

The effect of calcium nutrition on reducing the effects of salinity on tomato plant

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Abstract

Since, the indiscriminate and irregular use of chemical fertilizers and improper management of cultivation and irrigation caused to increase the development process of saline areas and decrease of the agricultural crops growth is one of the important effects of salinity that in these conditions sodium and chloride ions in shoots and roots have been increased while we can see that the potassium and calcium ions have been decreased. By maintaining the proper amount of calcium ions in the soil, toxicity of sodium ions is controlled. In this study the effects of three different nutrient solutions, including the sodium chloride concentration with 0, 30, 60 and 90 mM , Calcium chloride concentrations with 0, 10, 20, 30 mM and sodium chloride + calcium chloride respectively to the same concentration were reviewed and investigated on two cultivated tomato varieties in a hydroponic form and pots containing Coco Peat.

In the vegetative growth stage, relative water content of tissue and cytoplasmic membrane stability and leaf chlorophyll concentration after removal of the root and shoot dry weight were measured. Results showed that increase of salinity caused a significant reduction in relative water content of tissues, cytoplasmic membrane stability and chlorophyll concentration in leaves. Dry weight yield of roots and shoots also decreased with increasing the salinity so that all the characters were lowest in 90 mM of sodium chloride concentration. The results showed that the growth terms of calcium chloride and chloride + calcium chloride solutions were better, as the 10 mM concentration of calcium chloride has a significant impact on improving the damage caused by the salinity.

Keywords: salinity stress, tomato, sodium chloride and calcium chloride



The 1st International Conference on New Ideas in Agriculture
Islamic Azad University Khorasgan Branch
26-27 Jan. 2014, Isfahan, Iran

