

Alleviation of Salt Stress Effects on *Solanum lycopersicum* (L.) Plants Grown in a Saline Soil by Foliar Spray with Salicylic Acid

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Abstract : Salinity stress is one of the major abiotic stresses, restricting plant growth and crop productivity in different world regions, especially in arid and semi-arid regions, including Saudi Arabia. The tomato plant is proven to be moderately sensitive to salt stress. Therefore, two field experiments were conducted using tomato plants (Hybrid 6130) to evaluate the effect of four concentrations of salicylic acid (SA; 0, 20, 40, and 60 μ M) applied as foliar spraying in improving plant tolerance to saline soil conditions. Tomato plant growth, yield, osmoprotectants, chlorophyll fluorescence, and ionic contents were determined. The results of this study displayed that growth and yield components and physiological attributes of water-sprayed plants (the control) grown under saline soil conditions were negatively impacted. However, under the adverse conditions of salinity, SA-treated plants had enhanced growth and yield components of tomato plants compared to the control. Free proline, soluble sugars, chlorophyll fluorescence, relative water content, membrane stability index, and nutrients contents (e.g., N, P, K⁺, and Ca²⁺) were also improved significantly, while Na⁺ content was significantly reduced in SA-applied tomato plants. SA at 40 μ M was the best treatment, which could be recommended to use for salt-stressed tomato plants to enable them to tolerate the adverse conditions of saline soils.

Keywords : tomatoes, salt stress, chlorophyll fluorescence, dehydration tolerance, osmoprotectants

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