

Bio Stimulants

Mains: *GS III – Science and Technology | Developments and their Applications and Effects in Everyday Life | Bio-technology and issues relating to Intellectual Property Rights.*

Why in news?

Recently, the Indian farmers has raised complaints about the inefficacy of the bio stimulants.

What are bio stimulants?

- **Definition** – It is a substance or microorganism or a combination of both whose primary function when applied to plants, seeds or rhizosphere is to stimulate physiological processes in plants.
- **Purpose** – It is to enhance its nutrient uptake, growth, yield, nutrition efficiency, crop quality and tolerance to stress.

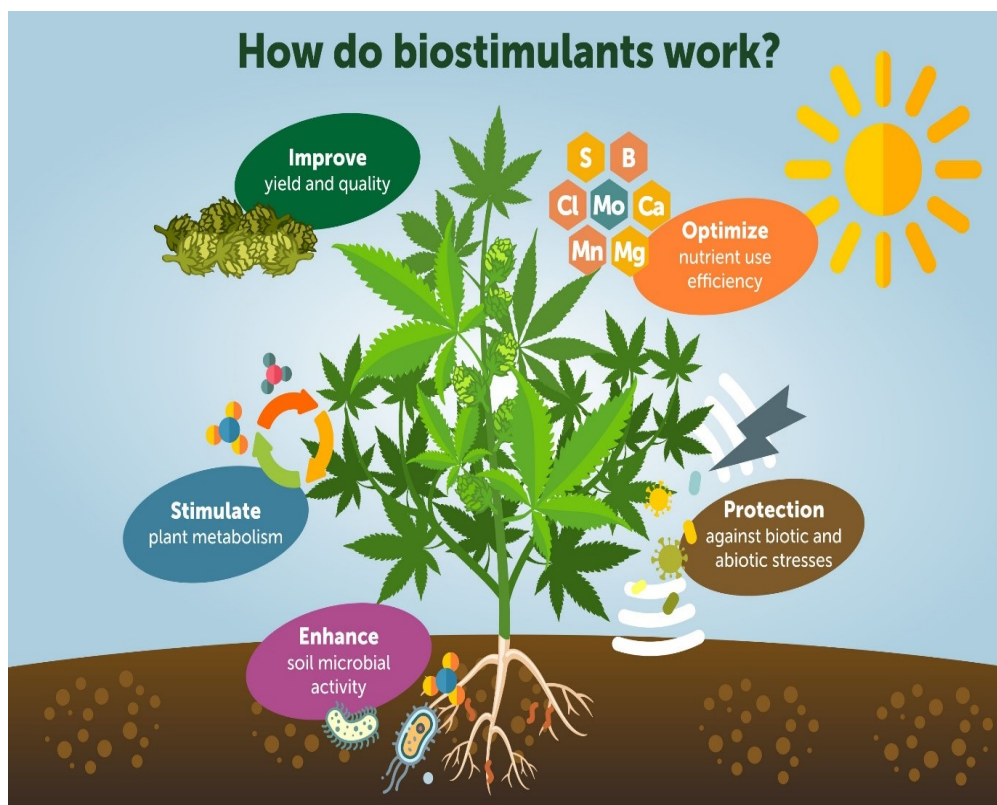
Rhizosphere is the area around a plant root that is inhabited by a unique population of microorganisms, influenced by the chemicals released from plant roots.

- **Constituents** – Plant-derived waste materials and seaweed extracts.
- **Application**

MODE OF APPLICATION OF BIOSTIMULANTS



- **Working**



Why they need to be regulate in India?

Bio Stimulant Market in India

- **Current value** - The India bio stimulants market size was valued at USD 355.53 million in 2024.
- **Future projections** - The market is projected to grow from USD 410.78 million in 2025 to USD 1,135.96 million by 2032, exhibiting a CAGR of 15.64% during the forecast period.

Compound Annual Growth Rate (CAGR), is a way to describe the average annual growth rate of an investment over a specified period

- **Absence of classification** - Bio stimulants did not fall under the existing fertilizer or pesticide categories.
- **Unregulated sale** - They were sold in the open market without government approval for a long time.
 - Around 30,000 bio stimulant products had been sold unchecked for several years in India.
- **Increased sale** - As the sale of bio stimulants increased over the years, it is high time for Centre's regulation.

