Effects of salinity, alkalinity, and acidity on crop growth and development on pea (Pisum sativum)

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Pea (*Pisum sativum*) is one of the vegetables that belong to the Fabaceae family, is a pulse crop that has been widely used and cultivated in all parts of the world. As with many crops pea plants also experience abiotic stresses that affect the plant's growth, development, and productivity. Abiotic stresses that affect crop growth and development include soil salinity, alkalinity, and acidity. This study was conducted to determine the effect of salinity, alkalinity, and acidity on the growth and development of pea plants that were grown in plastic cups in which soil is treated with different levels of salinity, alkalinity, and acidity. Each treatment is replicated 3 depending on the levels of treatment. Root morphology and length were determined on day 13 at the time of harvest. Results indicate that pea germination was negatively affected by the soil under salt stress and alkaline stress condition and maximum seed germination were observed with the control with 100% germination rate. The acid-treated soil was measured with a 66% germination rate. The study determines that salinity and alkalinity have negative effects on the germination, growth, and development of pea plants. Acidic soils at lower concentrations did not affect germination and growth, as a concentration of acidic levels increased there was a negative impact on germination and growth for pea plants. For shoot length, root length, and emergence, the T-test revealed substantial variations between control and acidity. Comparable results are seen for chlorophyll fluorescence.

Keywords: Pea (Pisum sativum), Salt stressed soils, Alkaline soils, and Acidic soils