

Nano Materials

Ashmita Sharma¹ and Jassi Singh²

^{1,2} Research scholar, Horticulture (Fruit science), School of Agriculture, ITM University, Gwalior

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Introduction:

In the current scenario, in regarding to requirement of the rapidly growing population, nanotechnology are very innovative ideas to the revolution for agricultural technical systems to reform the supply food security agricultural systems. Therefore, nanomaterials have contributed to transform modern agricultural practices and it is practised at nano-scale. With the small size and high surface area that provides greater strength, stability and chemical and biological activities. Have a great role and contribution in food packaging helps to detect microbial contamination and enhance bioavailability of nutrients.

History:

Over the past ten years, there has been a lot of attention and investment in the use of nanoparticles as additives to improve the performance of materials. Due of their benefits for the environment, natural abundance, inexpensive cost, and contribution to better qualities, layered silicates like clay are the most used nano reinforcing particles. In the 1980s, the Toyota Company was the first to manufacture multilayer silicate-based nanocomposite materials for automotive applications.



As a way to improve the performance of materials, nano-based composites continued to get more and more interest in the years that followed. In response to environmental concerns, there has recently been a resurgence of interest in creating a new class of bioplastic materials

reinforced with nanocomposites. Although clay-based nanocomposites have been developed successfully, there are still several limits in their design and manufacture. Additionally, their large-scale applications are still in the early phases of development. The performance of starch-based bioplastics has been improved by the introduction of nanoparticle additions, which is reviewed in this work. There are also recommendations for the course of future study.

Food packaging in nano material in different agriculture sectors:

- The use of nanomaterials and their nanotechnology is very good in food packaging and there is a lot of interest in it nowadays.
- It is full of advanced qualities. This gives a lot of increase in the self-life of the food like if someone takes any food products or fruit which has less shelf life in different agriculture sector, we can increase the life of product or fruits if you take any fruit then its shelf-life cycle is less than its shelf life is better to application to this technology and
- It can also make significant contribution in agriculture sector by increasing the supply chain.
- Nanomaterials are used as additives (e.g., Vitamins, Antimicrobials, Antioxidants) in nutrients and health supplements and preserve food during storage.

The shelf life of food can be extended by nano materials:

- Based on nanotechnology, shelf-life extension has been developed to enhance the shelf-life of fruits by enhancing the shelf-life of fruits by developing active and smart nano-coatings in different types of technology based on its potential in view of traditional preservation, so that it can express itself in such a way.
- Can convert from by developing advanced packaging in this way, you can keep fresh produce self-live for a long time and by using it extensively in different areas, you can increase the shelf life of many fruits.
- Packaging with nano-silver particles to make them antibacterial employing barriers (Polyethylene) and packaging embedded with silicon nano-particles that aid to identify infections are some examples of how nanoparticles are used in food. Titanium dioxide is the most prevalent nanoparticle utilised in meals.
- Carbon Nanotubes is one of the significant advanced carbon nano-particles with greater contribution to the packaging quality and security of food. Nano-Magnesium Chloride may extend shelf life in a variety of food goods.

How beneficial in the sector of post-harvest technology:

- This is the importance of Post harvest fact lies in the fact that it is used in many of its methods.
- The operation of which is important in our agriculture without inance the raw material and more nutritious foods.
- In view of its increasing population, its needs have to be balanced to provide good quality food. It becomes one of the main objectives.
- But as we see that nowadays post-harvest is being used in different ways, then it can be used to make a very useful product by providing nanotechnology or nanomaterials, which can be used by human beings at present time to take a great chance to be able to use our farmers and or family.

Influence of nano material technology on medicinal as well as aromatic plants:

- There always have been many struggles to cultivate the fruit.
- These conflicts are such that the fruit and on flower growing such as a difficult task.
- Nanomaterials in Pomology and in the field of floriculture cultivation has reduced and the wastage are reduced to use these advance nanomaterials techniques.
- This is very useful due to which the systematic growing becomes improved to a great extent.
- Nanomaterials as a growth regulator in Medicinal and Aromatic Plants.
- There has been technically beneficial by using the nanomaterial with plants and environment.
- There has been seen a different types of qualitative changes in Floriculture, Medicinal & Aromatic plants and in Late maturity period, such as by applying Tio₂ (Titanium dioxide) on Marigold for the better and faster growth and development and enhance the nano- coated fruits.

Why should farmers use that the advance technology:

- Nanotechnology includes Nano-fertilizers, use of effective herbicide and pesticides helps farmers to improve their productivity of crops.
- Nanomaterials also practised as a sensor to detect contamination helps them in preservation and improving food quality.
- Nanotechnology helps to reduce the nutrient losses to give better yield.

- It helps to increase shelf life to give better quality of food.
- It helps to improve soil quality.
- Nanomaterials used as a Plant growth regulator that gives beneficial effects to crops for providing better outcomes to the farmers.



Conclusion:

The potential for Nano Materials to play a promising role in several facets of the food business, including as packaging, storage, distribution, and enhancing the quality and flavour of food ingredients, has been demonstrated. Although it has revolutionised the food industry through the nano-processing and nano-packaging of foodstuffs, in addition to ensuring the safety and quality of food products through the use of cutting-edge nanosensors, the data collected to date on the potential applications of NT indicates that the utilisation of NT in the food industry is still in the early stages. The targeted administration of active chemicals is made easier and the shelf-life of the food items is extended by nano-encapsulating bioactive compounds.

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