

S Sol B[®]
Tthiobacillus thioxidans
BioFertilizer

APPROVED FOR USE IN ORGANIC AGRICULTURE

Introducing S Sol B[®]

S Sol B[®] is a biological fertilizer based on a selected strain of naturally-occurring beneficial autotrophic, acidophilic bacteria *Tthiobacillus thioxidans* (NCIM 5069) . *Tthiobacillus thioxidans* is a gram negative , rod shaped , non sporing bacteria. .It is used as an effective soil inoculant.

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

A Historical Brief

Tthiobacillus thioxidans, was discovered in 1922 by Jacob Jaffe and Selman Waksman.

Mode of Action

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

Tthiobacillus thioxidans 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 its metabolic energy by oxidation of reduced inorganic sulphur compounds or ferrous ions. Anaerobic growth happens by using elemental hydrogen or reduced inorganic sulphur compounds as electron donors and ferric ions as electron acceptors.

Enzyme production : *Tthiobacillus thioxidans* oxidizes sulphur and secretes organic acids like sulphuric acid , mallic acid which helps mobilize the fixed sulphur and makes it available to the plants. This also brings down the pH of the soil and helps in reclaiming alkaline oils.

Method of Application

Seedling treatment: Mix 100 g. of S 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 S Sol B[®] with compost and apply to an acre of soil.

Drip Irrigation : Mix 3 Kg/ acre of S Sol B® in drip stream

Target Nutrition

Sulphur mobilization.

Crops

S 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

S Sol B® is compatible with BioPesticides and other BioFertilizers.

Shelf Life

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

Mass Composition

| CONSTITUENT | W/W % | FUNCTION |
|--|-------|----------|
| <i>Thiobacillus thiooxidans</i> | 2.0% | Active |
| Carrier Powder – Talc/Dextrose/Lignite | q.s. | Inactive |

BIOLOGICAL COMPOSITION

| CONSTITUENT | CFU/g. | FORMULATION |
|---------------------------------|-------------------|-------------|
| <i>Thiobacillus thiooxidans</i> | 5*10 ⁷ | Powder |

OTHER FORMULATIONS AVAILABLE

| | | |
|--|--------------------|----------------|
| <i>Thiobacillus thiooxidans</i> CFU/ml | 1*10 ⁸ | Liquid |
| <i>Thiobacillus thiooxidans</i> CFU/g/ml | 1*10 ⁹ | Powder/ Liquid |
| <i>Thiobacillus thiooxidans</i> CFU/g | 1*10 ¹⁰ | Powder |
| <i>Thiobacillus thiooxidans</i> | | 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 S 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 *Thiobacillus thiooxidans* as a BioFertilizer

Commitment to Nature

- S Sol B[®] is approved for use in organic agriculture.
- S 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) : Fe Sol B[®] (Iron / Ferrous solubilizing bacteria) : Mn Sol B[™] (Manganese solubilizing microbe) and Agri Life Agrivam[®] (Vesicular-arbuscular mycorrhiza)
- S Sol B[®] is safe to use along with botanical and microbial bio pesticides.
- S Sol B[®] can be used as an effective component in INM programmes, thereby leading to a reduction in use of chemical fertilizers and creating a safer environment.
- S Sol B[®] does not lead to residue problems and doesn't cause resistance or resurgence problems.

Benefits from S Sol B[®]

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