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Sommario/riassunto

Nanofertilizers and nanopesticides increase crop efficiency because of a several-fold increase in the surface-to-volume ratio of nano-forms of nutrients and their suitability to foliar application. The potential agricultural benefits of these nanomaterials, their modes of action, and the fate of nanomaterials in the soil are all discussed. This book uses a multidisciplinary approach and highlights the expertise of the authors in the fields of materials science, nanotechnology, nanobiosensors, and agricultural research. It describes the details of nanoscale synthesis of materials for targeted delivery; in vitro, in vivo, and field trials experimentation; how to use digital technology for specific solutions including Big Data to create predictive mathematical modelling; along with the core knowledge of plant systems and their biosphere to improve crop yields. Also, the book discusses future perspectives and challenges of nanomaterials in agricultural applications. In summary, this book discusses agricultural nanobiotechnology with its main emphasis on understanding the interactions of nanoscale materials of pesticides and fertilizers. It also covers their application to improve the quality and increase crop yield with a minimum use of the active ingredients attached to the nanocarriers.