

Biofertilizer One-liner Notes For IBPS-AFO By agriguru.in



Microorganism – Function

- ✚ **Rhizobium spp.** – Nodulation and nitrogen fixation
- ✚ **Arbuscular Mycorrhizae** – Nutrient mobilization
- ✚ **Phanerochaete chrysosporium** – Composting
- ✚ **Azolla** – Improve nitrogen availability in rice
- ✚ **Bacillus megaterium** – Silicate/Phosphate solubilization
- ✚ Biofertilizers can be applied as **seed coating, soil application** or **seedling dip**.

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- ✚ Dry formulations of **microbial inoculants** can be in the form of dusts, wet-table powders, granules, pellets, capsules and briquettes.
- ✚ Commonly used carriers for **biofertilizers** are peat, lignite, soil, charcoal, vermiculite, talc, vermicompost, sawdust and press mud.
- ✚ **Biofertilizer** - specific crop Azospirillum - Cereals, particularly grasses Blue green algae - Rice Frankia – Casuarina Azotobacteria – cotton
- ✚ **Frankia** fixes nitrogen.
- ✚ Rhizobium establishes efficient symbiotic associations with **pulses, leguminous oil-seeds** and **fodder crops**.
- ✚ For seed treatment, Rhizobium inoculum @ **1.5kg/ha** is mixed in the jaggery solution and sprinkled over the seeds.
- ✚ Free living organisms that can fix atmospheric nitrogen are **blue green algae (BGA), Azolla, Azotobacter** and **Rhizo-spirillum**.
- ✚ **BGA** and **Azolla** can survive only in lowland conditions.

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✚ Important species of BGA that fix atmospheric nitrogen are **Anabaena** and **Nostoc**.

✚ Amount of nitrogen fixed by **BGA** ranges from **15-45 kg N/ha**.

✚ BGA can grow at a temperature of **25 to 45 °C**.

✚ Bright sunshine **increases** the growth rate of BGA while rains and cloudiness slows **growth rate**.

✚ BGA grows well in a pH range of **7 to 8** and in soils with high organic matter.

✚ Amount of BGA inoculums required is **10 kg/ha**.

✚ **Azolla** is a free-floating water fern which forms symbiotic association with blue-green algae species **Anabaena azolla** present in the lobes of **Azolla** leaves and provides nitrogen to rice crop.

✚ **Azolla pinnata** is the most common species occurring in India.

✚ A thick mat of **Azolla** supplies **30-40 kg N/ha**.

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- ✚ Unlike **blue-green algae**, **azolla** thrives well at low temperature.
- ✚ Normal growth of Azolla occurs in the temperature range of **20 to 30 °C**.
- ✚ Azolla grows better under monsoon season with frequent **rains** and **cloudiness**.
- ✚ For Azolla suitable soil pH is **5.5-7.0**.
- ✚ Amount of Azolla inoculum required is **0.1 to 0.5 kg/m²**.
- ✚ As **green manure crop**, **Azolla** is allowed to grow on the flooded fields for **2 to 3** weeks before transplanting, later water is drained and Azolla is incorporated by ploughing in.
- ✚ Advantages of **Azotobacter** to crops are Biological nitrogen fixation, release of growth promoting substances, suppression of plant diseases.
- ✚ Azotobacter chroococcum is capable of fixing **20 to 30 kg N/ha**.
- ✚ Amount of Azotobacter inoculums required is **3-5 kg/ha**.

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✚ **Azotobacter** can be used for **rice, cotton** and **sugarcane**.

✚ **Acetobacter** is commercially utilized for **Sugarcane**.

✚ **Azospirillum** inoculants are recommended in several crops such as **jowar, bajra, ragi** and other millets. Cell number or colony forming units at the time of manufacture should not be **less than 10⁸ and 10⁷ per gram** of carrier material, respectively for Rhizobium and Azotobacter.

✚ **Pseudomonas striata, Aspergillus awamori** and **Bacillus polymyxa** are capable of solubilising phosphates.

✚ **Liquid inoculants** and **biofilmed inoculants** are new generation biofertilizers.

✚ Shelf life of liquid biofertilizers is **12-24 months**.

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