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# Biofertilizers: Importance and Application of Indian Agriculture

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Biofertilizers play a key role in sustainable agriculture by improving soil fertility, enhancing nutrient availability, and reducing the use of chemical fertilizers. They contain beneficial microorganisms that promote plant growth and protect crops from diseases. This article explains the importance and application of major biofertilizers used in Indian agriculture such as Rhizobium, Phosphobacteria, Pseudomonas fluorescens, and Azospirillum. Rhizobium and Azospirillum help in biological nitrogen fixation, while Phosphobacteria increase phosphorus availability in soil. Pseudomonas fluorescens controls plant diseases and improves crop health. The proper use of biofertilizers supports higher yield, soil health, and environmental sustainability.

## Introduction

Indian agriculture depends heavily on soil fertility for crop production. Excessive use of chemical fertilizers has caused soil degradation and environmental problems. Biofertilizers offer an eco-friendly solution by improving nutrient availability and soil health through beneficial microorganisms. They help in nitrogen fixation, phosphorus solubilization, plant growth promotion, and disease control. Biofertilizers such as Rhizobium, Phosphobacteria, Pseudomonas fluorescens, and Azospirillum play an important role in increasing crop yield while reducing dependence on chemical fertilizers and promoting sustainable agriculture.

## Rhizobium

Leguminous crops like black gram, green gram, and groundnut fix atmospheric nitrogen in association with a beneficial bacterium called Rhizobium. Seed treatment with Rhizobium biofertilizer before sowing increases the formation of root nodules, enhances nitrogen fixation, and improves crop yield.

**Method of application:** Generally, 200 g of Rhizobium is mixed with 20 kg of seeds using cooled rice gruel for seed treatment. The treated seeds are shade-dried and sown after one day. This practice increases yield. and reduces the requirement of chemical nitrogen fertilizers by nearly one-third.

## Phosphobacteria

Phosphobacteria is a biofertilizer that solubilizes insoluble phosphorus present in the soil and makes it available for plant uptake. It belongs to the bacterial group and can be used for all /types of crops.

**Methods of application**

**Seed treatment:** Dipping seedlings and tubers before transplanting.Application as basal manure.

**Seed treatment method :** Mix 50 ml of liquid biofertilizer with the required quantity of cooled rice gruel and seeds for one acre. Shade-dry for 30 minutes and then sow

## Pseudomonas fluorescens


Pseudomonas fluorescens is a biological control agent used to manage diseases such as leaf spot, blight, rust, and wilt in crops. It suppresses disease-causing fungi and protects crops from infections. It is suitable for all crops.

**Methods of application**: Can be applied as basal manure.Can be applied near the root zone by mixing with water

**seed treatment:** mix 10 g of Pseudomonas with a small quantity of water per kg of seeds, shade-dry for 30 minutes, Dissolve 1 kg of Pseudomonas powder in 100 liters of water and spray during morning or evening hours to thoroughly wet the crop.

## Azospirillum

Azospirillum is a beneficial nitrogen-fixing bacterium that lives in the root zone of crops such as rice, maize, sorghum, cotton, and sugarcane. Its application can add up to 10 kg of nitrogen per acre, which is equivalent to about 22 kg of urea.In addition, Azospirillum produces plant growth–promoting substances such as gibberellic acid and indole acetic acid, which enhance crop growth and increase yield.

**Methods of application:** Seed treatment: Mix 50 ml of liquid biofertilizer with cooled rice gruel and seeds required for one acre, shade-dry for 30 minutes, and sow Seedling root dipping: Mix 10 ml of liquid biofertilizer in the required quantity of water and dip seedling roots for 30 minutes before transplanting.

## Conclusion

Biofertilizers are essential components of sustainable agriculture as they improve soil fertility, enhance nutrient availability, and reduce dependence on chemical fertilizers. The use of biofertilizers such as Rhizobium, Phosphobacteria, Pseudomonas fluorescens, and Azospirillum supports healthy plant growth, increases crop yield, and helps in disease management. Their regular application maintains long-term soil health and protects the environment. Therefore, biofertilizers play a vital role in promoting eco-friendly and economically viable agricultural practices in India.

## References

1. Subba Rao, N. S. (2017). Biofertilizers in Agriculture and Forestry. Oxford & IBH Publishing Co., New Delhi.
2. Vessey, J. K. (2003). Plant growth promoting rhizobacteria as biofertilizers. Plant and Soil, 255: 571–586.

3. Kannaiyan, S. (2002). Biofertilizers for Sustainable Crop Production. TNAU Publications, Coimbatore.
4. Lucy, M., Reed, E., & Glick, B. R. (2004). Applications of free living plant growth-promoting rhizobacteria. Antonie van Leeuwenhoek, 86: 1–25.
5. Tamil Nadu Agricultural University (TNAU). (2020). Biofertilizer Production and Application Manual. TNAU, Coimbatore.