

The Effect of Adding Soil Amendments on Some Soil Physical Properties and the Growth of Sunflower Crop in Clay Soil

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Abstract:

The experiment was conducted in clay soil at the Agricultural Research Station affiliated with the College of Agriculture, University of Basrah, during the spring of 2021. Research aimed to study the effect of soil amendments on soil physical properties such as (bulk density, total porosity, and electrical conductivity) and some growth and yield of sunflowers such as (plant height and dry weight). The soil amendments used in the experiment were cattle manure and synthetic polymer. The amendments were added to the surface layer of the soil at a depth of 15 cm, using individual and mixed application treatments with six levels of addition (Cont, P4, O4, P3O1, O3P1, and P2O2). The field was divided into plots measuring 2.5 m in length and 1.5 m in width, and then the plots were planted with sunflower seeds. The results showed that all the amendment treatments outperformed the treatment without amendments, improving the soil's physical properties by reducing bulk density, increasing total porosity, and decreasing electrical conductivity. Additionally, the amendment treatments showed improvement in growth and yield characteristics, indicated by increased plant height and dry weight of the plants.

Keywords: soil amendments, bulk density, total porosity, electrical conductivity, plant height ,and Sunflower .

I. INTRODUCTION

Organic amendments enhance soil properties, provide nutrients for plant growth, enhance soil aggregation, stability, and water-holding capacity, and reduce soil salinity damage by reducing bulk density and improving porosity. Organic amendments also act as nutrient sources and reservoirs, enhancing plant growth and production. These amendments are crucial in improving soil health and reducing damage caused by soil salinity. Abu-Hamdeh et al. (2018) and Dahri et al. (2019) conducted studies on the physical properties of soil, including the addition of

