

ABSTRACT

Soil is a diverse and dynamic natural resource that is important for the production of food, fibre and other products as well as a wide range of ecological services. For many applications, including agricultural, forestry and environmental management, understanding the physical and chemical properties of the soil is essential. In this study, the physical and chemical properties of watermelon soil before and after agricultural activities were analysed. Texture, structure, bulk density, porosity and pH were evaluated on agricultural and non-agricultural soil samples. Fourier transform infrared (FTIR) spectroscopy was performed to determine the functional groups of organic matter in the soil. The results show that the pH, nitrogen, and organic matter of agricultural soil are lower than that of non-agricultural land. Agriculture has changed the texture and structure of the soil. These data show that agriculture significantly affects the physical and chemical properties of soil and underline the importance of sustainable agricultural methods to maintain soil health.

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CHAPTER ONE

BACKGROUND

1.1 Introduction

Soil includes topsoil, subsoil, and other internal layers above the source rock. It is an integral part of nature. It develops through the weathering of the rocks that are its parent element. The nature and characteristics of the soil vary depending on the climate it experiences, the type of topography it is found on, the vegetation and other organisms that play a role in the soil's development, and the amount of time it takes for the soil to form. Minerals, soil organic matter, water, and air are all components of soil, which is a complex substance (Learning, 2001).

In some ways, growing okra from seed is easy. It will tolerate nutrient-poor soils, low moisture content and the pH range of the soil. This tolerance extends to cooking, where it is a delicious addition to soups and can be fried or simmered. But okra is also a plant that requires heat and sun. This African relative of hibiscus, hollyhock and hibiscus will become weak and susceptible to pests and diseases if the weather is too cool or shady, even for a short time. It wouldn't have endured those wonderful shells without a lot of warmth and sunlight (Almanac, 2023). Pineapple (*Ananas comosus*) is one of the commercially important fruit trees of India. Total annual world production is estimated at 14.6 million tons of fruit. India is the fifth largest pineapple producer with an annual output of about 1.2 million tons. Other major producers are Thailand, the Philippines, Brazil, China, Nigeria, Mexico, Indonesia, Colombia, and the United States. Pineapple is suitable for growing in humid tropics. The fruit grows well near the coast as well as inland if the temperature is not too high. The optimum temperature required for successful cultivation is 22-32°C. High night-time temperatures are harmful to plant growth and there should be a difference of at least 4°C between daytime and night-time temperatures. It can be grown up to 1000 m. above sea level if the area is frost free. The required rainfall varies from 100 to 150 cm (Petruzzello, 2016).

Therefore, the physicochemical properties of soil (soil physical and chemical properties) have a great influence on soil quality, especially in agriculture. The physical