



Arihant
Empowering Farmers

Bio-Logical Products

**"Nature's Best for
Your Plants!"**



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AN ISO 9001 : 2015 & 14001 : 2015 CERTIFIED COMPANY



**Harvesting Success,
Empowering Farmers**



About **ARIHANT**

Arihant Group is a pathfinder committed to developing novel solutions that strengthen farmers' livelihoods and plant health alike. Our adventure began in 2000, at the start of a new millennium, with a basic desire to create sustainable advances in agriculture. The foundation of our efforts is innovation and science.

Our main objective is to provide long-term crop health solutions that will benefit current and future generations. Our own innovative processes have delivered pathbreaking products such as best-in-class NPK liquid and gel-based fertilizers, organic + NPK liquid fertilizers, and a range of exceptional agricultural products such as granules, micronutrient fertilizers, plant growth promoters, etc. Organic and biofertilizers, soil conditioners, biostimulants, biopesticides, and bio fungicides are just a few of the environmentally friendly goods we endorse. With unbreakable passion, we work to provide farmers with the best resources possible to help them overcome the obstacles facing the modern agricultural landscape.

In a time when farmers, merchants, and consumers all place a high value on sustainability, Arihant Group strives to provide biological products with exceptional levels of sustainability. Our products increase plant vitality and stimulate the soil microbiome by utilizing the potential of naturally occurring microbes and nutrients.

Our goal continues to be to develop agricultural inputs that provide our clients with significant financial returns in addition to observable environmental advantages. We enable growers to improve nutrient efficiency and soil quality by increasing crop output and quality.

At Arihant Group, we're not just focused on the here and now; we're also designing a sustainable agricultural future. Our products have the potential to increase crop output and quality while also giving growers more control over the quality and efficiency of their soil.

Our Vision & Mission

Vision

"To Empower Farmers and Their Crops to Sustainably Feed the World Today and in the Future."



Mission

"To Be A Leader of Science-Driven Innovations Which Provide Proven Plant Health Solutions That Increase Crop Productivity While Respecting The Environment And Society"



Value

Our core values are driven by a desire to improve the richness and protection of crops through excellence and high standards of integrity.

- Excellence
- Sustainability
- Integrity
- Customer Focus
- Safety
- Innovation
- Community Engagement

STATEMENT FROM THE FOUNDERS OF THE COMPANY



Chairman: BHAVESH PATEL

Leading the company with the knowledge and expertise of 25 years in the industry. By implementing innovative techniques in agriculture, I aim to increase production while ensuring minimal impact on the soil. This approach not only benefits farmers by providing high-quality supplies but also contributes to environmental preservation. The main focus is on sustainable practices, fostering a commitment to eco-friendly production. By adopting cutting-edge methods, the company is poised to develop globally, creating a positive impact on both the industry and the environment.

Managing Director: NARENDRA PATEL

I've had the privilege of leading the Arihant Group of Industries for the past 20 years, during which our focus has been on creating sustainable solutions for agriculture. Our passion for empowering farmers and enhancing crop health shines through our unwavering commitment. We are driven by a vision to combat losses attributed to abiotic stress factors. Understanding the urgency of this issue, we are dedicated to implementing strategies that mitigate multiple stressors, including improved agronomic management. Our goal is to increase soil health by using less conventional fertilizers and adding organic materials to feed microorganisms. We work to provide solutions that improve crop tolerance to abiotic stress by combining cutting-edge methods and technology, ensuring higher yields and sustainable farming methods. We aim to boost crop productivity worldwide while maintaining affordability and environmental sustainability.



Company Milestones

2007-2008

ARIHANT CHEMICAL INDUSTRIES

Started manufacturing:

- Plant Growth Promoters
- NPK Water Soluble Fertilizers
- Micronutrient Fertilizers

Our plant growth promoters, NPK water-soluble fertilizers, and micronutrient fertilizers are formulated with organic compounds and beneficial microorganisms to enhance plant growth, provide essential nutrients, and promote overall plant health.

2008-2009

ARIHANT INORGANIC PROCESS Pvt Ltd

Started manufacturing for :

- Potassium Sulphate
- Magnesium Sulphate Anhydrous

These products are crucial for addressing nutrient deficiencies in soil, promoting healthier crop development, and improving overall agricultural productivity.

2011-2012

ARIHANT AGRISCIENCE PVT. LTD

Started large-scale production of granule fertilizer

Started manufacturing:

- Bio Pesticide Granule
- Bio Fertilizer Granule
- Soil Conditioner Granule
- Organic Fertilizer

Introducing biopesticide granules, bio-fertilizer granules, soil conditioner granules, and organic fertilizer in one innovative solution for sustainable agriculture.

2012-2013

ARIHANT FERTILIZER CORPORATION UNIT: 2

Involved in the large-scale production of pesticides, fungicides, and insecticides.

2013-2014

ARIHANT BIOSCIENCE INDIA PVT LTD

We are revolutionizing agriculture with our state-of-the-art enzymatic manufacturing process, delivering high-quality enzymes for enhanced crop productivity and environmental sustainability.

2009-2010

ARIHANT FERTILIZER CORPORATION UNIT - 1

Started manufacturing:

- Granule Fertilizer
- Soil Conditioner Fertilizer
- Organic Fertilizer

Granule fertilizer provides slow-release nutrients for plants, soil fertilizer rejuvenates soil, and organic fertilizer supports sustainable farming practices, minimizing environmental impacts.

Company Milestones

2017-2018

ANBR ELIXIR PVT LTD

With an eye on the global markets and a mission to take our pathbreaking products to the world, ANBR started export activities

Arihant Fertilizers Corporation Unit 1 has been merged with ANBR Elixir Pvt. Ltd

2016-2017

ARIHANT BIOFERTICHEM PVT LTD

Retail Marketing

Key partnerships with suppliers and distributors have been secured to ensure a steady supply chain through our retail sector

2015-2016

ARIHANT CHEMICAL INDUSTRIES

Started manufacturing for:

- Biofertilizers Liquid
- Biofertilizers Powder
- Biopesticides Liquid
- Biopesticides Powder
- Amino chelated micronutrients
- Chelated Fertilizers

Introducing a comprehensive line of eco-friendly agricultural solutions

2019-2020

ANBK SEEDS INDIA Pvt Ltd

Ventured into seed production, furthering our commitment to providing holistic agricultural solutions from seed to harvest.

2022-2023

ARIHANT GROUP OF INDUSTRIES

During this period, we acquired Unit 2 at ANBR Elixir Pvt. Ltd, paving the way for the expansion of our production capacity for slow-release fertilizers. This strategic move positions us to meet the anticipated increase in demand and reinforces our commitment to innovation and sustainability in agriculture

ANBR Elixir Pvt. Ltd Unit 2 Plans For Expansion Of Slow-Release Fertilizers

Manufactures:

- Diatomite Silicon Grannual (For Export)
- Speciality Micronutrient Fertilizers
- Bio Fungicides
- Developed Organic+ Npk
- Liquid And Gel Fertilizers

2021-2022

ARIHANT GROUP OF INDUSTRIES

Launches: Science-driven slow-release fertilizers like

- NPK liquid fertilizer
- NPK gel fertilizer
- Liquid urea
- Specialty plant nutrition

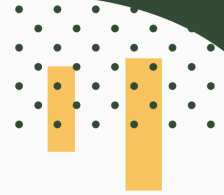
We have been awarded for

- Bharat Udyog Ratan Award For Outstanding Achievement
- Business Excellence Award: Asia Pacific Chamber Of Commerce

2023-2024

Developed the world's first innovation in Zinc-Related Fertilizers with N-46 Zincated Slow-Release Fertilizers, alongside the introduction of pH Balancer, continuing our legacy of pioneering agricultural solutions.

Arihant Group Of Industries



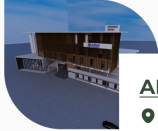
ARIHANT CHEMICAL INDUSTRIES

- Plot No. 5144, Nr. Prime Industries, Seven Water Tank Road, Paras Chowkdi, GIDC Estate, Ankleshwar - 393002, Gujarat, India



ARIHANT AGRI-SCIENCE PVT LTD

- Plot No. 227/5/1 And 2, Arihant Agri Science Pvt Ltd, Near Cheminova, GIDC Industrial Estate, Sanjali, Bharuch - 394116, Gujarat, India



ARIHANT BIO FERTICHEM PVT LTD

- 204, Sidhhraj Zavod, Sargasan, Gandhinagar - 382421 Gujarat (India)



ANBR ELIXIR PVT LTD

- Plot No.10008-3, ANBR ELIXIR PRIVATE LIMITED, NEAR BEIL, GIDC ANKLESHWAR, Ankleshwar GIDC, Bharuch - 393002, Gujarat, India



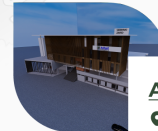
ARIHANT BIO SCIENCE PVT LTD

- PL-H-3136, FL- A/202, SWET RESIDENCY, PH-4, ANKLESHWAR Bharuch GJ 393002 IN



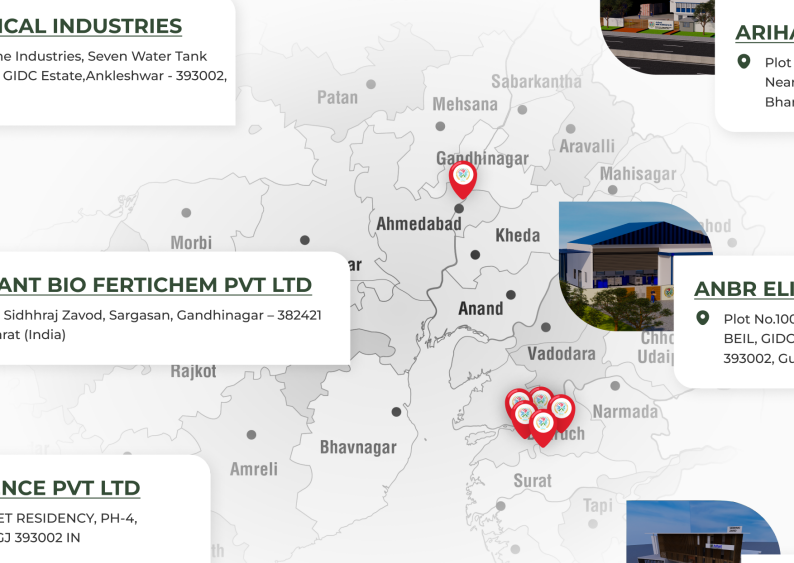
ARIHANT FOUNDATION

- Plot No. 5144, Nr. Prime Industries, Seven Water Tank Road, Paras Chowkdi, GIDC Estate, Ankleshwar - 393002, Gujarat, India



ANBK SEEDS PVT LTD

- 204, Sidhhraj Zavod, Sargasan, Gandhinagar - 382421 Gujarat (India)

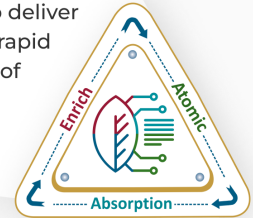


TECHNOLOGIES



EA² Technology

The Arihant group's EA2 technology coats fertilizer nutrients with polymer to deliver them directly to plants, providing rapid uptake and uniform translocation of nutrients.



S⁴ Technology

The Arihant group has developed S4 Technology that introduces nutrients to plants in a liquid gel form. It has long shelf-life, high concentrations, and prevents phase separation and sedimentation while keeping all components in suspension.



Research & Development



**One Of Our Strongest Driving Forces Is
Research-based innovative approach**

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Bio Fertilizer



Mycorrhizal (VAM)



Specifications :

Base	Powder
Moisture percent by weight, maximum	8-12%
pH	6.0-7.5
Total Viable propagules / gm of product	100 gm of finished product with min. 60 spores/gm
Infectivity Potential	Inoculum potential : 1200 IP/gm

Packing :

25 Kgs HDPE Bags

Dosage :

1 Kgs per acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Mycorrhizal (VAM)

Mycorrhizal VAM Dextrose Carrier Base

Description :

Dextrose, a sugar derived from corn, plays a crucial role when combined with liquid nitrogen by providing essential sugars that nourish bacteria as they become active in the soil. This process supports the initial stages of bacterial activity and enhances soil health.

Vesicular Arbuscular Mycorrhizal (VAM) fungi are beneficial organisms capable of solubilizing soil phosphates, thereby increasing phosphorus availability to plants. Beyond nutrient enhancement, VAM fungi strengthen plants, enabling them to resist diseases, adverse weather, and pathogenic infections.

The symbiotic association with host plants enhances water uptake and facilitates the absorption of vital mineral nutrients such as phosphate and nitrogen. This dual benefit of nutrient uptake and enhanced plant resilience underscores the significance of VAM fungi in promoting sustainable agriculture practices and improving overall crop productivity and health.

