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Soil Science

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COMMENTARY

Minerals, dead and live creatures (organic materials), air, and water make up soil. These four elements interact in amazing ways, making soil one of the most dynamic and vital natural resources on the planet. People use soil in a variety of ways. As a result, it has a wide range of definitions. An engineer might think of soil as a substance for building infrastructure, while a diplomat might think of it as a country's territory. Soil, according to a soil scientist, is the earth's surface mineral or organic layer that has undergone some degree of physical, biological, and chemical weathering. Minerals, soil organic matter, living organisms, gas, and water are the five components that make up soil. Soil minerals are categorised into three size classes: clay, silt, and sand; soil texture refers to the percentages of particles in each size class. Soil mineralogy varies greatly. Smectite, a clay mineral, for example, may shrink and swell so much when wet and dry that it can topple structures. Quartz is the most common mineral found in soils; it forms beautiful crystals but is not very reactive. Plant, animal, and microbial wastes in various stages of decomposition make up soil organic matter, It's an important component; in fact, the proportion of soil organic matter in a soil is one of the most reliable markers of agricultural soil quality [1]. Browns, yellows, reds, greys, whites, and blacks are common soil colours, but unusual soil colours like greens and blues exist as well. Different layers within soils, known as soil horizons, may typically be distinguished. Soil horizons are complicated and diverse, but in general, the surface horizons are lively and abundant in life and organic stuff. Below the surface horizons, more stable horizons generated by a variety of soil formation processes, such as bright white horizons formed by clay removal or deep-red, low-fertility horizons, are frequently seen formed through millions of years of weathering while pinpointing the exact date of birth of some soils is difficult, we can conclude that while some are young, many are quite old. Some of the world's oldest soils may be found in Australia, where stable landforms have allowed some soils to age millions of years [2]. Every landslide, volcanic explosion, or glacier retreat creates new soils. Soils undergo a variety of biological, chemical, and physical changes over time. Minerals and rocks weather, nutrients drain, and plant communities alter as a result of horizons. Given five important pieces of information about the soil's past the five components of soil formation climate, organisms, topography, and parent material, soil scientists have learned to anticipate the current stage of these processes. Soils are the primary provider of nutrients and water for much of the plant life on earth. There are 18 elements considered essential for plant growth, most of which are made available to plants through root uptake from soils. Soils retain nutrients by several mechanisms. Most nutrients are dissolved in soil water as either positively or negatively charged ions; soil particles are also charged. Soil can also store nutrients by holding soil water. The retention of water is the most important of all the ecosystem services given by soils; without soils, our land would be nothing but rocky deserts. Plants use a lot more water than one might believe because they are constantly releasing water into the atmosphere through transpiration, which is part of the photosynthesis process. The principal mineral components in soils that hold water are clay and silt particles. These microscopic particles act like a sponge, slowing the flow of water and physically holding it in place through capillary forces [3].

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