**Biofertilizers**

Biofertilizers are carrier based preparations containing beneficial microorganisms in a viable state intended for seed or soil application and designed to improve soil fertility and help plant growth by increasing the number and biological activity of desired microorganisms in the root environment.

Biofertilizers are the [microbial inoculants](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/microbial-inoculant) which can be usually defined as a preparation containing living microgranisms are the efficient strains of nitrogen fixing, phosphate solubilizing etc.

In contrast to chemical fertilizers, biofertilizers are viable microorganisms which are not the source of nutrients but provide help to plants in accessing the nutrient availability in rhizospheric region. Several microorganisms are commonly used as biofertilizers including nitrogen-fixing soil bacteria (*[Azotobacter](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/azotobacter%22%20%5Co%20%22Learn%20more%20about%20undefined%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages)*, *[Rhizobium](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/rhizobium%22%20%5Co%20%22Learn%20more%20about%20undefined%20from%20ScienceDirect%27s%20AI-generated%20Topic%20Pages)*), [nitrogen-fixing cyanobacteria](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/nitrogen-fixing-cyanobacteria) ([*Anabaena*](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/anabaena)), [phosphate-solubilizing bacteria](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/phosphate-solubilizing-bacteria) ([*Pseudomonas*](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/pseudomonas) sp.), and AM fungi.  Biofertilizers are low-cost, renewable sources of plant nutrients. These are the strains of beneficial soil microorganisms which are cultured and packed in suitable carrier in laboratory. Biofertilizers have various other benefits for example control [soil-borne diseases](https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/soil-borne-diseases), improves soil health, soil properties and result in higher yield rates.

**Commercially available biofetilizers and their manufacturers, beneficiary crop and associated microorganisms**

|  |  |  |  |
| --- | --- | --- | --- |
| Product | Manufacturer’s name | Microbe used  | Beneficial Crop |
| Nitragin TM | Nitragin Sales Corpn. Wisconsin, 53209 | *Rhizobium* | Soybean |
| Rhizocote  | Coated seed ltd., Nelson, New Zealand  | *Rhizobium* | Legumes |
| Nodosit | Union Chemiques S.A. Belzium | *Rhizobium* | Legumes |
| Rhizonit | Phylaxia Allami Budapest, Hungary | *Rhizobium* | Legumes |
| Nitrazina | Wytwornia Walcz. Poland | *Azotobacter*  | Rice and wheat |
| Nodian | Indian Organic Chems. Ltd. Mahew Mahal, Bombay  | *Rhizobium*  | Legumes  |
| Azoteeka  | Bacifil, 25 Nawal Kishore Rd. Lucknow | *Azotobacter*  | cereals |
| Agroteeka  | National fertilizers & Chemicals 11, Ind. Area- II, Ramdarbar, Chandigarh | *Azotobacter*  | Wheat, rice, maize, tea, sugarcane, potato |
| Rhizoteeka  | Microbes India, 87, Lenin Savabe, Calcutta  | *Rhizobium*  | Legumes |

Advantages of Biofertilizers

Sustainability

Biofertilizers increase the nitrogen and phosphorus available to plants more naturally than other fertilizers. Biofertilizers are simple to use, even for novice small growers. Biofertilizers do not pollute the soil or the environment, whereas chemical fertilizers often result in too much phosphate and nitrogen in the soil. The excess then leaches into lakes and streams through runoff. Waters decline in quality and suffer from overgrowth of algae and the death of fish.

## Improved Soil

Biofertilizers restore normal fertility to the soil and make it biologically alive. They boost the amount of organic matter and improve soil texture and structure. The enhanced soil holds water better than before. Biofertilizers add valuable nutrients to the soil, especially nitrogen, proteins and vitamins. They take nitrogen from the atmosphere and phosphates from the soil and turn them into forms that plants can use.

## Improved Plants

Biofertilizers increase yield by up to 30 percent because of the nitrogen and phosphorus they add to the soil. The improvement in soil texture and quality helps plants grow better during periods of drought. Biofertilizers help plants develop stronger root systems and grow better. Biofertilizers also reduce the effects of harmful organisms in the soil, such as fungi and nematodes.