Benefits Of Mycorrhizal VAM Dextrose Carrier Base :

Colonizes roots, enhancing root mass and health, thereby promoting high yields.

Increases both yields and crop quality through improved nutrient uptake and plant vigor.

Optimizes fertilizer use, particularly enhancing phosphorus uptake efficiency.

Enhances tolerance to soil salinity, enabling plants to thrive in challenging soil conditions.

Contributes to soil quality maintenance, nutrient cycling, and erosion control.

Provides effective protection against fungal diseases, boosting plant resistance to fungal infections and bacterial attacks.



Specifications :

Base	Powder
Moisture percent by weight, maximum	8-12%
pH	6.0-7.5
Total Viable propagules / gm of product	100 gm of finished product with min. 60 spores/gm
Infectivity Potential	Inoculum potential : 1200 IP/gm

Packing :

25 Kgs HDPE Bags

Dosage :

1 Kgs per acre

Method Of Application :

Soil application

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Mycorrhizal (VAM)

Mycorrhizal VAM Talc Carrier Base

Arihant
Empowering Farmers



Description :

Talc is a very efficient Carrier for fertilizers since it helps the soil quality and also reduces water wastage since it improves fertilizer flow, reducing water pick-up

Vesicular Arbuscular Mycorrhizal (VAM) is a fungus which has the ability to dissolve the phosphates found in abundance in the soil. Apart from increasing the availability of phosphorus, VAM provides the plants with the necessary strength to resist disease germs and unfavourable weather conditions and to tolerate various pathogenic infections

VAM fungi can increase the nutrient uptake of their host plants. Arbuscular mycorrhizal association with the host plant increases the uptake of water and most essential mineral nutrients for their host plant, such as phosphate and nitrogen.

Benefits Of Mycorrhizal VAM Talc Carrier Base :

It colonize roots, increases root mass and health, consequently provides high yield

Increase yields and crop quality

Optimize fertilizer use, especially phosphorus

Increase tolerance to soil salinity

Contribute to maintain soil quality and nutrient cycling and control soil erosion

It is an effective protection from fungal diseases and make plant resistant to fungal infection and bacterial attacks



Specifications :

Base	Granule
Moisture percent by weight, maximum	8-12%
pH	6.0-7.5
Total Viable propagules / gm of product	100 gm of finished product with min. 60 spores/gm
Infectivity Potential	Inoculum potential : 1200 IP/gm

Packing :

50 Kgs HDPE Bags

Dosage :

5 Kgs. per acre

Method Of Application :

Soil application

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Mycorrhizal (VAM)

Mycorrhizal VAM Carrier Base Granule

Description :

Vesicular Arbuscular Mycorrhizal (VAM) fungi are crucial organisms capable of solubilizing abundant soil phosphates, thereby enhancing phosphorus availability to plants. Beyond nutrient enrichment, VAM fungi fortify plants, bolstering their ability to withstand disease pathogens, adverse weather conditions, and various pathogenic infections. This symbiotic relationship significantly augments nutrient uptake in host plants, facilitating increased absorption of water and essential minerals like phosphorus and nitrogen.

The mycorrhizal association between VAM fungi and host plants not only boosts nutrient availability but also strengthens plant resilience and vigor. By improving water and nutrient uptake efficiency, VAM fungi contribute to enhanced plant growth and overall crop productivity. Their role extends beyond nutrient acquisition, offering plants better defense mechanisms against fungal diseases and bacterial assaults, thereby promoting sustainable agricultural practices and ensuring robust plant health in diverse environmental conditions.

Benefits Of Mycorrhizal VAM Carrier Base Granule :

- Colonizes roots, increasing root mass and health, thereby enhancing yield potential.
- Enhances both yield and crop quality through improved nutrient uptake and plant vigor.
- Optimizes fertilizer use, particularly enhancing phosphorus utilization efficiency.
- Improves tolerance to soil salinity, enabling plants to thrive in saline conditions.
- Contributes to maintaining soil quality, nutrient cycling, and erosion control.
- Provides effective protection against fungal diseases, enhancing plant resistance to fungal and bacterial infections.

Bio Fertilizer
Mycorrhizal (VAM)

Mycorrhizal VAM Liquid

Description :

Vesicular Arbuscular Mycorrhizal (VAM) fungi are essential organisms capable of solubilizing abundant soil phosphates, thereby enhancing phosphorus availability for plants. Beyond nutrient enrichment, VAM fungi fortify plants, imparting resilience against disease pathogens, adverse weather, and various pathogenic infections. This symbiotic association significantly augments nutrient uptake in host plants, facilitating increased absorption of water and essential minerals such as phosphorus and nitrogen.

The mycorrhizal relationship between VAM fungi and host plants not only improves nutrient availability but also strengthens plant vigor and health. By enhancing water and nutrient uptake efficiency, VAM fungi contribute to enhanced plant growth and overall crop productivity. Their role extends beyond nutrient acquisition, providing plants with robust defense mechanisms against fungal diseases and bacterial attacks, thereby promoting sustainable agricultural practices. VAM fungi play a pivotal role in ensuring plant health and productivity in diverse environmental conditions, highlighting their importance in modern agriculture for optimizing plant nutrition and resilience.

Benefits Of Mycorrhizal VAM Liquid :

- Colonizes roots, boosting root mass and health, thereby enhancing overall yield.
- Enhances yields and improves crop quality by optimizing nutrient uptake and plant vigor.
- Optimizes fertilizer use, particularly enhancing phosphorus utilization efficiency.
- Increases tolerance to soil salinity, enabling plants to thrive in saline conditions.
- Contributes to maintaining soil quality, nutrient cycling, and erosion control.
- Provides effective protection against fungal diseases, enhancing plant resistance to fungal infections and bacterial attacks.

Specifications :

Base	Liquid
pH	4.0-5.5
Total Viable propagules / gm of product	100 gm of finished product with min. 60 spores/gm
Infectivity Potential	Inoculum potential : 1200 IP/gm

Packing :

200 ltr HDPE Barrel

Dosage :

1 ltr per acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.



Mycorrhizal (ECTO)

Bio Fertilizer
Mycorrhizal (ECTO)

Mycorrhizal Ecto Talc Carrier Base

Description :

In commercial forestry, the successful transplanting of crop trees to new locations often necessitates the presence of an ectomycorrhizal partner. This is particularly critical for trees that exhibit a high specificity towards their mycorrhizal fungi, or when planting occurs in environments where native fungal species may not naturally occur. This need is prominently observed in plantations involving obligate ectomycorrhizal trees like Eucalyptus and Pinus species.

For mass plantings of these species to thrive, it is common practice to introduce a native inoculum of ectomycorrhizal fungi. These fungi form symbiotic associations with tree roots, significantly enhancing nutrient uptake and overall plant health. In addition to supporting tree vitality, species such as pine and eucalyptus are often selected and promoted in forestry due to their capacity to sequester atmospheric carbon. This dual role underscores their importance not only in ecological restoration efforts but also in mitigating climate change by acting as carbon sinks.

Benefits Of Mycorrhizal Ecto Talc Carrier Base :

- Can utilize organic forms of nitrogen
- Improves N and P uptake
- Tolerant of high fertility levels
- High levels of enzyme activity benefiting nutrient and micronutrient acquisition
- Benefits plants in disturbed environments and acid soils
- Prolific rhizomorph producer improves performance in hot, dry conditions
- Inhibits soil pathogen growth and plant infection
- Protects roots from soil pathogens

Specifications :

Base	Powder
Spore count	1 x 10 ⁷ viable fungal spore/gm
pH	3.5-5.5

Packing :

25 Kgs HDPE Bags

Method Of Application :

Soil Application

Recommendation Crop :

For All crops

Dosage :

1 Kgs per acre



Specifications :

Base	Granule
Spore count	1 x 10 ⁷ viable fungal spore/gm
pH	3.5-5.5

Packing :

50 Kgs HDPE Bags

Dosage :

5 Kgs. per acre

Method Of Application :

Soil Application

Bio Fertilizer
Mycorrhizal (ECTO)

Mycorrhizal Ecto Carrier Base Granule

Description :

In commercial forestry, the successful transplanting of crop trees to new locations often depends on having a suitable ectomycorrhizal partner. This is crucial for trees that exhibit a strong specificity towards their mycobiont, especially when they are planted in environments where native fungal species may not naturally occur. This necessity is particularly evident in plantations involving obligate ectomycorrhizal trees like Eucalyptus and Pinus species.

To ensure the thriving of these species in mass plantings, it is common practice to introduce a native inoculum of ectomycorrhizal fungi. These fungi form symbiotic relationships with tree roots, enhancing nutrient uptake and overall plant health significantly.

Beyond supporting tree vitality, species such as pine and eucalyptus are chosen and promoted in forestry due to their capacity to sequester atmospheric carbon. This dual role underscores their importance not only in ecological restoration efforts but also in climate change mitigation efforts by serving as effective carbon sinks.

Benefits Of Mycorrhizal Ecto Carrier Base Granule :

Capable of utilizing organic forms of nitrogen, enhancing nutrient availability.

Improves uptake of nitrogen (N) and phosphorus (P), optimizing plant nutrition.

Tolerant of high fertility levels, adapting well to nutrient-rich soils.

Exhibits high levels of enzyme activity, facilitating efficient acquisition of nutrients and micronutrients.

Benefits plants in disturbed environments and acid soils by improving nutrient uptake and resilience.

Produces prolific rhizomorphs that enhance performance in hot and dry conditions.

Inhibits growth of soil pathogens, reducing plant infection risks.

Protects plant roots from soil-borne pathogens, enhancing overall plant health and vigor.

Bio Fertilizer
Mycorrhizal (ECTO)

Mycorrhizal Ecto Liquid

Description :

In commercial forestry, successful transplantation of crop trees to new locations often hinges on the presence of an ectomycorrhizal partner. This need is particularly critical for trees that exhibit specific requirements for their mycobiont, especially when they are planted in environments far from their native habitats and among unfamiliar fungal species. This necessity is well-documented in plantations involving obligate ectomycorrhizal trees like Eucalyptus and Pinus species.

To ensure the thriving of these species in large-scale plantings, it is common practice to introduce a native inoculum of ectomycorrhizal fungi. These fungi establish symbiotic relationships with tree roots, significantly enhancing nutrient uptake and overall plant health.

Beyond supporting tree vitality, species such as pine and eucalyptus are strategically chosen and promoted in forestry for their capacity to sequester atmospheric carbon dioxide, thereby mitigating climate change impacts. This dual role underscores their importance in both ecological restoration initiatives and global efforts to address environmental challenges through sustainable forestry practices.

Benefits Of Mycorrhizal Ecto Liquid :

Utilizes organic forms of nitrogen effectively, enhancing nutrient availability for plants.

Improves uptake of nitrogen (N) and phosphorus (P), optimizing plant nutrition and growth.

Tolerates high fertility levels in soils, adapting well to nutrient-rich environments.

Exhibits high levels of enzyme activity, facilitating efficient acquisition of nutrients and micronutrients.

Benefits plants in disturbed environments and acidic soils by improving nutrient uptake and enhancing resilience.

Produces prolific rhizomorphs that enhance performance in hot and dry conditions, aiding in water and nutrient absorption.

Inhibits the growth of soil pathogens, reducing the risk of plant infections and promoting overall plant health.

Protects plant roots from soil-borne pathogens, contributing to enhanced root health and vigor.

Specifications :

Base	Liquid
Spore count	1 x 10 ⁷ viable fungal spore/gm
pH	3.5-5.5

Packing :

200 ltr HDPE Barrel

Dosage :

1 ltr per acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.



