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RESPONSE OF GROWTH, YIELD AND QUALITY OF TOMATO PLANTS TO NPK FERTILIZER AND POTASSIUM HUMATE UNDER SINAI CONDITIONS

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ABSTRACT

Two successive field experiments were carried out on sandy soil at Balouza Research Station of Desert Research Center, North Sinai Governorate Egypt during autumn seasons of 2015 and 2016, to investigate the growth parameters, yield and its components in addition to minerals content of tomato (*Lycopersicon esculentum,* L.)" Fayrouz F1 cultivar" as influenced by NPK fertilizers and soil or foliar potassium humate treatments as well as their interactions under drip irrigation system. The obtained results showed that the mean values of plant height, number of branches/plant, fresh and dry weights of tomato plants, No. of fruit/plant, fresh weight of fruit (g), total yield ton/fed, total chlorophyll, N, protein, P, K% in the leaves, total soluble solids (%) and ascorbic acid in fruits were increased due to increasing NPK rate 25 % up to 100% recommended dose (RD) during both seasons of the experimentation. The highest significant values of growth parameters yield and chemical contents were recorded with 100% NPK (RD). The lowest values were recorded with 25% NPK (RD). Results showed that the highest values were recorded at 20t/fed. potassium humate soil addition and lowest values were recorded at 10t/fed.. The highest significant values of growth parameters yield and chemical contents were recorded with 4g/L potassium humate foliar spraying. While the soil addition of potassium humate superiority on foliar spray of potassium humate. The best significant values of the aforementioned parameters were recorded with interaction between 100% NPK (RD) with 20kg potassium humate soil addition, followed by75% NPK(RD) with 20kg potassium humate soil addition. These increases were true in the two seasons of the study. It can be concluded that application of potassium humate at rate of 20 kg/fed with 75% of the recommended dose of NPK fertilization will result in the same production of tomato in addition to the improvement in fruit quality in terms of average individual fruit weight .These results will contribute to the reduction of fertilizer application by 25% from the recommended dose hence reducing environmental pollution. It can be concluded that 75% NPK with 20kg/fed. soil addition of potassium humate could be used as a complementary for 100% mineral fertilizers to improve yield and quality of tomato plant under sandy soil conditions which protect the environment chemical pollution and its harmful effect on human and animal health

Key words: Chemical composition, humic acid, growth, mineral fertilization, potassium humate, tomato, yield,.