DEVELOPMENT OF A BETTER NUTRIENT MANAGEMENT PACKAGE FOR ENHANCING THE QUALITY OF FRUITS AND SEEDS OF TOMATO UNDER OPEN FIELD CONDITIONS

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Nutrient management is a key factor for quality seed and fruit production of tomato (*Solanum lycopersicum* L). Therefore, this study was conducted to develop a better nutrient management package to increase the soil fertility to achieve high quality fruits and seeds production of tomato. Six treatments; no fertilizer/Control (T_1), NPK fertilizer recommended by Department of Agriculture (DoA) (T_2), 3 splits of 1.5 x DoA recommended NPK fertilizer (T_3), 6 splits of 1.5 x DoA recommended NPK fertilizer (T_4), 6 splits of 1.5 x DoA recommended NPK fertilizer with secondary nutrients (Ca,Mg) (T_5), 6 splits of 1.5 x DoA recommended NPK fertilizer with secondary (Ca,Mg) and micro nutrients (Zn,Cu,B) (T_6) in a Randomized Complete Block Design with three replicates. Fruit quality parameters (single fruit weight, juice pH and firmness) and seed quality parameters (germination percentage, thousand seed weight, seedling shoot and root length, seedling fresh and dry weight) were measured using ripen (>80% of red color) fruits at second harvest. Nitrogen, phosphorus and potassium content was measured in third leaf at flower initiation stage and fruits at second harvesting stage. As fruit quality parameters, highest single fruit weight (72.5g), fruit firmness (1.9) and juice pH (4.5) were recorded in T_4 and significantly lowest in T_1. As seed quality parameters, highest germination percentage (82.7%) and seedling root length (4.7cm) were recorded in T_6. Highest thousand seed weight (3.1g), seedling shoot length (9.8cm) and dry weight (0.005g) were recorded in T_5. Highest seedling fresh weight was recorded in T_4 (0.09g) and above tested parameters were significantly lowest in T_1. Highest nutrient content (NPK) in leaf and fruit were recorded in treatments of T_3, T_4, T_5 and T_6. Based on these results, there were not significant differences between treatments of T_2, T_3, T_4, T_5 and T_6 for all the tested parameters. Therefore, addition of excess macro nutrients (1.5 x NPK), secondary nutrients (Ca,Mg), micro nutrients (Zn,Cu,B) and split application of fertilizer were not significantly affected on quality of tomato fruit and seed. It can be concluded that, the present NPK fertilizer recommendation of the Department of Agriculture (T_2) could be verified for achieving better fruit and seed quality of open field tomato cultivation.

Keywords: Fruit quality, Nutrient package, Nutrient uptake, Seed quality, Tomato