Bio Fertilizer Culture Liquid

Bio Fertilizer Bio Fertilizer Culture Liquid **Azotobacter**



Specifications :

1 x 10¹⁰ cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus Fruits, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Description :

Azotobacter is a genus of free-living, nitrogen-fixing bacteria that plays a vital role in the nitrogen cycle. These bacteria are found in various soil environments and can thrive in both aerobic (oxygen-rich) and anaerobic (oxygen-depleted) conditions. They possess the unique ability to convert atmospheric nitrogen into a form usable by plants, thereby reducing the dependency on synthetic nitrogen fertilizers. Azotobacter also promotes plant growth through the production of growth-promoting substances, enhancing nutrient availability and root development. Additionally, they contribute to soil fertility by producing enzymes that degrade organic matter, releasing nutrients for plants. As a natural biofertilizer, Azotobacter offers sustainable and eco-friendly solutions for agriculture, improving soil health and crop productivity. Azotobacter can accomplish nitrogen fixation by using three different enzymes, which are termed nitrogenases. The enhanced versatility of Azotobacter bacteria makes the microbe attractive for agricultural purposes.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Azotobacter :

- 1. Nitrogen fixation:** Azotobacter has the unique ability to convert atmospheric nitrogen into ammonia, a form usable by plants. This process, known as nitrogen fixation, helps reduce the need for synthetic nitrogen fertilizers and promotes sustainable crop production.
- 2. Growth promotion:** Azotobacter produces growth-promoting substances like auxins, cytokinins, and gibberellins, which stimulate plant growth and development. This leads to enhanced root growth, nutrient uptake, and overall plant vigor.
- 3. Improved nutrient availability:** These bacteria secrete enzymes that break down organic matter, releasing nutrients such as phosphorus, potassium, and micronutrients into the soil. This process improves nutrient availability for plants and supports healthy root development.
- 4. Enhances soil fertility:** Azotobacter contributes to soil fertility by increasing organic matter content, improving soil structure, and enhancing cation exchange capacity. It helps create a favorable environment for beneficial soil microorganisms and supports the overall health of the soil ecosystem.
- 5. Strengthened plant resistance:** Azotobacter can stimulate the production of certain compounds in plants that enhance their defense mechanisms against pathogens and pests. This can lead to improved disease resistance and reduced reliance on chemical pesticides.
- 6. Environmental sustainability:** By reducing the need for synthetic nitrogen fertilizers, Azotobacter biofertilizers help minimize the negative impacts of nitrogen runoff into water bodies. This mitigates pollution and improves environmental sustainability in agricultural practices.
- 7. It thrives even in alkaline soils.**
- 8. Biological Control Agent:** Azotobacter produces substances that inhibit plant pathogens, thus acting as a biological control agent.

Bio Fertilizer Bio Fertilizer Culture Liquid **Rhizobium**



Specifications :

1×10^{10} cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Gram, lentil, pea, pigeon pea, Soyabean, green gram, black gram, ground nut, etc

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Description :

Rhizobium is a genus of nitrogen-fixing bacteria that forms a symbiotic relationship with leguminous plants. Rhizobium forms an endosymbiotic nitrogen-fixing association with the roots of legumes. These bacteria play a crucial role in biological nitrogen fixation, converting atmospheric nitrogen into a form that can be used by plants. Rhizobium bacteria colonize the roots of legumes and form specialized structures called nodules. Within these nodules, the bacteria establish a mutually beneficial relationship with the plant. The bacteria supply the plant with fixed nitrogen, while the plant provides the bacteria with carbohydrates and an appropriate environment for growth. This symbiosis leads to increased nitrogen availability for the legume plant, promoting its growth and productivity. Rhizobium also contributes to soil fertility, as the fixed nitrogen enriches the soil and benefits other non-leguminous plants. By reducing the dependence on synthetic nitrogen fertilizers, Rhizobium plays a significant role in sustainable agriculture and ecological balance. The plant provides organic compounds to the bacteria, which are made by photosynthesis.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Rhizobium :

- Nitrogen fixation:** Rhizobium bacteria have the ability to fix atmospheric nitrogen, converting it into ammonia that can be utilized by leguminous plants. This reduces the reliance on synthetic nitrogen fertilizers, saving costs and reducing environmental pollution.
- Enhanced plant growth:** The symbiotic relationship between Rhizobium and leguminous plants leads to increased plant growth and yield. The fixed nitrogen supplied by the bacteria promotes vigorous vegetative growth, improved root development, and overall plant health.
- Improved soil fertility:** The process of nitrogen fixation by Rhizobium results in the accumulation of fixed nitrogen in the soil. This not only benefits the associated leguminous plants but also provides a nutrient source for other non-leguminous plants in the vicinity, improving overall soil fertility.
- Reduce environmental impact:** By reducing the use of synthetic nitrogen fertilizers, which can contribute to environmental issues such as water pollution and greenhouse gas emissions, the use of Rhizobium promotes sustainable agricultural practices and reduces the environmental impact of farming.
- Lower cost input:** Incorporating Rhizobium in agricultural practices can lead to cost savings for farmers. As the bacteria fix nitrogen from the air, it eliminates or reduces the need for nitrogenous fertilizers, which can be expensive.
- Disease suppression:** Rhizobium bacteria have been found to possess biological control properties, suppressing the growth of certain plant pathogens. This can help in reducing the occurrence and severity of plant diseases, enhancing crop health, and reducing the need for chemical pesticides.
- Drought tolerance:** Rhizobium can enhance a plant's tolerance to drought stress due to its ability to improve root development. The symbiotic association between Rhizobium and legumes can result in increased water and nutrient uptake efficiency, helping plants withstand periods of water scarcity.

Bio Fertilizer
Bio Fertilizer Culture Liquid

Azospirillum



Specifications :

1 x 10¹⁰ cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Description :

Azospirillum is a genus of beneficial, plant growth-promoting bacteria commonly found in soil and rhizosphere environments. This gram-negative, motile bacterium is commonly found in the roots of monocots. It plays a crucial role in nitrogen fixation by converting atmospheric nitrogen into a form that plants can use, significantly reducing the need for chemical nitrogen fertilizers by up to 50%. These bacteria play a crucial role in agriculture by promoting plant growth and health through various mechanisms. Azospirillum is known for its ability to fix atmospheric nitrogen, converting it into a plant-usable form through a symbiotic association with plant roots. This reduces the dependency on synthetic nitrogen fertilizers, making it environmentally sustainable. Additionally, Azospirillum produces growth-promoting substances like auxins and cytokinins, which stimulate root development and enhance nutrient uptake.

It also increases nutrient availability by solubilizing and mineralizing nutrients in the soil. Furthermore, Azospirillum can induce systemic resistance in plants, making them more resistant to pathogens and alleviating biotic stress. This combination of benefits makes Azospirillum a valuable tool for sustainable agriculture and improving crop yields. In addition to its nitrogen-fixing capabilities, Azospirillum secretes small amounts of fungicides and enzymes, which contribute to plant health and protection. This combination of benefits makes Azospirillum an essential component in sustainable agriculture practices.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Azospirillum :

- 1. Nitrogen Fixation:** Azospirillum is a nitrogen-fixing bacterium that converts atmospheric nitrogen into a usable form for plants.
- 2. Reduced Fertilizer Usage:** It reduces the need for nitrogen fertilizers by up to 50%, promoting cost-effective and environmentally friendly farming.
- 3. Production of Fungicides and Enzymes:** Produces small amounts of fungicides and enzymes, contributing to plant health and disease resistance.
- 4. Enhanced Crop Productivity:** Increases crop productivity on a large scale, supporting higher yields and better-quality produce.
- 5. Specificity for Monocots:** Primarily used for monocot vegetables, making it highly effective for crops like wheat, rice, and maize.
- 6. Biologically Active Substances:** Produces vitamins, nicotinic acids, indole acetic acid, gibberellins, and other biologically active substances that improve flowering retention and enhance overall plant growth.

Bio Fertilizer Bio Fertilizer Culture Liquid **Acetobacter**



Specifications :

1 x 10¹⁰ cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Description :

Acetobacter is a versatile genus of bacteria known for its dual role in agriculture and industry. In agriculture, it functions as an aerobic nitrogen-fixing bacterium, thriving in the roots, stems, and leaves of plants like sugarcane and coffee. It produces growth-promoting substances such as Indole Acetic Acid and Gibberellic Acid, stimulating root proliferation and enhancing nutrient uptake, water absorption, and phosphate solubilization. This promotes robust growth and improves sugar recovery in sugarcane crops.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Acetobacter :

- 1. Better Crop Growth and Seedling Establishment:** Acetobacter enhances crop growth and promotes robust seedling establishment by improving nutrient uptake, water absorption, and mineral utilization.
- 2. Increased Crop Yield (25%-35%):** It significantly boosts crop yields by 25%-35%, ensuring higher productivity and better returns for farmers.
- 3. Production of Vitamins and Hormones:** Acetobacter produces essential vitamins such as thiamine, riboflavin, nicotinic acid, and pantothenic acid. It also synthesizes hormones like Indole Acetic Acid (IAA) and Gibberellic Acid (GA), which promote plant growth and development.
- 4. Unique Physiological Properties:** The bacterium possesses unique physiological traits, including tolerance to low pH levels, and high sugar and salt concentrations. It lacks nitrate reductase and nitrogenase activity, enabling it to tolerate short-term exposure to ammonia without compromising its function.
- 5. Enhanced Root System Development:** Acetobacter increases the number of rootlets and stimulates root proliferation, facilitating improved uptake of minerals, phosphate, and water. This strengthens the plant's root system, enhancing overall nutrient absorption and resilience to environmental stresses.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Culture Liquid

Phosphate Solubilizing Bacteria

Description :

Phosphorus, second only to nitrogen, is one of the most crucial mineral nutrients limiting crop growth. It is essential for plant development and growth but is often insoluble and unavailable to plants. Consequently, the amount of phosphorus accessible to plants is typically a small fraction of its total presence in the soil. Phosphate Solubilizing Bacteria (PSB) play a vital role by converting insoluble phosphates into soluble forms, making phosphorus available to plants, and enhancing crop growth. They secrete organic acids and enzymes that dissolve bound phosphates, improving nutrient uptake and promoting plant health. PSBs are crucial for sustainable agriculture, reducing the need for chemical fertilizers, enhancing root development, increasing crop yield, and supporting environmentally friendly farming practices. By harnessing PSB, farmers can achieve better productivity and contribute to ecological balance.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Phosphate Solubilizing Bacteria :

- Improves Resistance of Crop Plants:** PSB helps strengthen the natural defenses of crop plants, making them more resilient to diseases and pests. This improved resistance reduces the reliance on chemical pesticides and enhances overall plant health, leading to more robust and healthy crops.
- Resistance to Varying Soil pH and Temperatures:** PSBs are adaptable to different soil pH levels and temperatures, allowing them to function effectively in diverse environmental conditions. This versatility ensures that plants can benefit from phosphorus solubilization even in challenging soil and climatic conditions.
- Suitable for All Crops:** PSB can be used across a wide range of crops, making it a versatile solution for farmers. Whether cultivating cereals, vegetables, fruits, or legumes, PSB can improve phosphorus availability and promote healthy plant growth.
- Improves Crop Growth and Yield by 20-30%:** By enhancing phosphorus availability, PSB significantly boosts crop growth and yield. Studies have shown that the use of PSB can increase crop yields by 20-30%, making it a valuable tool for improving agricultural productivity and profitability.
- Compatible with Other Biofertilizers:** PSB works well in conjunction with other biofertilizers, creating a synergistic effect that further enhances soil fertility and plant health. This compatibility allows farmers to adopt integrated nutrient management practices, optimizing the benefits of various biofertilizers.
- Better Nutrient Uptake and Vigorous Crop Growth:** PSB improves the efficiency of nutrient uptake by plants, ensuring that essential nutrients like phosphorus are readily available. This enhanced nutrient absorption leads to vigorous crop growth, stronger root systems, and improved overall plant development, resulting in healthier and more productive crops.



Specifications :

1×10^{10} cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Culture Liquid

Potassium Mobilizing Bacteria

Description :

Potassium mobilizing bacteria (KMB) are beneficial microorganisms that play a vital role in improving crop growth. These bacteria have the unique ability to mobilize insoluble forms of potassium, making it more readily available for plants. By doing so, they enhance the nutrient uptake efficiency of crops, leading to faster and healthier growth.

When KMB is applied to the soil, it helps release several percent of insoluble potassium within just 25 days. This significantly reduces the need for expensive potash fertilizers, ultimately cutting down costs by 50-60%.

The bacteria produce organic acids and enzymes, which aid in solubilizing fixed potassium and converting it into an exchangeable form that can be easily absorbed by plants. This ability protects crops against potassium deficiency and ensures their optimal growth.

One of the remarkable traits of KMB is its high tolerance level, which allows it to thrive at various soil pH levels and temperatures. Additionally, KMB colonizes the rhizosphere, which is the soil zone around the roots of plants. This colonization further strengthens the bacteria-plant interaction and enhances nutrient availability for the crops.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Potassium Mobilizing Bacteria :

- Resistance to a wide range of soil pH and temperature:** Potassium mobilizing bacteria (KMB) exhibit high tolerance to different soil pH levels and temperature variations, allowing them to thrive in diverse agricultural environments.
- Improves resistance capacity of crop plants:** KMB enhances the natural defense mechanisms of crop plants, making them more resilient against various environmental stresses, such as drought, salinity, and disease.
- Suitable to apply to all crops:** KMB can be applied to a wide range of crop species, including cereals, fruits, vegetables, and legumes. It adapts well to different crop systems and helps maximize nutrient availability regardless of the crop type.
- Improves crop growth and yield by 20-30%:** By mobilizing insoluble forms of potassium and increasing nutrient uptake efficiency, KMB promotes vigorous crop growth and enhances overall yield potential. Studies have shown significant yield increases ranging from 20% to 30% in various crops.
- Reduce cost of potash application by 50-60%:** With the help of KMB, farmers can reduce their reliance on expensive potash fertilizers. The bacteria mobilize insoluble potassium, making it more accessible to plants, thereby reducing the need for costly potash applications.
- It increases fruit sweetness, color, and size:** KMB's ability to enhance nutrient uptake and promote healthier plant growth can lead to improved fruit quality. This includes increased sweetness, enhanced color development, and even larger fruit sizes in certain crop varieties.
- Compatible with other biofertilizers:** KMB is compatible with other biofertilizers, allowing farmers to easily combine its benefits with those of other beneficial microorganisms. This synergistic effect can further enhance nutrient availability, improve soil health, and promote sustainable agriculture practices.



