Plant Biostimulants & Biofertilizers Regulation in the US

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Beneficial Substance

- **“Beneficial Substance”** means any substance or compound other than primary, secondary, and micronutrients, excluding pesticides, that can be demonstrated by scientific research to be beneficial to one or more species of plants, soil or media. A beneficial substance includes, but is not limited to plant biostimulants.

Beneficial Substances Umbrella

- **Beneficial Substances**
  - Plant Biostimulants / Biofertilizers
  - Soil Amendments

What is a Plant Biostimulant

- **“Plant Biostimulant”** means a substance(s) or microorganism(s), or mixtures thereof, that, when applied to seeds, plants, the rhizosphere, soil, or other growth media, act to support a plant’s natural nutrition processes independently of the biostimulant’s nutrient content. The plant biostimulant thereby may improve nutrient availability, uptake, or use efficiency, tolerance to abiotic stress, and consequent growth, development, quality, or yield.

- Officially recognized by AAPFCO – February 2024

AAPFCO Plant Biostimulant Timeline

- Regulatory discussions on plant biostimulants began with the AAPFCO in 2013
- AAPFCO created formal Biostimulant Committee in late 2019
- AAPFCO's Beneficial Substances Uniform Bill
  - Encompasses definitions for beneficial substances, plant biostimulants, and establishes labeling standards.
  - Goal is to bring standardization and uniformity to all US states and Canada
- Next Steps
  - Continue adoption of other ingredients as "plant biostimulants"
  - Initiating recognition of **beneficial microorganisms** as a group
  - Support from California

California Leading the Way

- **California's Senate Bill 1522**
  - Signed August 26, 2024
  - Defines Plant Biostimulant
  - Defines Beneficial Substance
  - Created a Beneficial Substance Product Category
  - Corresponding rulemaking is currently underway for early 2025 adoption

AAPFCO-Recognized Plant Biostimulants

- Official Plant Biostimulants within AAPFCO as of August 2024:
  - Seaweed Extract
  - Kelp Extract
  - Humic Acid
  - Hydrophobic Fulvic Acid*
  - Fulvic Fraction*

*Not currently recognized in California

Other Materials Under Consideration As Plant Biostimulants

- Beneficial Microorganisms
- Protein Hydrolysates
- Plant Extracts
- Enzymes & Amino Acids
- Inorganic Elements or Compounds (Soluble Silicon, Iodine, etc.)

Regulation of Biostimulant Products in the US

- There has always been path to market for plant biostimulant products in the United States
- Companies are required to **identify** and guarantee what the “plant biostimulant” ingredients are listed on labeling.
  - If the ingredient presently recognized by AAPFCO, it is typically permitted to claim on labels in most US states and Canada
- Until Feb 2024, the term “plant biostimulant” was largely prohibited across the US, but the products/ingredients can be lawfully sold.

