

Use of Biological Products in Agriculture

- These products are derived from living organisms, such as plants, beneficial insects, animals, microorganisms (microbials), and others.
- Microbial products can provide biological pest control, fertility, and yield enhancement for crops.
- These naturally-occurring solutions can complement or replace traditional fertilizers and chemicals to help farmers improve crop health and productivity while limiting the environmental impact of agriculture.

What are Agricultural Biological Products?

Interest in biological products has increased recently. This is primarily due to research that has demonstrated the economic benefits of these products and credible performance in integrated crop management systems. These products are derived from living organisms, such as plants, beneficial insects, animals, microorganisms (microbials), and others. They can be modified to improve suitability for agricultural uses. These naturally-occurring solutions can complement or replace traditional fertilizers and chemicals to help farmers improve crop health and productivity while limiting the environmental impact of agriculture.

There are several groups of products within this diverse category:

- Naturally-occurring biochemical pesticides, such as pheromones, growth regulators, enzymes, and vitamins that control pests by non-toxic mechanisms or modify pest behavior.
- Plant oils and extracts or extracts from other sources.
- Microbials such as fungi, bacteria, viruses, and protozoa.
- Other living organisms such as microscopic insects, plants, and animals.

Microbials

Microbial products are derived from naturally-occurring microorganisms such as bacteria, fungi, or nematodes. They can be seed-applied, used in-furrow, or sprayed on crops to protect plants from pests and diseases, or enhance plant productivity and fertility. Microbials have many potential weed, insect, and disease targets but each individual microbial strain is relatively specific to a target. Microbial products offer the potential to deliver sustainable, cost-effective solutions that can help increase yield while using less input.

BioControl Products

Products in this category help protect plants against insects, diseases, nematodes, and weeds. Fungi, bacteria, and other microbes can exhibit biocontrol activity. Commercially available bacterial products that grow with roots can provide pest

protection for the crop. Another example of is a fungus-based biocontrol product, metarhizium, which provides control of thrips, mite, and vine weevil pests of fruits and vegetables. Spores of the fungus attack the surface of these pests, thereby limiting crop damage.

BioFertility Products

Products in this category can help improve plant access to and use of nitrogen, phosphate, and other soil nutrients. Currently available inoculant products grow with or in association with plant roots to enhance plant uptake of soil and fertilizer phosphate or promote optimum nitrogen-fixation and root growth.

BioYield Products

Bioyield enhancers are products derived from plants and microorganisms that enhance the crop's nutritional capabilities to improve plant growth, increase stress tolerance, and improve yields. An example of a bioyield enhancer is an isoflavonoid signaling technology that can be applied to the seed, in-furrow, or on the foliage in crops, such as soybean, cotton, corn, and alfalfa.

Agricultural biological products provide benefits for better integrated pest control and crop enhancement to improve crop productivity.

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For additional agronomic information, please contact your local seed representative.

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