Specifications :

1 x 10¹⁰ cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Culture Liquid

Consortia (Bio NPK)

Description :

Consortia is a combination of more than one microorganism that, being in the rhizosphere, directly or indirectly influences the composition and productivity of natural plant communities. Consortia, also known as Bio NPK (Nitrogen, Phosphorus, and Potassium), are a combination of multiple beneficial microorganisms that work together to provide a comprehensive nutrient management solution for plants. These consortia consist of different strains of bacteria, fungi, and other beneficial microbes.

Each microorganism plays a unique role in fixing nitrogen, solubilizing phosphorus, and mobilizing potassium, thereby promoting the availability and uptake of these vital nutrients by plants. By utilizing Bio NPK consortia, farmers can optimize nutrient utilization, improve soil fertility, enhance crop growth and yield, and reduce their reliance on chemical fertilizers, thereby promoting sustainable and environmentally friendly agricultural practices. Bio NPK is a combination of Azotobacter, Phosphate Solubilizing Bacteria, and Potash Mobilizing Bacteria; combined they give a wholesome nutritional solution for the crop.

Specifications :

1×10^{10} cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Consortia (Bio NPK) :

- Azotobacter:** This microorganism has the ability to fix atmospheric nitrogen, reducing the dependency on synthetic fertilizers. It can fix nitrogen up to 20-40 kg per hectare, providing an important source of nitrogen for plant growth.
- PSB (Phosphorus Solubilizing Bacteria):** PSB produces organic acids that assist in the uptake of phosphate, leading to increased maturity and enhanced yield. The production of organic acids such as malic, succinic, fumaric, citric tartaric acid, and acetic acid accelerates phosphate availability and uptake by plants.
- KMB (Potassium Mobilizing Bacteria):** KMB enhances crop resistance against diseases and stress conditions. It also secretes growth hormones, which can increase crop productivity. By mobilizing insoluble potassium, KMB reduces the need for potash fertilizers by 50-60%.
- Supply of Essential Nutrients:** The Bio NPK consortia ensures the supply of essential nutrients in optimal quantities to the crops. This balanced nutrient availability promotes healthy plant growth and development.
- Prevention of Micronutrient Deficiency:** The consortia helps prevent micronutrient deficiencies that may occur at different growth stages of crops. By supplying a complete range of nutrients, it ensures that the crops have access to the necessary elements throughout their growth cycle.
- Chelation with EDTA:** The presence of EDTA (Ethylene Diamine Tetraacetic Acid) chelates in the consortia facilitates the fast absorption of all individual microelements by plants. This improves the efficiency of nutrient uptake, ensuring that plants receive the required microelements for optimal growth and development.

Bio Fertilizer
Bio Fertilizer Culture Liquid

Zinc Solubilizing Bacteria

Description :

Zinc solubilizing bacteria play a crucial role in enhancing plant growth and productivity by mobilizing zinc in the soil. These bacteria employ various mechanisms, one of which involves acidification. They secrete organic acids into the soil, which effectively sequester zinc cations, making them more available to plants. Additionally, the organic acids released by these microbes contribute to a decrease in the pH of the nearby soil, promoting zinc solubility. This acidification process helps break down the complex forms of zinc in the soil, ensuring better absorption and utilization by plants. Consequently, the increased availability of zinc leads to improved crop yield and quality. The beneficial effects of zinc-solubilizing bacteria on plant growth make them valuable allies in sustainable agriculture practices, especially in zinc-deficient soils.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Zinc Solubilizing Bacteria :

- 1. Reduces Chemical Fertilizer Usage:** The use of this biological zinc fertilizer can decrease the reliance on chemical zinc-based fertilizers by up to 40%, promoting a more sustainable approach to agriculture.
- 2. Promotes Plant Growth:** The bacteria in the fertilizer secrete plant growth promoters, which aid in better and faster plant development.
- 3. Enhances Soil Fertility:** This fertilizer improves soil fertility, with effects that extend into the next crop season due to bacterial multiplication and persistence.
- 4. Increases Crop Yield and Quality:** By using this fertilizer, farmers can expect an increase in both crop yield and the quality of the produce.
- 5. Boosts Soil Health and Activates Hormones:** The fertilizer contributes to overall soil health and activates essential plant hormones, ensuring robust plant growth.
- 6. Improves Photosynthesis:** The enhanced photosynthesis activity facilitated by this fertilizer leads to healthier and more productive plants.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.



Specifications :

1×10^{10} cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Bio Fertilizer Culture Liquid

Phosphate Solubilizing Fungal

Description :

Phosphorus-solubilizing fungi are a beneficial group of microorganisms that play a vital role in converting insoluble phosphorus compounds into soluble forms that can be readily absorbed by plants. They achieve this by employing various mechanisms such as lowering the pH level of the soil, chelation, and mineralization processes. This transformation makes phosphorus more accessible for plant uptake and utilization.

Furthermore, phosphorus-solubilizing fungi provide protection to plants by suppressing phytopathogens, thereby enhancing plant health and reducing the risk of diseases. Additionally, a sufficient supply of phosphate facilitated by these fungi promotes seed formation and aids in the early maturation of crops. Moreover, it can contribute to early ripening and stimulate young plants to develop deeper, more abundant root systems, improving nutrient uptake efficiency.

The presence of phosphorus-solubilizing fungi in the soil promotes the availability of essential phosphorus for plant growth through pH regulation, chelation, and mineralization processes. Their activities provide protection against phytopathogens, aid in seed formation and maturation, encourage early ripening, and promote vigorous root growth. Ultimately, this leads to improved crop productivity and overall plant health.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Phosphate Solubilizing Fungal :

- Fulfilling Deficiencies:** These fungi help in addressing phosphorus deficiencies in plants, ensuring the plants have an adequate supply of this essential nutrient.
- Enhancing Plant Activities:** Phosphorus-solubilizing fungi facilitate important plant activities such as photosynthesis, root development, stalk and stem strength, flower and seed formation, and overall growth.
- Early Ripening and Root Growth:** These fungi aid in the early ripening of fruits and promote the growth of young plants with deeper and more abundant root systems.
- Auxin and Gibberellin Production:** Phosphorus-solubilizing fungi stimulate plant growth by producing growth-promoting substances like auxins and gibberellins.
- Increased Phosphorus Availability:** These fungi enhance phosphorus availability in the soil without disturbing its biochemical composition, ensuring that plants can efficiently acquire and utilize this nutrient.



Specifications :

1 x 10¹⁰ spores/ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Culture Liquid

Sulphur Oxidizing Bacteria

Description :

Sulphur oxidizers play a crucial role in converting elemental sulphur into plant-available sulfate. Sulphur is an essential element for pulse production and is involved in the formation of proteins, vitamins, and enzymes. It is a key component of amino acids such as cystine, cysteine, and methionine.

Sulphur oxidizers facilitate the conversion of various sulfur forms, including elemental sulphur and reduced sulfur compounds, into sulphate through the process of oxidation in the soil. The chemolithotrophic bacteria of the Thiobacillus genus are particularly important in this process. By utilizing sulphur oxidizers, the natural oxidation of sulfur is enhanced, leading to an accelerated production of sulfate.

The availability of sulphate in the soil is vital for plants to acquire the necessary sulphur for their growth and development. Therefore, the use of sulfur oxidizers is beneficial as it helps in increasing sulphate production, ensuring an adequate supply of sulphur for plants. This, in turn, supports the formation of important molecules like proteins, vitamins, and enzymes, ultimately contributing to improved crop productivity and quality.

Specifications :

1×10^{10} cells /ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Sulphur Oxidizing Bacteria :

- 1. Essential Secondary Nutrients:** Sulfur is classified as a secondary nutrient, but it is vital for plant growth and metabolism.
- 2. Indispensable for Growth:** Sulfur is essential for all plants, playing a crucial role in their growth and metabolic processes.
- 3. Enhances Micronutrient Solubility:** It increases the solubility of key micronutrients like iron, zinc, and manganese, facilitating better nutrient uptake by plants.
- 4. Chlorophyll Formation:** Sulfur is involved in the formation of chlorophyll, which is essential for photosynthesis and overall plant health.
- 5. Role in Protein Synthesis:** Known for its role in protein synthesis, sulfur performs numerous oxidizing functions in plant nutrition, contributing to robust and healthy plant development.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Culture Liquid

Calcium Solubilizing Bacteria

Description :

Calcium-solubilizing bacteria are microorganisms that convert insoluble calcium into soluble forms, enhancing soil fertility and plant health. They possess enzymes like organic acids that break down calcium compounds in the soil, making them available for plants. Calcium is essential for plant growth and development, and these bacteria contribute to soil fertility and nutrient uptake. They can be found naturally in soil, the rhizosphere, and plant roots, forming a symbiotic relationship with plants.

Their presence in the soil ecosystem increases calcium bioavailability and promotes soil structure, nutrient cycling, and plant resistance to stress. These bacteria can be commercially isolated, cultured, and applied as biofertilizers or bioinoculants, improving crop yield and reducing reliance on chemical fertilizers. In summary, calcium-solubilizing bacteria are vital for sustainable agriculture and eco-friendly farming practices, as they enhance calcium availability, improve soil fertility, and reduce reliance on chemical fertilizers.

Specifications :

1 x 10¹⁰ cells/ml

Packing :

1 lt, 5 lt, 50 lt

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Recommended Crops :

Some recommended crops for the application of calcium-solubilizing bacteria are Tomatoes, Peppers, Potatoes, Cucumbers, Strawberries, Grapes, Apples, Cabbage, Broccoli, Lettuce, Carrots, Spinach, Cauliflower, Beans, Peas, Citrus Fruits (e.g., oranges, lemons), Melons (e.g., watermelons, cantaloupes), Brassicas (e.g., Brussels sprouts, kale), Root Vegetables (e.g., beets, radishes), and flowering plants (e.g., roses, chrysanthemums). These crops benefit from improved calcium availability, which enhances cell wall structure, nutrient absorption, and overall plant health.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

USP :

Significant Cost Savings: Optimize your budget with our cost-effective solution. The high dilution ratio translates to lower transportation, storage, and application costs, improving your bottom line.

User-Friendly Application: Streamline your operations with our easy-to-use biofertilizer. Simply dilute and apply, reducing labor and time costs associated with complex fertilization processes.

Exceptional Concentration and Efficiency: Multiply your impact with just 1 liter of our biofertilizer, which dilutes to make 100 liters of powerful nutrient solution. Maximize efficiency in large-scale operations.

Benefits of Calcium Solubilizing Bacteria :

- 1. Improved plant growth:** Calcium solubilizing bacteria enhance the availability of calcium, an essential nutrient for plant growth and development. This leads to improved root development, stronger stems, and increased overall plant growth.
- 2. Increased nutrient uptake:** By solubilizing calcium, these bacteria also improve the availability of other nutrients in the soil. Calcium is necessary for the efficient uptake of other nutrients, such as nitrogen and phosphorus, so increased calcium availability benefits plants' overall nutrient uptake.
- 3. Enhanced soil fertility:** Calcium solubilizing bacteria contribute to the overall fertility of the soil by improving the availability of calcium. This helps maintain a balanced soil pH, supports soil structure, and promotes nutrient cycling.
- 4. Disease resistance:** Calcium plays a crucial role in plant defense mechanisms. By increasing calcium availability, these bacteria help plants develop stronger cell walls, improving their resistance to diseases and pests.
- 5. Drought tolerance:** Calcium solubilization facilitates the efficient use of water by plants, leading to improved drought tolerance. This is particularly important in regions with limited water availability or during periods of water scarcity.
- 6. Reduced chemical fertilizer dependency:** By enhancing calcium availability, these bacteria reduce the reliance on synthetic chemical fertilizers. This can lead to more sustainable agriculture practices, reduce environmental pollution, and promote ecological balance.

The background features a white central area surrounded by dark green organic shapes. A large yellow semi-circle is at the top right, and a yellow wavy line runs along the bottom. Several light green shapes, including a semi-circle on the left and two rounded squares, are scattered in the white area. A circular pattern of thin green lines is partially visible on the right.

