

Interactive of Calcium, Potassium, and Dynamic Unequal Salt Distribution on the Growth of Tomato in Hydroponic System

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Abstract : Due to water shortage, application of saline water for irrigation is an urgent requirement in agriculture. Thus, this study, the effect of calcium and potassium application as additive in saline root media for reduce salinity adverse effects was investigated on tomato growth in a hydroponic system with unequal distribution of salts in the root media, which was divided into two equal parts containing full Johnson nutrient solution and 40 mM NaCl solution, alone or in combination with KCl (6 mM), CaCl₂ (4 mM), K+Ca (3+2 mM) or half-strength Johnson nutrient solution. The root splits were exchanged every 7 days. Results showed that addition of calcium, calcium-potassium and nutrition elements equivalent to half the concentration of Johnson formula to the saline-half of culture media minimized the reduction in plant growth caused by NaCl, although the addition of potassium to culture media was not effective. The greatest concentration of sodium was observed at the shoot of treatments which had the smallest growth. According to the results of this study, in the case of dynamic and non-uniform distribution of salts in the root media, by the addition of additive to the saline solution, it would be possible to use of saline water with no significant growth reduction.

Keywords : calcium, hydroponic, local salinity, potassium, saline water, tomato

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