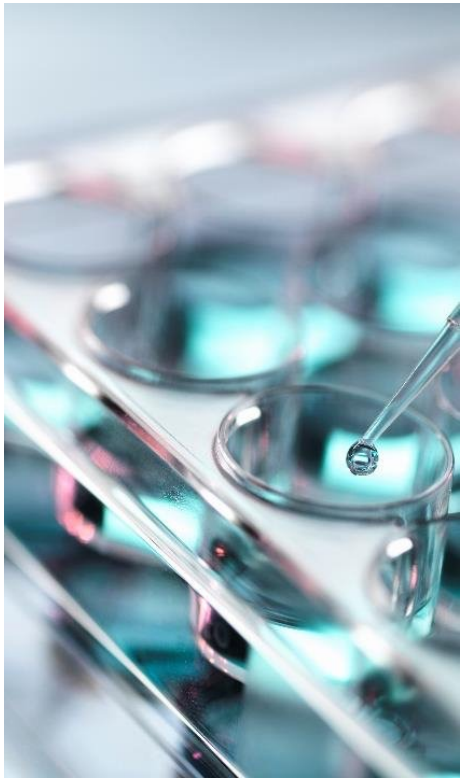
List of Microbial Agents Biostimulant

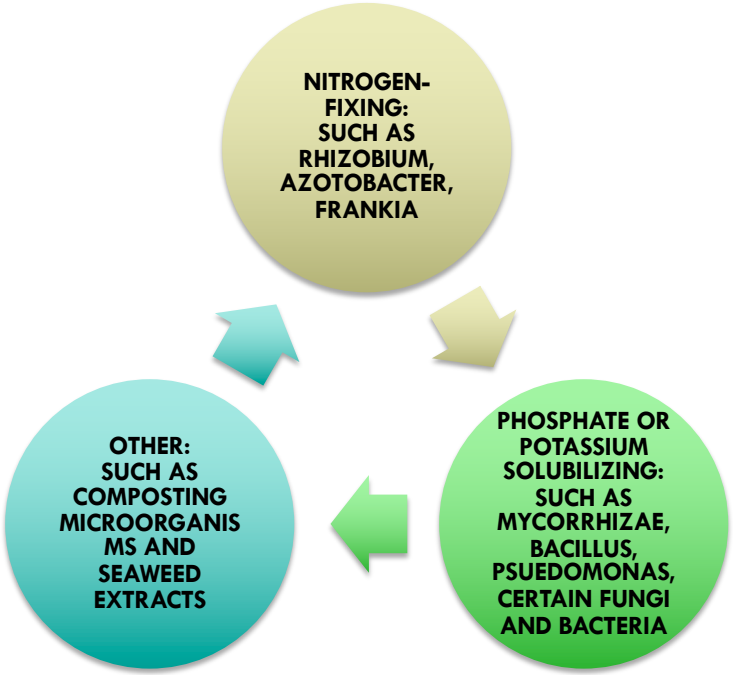
- As of February 2025, 226 microbial agents are recognized as biostimulants by AAPFCO. These agents will have an easy review and approval by most states.
- Other microbial agents may take more time for review.
- Future addition of microbes may be added this summer
- The process for adding microbes is not determined yet.,, but will require some form efficacy testing…

WHAT ARE BIOFERTILIZERS?

- Natural fertilizers containing living microorganisms
- Enhance soil fertility and plant growth
- Key to sustainable agriculture and conservation

TYPES OF BIOFERTILIZERS





Ways They Work

NUTRIENT UPTAKE	SOIL HEALTH	DISEASE RESISTANCE
ENHANCE PLANT NUTRIENT ABSORPTION	IMPROVE SOIL STRUCTURE AND MICROBIAL ACTIVITY	SOME BIOFERTILIZERS INCREASE THE PLANT VIGOR AND MAY PROMOTE PLANT RESISTANCE TO DISEASE*

Example: Trichoderma spp.

- **Mechanism**: Trichoderma works by outcompeting pathogenic fungi in the soil, producing antifungal compounds, and enhancing the plant's own defense mechanisms.
- **Application**: When applied to crops like tomato or cucumber, Trichoderma can significantly reduce the incidence of root rot caused by pathogens such as *Phytophthora* and *Fusarium*.
- **Outcome**: Studies have shown that plants treated with Trichoderma exhibit improved health and yield, while also demonstrating greater resilience to diseases, resulting in lower crop losses and reduced need for chemical fungicides.

Source: "Trichoderma as a Biocontrol Agent: A Review." *Biological Control*, 2018.

Benefits of BioFertilizers

ENVIRONMENTAL:

- REDUCE DEPENDENCY ON CHEMICAL FERTILIZERS, DECREASING SOIL AND WATER POLLUTION.
- LOWER GREENHOUSE GAS EMISSIONS ASSOCIATED WITH FERTILIZER PRODUCTION.

ECONOMIC:

- COST-EFFECTIVE SOLUTION FOR FARMERS, REDUCING INPUT COSTS WHILE INCREASING YIELDS.
- IMPROVED CROP QUALITY CAN LEAD TO BETTER MARKET PRICES.

SUSTAINABILITY:

- ENHANCES LONG-TERM SOIL FERTILITY AND BIODIVERSITY, SUPPORTING RESILIENT AGRICULTURAL SYSTEMS.

Regulatory Considerations

knoell worldwide registration

SAFETY	QUALITY STANDARDS	LABELING REQUIREMENTS
RESPONSIBILITY TO ENSURE BIOFERTILIZERS DO NOT INTRODUCE HARMFUL PATHOGENS OR TOXINS INTO THE ECOSYSTEM.	ESTABLISH CLEAR GUIDELINES FOR PRODUCTION, FORMULATION, AND EFFICACY TESTING TO ENSURE CONSISTENCY AND RELIABILITY.	CLEAR LABELING OF ACTIVE MICROORGANISMS, APPLICATION RATES, AND USAGE INSTRUCTIONS TO INFORM CONSUMERS AND PROMOTE PROPER APPLICATION.

Challenges in Regulation

- **STANDARDIZATION**:
  - THE ABSENCE OF UNIFORM REGULATIONS CAN LEAD TO INCONSISTENCIES IN PRODUCT QUALITY AND EFFICACY.
- **RESEARCH AND DEVELOPMENT**:
  - MORE EXTENSIVE RESEARCH IS NEEDED TO ASSESS THE LONG-TERM EFFECTS AND BEST PRACTICES FOR VARIOUS BIOFERTILIZERS.
- **MARKET ACCEPTANCE**:
  - OVERCOMING SKEPTICISM FROM TRADITIONAL FARMERS REQUIRES EDUCATION ON THE BENEFITS AND SUCCESS STORIES OF BIOFERTILIZER USE.