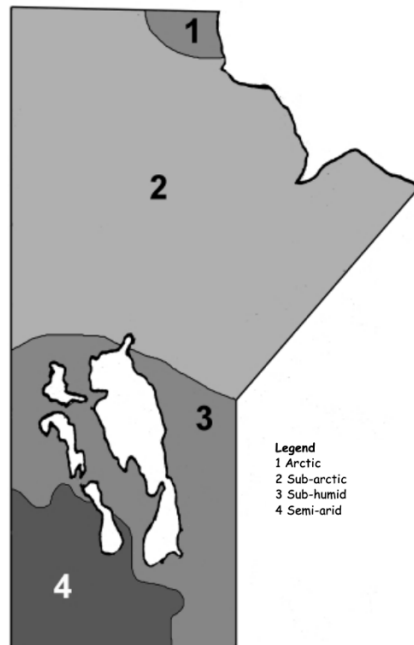
Climate and vegetation play major roles in soil formation. The boundaries of the soil zones are like the boundaries for climatic and vegetation belts. All have significant effects on the farming operations of their areas. About 12 percent of Manitoba's land area is considered to have soils suitable for agriculture. Compare the following three maps: Soil Zones of Manitoba, Climatic Regions in Manitoba, and Natural Vegetation in Manitoba. Notice the similarities:

Soil Zones of Manitoba



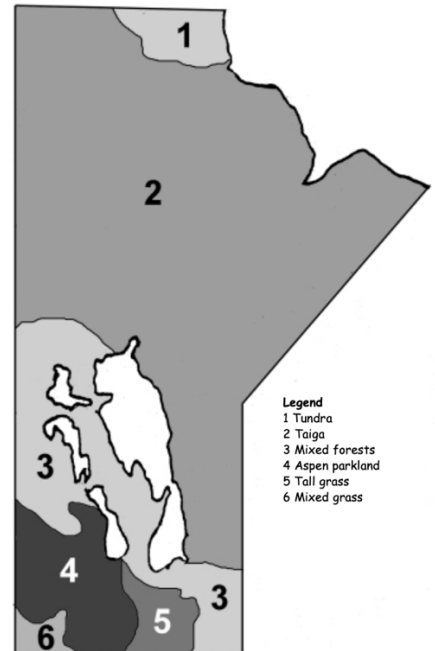
- Legend**
- 1 Bog and subarctic
 - 2 Peat and podzolic
 - 3 Lime-rich forest (grey)
 - 4 Grey brown
 - 5 Black

Climatic Regions in Manitoba



- Legend**
- 1 Arctic
 - 2 Sub-arctic
 - 3 Sub-humid
 - 4 Semi-arid

Natural Vegetation in Manitoba



- Legend**
- 1 Tundra
 - 2 Taiga
 - 3 Mixed forests
 - 4 Aspen parkland
 - 5 Tall grass
 - 6 Mixed grass