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Abstract

In this book, the following parameters, related to soil characteristics, properties and formation, are discussed and analyzed: a) minerals and rocks that constitute the soil parent material and their weathering for soil genesis, leading to clay minerals formation and liberation of nutrients essential for plant growth, b) clay minerals, their crystalline structure, and their effect on soil properties, c) soil water and its retention forces by soil components, water flow in soils and its absorption by plants, d) soil organic components, their origin, transformation and their effect on soil physical and chemical properties, e) soil physical properties such as soil texture, structure, porosity, bulk density, soil temperature and color, f) soil physical-chemical properties such as cation-anion exchange, flocculation and dispersion, expansion

and shrinking of clay minerals, soil reaction, degree of base saturation of soil colloids, soil buffering capacity and oxidation - reduction conditions, g) the soil forming factors and their action on the parent material for soil formation, the process of soil classification and the various classification systems, such as Soil Taxonomy and the FAO-Unesco system (with details about the Orders of the new American system and the classification units of the FAO-Unesco system), h) the process of soil mapping and the most important soil mapping systems are also analyzed with reference to geographic information systems and the interpretation of soil maps. Finally, a series of questions and exercises are cited at the end of the text with the intent that the reader acquires a better understanding and consolidation of this book contents.

