

Shakti BM

Introduction :

Shakti BM is a biological fertilizer based on a selected strain of naturally-occurring beneficial eubacteria *Bacillus megaterium* (NCIM 2087 , ATCC 10778) . *Bacillus megaterium* is a gram positive , rod shaped , endospore forming bacteria. It is used as an effective soil inoculant. Shakti BM contains endospores of *Bacillus megaterium*. It is formulated as carrier based powder with CFU count of 5×10^7 / g. and as 1×10^8 CFU/ml Liquid. P Sol B®-BM is registered under the Fertilizer Control Order-Govt of India. Shakti BM is approved for use in Organic Agriculture.

Phosphorus is abundant in several soils and is one of the major nutrients limiting the plant growth. The overall Phosphorus use efficiency following phosphate fertilizer application is low because of the formation of insoluble complexes Therefore this mandates frequent application of soluble forms of inorganic Phosphorus necessary for crop production. This results in leaching to the ground water and results in eutrophication of aquatic systems and pollutes soil.

Phosphorus is an important macronutrient which is applied to soil in the form of phosphatic fertilizers. A large portion of this soluble inorganic phosphate applied to the soil as chemical fertilizer is immobilized rapidly and becomes unavailable to plants. Shakti BM aids in transformation of soil Phosphorus into an assimilable form and is therefore an integral part of the soil Phosphorus cycle as they help in releasing Phosphorus from inorganic and organic pools of total soil Phosphorus through solubilization and mineralization.

Mode of Action :

Carbon utilization : The bacteria contained in P Sol B ® -BM on application to the soil get activated and multiply by utilizing the carbon source of soil or exudates of the root and in this process secrete organic acids and enzymes.

Metabolite production : *Bacillus megaterium* produces organic such as lactic acid , gluconic acid , citric acid , succinic acid , propionic acid and enzymes that help solubilize the fixed phosphorus into exchangeable form. These organic acids through their hydroxyl and carboxyl groups chelate the cations (mainly Calcium) bound to phosphate converting them into the soluble forms. An inverse relationship is observed between the pH and soluble-Phosphorus concentration which indicates that organic acid production by phospho bacteria plays a significant role in the acidification of the soil medium facilitating Phosphorus solubilization and easier assimilation by plants.

Method of Application :

1. **Seed Treatment :** Mix 10 g. of P Sol B®-BM with 10 g. of crude sugar in sufficient water to make a slurry and coat 1 kg of seeds. Dry the seeds in shade and sow / broadcast / dibble in the field. Note: Do not store treated / coated seeds more than 24 hrs.
2. **Seedling treatment :** Mix 100 g. of P Sol B®-BM with sufficient quantity of water and organic manure to form a slurry. The seedlings are dipped in this slurry for 30 minutes prior to planting so that the bacteria get attached to the roots.
3. **Soil application :** Mix 3-5 Kg/ acre of P Sol B®-BM with compost and apply to an acre of soil.
4. **Drip Irrigation :** Mix 3 Kg/ acre of P Sol B®-BM in drip stream.

Target Nutrition Phosphorus mobilization.

Crops : Shakti BM is suitable for application on Cereals , Millets , Pulses, Oilseeds, Fibre Crops , Sugar Crops , Forage Crops , Plantation crops ,Vegetables, Fruits, Spices , Flowers , Medicinal crops , Aromatic Crops , Orchards and Ornamentals.

Shelf Life: Shakti BM is stable for a period of 12 months from the date of manufacturing.