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The Potential of Nanomaterials in Agriculture

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Abstract

Climate change and humanity evolution ask for an optimisation of agriculture procedures and/or new trends to attain a ecological agriculture. The materials science can present the appropriate devices to agricultural activities and experiences from germination, growth up to harvest and post-harvest of agricultural yields. At this point, recent results driven on the eco-friendly features provided by the usage of nanomaterials are discussed to point out the challenges and prospects of nanostructures in the new agriculture era. Nanostructures offer a proposal to fertilizer delivering, mediate pollution in water and control the pathogenic microorganisms which occur in agriculture practices. For example combined treatment of chitosan and sodium benzoate inhibited the development of the *R. stolonifer* fungus in 100% of the evaluated in jackfruit *in-vitro* tests, TiO_2–SiO_2 (TSO) composites are used to promote the germination of tomato seeds. The immobilization of mesoporous materials results in an alternative to help the germination and early growth of agricultural plants searching to avoid the lixiviation of nanomaterials to the environment.

Keyworks: sustainable agriculture, nanomaterials, phytopathogen, environmental damage.

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