Bio Fertilizer Liquid

Bio Fertilizer
Bio Fertilizer Liquid

Azotobacter



Specifications :

Base	Liquid
Viable cell count	CFU minimum 1×10^6 cell/ml
Contamination level	No contamination at 10^5 dilution
pH	5.0 – 7.0
Efficiency character	The strain should be capable of fixing at least 10 mg of nitrogen per g of sucrose consumed

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Description :

Azotobacter is a genus of free-living, nitrogen-fixing bacteria that plays a vital role in the nitrogen cycle. These bacteria are found in various soil environments and can thrive in both aerobic (oxygen-rich) and anaerobic (oxygen-depleted) conditions. They possess the unique ability to convert atmospheric nitrogen into a form usable by plants, thereby reducing the dependency on synthetic nitrogen fertilizers.

Azotobacter also promotes plant growth through the production of growth-promoting substances, enhancing nutrient availability and root development. Additionally, they contribute to soil fertility by producing enzymes that degrade organic matter, releasing nutrients for plants. As a natural biofertilizer, Azotobacter offers sustainable and eco-friendly solutions for agriculture, improving soil health and crop productivity. Azotobacter can accomplish nitrogen fixation by using three different enzymes, which are termed nitrogenases. The enhanced versatility of Azotobacter bacteria makes the microbe attractive for agricultural purposes.

Benefits of Azotobacter :

Nitrogen fixation: Azotobacter has the unique ability to convert atmospheric nitrogen into ammonia, a form usable by plants. This process, known as nitrogen fixation, helps reduce the need for synthetic nitrogen fertilizers and promotes sustainable crop production.

Growth promotion: Azotobacter produces growth-promoting substances like auxins, cytokinins, and gibberellins, which stimulate plant growth and development. This leads to enhanced root growth, nutrient uptake, and overall plant vigor.

Improved nutrient availability: These bacteria secrete enzymes that break down organic matter, releasing nutrients such as phosphorus, potassium, and micronutrients into the soil. This process improves nutrient availability for plants and supports healthy root development.

Enhances soil fertility: Azotobacter contributes to soil fertility by increasing organic matter content, improving soil structure, and enhancing cation exchange capacity. It helps create a favorable environment for beneficial soil microorganisms and supports the overall health of the soil ecosystem.

Strengthened plant resistance: Azotobacter can stimulate the production of certain compounds in plants that enhance their defense mechanisms against pathogens and pests. This can lead to improved disease resistance and reduced reliance on chemical pesticides.

Environmental sustainability: By reducing the need for synthetic nitrogen fertilizers, Azotobacter biofertilizers help minimize the negative impacts of nitrogen runoff into water bodies. This mitigates pollution and improves environmental sustainability in agricultural practices.

It thrives even in alkaline soils.

Biological Control Agent: Azotobacter produces substances that inhibit plant pathogens, thus acting as a biological control agent.

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Liquid

Rhizobium



Specifications :

Base	Liquid
Viable cell count	CFU minimum 1 x 10 ⁶ cell/ml
Contamination level	No contamination at 10 ⁵ dilution
pH	5.0 – 7.0
Efficiency character	Should show effective nodulation on all the species listed on the packet.

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Recommended Crops :

Gram, lentil, pea, pigeon pea, Soyabean, green gram, black gram, ground nut etc.

Description :

Rhizobium is a genus of nitrogen-fixing bacteria that forms a symbiotic relationship with leguminous plants. Rhizobium forms an endosymbiotic nitrogen-fixing association with the roots of legumes. These bacteria play a crucial role in biological nitrogen fixation, converting atmospheric nitrogen into a form that can be used by plants. Rhizobium bacteria colonize the roots of legumes and form specialized structures called nodules. Within these nodules, the bacteria establish a mutually beneficial relationship with the plant. The bacteria supply the plant with fixed nitrogen, while the plant provides the bacteria with carbohydrates and an appropriate environment for growth.

This symbiosis leads to increased nitrogen availability for the legume plant, promoting its growth and productivity. Rhizobium also contributes to soil fertility, as the fixed nitrogen enriches the soil and benefits other non-leguminous plants. By reducing the dependence on synthetic nitrogen fertilizers, Rhizobium plays a significant role in sustainable agriculture and ecological balance. The plant provides organic compounds to the bacteria, which are made by photosynthesis.

Benefits Of Rhizobium :

Nitrogen fixation: Rhizobium bacteria have the ability to fix atmospheric nitrogen, converting it into ammonia that can be utilized by leguminous plants. This reduces the reliance on synthetic nitrogen fertilizers, saving costs and reducing environmental pollution.

Enhanced plant growth: The symbiotic relationship between Rhizobium and leguminous plants leads to increased plant growth and yield. The fixed nitrogen supplied by the bacteria promotes vigorous vegetative growth, improved root development, and overall plant health.

Improved soil fertility: The process of nitrogen fixation by Rhizobium results in the accumulation of fixed nitrogen in the soil. This not only benefits the associated leguminous plants but also provides a nutrient source for other non-leguminous plants in the vicinity, improving overall soil fertility.

Reduce environmental impact: By reducing the use of synthetic nitrogen fertilizers, which can contribute to environmental issues such as water pollution and greenhouse gas emissions, the use of Rhizobium promotes sustainable agricultural practices and reduces the environmental impact of farming.

Lower cost input: Incorporating Rhizobium in agricultural practices can lead to cost savings for farmers. As the bacteria fix nitrogen from the air, it eliminates or reduces the need for nitrogenous fertilizers, which can be expensive.

Disease suppression: Rhizobium bacteria have been found to possess biological control properties, suppressing the growth of certain plant pathogens. This can help in reducing the occurrence and severity of plant diseases, enhancing crop health, and reducing the need for chemical pesticides.

Drought tolerance: Rhizobium can enhance a plant's tolerance to drought stress due to its ability to improve root development. The symbiotic association between Rhizobium and legumes can result in increased water and nutrient uptake efficiency, helping plants withstand periods of water scarcity.

Bio Fertilizer
Bio Fertilizer Liquid

Azospirillum

Description :

Azospirillum is a genus of beneficial, plant growth-promoting bacteria commonly found in soil and rhizosphere environments. This gram-negative, motile bacterium is commonly found in the roots of monocots. It plays a crucial role in nitrogen fixation by converting atmospheric nitrogen into a form that plants can use, significantly reducing the need for chemical nitrogen fertilizers by up to 50%. These bacteria play a crucial role in agriculture by promoting plant growth and health through various mechanisms. Azospirillum is known for its ability to fix atmospheric nitrogen, converting it into a plant-usable form through a symbiotic association with plant roots. This reduces the dependency on synthetic nitrogen fertilizers, making it environmentally sustainable. Additionally, Azospirillum produces growth-promoting substances like auxins and cytokinins, which stimulate root development and enhance nutrient uptake.

It also increases nutrient availability by solubilizing and mineralizing nutrients in the soil. Furthermore, Azospirillum can induce systemic resistance in plants, making them more resistant to pathogens and alleviating biotic stress. This combination of benefits makes Azospirillum a valuable tool for sustainable agriculture and improving crop yields. In addition to its nitrogen-fixing capabilities, Azospirillum secretes small amounts of fungicides and enzymes, which contribute to plant health and protection. This combination of benefits makes Azospirillum an essential component in sustainable agriculture practices.

Benefits Of Azospirillum :

Nitrogen Fixation: Azospirillum is a nitrogen-fixing bacterium that converts atmospheric nitrogen into a usable form for plants.

Reduced Fertilizer Usage: It reduces the need for nitrogen fertilizers by up to 50%, promoting cost-effective and environmentally friendly farming.

Production of Fungicides and Enzymes: Produces small amounts of fungicides and enzymes, contributing to plant health and disease resistance.

Enhanced Crop Productivity: Increases crop productivity on a large scale, supporting higher yields and better-quality produce.

Specificity for Monocots: Primarily used for monocot vegetables, making it highly effective for crops like wheat, rice, and maize.

Biologically Active Substances: Produces vitamins, nicotinic acids, indole acetic acid, gibberellins, and other biologically active substances that improve flowering retention and enhance overall plant growth.

Specifications :

Base	Liquid
Viable cell count	CFU minimum 1 x 10 ⁹ cell/ml
Contamination level	No contamination at 10 ⁵ dilution
pH	5.0 – 7.0
Efficiency character	Formation of white pellicle in semisolid nitrogen free bromothymol blue media

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Bio Fertilizer Liquid

Acetobacter

Description :

Acetobacter is a versatile genus of bacteria known for its dual role in agriculture and industry. In agriculture, it functions as an aerobic nitrogen-fixing bacterium, thriving in the roots, stems, and leaves of plants like sugarcane and coffee. It produces growth-promoting substances such as Indole Acetic Acid and Gibberellic Acid, stimulating root proliferation and enhancing nutrient uptake, water absorption, and phosphate solubilization. This promotes robust growth and improves sugar recovery in sugarcane crops.

Benefits Of Acetobacter :

Better Crop Growth and Seedling Establishment: Acetobacter enhances crop growth and promotes robust seedling establishment by improving nutrient uptake, water absorption, and mineral utilization.

Increased Crop Yield (25%-35%): It significantly boosts crop yields by 25%-35%, ensuring higher productivity and better returns for farmers.

Production of Vitamins and Hormones: Acetobacter produces essential vitamins such as thiamine, riboflavin, nicotinic acid, and pantothenic acid. It also synthesizes hormones like Indole Acetic Acid (IAA) and Gibberellic Acid (GA), which promote plant growth and development.

Unique Physiological Properties: The bacterium possesses unique physiological traits, including tolerance to low pH levels, and high sugar and salt concentrations. It lacks nitrate reductase and nitrogenase activity, enabling it to tolerate short-term exposure to ammonia without compromising its function.

Enhanced Root System Development: Acetobacter increases the number of rootlets and stimulates root proliferation, facilitating improved uptake of minerals, phosphate, and water. This strengthens the plant's root system, enhancing overall nutrient absorption and resilience to environmental stresses.

Specifications :

Base	Liquid
Viable cell count	CFU minimum 1×10^8 cell/ml
Contamination level	No contamination at 10^5 dilution
pH	3.0 – 6.0
Efficiency character	Formulation of yellowish pellicle in semisolid medium N free medium.

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Bio Fertilizer Liquid

Phosphate Solubilizing Bacteria

Description :

Phosphorus, second only to nitrogen, is one of the most crucial mineral nutrients limiting crop growth. It is essential for plant development and growth but is often insoluble and unavailable to plants. Consequently, the amount of phosphorus accessible to plants is typically a small fraction of its total presence in the soil. Phosphate Solubilizing Bacteria (PSB) play a vital role by converting insoluble phosphates into soluble forms, making phosphorus available to plants, and enhancing crop growth. They secrete organic acids and enzymes that dissolve bound phosphates, improving nutrient uptake and promoting plant health. PSBs are crucial for sustainable agriculture, reducing the need for chemical fertilizers, enhancing root development, increasing crop yield, and supporting environmentally friendly farming practices. By harnessing PSB, farmers can achieve better productivity and contribute to ecological balance.

Benefits Of Phosphate Solubilizing Bacteria :

Improves Resistance of Crop Plants: PSB helps strengthen the natural defenses of crop plants, making them more resilient to diseases and pests. This improved resistance reduces the reliance on chemical pesticides and enhances overall plant health, leading to more robust and healthy crops.

Resistance to Varying Soil pH and Temperatures: PSBs are adaptable to different soil pH levels and temperatures, allowing them to function effectively in diverse environmental conditions. This versatility ensures that plants can benefit from phosphorus solubilization even in challenging soil and climatic conditions.

Suitable for All Crops: PSB can be used across a wide range of crops, making it a versatile solution for farmers. Whether cultivating cereals, vegetables, fruits, or legumes, PSB can improve phosphorus availability and promote healthy plant growth.

Improves Crop Growth and Yield by 20-30%: By enhancing phosphorus availability, PSB significantly boosts crop growth and yield. Studies have shown that the use of PSB can increase crop yields by 20-30%, making it a valuable tool for improving agricultural productivity and profitability.

Compatible with Other Biofertilizers: PSB works well in conjunction with other biofertilizers, creating a synergistic effect that further enhances soil fertility and plant health. This compatibility allows farmers to adopt integrated nutrient management practices, optimizing the benefits of various biofertilizers.

Better Nutrient Uptake and Vigorous Crop Growth: PSB improves the efficiency of nutrient uptake by plants, ensuring that essential nutrients like phosphorus are readily available. This enhanced nutrient absorption leads to vigorous crop growth, stronger root systems, and improved overall plant development, resulting in healthier and more productive crops.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.



