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A Review

Application of nano-technology in soil-plant system

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Summary

In this review, we focus on nanomaterial-based technologies and their applications in soil-plant system for better crop management. Indiscriminate use of pesticides and fertilizers causes environmental pollution, emergence of pests, disease, pathogens and loss of biodiversity. Nanotechnology, by virtue of nanomaterial related properties, has potential agro-biotechnological applications for alleviation of these problems. The literature pertaining to the role of nanotechnology in plant and soil systems demonstrates that nanomaterials may assist in the formulations of nanomaterials-based pesticides and insecticides, enhancement of agricultural productivity using bio-conjugated nanoparticles (encapsulation) for slow release of nutrients and water, nanoparticle-mediated gene or DNA transfer in plants for the development of insect pest-resistant varieties and use of nanomaterials for preparation of different kind of biosensors, use of nano clay composite superabsorbent for higher retention of soil moisture and essential plant nutrient is effective in mitigating the drought stress tolerance in the crop. The nanoclay composite with excellent slow release and water-retention capacity, nontoxic to soil and environment, could be especially useful in agricultural and horticultural applications for higher input use efficiency.

Key words : Nano-technology, Soil-plant system

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