How they are regulated in India?

- **Control orders** - The Fertilizer (Inorganic, Organic or Mixed) (Control) Order (FCO), 1985, regulates the manufacturing and sale of bio stimulants.
- They are issued under the Essential Commodities Act, 1955, and makes changes to it from time to time.
- In 2021, FCO was amended to include bio stimulants, paving the way for their regulated manufacturing, sale and import.
- **Judicial intervention** - In 2011, the Punjab and Haryana High Court held that 'any manufacturer producing a bio product claiming to be a substitute for insecticides or fertilizer, but not covered under the rules, was to apply to the respective Director General of Agriculture, in the case of Haryana and Punjab.
- This paved the way for states to take samples of these products and check them before allowing their sale to farmers.
- **Frameworks** - In 2017, NITI Aayog and the Agriculture Ministry started working on a framework for bio stimulants.

Recent Regulation Guidelines

- **Time limit for sale** - According to the FCO order, manufacturers could make and sell bio stimulants for 2 years if they made an application for provisional registration.
- **Extension of permission** - The 2 year deadline was extended continuously which allowed most of the manufacturers to continue production and selling bio stimulants.
- **Recent Extension** - In March 2025, the bio stimulants' sale was allowed for 3 months until June 16, 2025.
- It applied to all companies manufacturing or importing a bio stimulant, for which no standards were specified.
- **Prohibition on sale** - With the March 17 notification having expired, the companies having provisional certificates and stocks of bio stimulants cannot sell their products in the market now.
- **Specifications of Bio stimulants** - Tomato, chilli, cucumber, paddy, urinal, cotton, potato, green gram, grape, hot pepper, soybean, maize, and onion.

Provisional registration is a temporary approval granted to fertilizer manufacturers or dealers, while regular registration is the long-term, permanent registration.

How did FCO regulate bio stimulants?

- **Fixing of conditions** - The inclusion of bio stimulants empowered the Central government to fix specifications.
- **Classification** - Bio stimulants specified in Schedule VI of the FCO are classified into 8 categories.
 - For example, it includes botanical extracts (as well as seaweed extracts), bio-chemicals, vitamins, and antioxidants.
- **Submission of application** - Every manufacturer or importer of a bio stimulant shall make an application to the Controller of Fertilizers along with the requisite product information.
- **Disclosure of information** - The product's chemistry, source (natural extracts of plant/microbe/animal/synthetic), shelf-life, reports of bio-efficacy trials, and toxicity must be submitted, along with other data.

5 Basic Acute Toxicity Tests	4 Eco-toxicity Tests
<ul style="list-style-type: none">• Acute oral (Rat)• Acute dermal (Rat)• Acute Inhalation (Rat)• Primary skin Irritation (Rabbit)• Eye irritation (Rabbit)	<ul style="list-style-type: none">• Toxicity to birds• Toxicity to Fish (Freshwater)• Toxicity to honeybees• Toxicity to earthworm

- **Acceptable limit** - No bio stimulant shall contain any pesticide beyond the permissible limit of 0.01 ppm (parts per million).
- **Agronomic Bio-efficiency trials** - It shall be conducted under the National Agricultural Research System, including the Indian Council of Agricultural Research and state agricultural universities.
- The trials shall be conducted at minimum 3 different doses for one season at three agro-ecological locations.
- **Central Bio stimulant Committee** - It was constituted for 5 years, with the Agriculture Commissioner as its Chairperson and 7 other members.
- It shall advise the Centre on
 - Inclusion of a new bio stimulant
 - Specifications of various bio stimulants
 - Methods of drawing of samples and its analysis
 - Minimum requirements of laboratory
 - Method of testing of bio stimulants
 - Any other matter referred to it by the central government.

What lies ahead?

- Institutions like the ICAR could evaluate bio stimulants to uphold the trust of farmers and ensure their technical usefulness.

- Only those bio stimulants that meet all the criteria of scientific validation and are proven beneficial to farmers could be approved.

Reference

[The Indian Express| Regulation of Biostimulants in India](#)