Specifications :

Base	Liquid
Viable cell count	CFU minimum 1 x 10 ⁸ cell/ml
Contamination level	No contamination at 10 ⁵ dilution
pH	5.0 – 7.5
Efficiency character	The strain should have Phosphate solubilizing capacity in the range of minimum 30% when tested spectrophotometrically. In terms of zone formation, minimum 5 mm solubilization zone in prescribed media having at least 3 mm thickness

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Liquid

Potassium Mobilizing Bacteria

Description :

Potassium mobilizing bacteria (KMB) are beneficial microorganisms that play a vital role in improving crop growth. These bacteria have the unique ability to mobilize insoluble forms of potassium, making it more readily available for plants. By doing so, they enhance the nutrient uptake efficiency of crops, leading to faster and healthier growth.

When KMB is applied to the soil, it helps release several percent of insoluble potassium within just 25 days. This significantly reduces the need for expensive potash fertilizers, ultimately cutting down costs by 50-60%.

The bacteria produce organic acids and enzymes, which aid in solubilizing fixed potassium and converting it into an exchangeable form that can be easily absorbed by plants. This ability protects crops against potassium deficiency and ensures their optimal growth.

One of the remarkable traits of KMB is its high tolerance level, which allows it to thrive at various soil pH levels and temperatures. Additionally, KMB colonizes the rhizosphere, which is the soil zone around the roots of plants. This colonization further strengthens the bacteria-plant interaction and enhances nutrient availability for the crops.

Benefits Of Potassium Mobilizing Bacteria :

Resistance to a wide range of soil pH and temperature: Potassium mobilizing bacteria (KMB) exhibit high tolerance to different soil pH levels and temperature variations, allowing them to thrive in diverse agricultural environments.

Improves resistance capacity of crop plants: KMB enhances the natural defense mechanisms of crop plants, making them more resilient against various environmental stresses, such as drought, salinity, and disease.

Suitable to apply to all crops: KMB can be applied to a wide range of crop species, including cereals, fruits, vegetables, and legumes. It adapts well to different crop systems and helps maximize nutrient availability regardless of the crop type.

Improves crop growth and yield by 20-30%: By mobilizing insoluble forms of potassium and increasing nutrient uptake efficiency, KMB promotes vigorous crop growth and enhances overall yield potential. Studies have shown significant yield increases ranging from 20% to 30% in various crops.

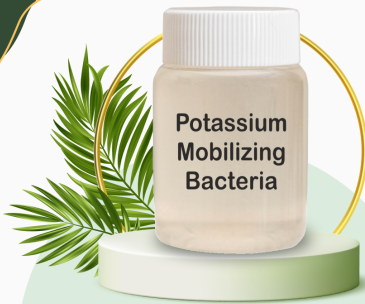
Reduce cost of potash application by 50-60%: With the help of KMB, farmers can reduce their reliance on expensive potash fertilizers. The bacteria mobilize insoluble potassium, making it more accessible to plants, thereby reducing the need for costly potash applications.

It increases fruit sweetness, color, and size: KMB's ability to enhance nutrient uptake and promote healthier plant growth can lead to improved fruit quality. This includes increased sweetness, enhanced color development, and even larger fruit sizes in certain crop varieties.

Compatible with other biofertilizers: KMB is compatible with other biofertilizers, allowing farmers to easily combine its benefits with those of other beneficial microorganisms. This synergistic effect can further enhance nutrient availability, improve soil health, and promote sustainable agriculture practices.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.



Specifications :

Base	Liquid
Viable cell count	CFU minimum 1 x 10 ⁸ cell/ml
Contamination level	No contamination at 10 ⁵ dilution
pH	5.0 - 7.5
Efficiency character	The strain should be capable of solubilizing at least 20 mg/liter of potash in liquid broth when tested as per the method given using Aluminum, potassium, silicate as K source.

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Liquid

Consortia (Bio NPK)

Description :

Consortia is a combination of more than one microorganism that, being in the rhizosphere, directly or indirectly influences the composition and productivity of natural plant communities. Consortia, also known as Bio NPK (Nitrogen, Phosphorus, and Potassium), are a combination of multiple beneficial microorganisms that work together to provide a comprehensive nutrient management solution for plants. These consortia consist of different strains of bacteria, fungi, and other beneficial microbes.

Each microorganism plays a unique role in fixing nitrogen, solubilizing phosphorus, and mobilizing potassium, thereby promoting the availability and uptake of these vital nutrients by plants. By utilizing Bio NPK consortia, farmers can optimize nutrient utilization, improve soil fertility, enhance crop growth and yield, and reduce their reliance on chemical fertilizers, thereby promoting sustainable and environmentally friendly agricultural practices. Bio NPK is a combination of Azotobacter, Phosphate Solubilizing Bacteria, and Potash Mobilizing Bacteria; combined they give a wholesome nutritional solution for the crop.

Specifications :

Viable cell count	FU minimum in a mixer of any 2 or maximum three of the following microorganisms
Azotobacter	5×10^7 per ml
Rhizobium	5×10^7 per ml
Azospirillum	5×10^7 per ml
Total Viable Count	CFU minimum 1.5×10^8 cells per ml
Contamination level	No contamination at any dilution
pH	5.0 – 7.0
Efficiency character	The efficiency character of individual microorganism to be determined as mentioned in case of individual bio fertilizer quantitative estimation method.

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seeding treatment, Soil application and Drip irrigation.

Benefits Of Consortia (Bio NPK) :

Azotobacter: This microorganism has the ability to fix atmospheric nitrogen, reducing the dependency on synthetic fertilizers. It can fix nitrogen up to 20-40 kg per hectare, providing an important source of nitrogen for plant growth.

PSB (Phosphorus Solubilizing Bacteria): PSB produces organic acids that assist in the uptake of phosphate, leading to increased maturity and enhanced yield. The production of organic acids such as malic, succinic, fumaric, citric tartaric acid, and acetic acid accelerates phosphate availability and uptake by plants.

KMB (Potassium Mobilizing Bacteria): KMB enhances crop resistance against diseases and stress conditions. It also secretes growth hormones, which can increase crop productivity. By mobilizing insoluble potassium, KMB reduces the need for potash fertilizers by 50-60%.

Supply of Essential Nutrients: The Bio NPK consortia ensures the supply of essential nutrients in optimal quantities to the crops. This balanced nutrient availability promotes healthy plant growth and development.

Prevention of Micronutrient Deficiency: The consortia helps prevent micronutrient deficiencies that may occur at different growth stages of crops. By supplying a complete range of nutrients, it ensures that the crops have access to the necessary elements throughout their growth cycle.

Chelation with EDTA: The presence of EDTA (Ethylene Diamine Tetraacetic Acid) chelates in the consortia facilitates the fast absorption of all individual microelements by plants. This improves the efficiency of nutrient uptake, ensuring that plants receive the required microelements for optimal growth and development.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Bio Fertilizer Liquid

Zinc Solubilizing Bacteria

Description :

Zinc solubilizing bacteria play a crucial role in enhancing plant growth and productivity by mobilizing zinc in the soil. These bacteria employ various mechanisms, one of which involves acidification. They secrete organic acids into the soil, which effectively sequester zinc cations, making them more available to plants. Additionally, the organic acids released by these microbes contribute to a decrease in the pH of the nearby soil, promoting zinc solubility. This acidification process helps break down the complex forms of zinc in the soil, ensuring better absorption and utilization by plants. Consequently, the increased availability of zinc leads to improved crop yield and quality. The beneficial effects of zinc-solubilizing bacteria on plant growth make them valuable allies in sustainable agriculture practices, especially in zinc-deficient soils.

Specifications :

Base	Liquid
Viable cell count	CFU minimum 1×10^8 cell/ml
Contamination level	No contamination at 10^5 dilution
pH	5.0 – 7.5
Efficiency character	The strain should be capable of solubilizing at least 20 mg/ liter of zinc in liquid broth when tested as per the method given using zinc oxide / zinc carbonate/ zinc phosphate as zinc source.

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Benefits Of Zinc Solubilizing Bacteria :

Reduces Chemical Fertilizer Usage: The use of this biological zinc fertilizer can decrease the reliance on chemical zinc-based fertilizers by up to 40%, promoting a more sustainable approach to agriculture.

Promotes Plant Growth: The bacteria in the fertilizer secrete plant growth promoters, which aid in better and faster plant development.

Enhances Soil Fertility: This fertilizer improves soil fertility, with effects that extend into the next crop season due to bacterial multiplication and persistence.

Increases Crop Yield and Quality: By using this fertilizer, farmers can expect an increase in both crop yield and the quality of the produce.

Boosts Soil Health and Activates Hormones: The fertilizer contributes to overall soil health and activates essential plant hormones, ensuring robust plant growth.

Improves Photosynthesis: The enhanced photosynthesis activity facilitated by this fertilizer leads to healthier and more productive plants.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Bio Fertilizer Liquid

Phosphate Solubilizing Fungal

Description :

Phosphorus-solubilizing fungi are a beneficial group of microorganisms that play a vital role in converting insoluble phosphorus compounds into soluble forms that can be readily absorbed by plants. They achieve this by employing various mechanisms such as lowering the pH level of the soil, chelation, and mineralization processes. This transformation makes phosphorus more accessible for plant uptake and utilization.

Furthermore, phosphorus-solubilizing fungi provide protection to plants by suppressing phytopathogens, thereby enhancing plant health and reducing the risk of diseases. Additionally, a sufficient supply of phosphate facilitated by these fungi promotes seed formation and aids in the early maturation of crops. Moreover, it can contribute to early ripening and stimulate young plants to develop deeper, more abundant root systems, improving nutrient uptake efficiency.

The presence of phosphorus-solubilizing fungi in the soil promotes the availability of essential phosphorus for plant growth through pH regulation, chelation, and mineralization processes. Their activities provide protection against phytopathogens, aid in seed formation and maturation, encourage early ripening, and promote vigorous root growth. Ultimately, this leads to improved crop productivity and overall plant health.

Benefits Of Phosphate Solubilizing Fungal :

Fulfilling Deficiencies: These fungi help in addressing phosphorus deficiencies in plants, ensuring the plants have an adequate supply of this essential nutrient.

Enhancing Plant Activities: Phosphorus-solubilizing fungi facilitate important plant activities such as photosynthesis, root development, stalk and stem strength, flower and seed formation, and overall growth.

Early Ripening and Root Growth: These fungi aid in the early ripening of fruits and promote the growth of young plants with deeper and more abundant root systems.

Auxin and Gibberellin Production: Phosphorus-solubilizing fungi stimulate plant growth by producing growth-promoting substances like auxins and gibberellins.

Increased Phosphorus Availability: These fungi enhance phosphorus availability in the soil without disturbing its biochemical composition, ensuring that plants can efficiently acquire and utilize this nutrient.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.



Specifications :

Base	Liquid
Spore count	1×10^7 viable fungal spore/ml
Contamination level	Nil for liquid inoculums
pH	3.5-5.5
Efficiency character	The strain should be capable of solubilizing at least 30 mg/liter of phosphorus in liquid broth when tested as per the method given using tri calcium phosphate or aluminum phosphate or iron phosphate as phosphate source.

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Bio Fertilizer
Bio Fertilizer Liquid

Sulphur Oxidizing Bacteria

Description :

Sulphur oxidizers play a crucial role in converting elemental sulphur into plant-available sulfate. Sulphur is an essential element for pulse production and is involved in the formation of proteins, vitamins, and enzymes. It is a key component of amino acids such as cystine, cysteine, and methionine.

Sulphur oxidizers facilitate the conversion of various sulfur forms, including elemental sulphur and reduced sulfur compounds, into sulphate through the process of oxidation in the soil. The chemolithotrophic bacteria of the Thiobacillus genus are particularly important in this process. By utilizing sulphur oxidizers, the natural oxidation of sulfur is enhanced, leading to an accelerated production of sulfate.

The availability of sulphate in the soil is vital for plants to acquire the necessary sulphur for their growth and development. Therefore, the use of sulfur oxidizers is beneficial as it helps in increasing sulphate production, ensuring an adequate supply of sulphur for plants. This, in turn, supports the formation of important molecules like proteins, vitamins, and enzymes, ultimately contributing to improved crop productivity and quality.

Specifications :

Base	Liquid
Viable cell count	CFU minimum 1×10^8 cell/ml
Contamination level	No contamination at 105 dilution
pH	6.5-7.5
Efficiency character	Sulphur oxidizing Bacteria has capacity in the range of minimum 30% when tested spectrophotometrically. In terms of zone formation, 5 mm solubilization zone in prescribed media having at least 3 mm thickness

Packing :

200 ltr HDPE Barrel

Dosage :

1 litre/acre

Method Of Application :

Seed Treatment, Seedling treatment, Soil application and Drip irrigation.

Benefits Of Sulphur Oxidizing Bacteria :

Essential Secondary Nutrients: Sulfur is classified as a secondary nutrient, but it is vital for plant growth and metabolism.

Indispensable for Growth: Sulfur is essential for all plants, playing a crucial role in their growth and metabolic processes.

