

Applications of Nanomaterials in Soil Remediation

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Received: June 2017, and Accepted: July 2018

Abstract

Soil forms the main source of agricultural production; hence, preserving its health and fertility plays an important role in sustainable food production. This warrants maintaining adequate soil nutrients and moisture and minimizing its pollutant load. Nanotechnology might be exploited to achieve these goals toward improved soil properties. Applications of nanotechnology in soil science might include the uses of such materials as nanomodifiers to improve the efficiency of agronomic operations and soil aeration, porous nanozeolites for the slow and effective release of nutrients present in chemical fertilizers, nanohydrogels to increase soil water retention capacity and reduce irrigation water, and nanoparticles to remove contaminants from the soil. However, excessive use of nanomaterials might have toxic effects on soil microorganisms. It follows that sound and proper utilization of nanotechnology as an emerging technology might lead to such beneficial outcomes as food security and development of environment-friendly and sustainable agriculture in developing countries.

Keywords: Soil, Nanotechnology Nanobiochar, Nanosensor, Nanoclay.