Bioinputs for Food Security and Economic Resilience

More productive farms. Healthier soils. Stronger agricultural economies.

WHY IT MATTERS

Farmers face growing pressures from rising and volatile input costs, the degradation of soils and ecosystems, and supply chains increasingly vulnerable to energy and geopolitical shocks.

Bioinputs offer an alternative approach, using living organisms, biological processes and natural materials to support agricultural production. They can complement conventional inputs, improve their efficiency or, in some contexts, replace them altogether. As such, bioinputs form part of a broader transition towards more locally adapted and resilient farming systems.

FOUR TYPES OF BIOINPUTS

01.
BIOFERTILIZERS AND MICROBIAL INOCULANTS
Microbes that support nutrient availability and absorption, including biological nitrogen fixation.

02.
BIOLOGICAL CROP PROTECTION
Beneficial insects, microbial biopesticides and pheromones to help manage pests and diseases.

03.
BIOSTIMULANTS
Products that support plant processes, nutrient-use efficiency, root function or tolerance to stress.

04.
SOIL IMPROVEMENT
Biological solutions, including microbial composting aids, that help recycle nutrients and support soil fertility.

WHY INVEST IN BIOINPUTS



FARMERS
Potential to improve nutrient efficiency, support productivity and reduce exposure to chemical input price shocks.



ECONOMIES
A growing market attracting major investment and supporting local businesses and rural opportunities.



FOOD SYSTEMS
Better nutrient management and biological processes supporting soil health and efficient resource use.

THE ECOSYSTEM

Researchers & knowledge institutions
Locally validated evidence

Governments & regulators
Clear regulations, standards and commercialization pathways

Investors & financial institutions
Investment in research and production

Businesses & industry
Reliable distribution

Farmers & producer organizations
On-farm validation and performance feedback

Civil society & international organizations
International cooperation

Outcomes depend on the product, crop, soil and management context.

Rethinking fertilizer systems

The goal is not simply to secure more fertilizer or replace one product with another, but to build resilient nutrient systems.

Healthy soils and their microorganisms underpin nutrient cycling and absorption; better agronomy and locally adapted mineral, organic and biological solutions can work together to improve efficiency and reduce avoidable losses.

Priorities differ: some regions need better access to nutrients, while others need to address inefficient use.

The **Belém Declaration** and **Fertilizers Plan to Accelerate Solutions (PAS)** provide platforms for implementation, including lower emissions and stronger farmer support.

"A Micro Green Revolution, a green revolution, but with microorganisms."

Dr. Mariangela Hungria · 2025 World Food Prize laureate

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AMBITION LOOP