Enhances Micronutrient Solubility: It increases the solubility of key micronutrients like iron, zinc, and manganese, facilitating better nutrient uptake by plants.

Chlorophyll Formation: Sulfur is involved in the formation of chlorophyll, which is essential for photosynthesis and overall plant health.

Role in Protein Synthesis: Known for its role in protein synthesis, sulfur performs numerous oxidizing functions in plant nutrition, contributing to robust and healthy plant development.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Bio Fertilizer Liquid

Calcium Solubilizing Bacteria

Description :

Calcium-solubilizing bacteria are microorganisms that convert insoluble calcium into soluble forms, enhancing soil fertility and plant health. They possess enzymes like organic acids that break down calcium compounds in the soil, making them available for plants. Calcium is essential for plant growth and development, and these bacteria contribute to soil fertility and nutrient uptake. They can be found naturally in soil, the rhizosphere, and plant roots, forming a symbiotic relationship with plants.

Their presence in the soil ecosystem increases calcium bioavailability and promotes soil structure, nutrient cycling, and plant resistance to stress. These bacteria can be commercially isolated, cultured, and applied as biofertilizers or bioinoculants, improving crop yield and reducing reliance on chemical fertilizers. In summary, calcium-solubilizing bacteria are vital for sustainable agriculture and eco-friendly farming practices, as they enhance calcium availability, improve soil fertility, and reduce reliance on chemical fertilizers.

Benefits of Calcium Solubilizing Bacteria :

- 1. Improved plant growth:** Calcium solubilizing bacteria enhance the availability of calcium, an essential nutrient for plant growth and development. This leads to improved root development, stronger stems, and increased overall plant growth.
- 2. Increased nutrient uptake:** By solubilizing calcium, these bacteria also improve the availability of other nutrients in the soil. Calcium is necessary for the efficient uptake of other nutrients, such as nitrogen and phosphorus, so increased calcium availability benefits plants' overall nutrient uptake.
- 3. Enhanced soil fertility:** Calcium solubilizing bacteria contribute to the overall fertility of the soil by improving the availability of calcium. This helps maintain a balanced soil pH, supports soil structure, and promotes nutrient cycling.
- 4. Disease resistance:** Calcium plays a crucial role in plant defense mechanisms. By increasing calcium availability, these bacteria help plants develop stronger cell walls, improving their resistance to diseases and pests.
- 5. Drought tolerance:** Calcium solubilization facilitates the efficient use of water by plants, leading to improved drought tolerance. This is particularly important in regions with limited water availability or during periods of water scarcity.
- 6. Reduced chemical fertilizer dependency:** By enhancing calcium availability, these bacteria reduce the reliance on synthetic chemical fertilizers. This can lead to more sustainable agriculture practices, reduce environmental pollution, and promote ecological balance.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.



Specifications :

Base	Liquid
Viable cell count	CFU minimum 1×10^8 cell/ml
Contamination level	No contamination at 105 dilution
pH	5.0-7.0

Packing :

1 lt, 5 lt, 50 lt

Dosage :

1 litre/acre

Recommended Crops :

Some recommended crops for the application of calcium-solubilizing bacteria are Tomatoes, Peppers, Potatoes, Cucumbers, Strawberries, Grapes, Apples, Cabbage, Broccoli, Lettuce, Carrots, Spinach, Cauliflower, Beans, Peas, Citrus Fruits (e.g., oranges, lemons), Melons (e.g., watermelons, cantaloupes), Brassicas (e.g., Brussels sprouts, kale), Root Vegetables (e.g., beets, radishes), and flowering plants (e.g., roses, chrysanthemums). These crops benefit from improved calcium availability, which enhances cell wall structure, nutrient absorption, and overall plant health.



Talc Base Bio Fertilizer Powder

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Azotobacter

Description :

Azotobacter is a genus of free-living, nitrogen-fixing bacteria that plays a vital role in the nitrogen cycle. These bacteria are found in various soil environments and can thrive in both aerobic (oxygen-rich) and anaerobic (oxygen-depleted) conditions. They possess the unique ability to convert atmospheric nitrogen into a form usable by plants, thereby reducing the dependency on synthetic nitrogen fertilizers.

Azotobacter also promotes plant growth through the production of growth-promoting substances, enhancing nutrient availability and root development. Additionally, they contribute to soil fertility by producing enzymes that degrade organic matter, releasing nutrients for plants. As a natural biofertilizer, Azotobacter offers sustainable and eco-friendly solutions for agriculture, improving soil health and crop productivity. Azotobacter can accomplish nitrogen fixation by using three different enzymes, which are termed nitrogenases. The enhanced versatility of Azotobacter bacteria makes the microbe attractive for agricultural purposes.

Benefits of Azotobacter :

Nitrogen fixation: Azotobacter has the unique ability to convert atmospheric nitrogen into ammonia, a form usable by plants. This process, known as nitrogen fixation, helps reduce the need for synthetic nitrogen fertilizers and promotes sustainable crop production.

Growth promotion: Azotobacter produces growth-promoting substances like auxins, cytokinins, and gibberellins, which stimulate plant growth and development. This leads to enhanced root growth, nutrient uptake, and overall plant vigor.

Improved nutrient availability: These bacteria secrete enzymes that break down organic matter, releasing nutrients such as phosphorus, potassium, and micronutrients into the soil. This process improves nutrient availability for plants and supports healthy root development.

Enhances soil fertility: Azotobacter contributes to soil fertility by increasing organic matter content, improving soil structure, and enhancing cation exchange capacity. It helps create a favorable environment for beneficial soil microorganisms and supports the overall health of the soil ecosystem.

Strengthened plant resistance: Azotobacter can stimulate the production of certain compounds in plants that enhance their defense mechanisms against pathogens and pests. This can lead to improved disease resistance and reduced reliance on chemical pesticides.

Environmental sustainability: By reducing the need for synthetic nitrogen fertilizers, Azotobacter biofertilizers help minimize the negative impacts of nitrogen runoff into water bodies. This mitigates pollution and improves environmental sustainability in agricultural practices.

It thrives even in alkaline soils.

Biological Control Agent: Azotobacter produces substances that inhibit plant pathogens, thus acting as a biological control agent.

Method Of Application :

Soil application



Specifications :

Base	Powder
Viable cell count	CFU minimum 5×10^7 cell/ml
Contamination level	No contamination at 10^5 dilution
pH	5.0 – 7.0
Efficiency character	The strain should be capable of fixing at least 10 mg of nitrogen per g of sucrose consumed

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Rhizobium

Description :

Rhizobium is a genus of nitrogen-fixing bacteria that forms a symbiotic relationship with leguminous plants. Rhizobium forms an endosymbiotic nitrogen-fixing association with the roots of legumes. These bacteria play a crucial role in biological nitrogen fixation, converting atmospheric nitrogen into a form that can be used by plants. Rhizobium bacteria colonize the roots of legumes and form specialized structures called nodules. Within these nodules, the bacteria establish a mutually beneficial relationship with the plant. The bacteria supply the plant with fixed nitrogen, while the plant provides the bacteria with carbohydrates and an appropriate environment for growth.

This symbiosis leads to increased nitrogen availability for the legume plant, promoting its growth and productivity. Rhizobium also contributes to soil fertility, as the fixed nitrogen enriches the soil and benefits other non-leguminous plants. By reducing the dependence on synthetic nitrogen fertilizers, Rhizobium plays a significant role in sustainable agriculture and ecological balance. The plant provides organic compounds to the bacteria, which are made by photosynthesis.

Specifications :

Base	Powder
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 10^6 dilution
pH	5.0 – 7.0
Efficiency character	Should show effective nodulation on all the species listed on the packet and their should be minimum of 25% increase in dry matter yield in test plant after 25 days after sowing (DAS) when tested as per the method given under controlled condition.

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Soil application

Benefits Of Rhizobium :

Nitrogen fixation: Rhizobium bacteria have the ability to fix atmospheric nitrogen, converting it into ammonia that can be utilized by leguminous plants. This reduces the reliance on synthetic nitrogen fertilizers, saving costs and reducing environmental pollution.

Enhanced plant growth: The symbiotic relationship between Rhizobium and leguminous plants leads to increased plant growth and yield. The fixed nitrogen supplied by the bacteria promotes vigorous vegetative growth, improved root development, and overall plant health.

Improved soil fertility: The process of nitrogen fixation by Rhizobium results in the accumulation of fixed nitrogen in the soil. This not only benefits the associated leguminous plants but also provides a nutrient source for other non-leguminous plants in the vicinity, improving overall soil fertility.

Reduce environmental impact: By reducing the use of synthetic nitrogen fertilizers, which can contribute to environmental issues such as water pollution and greenhouse gas emissions, the use of Rhizobium promotes sustainable agricultural practices and reduces the environmental impact of farming.

Lower cost input: Incorporating Rhizobium in agricultural practices can lead to cost savings for farmers. As the bacteria fix nitrogen from the air, it eliminates or reduces the need for nitrogenous fertilizers, which can be expensive.

Disease suppression: Rhizobium bacteria have been found to possess biological control properties, suppressing the growth of certain plant pathogens. This can help in reducing the occurrence and severity of plant diseases, enhancing crop health, and reducing the need for chemical pesticides.

Drought tolerance: Rhizobium can enhance a plant's tolerance to drought stress due to its ability to improve root development. The symbiotic association between Rhizobium and legumes can result in increased water and nutrient uptake efficiency, helping plants withstand periods of water scarcity.

Recommended Crops :

Gram, lentil, pea, pigeon pea, Soyabean, green gram, black gram, ground nut etc.

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Azospirillum

Description :

Azospirillum is a genus of beneficial, plant growth-promoting bacteria commonly found in soil and rhizosphere environments. This gram-negative, motile bacterium is commonly found in the roots of monocots. It plays a crucial role in nitrogen fixation by converting atmospheric nitrogen into a form that plants can use, significantly reducing the need for chemical nitrogen fertilizers by up to 50%. These bacteria play a crucial role in agriculture by promoting plant growth and health through various mechanisms. Azospirillum is known for its ability to fix atmospheric nitrogen, converting it into a plant-usable form through a symbiotic association with plant roots. This reduces the dependency on synthetic nitrogen fertilizers, making it environmentally sustainable. Additionally, Azospirillum produces growth-promoting substances like auxins and cytokinins, which stimulate root development and enhance nutrient uptake.

It also increases nutrient availability by solubilizing and mineralizing nutrients in the soil. Furthermore, Azospirillum can induce systemic resistance in plants, making them more resistant to pathogens and alleviating biotic stress. This combination of benefits makes Azospirillum a valuable tool for sustainable agriculture and improving crop yields. In addition to its nitrogen-fixing capabilities, Azospirillum secretes small amounts of fungicides and enzymes, which contribute to plant health and protection. This combination of benefits makes Azospirillum an essential component in sustainable agriculture practices.

Benefits Of Azospirillum :

Nitrogen Fixation: Azospirillum is a nitrogen-fixing bacterium that converts atmospheric nitrogen into a usable form for plants.

Reduced Fertilizer Usage: It reduces the need for nitrogen fertilizers by up to 50%, promoting cost-effective and environmentally friendly farming.

Production of Fungicides and Enzymes: Produces small amounts of fungicides and enzymes, contributing to plant health and disease resistance.

Enhanced Crop Productivity: Increases crop productivity on a large scale, supporting higher yields and better-quality produce.

Specificity for Monocots: Primarily used for monocot vegetables, making it highly effective for crops like wheat, rice, and maize.

Biologically Active Substances: Produces vitamins, nicotinic acids, indole acetic acid, gibberellins, and other biologically active substances that improve flowering retention and enhance overall plant growth.

Recommended Crops :

Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Specifications :

Base	Powder
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 10^6 dilution
pH	5.0 – 7.0
Efficiency character	Formulation of white pellicle in semisolid nitrogen free bromothymol blue media.

Packing :

200 ltr HDPE Barrel

Dosage :

1 kg/acre

Method Of Application :

Soil application



Bio Fertilizer
Talc Base Bio Fertilizer Powder

Acetobacter

Description :

Acetobacter is a versatile genus of bacteria known for its dual role in agriculture and industry. In agriculture, it functions as an aerobic nitrogen-fixing bacterium, thriving in the roots, stems, and leaves of plants like sugarcane and coffee. It produces growth-promoting substances such as Indole Acetic Acid and Gibberellic Acid, stimulating root proliferation and enhancing nutrient uptake, water absorption, and phosphate solubilization. This promotes robust growth and improves sugar recovery in sugarcane crops.

Benefits Of Acetobacter :

Better Crop Growth and Seedling Establishment: Acetobacter enhances crop growth and promotes robust seedling establishment by improving nutrient uptake, water absorption, and mineral utilization.

