Effects of Nano- Nutrient and Water Deficit Stress on Maternal Plant in Improvement of Seedling Growth Indices and Germination Quinoa (*Chenopodium quinoa* willd)

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Abstract

Bio-nanotechnology has many perspectives expanding in all agriculture fields of science, including various sectors of agriculture. In recent years, attention has been paid to the effect of nutrient requirements on plant growth and development, and positive results have been reported .Drought stress is one of the most important environmental constraints affecting seed germination and many crops' growth. To effects of nano- nutrient and water deficit stress on the maternal plant in maternal plant in the improvement of seedling growth indices and germination quinoa (*Chenopodium quinoa* willd), seeds harvested from a field experiment with 7 levels of foliar application with nutrients (control, Fe, Zn, Fe + Zn, nano-Fe, nano-Zn, nano-Fe + nano-Zn) at two times (50% and 100% flowering) and 2 levels of water deficit stress 50% (control) and 85% moisture discharge of crop capacity) was used in the research farm of Shahed University in 2018. Germination test with a completely randomized design with four replications was conducted in Seed Physiology and

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Technology Laboratory. The results showed the effect of foliar application with nutrients and drought stress; all traits evaluated were significant at 1% level. The highest germination speed and Seedling growth indices were obtained in nano-Fe and nano-Zn composition in a 50% flowering stage under water deficit stress conditions.

Keywords

Nano-nutrients, water deficit stress, maternal plant, quinoa

Synthesis and Coating of Fe_3O_4 Nanoparticles by Polyethylene Glycol Polymer Using co-precipitation Method as a Basis for Release of Imidacloprid Insecticide

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Abstract

Nowadays, biodegradable carriers are used to encapsulate therapeutic agents. The most common encapsulation method of the active agent in micro and polymeric nanoparticles is the solvent evaporation emulsion method. In polymer nanoparticle carriers, the active agent is dispersed in the tissue after preparing the nanocomposite. In this study, the imidacloprid insecticide was encapsulated by solvent evaporation using a polyethylene glycol - magnetite (Fe_3O_4-PEG) nanocomposite and used as a drug release system. Magnetic nanoparticles were synthesized by a co-precipitation method; then, Imidacloprid was loaded into the nanocomposite as a template drug. Identification spectra (FT-IR, UV-VIS) were performed to confirm the synthesis of nanoparticles and drug loading at its surface, that all spectra represent the synthesis of nanoparticles and drug loading on the nanocomposite. After the variable parameters were determined, the experiment's design was performed using the Plackett-Burman method; The purpose of this research is to obtain the maximum efficiency and investigate the variable parameters. After analyzing the results by spectrophotometer (UV-vis), It was found that the highest efficiency

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