Chernozem Soil

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What is Chernozem Soil?

Chernozem is a type of soil that is black in colour and is rich in nutrients. The chernozem soil is rich in humus ranging between 4% to 16% along with a higher concentration of nutrients like phosphoric acids, phosphorus and ammonia. This makes the chernozem soil very fertile and hence one of the most useful soils for agriculture and results in high agricultural yields.

Also, chernozem has high moisture storage capacities. It is also included as a Reference Soil Group of the World Reference Base for Soil Resources. It is one of the 30 soil groups which are classified by the Food and Agriculture Organization (FAO).

History and Formation of Chernozem Soil

Chernozem is a humus-rich grassland soil that is used extensively for agricultural purposes like growing cereals and for the raising of livestock all over the world. The word itself comes from the Russian language which means black earth. From the 19th and 20th century there have been discussions on the process of soil formation of Chernozem. They originated from the discussions on the climatic conditions of the early Holocene to roughly 5500 BC.

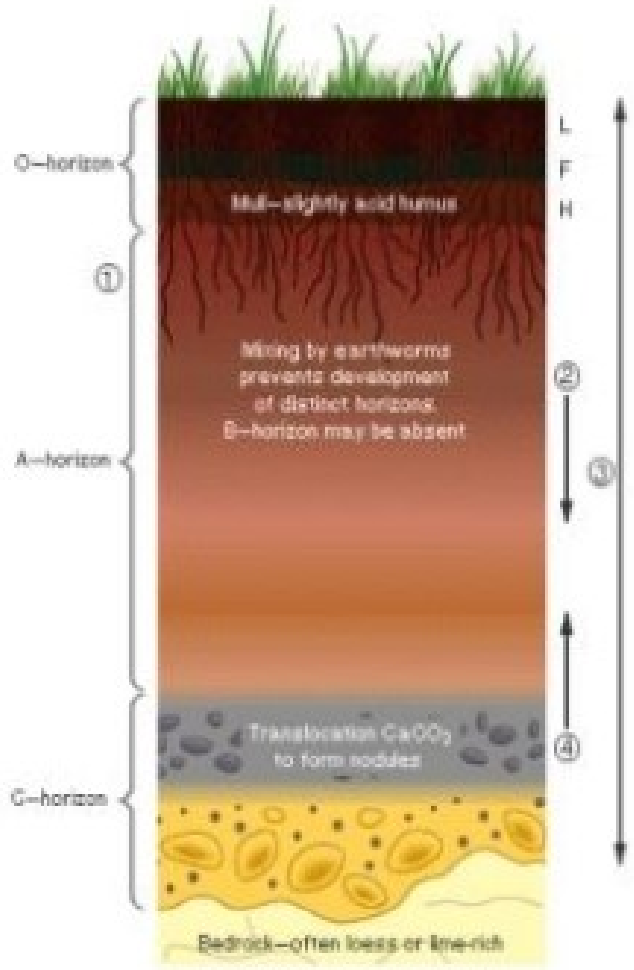
However, there has been no single consensus on any paleoclimate reconstruction that was able to accurately explain the processes of geochemical variations that had been found in Chernozems throughout central Europe. Better explanations were offered by the theory involving the anthropomorphic origin of the Chernozem soil formation.

The Chernozem soil is also known to have the highest magnetic susceptibility as well. This high magnetic susceptibility of Chernozem is explained by the process of vegetation burning by humans. The reasoning is that the initially deposited soil containing significant concentrations of goethite and ferrihydrite was converted to maghemite because of the exposure to temperatures of around 220℃ which are only reached because of the vegetation burning. These events of vegetation burning are a rare occurrence when only left to natural processes. Hence, most of the vegetation burning would have been carried out by the humans leading to the formation of a chernozem soil profile.

The chernozem soil profile is also obtained when there is an accumulation of black carbon. This is observed in some regions such as the regions spanning from North America to Lower Saxony. This accumulation of black carbon is thought to partially originate from some charred materials. Because of these wide variations in the chernozem soil profile, the term summarizes the different types of black soils that have the same appearance but the processes of different formation histories. An image of the chernozem soil is shown below:

What is the soil profile of Chernozem?

Chernozems account for 1.8 percent of the total continental land area on Earth. Chernozems are characterized by **a surface layer that is rich in humus and in available calcium ions bound to soil particles, resulting in a well-aggregated structure with abundant natural grass vegetation**.



