

Effect of different levels of a superabsorbent polymer, Vermicompost and salinity on soil water holding capacity

Abstract

Availability of soil water for plants is an important topic in the study of the relationship between water, soil and plants. Soil water holding capacity in the different soil depends on various factors such as texture, organic matter content and soil salinity differences. Superabsorbent Polymers and Vermicompost absorb water to prevent infiltrating into deep layers and accessible for plants. The effect of different levels of super absorbent polymer and Vermicompost on soil water holding capacity of the different salinity and soil texture (sandy clay loam, clay loam, and loam) were studied. According to this study, an experiment in a completely randomized design with three levels of salinity (0, 4 and 8 ds/m) polymer levels (0, 0.2, 0.4 and 0.6 % by weight) and Vermicompost (0, 2, 4 and 6 % by weight) were examined. The application of 0.6% by weight of the polymer and also 6% by weight of the Vermicompost at the lowest soil salinity, soil water holding capacity in the sandy clay loam, clay loam and loam soil increases 1.45, 1.035 and 1.15, 1.32, 1.03 and 1.065, respectively. Increasing salinity of soil reduced the water holding capacity of studied soils. The reason for this phenomenon is negative impact of salinity on bulk density, porosity and permeability of the soil. Interaction effect of salinity and polymer on the soil water holding capacity in the loam and sandy clay loam soils was considered statistically significant; but in the Clay loam soil their interaction was not statistically significant. Also, the interaction between salt and Vermicompost on the soil water holding capacity, in the three soil texture were statistically significant.

Keywords: Plant available water, Field capacity, Organic matter



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