

These features result in lower than average provincial yields and chances of crop failures. Under slightly cooler temperatures and more moisture, the black soil zones (tall grass and parkland prairie) are much more favorable to consistently good crop production. With still cooler temperatures, there is less decomposition of plant matter (leaf litter) in the grey soil zones. More moisture also leaches minerals and nutrients out of the upper layers faster. As a result, the grey topsoils tend to be shallow and, once again, less fertile than black soils.

Soil Fertility

The fertility of any soil, or its ability to support plant life, can be affected by any of the various soil components and their amounts or placements in the soil profile. Temperature (temperature and precipitation) and vegetation are major factors affecting these. Temperatures affect decomposition. A high temperature speeds up the breakdown of organic matter which leads to a shallow A horizon. The amount of original plant cover determines how much organic matter can be decomposed. The manner of movement of water through the soil, depending on precipitation amounts and topography, affects how minerals and nutrients are distributed in the horizons. Shortages of water or moisture can also drastically cut yields. Water not only forms a large part of plant or animal bodies, but is necessary to dissolve minerals or nutrients before they can enter living cells. Topography and climate patterns (where hills, ridges, flat lower lands or sloughs are considered) will decide what effects moisture and temperature may have on soil. For instance, tops of hills with higher temperatures and lower moisture amounts will have more shallow topsoils. In lower, flat areas, soils can become waterlogged. With little air and colder temperatures, plant growth decreases. The soil-building processes, climate and other natural conditions and actions are things over which humans may have little control. However, human actions have now become major influences on soil fertility as well.

The Human Influence

Negative Aspects

Prior to any major settlement or breaking up of land on the prairies, soils were part of many self-supporting ecosystems. Grasses, shrubs and trees supported many grazing and browsing animals. For the most part, plant and animal bodies and wastes were then returned to the soil and organic matter was building up.

Clearing and breaking of the land and the continual increase in the size of machinery, especially after 1925, subjected soils to losses in fertility which are still going on today. Since 1900, it is estimated that prairie soils have lost 50% of their organic matter. Much of this is brought about by tillage. Tillage exposes and allows the soil to warm up. These