

Fe Sol B[®]
Acidithiobacillus ferrooxidans
BioFertilizer
APPROVED FOR USE IN ORGANIC AGRICULTURE

Introducing Fe Sol B[®]

Fe Sol B[®] is a biological fertilizer based on a selected strain of naturally-occurring beneficial autotrophic, acidophilic bacteria *Acidithiobacillus ferrooxidans* (NCIM 5370). *Acidithiobacillus ferrooxidans* is a gram negative, rod shaped, non sporing bacteria. It is used as an effective soil inoculant.

Fe Sol B[®] contains vegetative cells of *Acidithiobacillus ferrooxidans*. It is formulated as Wettable Powder with CFU count of 5×10^7 / g. Fe Sol B[™] is approved for use in Organic Agriculture.

A Historical Brief

Acidithiobacillus ferrooxidans, was discovered in 1950 by Colmer et al.

The discovery of *Acidithiobacillus ferrooxidans* led to a new branch of metallurgical sciences called "biohydrometallurgy" which deals with all aspects of microbial mediated extraction of metals from minerals or solid wastes and acid mine drainage (Torma, 1980)

Mode of Action

Enzyme production : *Acidithiobacillus ferrooxidans* releases an iron oxidase, which allows them to metabolize non-assimilable ferrous/ iron.

Energy metabolism: They require inorganic molecules as an electron donor and inorganic carbon (such as carbon dioxide) as a source. They obtain nutrients by oxidizing iron and sulfur with O₂.

Acidithiobacillus ferrooxidans grows at pH values of 4.5 to 1.3 in salt medium and derives its biosynthetic requirements by autotrophy i.e it uses carbon from atmospheric carbon dioxide. It also fixes Nitrogen in acidophilic habitats. The bacteria derive their metabolic energy by oxidation of reduced inorganic sulfur compounds or ferrous ions. Anaerobic growth happens by using elemental hydrogen or reduced inorganic sulfur compounds as electron donors and ferric ions as electron acceptors.

Method of Application

Seedling treatment: Mix 100 g. of Fe Sol B[®] 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.

Soil application: Mix 3-5 Kg/ acre of Fe Sol B[®] with compost and apply to an acre of soil.

Drip Irrigation : Mix 3 Kg/ acre of Fe Sol B[®] in drip stream

Target Nutrition

Ferrous / Iron mobilization.

Crops

Fe Sol B[®] 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.

Compatibility

Fe Sol B[®] is compatible with BioPesticides and other BioFertilizers.

Shelf Life

Fe Sol B[®] is stable for a period of 1 year from the date of manufacturing.

Mass Composition

CONSTITUENT	WW %	FUNCTION
<i>Acidithiobacillus ferrooxidans</i>	2.0%	Active
Carrier Powder – Talc/Dextrose/Lignite	q.s.	Inactive

BIOLOGICAL COMPOSITION

CONSTITUENT	CFU/g.	FORMULATION
<i>Acidithiobacillus ferrooxidans</i>	5*10 ⁷	Powder

OTHER FORMULATIONS AVAILABLE

<i>Acidithiobacillus ferrooxidans</i> CFU/ml	1*10 ⁸	Liquid
<i>Acidithiobacillus ferrooxidans</i> CFU/g/ml	1*10 ⁹	Powder/ Liquid

Acidithiobacillus ferrooxidans CFU/g
Acidithiobacillus ferrooxidans

1*10¹⁰

Powder
Lyophilized

Free from Salmonella, Shigella, E.Coli

Cautions for handling and use of product

1. Mixing equipment is to be thoroughly rinsed with water and detergent before using the same equipment for formulating other fertilizers/ pesticides.
2. Surplus product may be disposed in crop lands
3. Do not eat / drink / smoke during application.
5. Direct incidence of Fe Sol B[®] may cause irritation and therefore it is recommended that the operator should use protective gear viz gloves, apron, mask, eye gear and hood.

Antidotes

In the case of ingestion: Symptomatic treatment

In the case of contact with Eyes: Flush with water liberally for 20 minutes.

Citations

There are many citations in public domain on effectiveness of *Acidithiobacillus ferrooxidans* as a BioFertilizer

Commitment to Nature

- Fe Sol B[®] is approved for use in organic agriculture.
- Fe Sol B[®] is safe to use along with bio fertilizer inoculums like Agri Life Nitrofix[™] (Nitrogen Fixing bacteria) ; P Sol B[®] (Phospho bacteria) ; K Sol B[®] (Potash mobilizing bacteria); Zn Sol B[®] (Zinc mobilizing bacteria) :S Sol B[®] (Sulphur solubilizing bacteria) : Si Sol B[™] (Silica solubilizing bacteria) : Mn Sol B[™] (Manganese solubilizing microbe) and Agri Life Agrivam[®] (Vesicular-arbuscular mycorrhiza)
- Fe Sol B[®] is safe to use along with botanical and microbial bio pesticides.
- Fe Sol B[®] can be used as an effective component in IPM/ INM programmes, thereby leading to a reduction in use of chemical fertilizers and creating a safer environment.
- Fe Sol B[®] does not lead to residue problems and doesn't cause resistance or resurgence problems.

Benefits from Fe Sol B[®]

- Fe Sol B[®] effectively mobilizes unavailable iron / ferrous ions and make it assimilable by plants
- Natural Ferrous / Iron solubilization improves both plant and soil health and also aids in soil remediation.
- The increase in the beneficial microbe population in soil improves soil health.
- Fe Sol B[®] is earthworm friendly , pet friendly , eco friendly and infant friendly