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Current Applications of Nanotechnology in Food and Agriculture

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Introduction

"Nanotechnology, additionally abbreviated in nanotech, is that the use of matter at the atomic, molecular and supra molecular level for industrial purposes. Nanotechnology as a means of substance with at least one size from 1 to 100 nanometers. Nanotechnology, as defined in size, naturally, wide, is including the field of science as a variety of surface sciences, organic chemistry, molecular biology, semiconductor physics, energy storage, Mechanical, micro fabrication and molecular technique." Nanomaterial" denotes that a natural, incidental, or artificial material enclosing particles in associate unbound state or as a mix or as an agglomerate and where, for 50% or extra of the particles within the variety size distribution, one or more external dimension is in the vary 1-100 nm. Materials that have one dimension in the nanoscale are layers; adore graphene, thin films, or surface coatings. Materials that are nanoscale in two dimensions consist of nanowire and nanotube. "The specific properties of Nanomaterials are mainly derived from their increase in relative and quantum effects". Nanotechnology can increase agricultural production and its applications include nano formulations; Nano sensors / biosensors; dwarf devices; Diagnosis of plant disease; Animal health, animal husbandry, poultry production; and postharvest management.

Pesticides are normally utilized in agriculture to boost crop yield and efficiency. Nano pesticides are one among a replacement methods being employed to deal with the issues of non-nano pesticides. Nano pesticides cover a large sort of products, a number of that is already on the market. They can't be thought-about as one entity; rather such nano formulations mix many surfactants, polymers, and metal nanoparticles within the nano meter size range. The shortage of water solubility is one of the limiting factors in the development of crop-protecting agents. Microencapsulation has been used as a flexible tool for hydrophobic pesticides, enhancing their dispersion in liquid media and permitting a controlled unleash of the active compound. Polymers typically utilized in the nanoparticle production are reported. The nanostructured food ingredients are being developed with the claims that they offer improved taste, texture, and consistency .Nanotechnology increasing the shelf-life of different kinds of food materials and also help brought down the extent of wastage of food due to microbial infestation .Nowadays nano carriers are being utilized as delivery systems to carry food additives in food products without disturbing their basic morphology.

Conclusion

Over past years the recognition of the uses of structures on the nm scale within the food sector is increasing, therefore, interest and activities during this analysis space have greatly focused. As nano biotechnology steps forward, devices or material supported this technology become smaller and a lot of sensitive. "Nanotechnology applications are currently being investigated, tested, tested, and in some cases already used throughout the food technology spectrum from agriculture to processing, packaging and dietary supplements." They're with distinctive chemical, physical, and mechanical properties. In recent years, agricultural waste products have attracted attention as supply of renewable raw materials. Green strategies for synthesizing nanoparticles with plant extracts are tremendous as it's far simple, convenient, environment friendly and require much less response time. Nanomaterials organized through green and inexperienced strategies may also boom agriculture ability for enhancing the fertilization process, plant boom regulators, insecticides transport of energetic issue to the preferred goal sites, remedy of wastewater and additionally improving the absorption of vitamins in plant.