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Nanotechnology in agriculture

The use of nanotechnology in agriculture is definitely linked to the following: reproduction of agricultural species, processing of final products and the improvement of its quality. Nanotechnology is already used for disinfection of air, and a variety of materials, including final products and feed livestock; seed and crops treatment in order to save it. They are used for stimulating the plants growth; treatment of animals; improving the quality of fodder.

It should be mentioned that these technologies were implemented in order to reduce energy consumption in production sphere, optimization of raw materials and processing methods to increase the amount of the final products; new packaging materials development. Most of them are related to the food industry, the use of nanomaterials in food packaging or identification, and in some cases, neutralization of dangerous toxins, allergens or pathogens. Different projects are developing in order to create and improve the quality and properties of nutritional supplements, oil with nanoadjunct to prevent the entry of cholesterol into the blood of mammals. Now it is difficult to estimate all benefits from the introduction of nanotechnology in agriculture, but it will certainly allow us to intensify agriculture and increase the competitiveness of stock-raising products.

Technology in agriculture:

Agricultural or “agrobot” robot - a robot used for agricultural purposes.
BoniRob - a prototype of an autonomous field robot, invented at Amazonen-Werkecompany. Harvest time is the main field of robot application in agriculture. Agricultural industry lags behind other industries in the use of robots. This is the result of the fact that different kinds of agricultural works are not "straightforward". Robots can be used for other crop production tasks, such as pruning, weeding / plowing, irrigation and monitoring.

The closed ecosystem is an ecosystem without any exchange of matter with the environment. Such systems are of scientific interest and could potentially serve as a life-support systems during spaceflight, space stations and space colonies.

Genetically modified food. This is food produced from genetically modified organisms (GMOs) - plants, animals or microorganisms. Products that were obtained with the use of genetically modified organisms or include at least one component based on GMO containing products. Genetically modified organisms get some new properties due to the transfer of individual genes in the genome of any organism in theory or from the genome of related species (transgenesis).

In vitro meat or artificial meat never was a part of living animal. Several current research projects are performing experiments trying to grow meat in vitro. The first phase is likely to produce minced meat, and the long-term goal is to grow high-grade muscular tissue. Potentially, any animal muscular tissue can be grown in vitro.

Vertical Farm - generic name of highly automated agriculture, housed in a specially designed high-rise building. However, all the evidence in favor of that, if not cereal, for important crops that require a truly gigantic size, but vegetables, herbs, mushrooms, berries - all these can and must be grown in an urban setting. This will eliminate transportation costs and damage to the fruit during transport. Moreover, the products which are grown indoors, protected from contaminated sediments and from most of the pests, work stages, the harvest is not dependent on the time of year. Also, the development of vertical farms will allow many people to engage in agriculture, while not losing the benefits provided by the city.

Plant growth regulator "Nano-Gro" is a breakthrough in the application of nanotechnology in agriculture. Growth regulator is widely used in the United States, Canada, Israel, China, Turkey and the European Union. Growth regulator Nano-Gro is intended for pre-treatment of seeds, bulbs, tubers, seedlings and cuttings and seedlings of

perennial plants. Incredible effect is achieved by the release of plant reserves and the direction of them to increase yield. The key principle of this drug has nothing to do with genetic engineering, using instead the mechanisms laid down by nature.

The drug is used for pre-treatment of seeds and doesn't require any additional efforts or costs. This year 280 thousand rubles were spent for the purchase of "growth regulators". In the future, it is planned to increase this amount greatly.

We became interested in these problems as it's well-known that the world population is constantly growing. As the result in the nearest future our civilization will face the problem of lack of agricultural lands. This problem forced scientists to develop these nanoprojects.

References:

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