

USES OF BIOFERTILIZER, AND IT'S APPLICATION

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INTRODUCTION

A biofertilizer is a substance which contains living microorganisms, when applied to seed, plant surfaces, or soil, colonizes the rhizosphere or the interior of the plant and promotes growth by increasing the supply or availability of primary nutrients to the host plant.

Bio-fertilizers add nutrients through the natural processes of nitrogen fixation, solubilizing phosphorus, and stimulating plant growth through the synthesis of growth-promoting substances.

What is Bio fertilizer?

- Biofertilizers are natural fertilizers that are microbial inoculants of bacteria, algae and fungi (separately or in combination).
- which may help biological nitrogen fixation for the benefit of plants.
- They help build up the soil micro-flora and there by the soil health.
- Biofertilizer also include organic fertilizers (manure, etc.).

- Use of bio-fertilizer is recommended for improving the soil fertility in organic farming

TYPES OF BIOFERTILIZERS

- ▶ Bacterial Biofertilizer
- ▶ Fungal Biofertilizer
- ▶ Algal Biofertilizer
- ▶ Aquatic fern Biofertilizer
- ▶ Earthworms Biofertilizer

Bacterial Biofertilizer:

Symbiotic nitrogen fixers- Close association between legumes and rhizobial bacteria.

Ex. - Rhizobium, Azospirillum spp



Free living nitrogen fixers- Bacteria live in the soil and fix significant levels of nitrogen without the direct interaction with

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other organism.

Ex. - Azotobacter, Klebsiella etc.,

Algal biofertilizers- BGA in association with Azolla.



The alga provides nitrogen to the fern and the fern provides a habitat for the alga

Ex. - Anabena, Nostoc, Ocillatoria

Phosphate solubilising bacteria:

Ex. - Pseudomonas, Bacillus megaterium

Fungal biofertilizer - It's involve the use of fungal agent (mycorrhiza) are formulated to provide nutrients to the host plant and safeguard crops against pathogens.

Ex. - VAM

Earthworms

Ex. - Eisenia fetida



Bio - fertilizers application methods:

There are three ways of using these N-fixing/P.S.M. bacteria.

Seed Treatment

Seed treatment is a most common method. Seed treatment with Rhizobium, Azotobacter, Azospirillum along with P.S.M. Seed treatment can be done with any of two or more bacteria, no side effect. Important thing is that the seeds must be coated first with Rhizobium or Azotobacter or Azospirillum when each seeds get a layer of above bacteria then the P.S.M. inoculant has to be treated on outer layer of the seeds.

Root dipping

Application of Azospirillum with the paddy/vegetable plants this method is needed. The required quantity of Azospirillum has to be mixed with 5-10 ltr of water at one corner of the field and all the plants have to kept for minimum ½ an hour before sowing.

Soil application

P.S.M. has to be used as a soil application use 2 kgs of P.S.M. per acre. Mix P.S.M. with 400 to 600 kgs of cow dung along with ½ bag of rock phosphate if available. The mixture of P.S.M., Cow dung and rock phosphate have to be kept under any tree shade or celling for over-night and maintain 50% moisture.

Precautions

- ✓ Store biofertilizer packets in cool and dry place away from direct sunlight and heat.
- ✓ Use right combination of biofertilizers
- ✓ Rhizobium is crop specific, so use in specified crop
- ✓ Do not mix with chemicals
- ✓ Use the packet before expiry, only on the specified crop, by the recommended method.

Advantage of biofertilizers

- Don't pollute environment and don't have toxic effect on the product.
- Renewable source of nutrients.
- Sustain soil health.
- Supplement chemical fertilizers.
- Replace 25-30% chemical fertilizers
- Increase the grain yields by 10-40%.
- Decompose plant residues, and stabilize C:N ratio of soil
- Improve texture, structure and water holding capacity of soil
- No adverse effect on plant growth and soil fertility.
- Stimulates plant growth by secreting growth hormones.
- Secrete fungistatic and antibiotic like substances
- Solubilize and mobilize nutrients
- Eco-friendly, non-pollutants and cost-effective method.