and Phosphorus Solubilizing Bacteria (PSB) when used in nursery mixtures.

Field trials with commercial biofertilizer containing *Pseudomonas striata, Aspergillus awamori, Candida Sp., and Bacillus Sp.* have also yielded promising results in terms of coffee yield and soil phosphorus availability.

Studies on seedling bio-priming in nurseries have indicated significant growth and nutrient uptake.

Biofertilizers have the potential to reduce the reliance on chemical fertilizers without compromising production thus protecting the soil and environment from pollution.

In organic coffee farming, biofertilizers play a significant role in nutrient mobilization along with organic inputs which serve as nutrient sources.

Acidic soil can render water-soluble phosphorus unavailable to plants due to fixation.

Soil analysis results of coffee plantations have indicated an increase in phosphorus and potassium levels due to excessive and indiscriminate fertilizer application.

Hence it is important to gradually reduce phosphorus and potassium fertilizer dosage and recycle the P and K fixed in the soil with biofertilizers.

Adequate soil moisture is crucial for the survival and proliferation of microbes, emphasizing the importance of soil and moisture conservation practices to maximize the benefits of bio-fertilisers.

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USE OF BIOFERTILIZERS IN COFFEE PLANTATION

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Bio-fertilisers are microbial inoculants which contain live (or) latent cells of selected bacteria and fungi in a carrier material which enhance nitrogen fixation, P recycling, K mobilization, plant growth and disease resistance.

These microbial inoculants play a crucial role in accelerating certain microbial processes making nutrients more easily available to plants.

The effectiveness of a biofertilizer depends on several critical factors. The species and strain of the microorganism should be suitable for the target crop and adapt to the local agro-ecological conditions.

Manufacturing processes should maintain aseptic conditions, maintain appropriate cell count, ensure purity and protect against contamination. The quality of the carrier material and packaging also influences the shelf life of the biofertilizer.

Proper storage conditions are crucial - ensuring cool temperatures and storing away from chemical fertilizers, fungicides and pesticides.

It is important to avoid mixing biofertilizer with chemicals during application.

A safe interval of at least two weeks between application of chemical fertilizer and biofertilizer should be provided.

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Types of bio fertilizers

Type	Name of the species
N fixers	*Rhizobium, Azotobacter, Azospirillum,* Blue green algae and Azolla
P solubilizers	*Bacillus sp, Pseudomonas striata, Aspergillus sp & Candida sp,* Vesicular Arbuscular Mycorrhizae (VAM) fungi
Potassium Mobilizers	*Acidothiobacillus ferrooxidans, Paenibacillus sp, Bacillus mucilaginosus & Bacillus edaphicus*
Anti fungal agents	*Trichoderma viridi & Pseudomonas fluorescens*
Pest control agents	*Beauveria bassiana* (against berry borer), *Verticillumlecanii* (against soft bodied insects)
Nematode control agent	*Paecilomyces-lilacinus*
Organic matter decomposers	Cellulolytic and Lignolytic micro organisms

Extensive research conducted by CCRI has shown positive effects of biofertilizers such as *Azospirillum*, Vesicular Arbuscular Mycorrhiza (VAM)

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