

BIOTILIS™
Bacillus subtilis
BioFungicide
APPROVED FOR USE IN ORGANIC AGRICULTURE

Introducing BIOTILIS™

BIOTILIS™ is a biological fungicide based on a selected strain of naturally-occurring antagonistic bacteria *Bacillus subtilis* (NCIM 2063). BIOTILIS™ contains endospores of *Bacillus subtilis*. It works as both a fungicide and a plant growth promoting rhizosphere bacteria (PGPR). It is formulated as Wettable Powder with CFU count of 1×10^8 / g. BIOTILIS™ is approved for use in Organic agriculture.

A Historical Brief

Bacillus subtilis was originally named *Vibrio subtilis* in 1835 by Christian Gottfried Ehrenberg and renamed as *Bacillus subtilis* in 1872 by Ferdinand Cohn. Synonyms for this bacteria are : *Bacillus uniflagellatus*, *Bacillus globigii*, and *Bacillus natto*. *Bacillus subtilis* was one of the first bacteria to be studied.

Mode of Action

Substrate Competition for space and Nutrients: BIOTILIS™ colonizes maximum space of the root systems and absorbs maximum nutrients available at the target site and thereby controls the pathogens by starving them for food and competing for space- Domino effect.

Mycoparasitism: BIOTILIS™ is a biological fungicide that attacks disease-causing pathogens before they reach the root system. It derives nutrition from the target pathogen and BIOTILIS™ spores multiply inside it and eventually kill the pathogen.

Enzyme production: BIOTILIS™ secretes certain antagonistic secondary metabolites which have an anti fungal effect that pathogenise and kill the disease causing organism.

Method of Application

Seed Treatment: Mix 10-15 g of BIOTILIS™ in sufficient quantity of water to make slurry and coat the seeds with this slurry. Dry the seeds under shade and sow the seeds. The seeds can be mechanically mixed in a seed treater also. The treated seeds should not be blended along with chemical fertilizer/ chemical pesticide.

Soil Application: Mix 5 Kg / Ha of BIOTILIS™ with 500 Kg of organic manure/fertilizer. Incorporate this mixture at the time of sowing/planting.

Foliar Spray: Mix 10g of BIOTILIS™ per 1 L of water and spray. Spraying depends on the climatic conditions that favour disease occurrence and must be done prior to the onset of the disease. Spray at an interval of 7 to 10 days depending upon the crop and intensity of disease. Adding a sticking agent to the solution will aid in better adherence of the formulation to the crops and offers better disease control.

Target Diseases

BIOTILIS™ controls disease causing pathogenic species like *Pythium*, *Alternaria*, *Xanthomonas*, *Rhizoctonia*, *Botrytis*, *Oidiopsis*, *Alternaria*, *Leveillula*, *Phakopsora*, *Sclerotium*, *Phytophthora*, *Peronospora*, *Sclerotinia* which cause diseases such as root rot, root wilt, seedling rot, early blight, late blight, leaf spot, stem rot and mildew diseases in crops.

Crops

BIOTILIS™ 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

BIOTILIS™ is compatible with BioPesticides and not with Chemical Fungicides.

Shelf Life

BIOTILIS™ is stable for a period of 12 months from the date of manufacturing.

Mass Composition

CONSTITUENT	W/W %	FUNCTION	
<i>Bacillus subtilis</i> (Spores and nutrient medium residues)	1.00%	Active	
Moisture	8.00% max	Inactive	
Carrier Powder – Talc/Dextrose/Glycerol		91.0%	Inactive

Biological Composition

CONSTITUENT	CFU/g.	FORMULATION
<i>Bacillus subtilis</i>	1*10 ⁸	Wettable Powder

Other Formulations available

<i>Bacillus subtilis</i> CFU/g	1*10 ⁹	Soluble Powder
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Bacillus subtilis CFU/ml

1*10⁹

Free from *Salmonella*, *Shigella*, *E.Coli*

Cautions for handling and use of product

1. Avoid inhalation and skin contact while diluting as there could be spillage / splashes of the product.
2. Mixing and spraying equipment is to be thoroughly rinsed with water and detergent before using the same equipment for spraying other chemical agricultural inputs.
3. Surplus spray solution should not be disposed in crop lands / stagnant water / flowing water where there is a possibility of causing pollution to natural resources
4. Do not eat / drink / smoke during application.
5. Direct incidence of BIOTILIS™ may cause irritation and therefore it is recommended that the operator should use protective gear viz gloves, apron, mask, eye gear and hood.

Symptoms and Antidotes

Symptoms: Occasional symptoms include head ache and nausea.

Antidote: In the case of ingestion: symptomatic treatment is advised. In the case of contact with Eyes: Flush with water liberally for 20 minutes. In case of Skin contact, wash the affected area with plenty of water and soap.

Citations

There are many citations in public domain on effectiveness of *Bacillus subtilis* as a BioFungicide and Plant Growth Promoting Rhizosphere Bacteria (PGPR)

Commitment to Nature

- BIOTILIS™ is approved for use in Organic Agriculture.
- BIOTILIS™ is safe to natural parasites, pollinators and predators.
- BIOTILIS™ can be used as an effective component in IPM programmes, thereby leading to a reduction in use of chemical pesticides and creating a safer environment.
- BIOTILIS™ does not lead to residue problems and doesn't cause resistance or resurgence problems.

Benefits from BIOTILIS™

- BIOTILIS™ effectively controls most of the economically important diseases such as root rot, root wilt, seedling rot, early blight, late blight, leaf spot, stem rot and mildew diseases in crops. Pest reduction leads to improved plant health and thereby increased crop productivity.
- BIOTILIS™ is pet friendly, eco friendly and infant friendly.

