World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:12, No:11, 2018

Effects of Macro and Micro Nutrients on Growth and Yield Performances of Tomato (Lycopersicon esculentum MILL.)

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Abstract : Tomato (Lycopersicon esculentum Mill.) is a major horticultural crop with an estimated global production of over 120 million metric tons and ranks first as a processing crop. The average tomato productivity in Sri Lanka (11 metric tons/ha) is much lower than the world average (24 metric tons/ha).To meet the tomato demand for the increasing population the productivity has to be intensified through the agronomic-techniques. Nutrition is one of the main factors which govern the growth and yield of tomato and the main nutrient source soil affect the plant growth and quality of the produce. Continuous cropping, improper fertilizer usage etc., cause widespread nutrient deficiencies. Therefore synthetic fertilizers and organic manures were introduced to enhance plant growth and maximize the crop yields. In this study, effects of macro and micronutrient supplementations on improvement of growth and yield of tomato were investigated. Selected tomato variety is Maheshi and plants were grown in Regional Agricultural and Research Centre Makadura under the Department of Agriculture recommended (DOA) macro nutrients and various combination of Ontario recommended dosages of secondary and micro fertilizer supplementations. There were six treatments in this experiment and each treatment was replicated in three times and each replicate consisted of six plants. Other than the DOA recommendation, five combinations of Ontario recommended dosage of secondary and micronutrients for tomato were also used as treatments. The treatments were arranged in a Randomized Complete Block Design. All cultural practices were carried out according to the DOA recommendations. The mean data was subjected to the statistical analysis using SAS package and mean separation (Duncan's Multiple Range test at 5% probability level) procedures. Secondary and micronutrients containing treatments significantly increased most of the growth parameters. Plant height, plant girth, number of leaves, leaf area index etc. Fruits harvested from pots amended with macro, secondary and micronutrients performed best in terms of total yield; yield quality; to pots amended with DOA recommended dosage of fertilizer for tomato. It could be due to the application of all essential macro and micro nutrients that rise in photosynthetic activity, efficient translocation and utilization of photosynthates causing rapid cell elongation and cell division in actively growing region of the plant leading to stimulation of growth and yield were caused. The experiment revealed and highlighted the requirements of essential macro, secondary and micro nutrient fertilizer supplementations for tomato farming. The study indicated that, macro and micro nutrient supplementation practices can influence growth and yield performances of tomato fruits and it is a promising approach to get potential tomato yields.

Keywords : macro and micronutrients, tomato, SAS package, photosynthates
Conference Title : ICAEE 2018 : International Conference on Agricultural and Environmental Engineering
Conference Location : Amsterdam, Netherlands
Conference Dates : November 05-06, 2018