- **Chernozem** soils occur under the temperate grasslands of the steppes of Russia, the prairies of North America, in Australia, South Africa, and the Pampas in South America (all approximately 30-40° north and south of the equator). T
- The vegetation is mainly grasses and herbaceous plants, which have become dominant following natural and accidental fires and extensive human modification of these regions over time.
- Although initial ploughing is difficult because of a dense mat of roots, once cultivated, these soils are regarded as the best in the world for agriculture. They have high nutrient levels, good humus content, and good texture and structure.
- **Chernozem** soils support the major grain growing belts of the world.

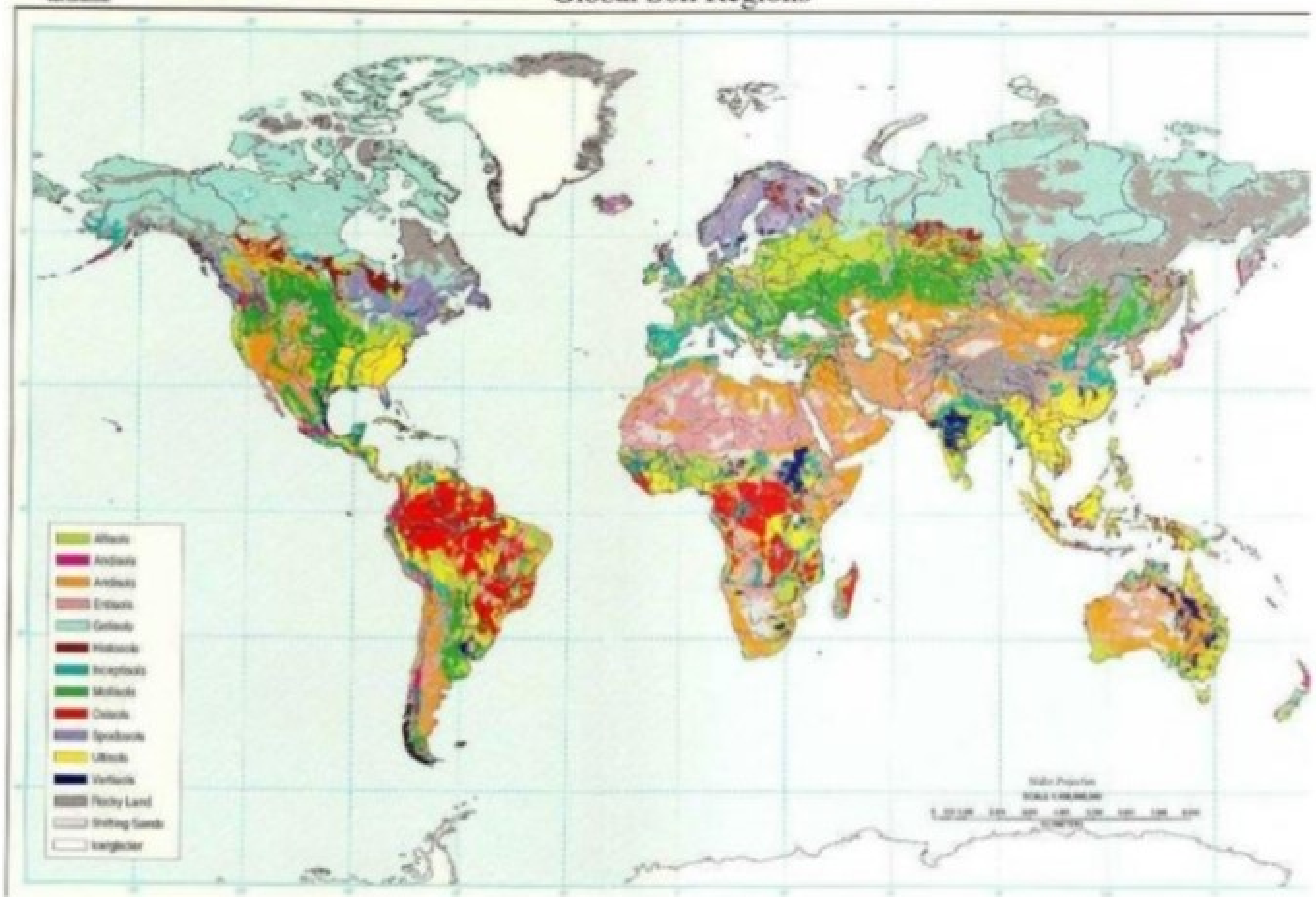
- Chernozem soil of temperate grassland areas
- Fertile with thick humus layer
- Due to climate leaching is not a problem
- Capillary action is good and cold winters force small animal down.

Chernozem

- Brown Chernozem
- Boreal Sub-Arctic of Alberta and Saskatchewan
- Often referred to as the "Breadbasket" areas of the world.

- Grey-Brown
- Rapid accumulation of leaf litter into the A horizon is due to the high earthworm activity

Global Soil Regions



Thanks