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Effect of a new Released Bio Organic-Fertilizer in Improving Tomato Growth in Hydroponic System and Under Greenhouse

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Abstract : The application of organic fertilizers is generally known to be useful to sustain soil fertility and plant growth, especially in poor soils, with less than 1% of organic matter, as it is very common in our Tunisian fields. Therefore, we focused on evaluating the effect of a new released liquid organic fertilizer named Solorga (with 5% of organic matter) compared to a reference product (Espartan: Kimitec, Spain) on tomato plant growth and physiology. Both fertilizers, derived from plant decomposition, were applied at an early stage in hydroponic system and under greenhouse. In hydroponic system, after 14 days of their application by root feeding, a significant difference was observed between treatments. Indeed, Solorga improved shoots and roots length, as well as the biomass respectively, by 45%, 27%, and 27.8% increase rate, while compared to control plants. However, Espartan induced less the measured parameters while compared to untreated control. Moreover, Solorga significantly increased the chlorophyll content by 42% compared to control and by 32% compared to Espartan. In the greenhouse, after 20 days of treatments, the results showed a significant effect of both fertilizers on SPAD index and the number of flowers blossom. Solorga increased the amount of chlorophyll present in the leaf by 7% compared to Espartan as well as the plant height under greenhouse. Moreover, the number of flowers blossom increased by 15% in plants treated with Solorga while compared to Espartan. Whereas, there is no notable difference between both organic fertilizers on the fruits blossom and the number of fruits per blossom. In conclusion, even though there is a difference in the organic matter between both fertilizers, Solorga improved better the plant growth in controlled conditions in hydroponic system while compared to Espartan. Altogether the obtained results are encouraging for the use of Solorga as a soil enriching source of organic matter to help plants to boost their growth and help them to overcome abiotic stresses linked to soil fertility.

Keywords : tomato, plant growth, organic fertilizer, hydroponic system, greenhouse
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