13 Sep 2020: PIB Summary & Analysis

1. Nano fertilizers

Context:

IFFCO's Nano experiment.

What are Nano Fertilizers?

- Nano fertilizers are synthesized or modified form of traditional fertilizers, fertilizers bulk materials or extracted from different vegetative or reproductive parts of the plant by different chemical, physical, mechanical or biological methods with the help of nanotechnology used to improve soil fertility, productivity and quality of agricultural produce.
- The term 'nano fertilizer' is used for both materials of a physical diameter between 1 and 100 nm in at least one dimension (e.g., ZnO nanoparticles) and those existing at the bulk scale with more than 100 nm in size but that have been modified with nanoscale materials (e.g., bulk fertilizer coated with nanoparticles).

Background:

- Nanoscience and Nanotechnology research in agriculture and horticulture are still at an elementary stage but developing rapidly.
- Conventional bulk fertilizer or traditional fertilizers are not only expensive for the producer, but may be harmful to humans and the environment.
- This has led to the search for environmentally friendly fertilizers or smart fertilizer, mainly those with high nutrient-use efficiency, and nanotechnology is rising as a promising alternative.
- The exceptional properties of nanoparticles, such as high surface area/volume size ratio and enhanced optoelectronic and physicochemical properties, compared to their bulk counterparts, are now emerging as a promising strategy to promote plant growth and productivity.

Advantages of Nano Fertilizers:

- Farmers or growers mainly apply conventional fertilizers through the soil by either surface broadcasting, subsurface placement, or as fertigation or with irrigation water. However, a large portion of applied fertilizers is lost to the atmosphere or enters water bodies, finally polluting our ecosystems.
- Nano fertilizers are required in a small amount which reduces the cost of transportation and field application.
- Their nutrient delivery system is slow or through a control release mechanism, this is associated with the covering or cementing of nutrients. By taking advantage of this slow nutrient delivery, growers can increase their crop growth because of consistently long-term delivery of nutrients to plants.
- The accumulation of salt in soil can be minimized as it is required in a small amount.
- They can be synthesized according to the nutrient requirements of planned crops.
- The miniature size, high specific surface area and high reactivity of nano fertilizers increase the bioavailability of nutrients.
- Providing balanced nutrition, nano fertilizers facilitate the crop plants to fight various biotic and abiotic stresses.

Concerns

However, there could be concerns associated with nano fertilizers as well. The properties of many nanoparticles are considered to be of potential risk to human health, viz., size, shape, solubility, crystal phase, type of material, and exposure and dosage concentrations. However, expert opinions indicate that food products containing nanoparticles available in the market are probably safe to eat, but this is an area that needs to be more actively investigated.

2. Hindi Diwas

Context:

Hindi Diwas is observed every year on 14th September to mark the occasion of the adoption of Hindi as the official language of India in 1949.

To know more about Hindi Diwas, check This Day in History dated 14th September.

3. Sessions of Parliament

Context:

Monsoon session 2020 of Parliament begins.

To know more about the sessions of the Indian Parliament, click on the linked article.

4. Genomic sequences of SARS-CoV-2

Context:

Scientists around the world including in India are working on genomic sequences of SARS-CoV-2.

Details:

- Scientists are aiming to identify the genetic variability and potential molecular targets in virus and humans to find the best possible answer to combat the COVID-19
- A team of researchers at the National Institute of Technical Teachers' Training and Research, Kolkata have developed a web-based COVID Predictor to predict the sequence of viruses online on the basis of machine learning and analysed 566 Indian SARS-CoV-2 genomes to find the genetic variability in terms of point mutation and Single Nucleotide Polymorphism (SNP).
- The study is sponsored by the Science and Engineering Research Board (SERB), a statutory body under the Department of Science and Technology (DST).
- They have mainly found that 57 out of 64 SNPs are present in 6 coding regions of Indian SARS-CoV-2 genomes, and all are nonsynonymous in nature.
- The scientists are on the track to identify the genetic variability in SARS-CoV-2 genomes around the globe including India, find the number of virus strains using Single Nucleotide Polymorphism

(SNP), spot the potential target proteins of the virus and human host based on Protein-Protein Interactions.