

EFFECT OF SOIL COMPACTION ON THE PHYSICAL PROPERTIES OF REGOSOL AND VERTISOL AND CORN PLANT GROWTH

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ABSTRACT

Soil compaction in agriculture can reduce soil aeration, and water availability for plants and inhibit the growth of plant roots and stems. This study aims to determine the effect of soil compaction on several physical properties of Regosol and Vertisol in the growth of Corn Plants. Laboratory soil compaction research by setting the value of normal soil Volume Weight to improve its status. The analyzed parameters are Volume Weight, Specific Gravity, Porosity, pF Curve, Permeability, and Growth of Corn Plants. The results showed that soil status after compaction had a major effect on the increase in the Specific Gravity of Regosol at a Volume Weight of 1.58 g/cm³ and 1.39 g/cm³ in Vertisol. There was a decrease in the percentage of Porosity and Regosol Permeability at a Volume Weight of 1.48 g/cm³ and 1.49 g/cm³ in Vertisol. Water content decreased in Regosol media at a Volume Weight of 1.48 g/cm³ and 1.59 g/cm³ in Vertisol. An increase in the pF curve of 2.54 and 4.20 Regosol media occurred at a Volume Weight of 1.78 g/cm³ as well as Vertisol at a Volume Weight of 1.59 g/cm³. Soil compaction also affected Plant Height which decreased in Regosol Soil at Volume Weight of 1.78 g/cm³ and 1.49 g/cm³ in Vertisol. Leaf Count also decreased in Regosol Soil at Volume Weight of 1.78 g/cm³ and 1.39 g/cm³ in Vertisol. Dry Weight Development of Stems was inhibited in Regosol Soil at Volume Weights of 1.58 g/cm³ and 1.49 g/cm³ in Vertisol. Disturbed Root Dry Weight Development in Regosol Soil at Volume Weights of 1.68 g/cm³ and 1.39 g/cm³ in Vertisol. Both types of soil have decreased compaction treatment of soil physical properties, but Regosol soil is greater than Vertisol soil. While the effect of compaction on plant growth in Vertisol soil is more sensitive because plants in Vertisol media have decreased more significantly than plants in Regosol media.

Keywords : Volume Weight, Soil Compaction, Physical Properties, Corn Plant