

Biofertilizers: An Essential Source of Plant Nutrient

**Monika Yadav*, Archana
Brar and Sumit Deshwal**

Department of Vegetable
Science
CCS Haryana Agricultural
University
Hisar, Haryana, India



Open Access

*Corresponding Author

Monika Yadav*

Available online at
www.sunshineagriculture.org

Article History

Received: 15.09.2021

Revised: 24.09.2021

Accepted: 8.10.2021

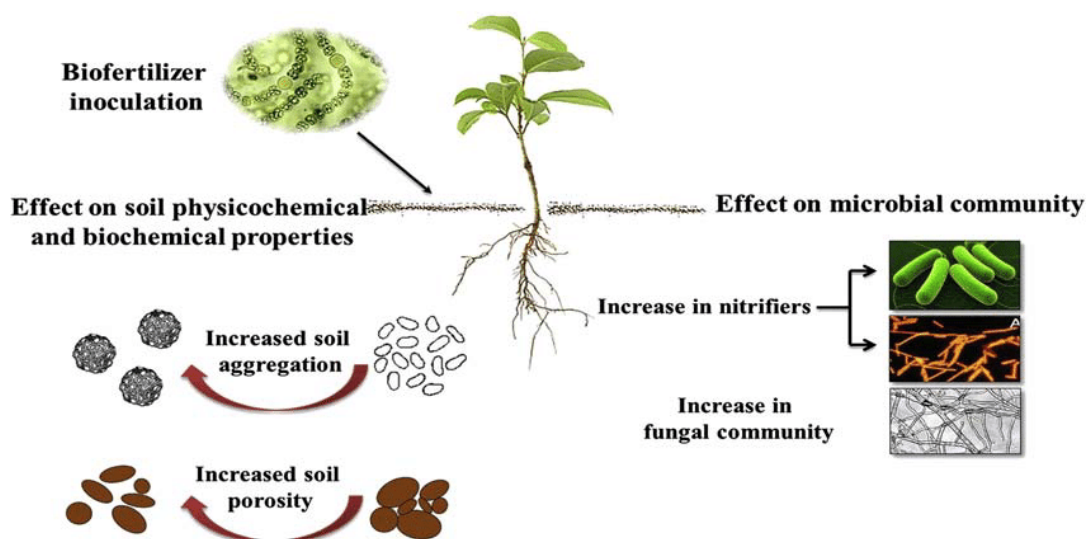
This article is published under the terms of the [Creative Commons Attribution License 4.0](https://creativecommons.org/licenses/by/4.0/).

INTRODUCTION

One of the present day challenges in agriculture is eco-friendly practices. Though the benefits of Green revolution have been reaped by us in terms of production, the other side of it, i.e., over usage of chemical fertilizers and its subsequent deterioration of soil health has been realised these days. Hence awareness of practicing organic agriculture has been taken to various spheres and products of organic agriculture are fetching up huge market. One of the organic agriculture practices includes usage of biofertilizers in farming. Biofertilizers are likely called as bioinoculants as they are the preparations containing living or latent cells of microorganisms that facilitate crop plants uptake of nutrients by their interactions within the rhizosphere once applied through seed or soil. It accelerates bound microorganism processes within the soil that augment the extent of convenience of nutrients in a very type simply assimilated by plants. Biofertilizers comprise a promising tool in agricultural ecosystems as a supplementary, renewable and ecofriendly source of plant nutrients. As they have an ability to transform nutritionally important elements from non-usable to highly assimilable forms without deleterious effects on natural environment, they are an important component of Integrated Plant Nutrient System. Biofertilizers are the substance that contains microbes, which helps in promoting the growth of plants and trees by increasing the supply of essential nutrients to the plants. It comprises living organisms which include mycorrhizal fungi, blue-green algae, and bacteria. Mycorrhizal fungi preferentially withdraw minerals from organic matter for the plant whereas cyanobacteria are characterized by the property of nitrogen fixation.

Biofertilizers may also help mitigate pitfalls arising from the growing demand of global population for food and from the widespread chemicalization in agroecosystems. The changing approach to the agricultural practices makes biofertilizers a vital part of modern-day crop production and emphasizes

significance of biological inoculants in forthcoming years. A number of rhizosphere microorganisms is known to exert multifarious plant growth promoting activities, but very few have been formulated in the form of biofertilizers.



Nitrogen fixation is defined as a process of converting the di-nitrogen molecules into nitrogen compounds. For instance, some bacteria convert insoluble forms of soil phosphorus into soluble forms. As a result, phosphorus will be available for plants.

Types of Biofertilizers

Following are the important types of biofertilizers:

i. Nitrogen fixing Biofertilizers:

- Symbiotic: Rhizobium, Frankia, Anabaena azollae.
- Free living: Azotobacter, Clostridium, Blue green algae, Azolla, Acetobacter, Nostoc, Anabaena.
- Associative symbiotic: Azospirillum.

ii. Phosphate supplier:

- Phosphate solubilising Biofertilizers:
Bacteria: Bacillus megaterium, Phosphaticum, Bacillus circulans, Pseudomonas striata, Pseudomonas sp..
- Fungi: Penicillium sp, Aspergillus awamori.

iii. Phosphate absorber Biofertilizers:

- Arbuscular mycorrhiza: Glomus sp., Gigaspora sp., Acaulospora sp., Scutellospora sp. and Sclerocystis sp., Ectomycorrhiza: Laccaria sp., Pisolithus sp., Boletus sp., Amanita sp. Orchid mycorrhiza: *Rhizoctonia solani*.

iv. Sulphur supplier Biofertilizers:

- Thiobacillus novellus, Aspergillus.

v. Micronutrients supplier Biofertilizers:

- Silicate and Zinc solubilisers: Bacillus sp.

Among all the types of biofertilizers, Rhizobium and Azospirillum are most widely used.

Components of Biofertilizers

The components of biofertilizers include:

Bio Compost

It is an eco-friendly product prepared by decomposing the waste material released from sugar industries. It is exaggerated with human-friendly fungi, bacteria and several types of plants.

Tricho-Card

It is a non-pathogenic and eco-friendly product used in a diversity of crops as well as in horticultural plants. It acts as an antagonistic hyper parasitic against eggs of several bores in the main field.

Azotobacter

It plays an important role in atmospheric nitrogen fixation and protects the plant roots from soil pathogens.

Phosphorus

Phosphorus is an essential nutrient for growth and development of plants. Phosphate solubilising microbes hydrolyze insoluble phosphorus compounds to the soluble form for uptake by plants. Various types of bacteria and fungi like *Penicillium*, *Aspergillus*, *Bacillus*, *Pseudomonas*, etc. are used for this purpose.

Vermicompost

It is an ecological organic fertilizer comprising of vitamins, hormones, organic

carbon, sulfur, antibiotics. It helps to enhance the quantity and quality of crop yield. Vermicompost is a quick nitrogen fixer which helps to improve the fertility of the soil.

Importance of Biofertilizers

- Biofertilizers are important for the following reasons:
- Biofertilizers improve soil texture, soil fertility and economic yield of crop plants.
- Biofertilizers are eco-friendly and cost-effective.
- Biofertilizers protect the environment from pollutants since they are natural fertilizers.
- Biofertilizers destroy several detrimental substances which are present in the soil and can cause several types of plant diseases.
- Biofertilizers are also effective under semi-arid conditions.