

Abstract

New Method of Tomato Fertilization with the Use of Chosen Nanoparticles [†]

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Abstract: The fast development of the world's population in the past few decades has forced the agricultural sector to increase crop productivity to satisfy the needs of billions of people, especially in developing countries. This situation creates serious challenges such as producing enough food for the world's increasing population. This situation requires the use of new technologies in crop fertilization. The increasing production efficiency and the requirements of food safety and environmental protection should be provided. Nanotechnology offers a potential solution. Nanofertilizers may be the solution for improving the efficiency and safety of fertilization. The aim of this study was to develop a new method of soil fertilization with the use of nano-zinc oxide (nano-ZnO). The main assumption of this research is the examination and comparison of the influence of certain concentration of nano-ZnO (50 mg/L, 150 mg/L, 250 mg/L) on seedlings and growth of tomatoes. Firstly, the parameters crucial for the process of seedling were examined after conducting the research on the influence of nano-ZnO (nanoparticles < 100 nm and <50 nm) on different tomato cultivars. Moreover, the other parameter that was taken into consideration is the improvement of plants' ability of macroelements assimilation from conventional bulks fertilizers. The solutions of nanoparticles were applied into the soil or by foliar spraying. Additionally, the parameters such as antioxidant activity and the content of sugars and allergens in tomato fruits were tested. Preliminary observations indicated that solutions of nano-ZnO have a significant influence on tomato germination and growth.

Keywords: nanoparticles; fertilization; tomatoes; nano-ZnO



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