Increased Crop Yield (25%-35%): It significantly boosts crop yields by 25%-35%, ensuring higher productivity and better returns for farmers.

Production of Vitamins and Hormones: Acetobacter produces essential vitamins such as thiamine, riboflavin, nicotinic acid, and pantothenic acid. It also synthesizes hormones like Indole Acetic Acid (IAA) and Gibberellic Acid (GA), which promote plant growth and development.

Unique Physiological Properties: The bacterium possesses unique physiological traits, including tolerance to low pH levels, and high sugar and salt concentrations. It lacks nitrate reductase and nitrogenase activity, enabling it to tolerate short-term exposure to ammonia without compromising its function.

Enhanced Root System Development: Acetobacter increases the number of rootlets and stimulates root proliferation, facilitating improved uptake of minerals, phosphate, and water. This strengthens the plant's root system, enhancing overall nutrient absorption and resilience to environmental stresses.

Specifications :

Base	Powder
Viable cell count	CFU minimum 5 x 10 ⁷ cell/g
Contamination level	No contamination at 10 ⁵ dilution
pH	5.5 – 6.0
Efficiency character	Formulation of yellowish pellicle in semisolid medium N free medium

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Soil application

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Phosphate Solubilizing Bacteria

Description :

Phosphorus, second only to nitrogen, is one of the most crucial mineral nutrients limiting crop growth. It is essential for plant development and growth but is often insoluble and unavailable to plants. Consequently, the amount of phosphorus accessible to plants is typically a small fraction of its total presence in the soil. Phosphate Solubilizing Bacteria (PSB) play a vital role by converting insoluble phosphates into soluble forms, making phosphorus available to plants, and enhancing crop growth. They secrete organic acids and enzymes that dissolve bound phosphates, improving nutrient uptake and promoting plant health. PSBs are crucial for sustainable agriculture, reducing the need for chemical fertilizers, enhancing root development, increasing crop yield, and supporting environmentally friendly farming practices. By harnessing PSB, farmers can achieve better productivity and contribute to ecological balance.

Specifications :

Base	Powder
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 10^5 dilution
pH	5.0 – 7.0
Efficiency character	The strain should have Phosphate solubilizing capacity in the range of minimum 30% when tested spectrophotometrically. In terms of zone formation, minimum 5 mm solubilization zone in prescribed media having at least 3 mm thickness.

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Soil application

Benefits Of Phosphate Solubilizing Bacteria :

Improves Resistance of Crop Plants: PSB helps strengthen the natural defenses of crop plants, making them more resilient to diseases and pests. This improved resistance reduces the reliance on chemical pesticides and enhances overall plant health, leading to more robust and healthy crops.

Resistance to Varying Soil pH and Temperatures: PSBs are adaptable to different soil pH levels and temperatures, allowing them to function effectively in diverse environmental conditions. This versatility ensures that plants can benefit from phosphorus solubilization even in challenging soil and climatic conditions.

Suitable for All Crops: PSB can be used across a wide range of crops, making it a versatile solution for farmers. Whether cultivating cereals, vegetables, fruits, or legumes, PSB can improve phosphorus availability and promote healthy plant growth.

Improves Crop Growth and Yield by 20-30%: By enhancing phosphorus availability, PSB significantly boosts crop growth and yield. Studies have shown that the use of PSB can increase crop yields by 20-30%, making it a valuable tool for improving agricultural productivity and profitability.

Compatible with Other Biofertilizers: PSB works well in conjunction with other biofertilizers, creating a synergistic effect that further enhances soil fertility and plant health. This compatibility allows farmers to adopt integrated nutrient management practices, optimizing the benefits of various biofertilizers.

Better Nutrient Uptake and Vigorous Crop Growth: PSB improves the efficiency of nutrient uptake by plants, ensuring that essential nutrients like phosphorus are readily available. This enhanced nutrient absorption leads to vigorous crop growth, stronger root systems, and improved overall plant development, resulting in healthier and more productive crops.

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Potassium Mobilizing Bacteria

Description :

Potassium mobilizing bacteria (KMB) are beneficial microorganisms that play a vital role in improving crop growth. These bacteria have the unique ability to mobilize insoluble forms of potassium, making it more readily available for plants. By doing so, they enhance the nutrient uptake efficiency of crops, leading to faster and healthier growth.

When KMB is applied to the soil, it helps release several percent of insoluble potassium within just 25 days. This significantly reduces the need for expensive potash fertilizers, ultimately cutting down costs by 50-60%.

The bacteria produce organic acids and enzymes, which aid in solubilizing fixed potassium and converting it into an exchangeable form that can be easily absorbed by plants. This ability protects crops against potassium deficiency and ensures their optimal growth.

One of the remarkable traits of KMB is its high tolerance level, which allows it to thrive at various soil pH levels and temperatures. Additionally, KMB colonizes the rhizosphere, which is the soil zone around the roots of plants. This colonization further strengthens the bacteria-plant interaction and enhances nutrient availability for the crops.

Benefits Of Potassium Mobilizing Bacteria :

Resistance to a wide range of soil pH and temperature: Potassium mobilizing bacteria (KMB) exhibit high tolerance to different soil pH levels and temperature variations, allowing them to thrive in diverse agricultural environments.

Improves resistance capacity of crop plants: KMB enhances the natural defense mechanisms of crop plants, making them more resilient against various environmental stresses, such as drought, salinity, and disease.

Suitable to apply to all crops: KMB can be applied to a wide range of crop species, including cereals, fruits, vegetables, and legumes. It adapts well to different crop systems and helps maximize nutrient availability regardless of the crop type.

Improves crop growth and yield by 20-30%: By mobilizing insoluble forms of potassium and increasing nutrient uptake efficiency, KMB promotes vigorous crop growth and enhances overall yield potential. Studies have shown significant yield increases ranging from 20% to 30% in various crops.

Reduce cost of potash application by 50-60%: With the help of KMB, farmers can reduce their reliance on expensive potash fertilizers. The bacteria mobilize insoluble potassium, making it more accessible to plants, thereby reducing the need for costly potash applications.

It increases fruit sweetness, color, and size: KMB's ability to enhance nutrient uptake and promote healthier plant growth can lead to improved fruit quality. This includes increased sweetness, enhanced color development, and even larger fruit sizes in certain crop varieties.

Compatible with other biofertilizers: KMB is compatible with other biofertilizers, allowing farmers to easily combine its benefits with those of other beneficial microorganisms. This synergistic effect can further enhance nutrient availability, improve soil health, and promote sustainable agriculture practices.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.



Specifications :

Base	Powder
Viable cell count	CFU minimum 5 x 10 ⁷ cell/g
Contamination level	No contamination at 10 ⁵ dilution
pH	5.0 - 7.0
Efficiency character	The strain should be capable of solubilizing at least 20 mg/liter of potash in liquid when tested as per the method given using aluminum potassium silicate as K source.

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Soil application



Bio Fertilizer
Talc Base Bio Fertilizer Powder

Consortia (Bio NPK)

Specifications :

Base	Powder
Viable cell count	CFU minimum in a mixer of any 2 or maximum three of the following microorganisms
Azotobacter	1 x 10 ⁷ Cell/ gram
Rhizobium	1 x 10 ⁷ Cell/ gram
Azospirillum	1 x 10 ⁷ Cell/ gram
Total Viable Count	CFU minimum 3 x 10 ⁷ Cell/ gram
Contamination level	No contamination at any dilution
pH	5.0 – 7.0
Efficiency character	The efficiency character of individual microorganism to be determined as mentioned in case of individual bio fertilizer quantitative estimation method.

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Soil application

Description :

Consortia is a combination of more than one microorganism that, being in the rhizosphere, directly or indirectly influences the composition and productivity of natural plant communities. Consortia, also known as Bio NPK (Nitrogen, Phosphorus, and Potassium), are a combination of multiple beneficial microorganisms that work together to provide a comprehensive nutrient management solution for plants. These consortia consist of different strains of bacteria, fungi, and other beneficial microbes.

Each microorganism plays a unique role in fixing nitrogen, solubilizing phosphorus, and mobilizing potassium, thereby promoting the availability and uptake of these vital nutrients by plants. By utilizing Bio NPK consortia, farmers can optimize nutrient utilization, improve soil fertility, enhance crop growth and yield, and reduce their reliance on chemical fertilizers, thereby promoting sustainable and environmentally friendly agricultural practices. Bio NPK is a combination of Azotobacter, Phosphate Solubilizing Bacteria, and Potash Mobilizing Bacteria; combined they give a wholesome nutritional solution for the crop.

Benefits Of Consortia (Bio NPK) :

Azotobacter: This microorganism has the ability to fix atmospheric nitrogen, reducing the dependency on synthetic fertilizers. It can fix nitrogen up to 20-40 kg per hectare, providing an important source of nitrogen for plant growth.

PSB (Phosphorus Solubilizing Bacteria): PSB produces organic acids that assist in the uptake of phosphate, leading to increased maturity and enhanced yield. The production of organic acids such as malic, succinic, fumaric, citric tartaric acid, and acetic acid accelerates phosphate availability and uptake by plants.

KMB (Potassium Mobilizing Bacteria): KMB enhances crop resistance against diseases and stress conditions. It also secretes growth hormones, which can increase crop productivity. By mobilizing insoluble potassium, KMB reduces the need for potash fertilizers by 50-60%.

Supply of Essential Nutrients: The Bio NPK consortia ensures the supply of essential nutrients in optimal quantities to the crops. This balanced nutrient availability promotes healthy plant growth and development.

Prevention of Micronutrient Deficiency: The consortia helps prevent micronutrient deficiencies that may occur at different growth stages of crops. By supplying a complete range of nutrients, it ensures that the crops have access to the necessary elements throughout their growth cycle.

Chelation with EDTA: The presence of EDTA (Ethylene Diamine Tetraacetic Acid) chelates in the consortia facilitates the fast absorption of all individual microelements by plants. This improves the efficiency of nutrient uptake, ensuring that plants receive the required microelements for optimal growth and development.

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Zinc Solubilizing Bacteria

Description :

Zinc solubilizing bacteria play a crucial role in enhancing plant growth and productivity by mobilizing zinc in the soil. These bacteria employ various mechanisms, one of which involves acidification. They secrete organic acids into the soil, which effectively sequester zinc cations, making them more available to plants. Additionally, the organic acids released by these microbes contribute to a decrease in the pH of the nearby soil, promoting zinc solubility. This acidification process helps break down the complex forms of zinc in the soil, ensuring better absorption and utilization by plants. Consequently, the increased availability of zinc leads to improved crop yield and quality. The beneficial effects of zinc-solubilizing bacteria on plant growth make them valuable allies in sustainable agriculture practices, especially in zinc-deficient soils.

Specifications :

Base	Powder
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 10^5 dilution
pH	5.0 – 7.0
Efficiency character	The strain should be capable of solubilizing at least 20 mg/liter of potash in liquid broth when tested as per the method given using zinc oxide/zinc carbonate / zinc phosphate as zinc source

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Soil application

Benefits Of Zinc Solubilizing Bacteria :

Reduces Chemical Fertilizer Usage: The use of this biological zinc fertilizer can decrease the reliance on chemical zinc-based fertilizers by up to 40%, promoting a more sustainable approach to agriculture.

Promotes Plant Growth: The bacteria in the fertilizer secrete plant growth promoters, which aid in better and faster plant development.

Enhances Soil Fertility: This fertilizer improves soil fertility, with effects that extend into the next crop season due to bacterial multiplication and persistence.

Increases Crop Yield and Quality: By using this fertilizer, farmers can expect an increase in both crop yield and the quality of the produce.

Boosts Soil Health and Activates Hormones: The fertilizer contributes to overall soil health and activates essential plant hormones, ensuring robust plant growth.

Improves Photosynthesis: The enhanced photosynthesis activity facilitated by this fertilizer leads to healthier and more productive plants.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Phosphate Solubilizing Fungal

Description :

Phosphorus-solubilizing fungi are a beneficial group of microorganisms that play a vital role in converting insoluble phosphorus compounds into soluble forms that can be readily absorbed by plants. They achieve this by employing various mechanisms such as lowering the pH level of the soil, chelation, and mineralization processes. This transformation makes phosphorus more accessible for plant uptake and utilization.

Furthermore, phosphorus-solubilizing fungi provide protection to plants by suppressing phytopathogens, thereby enhancing plant health and reducing the risk of diseases. Additionally, a sufficient supply of phosphate facilitated by these fungi promotes seed formation and aids in the early maturation of crops. Moreover, it can contribute to early ripening and stimulate young plants to develop deeper, more abundant root systems, improving nutrient uptake efficiency.

The presence of phosphorus-solubilizing fungi in the soil promotes the availability of essential phosphorus for plant growth through pH regulation, chelation, and mineralization processes. Their activities provide protection against phytopathogens, aid in seed formation and maturation, encourage early ripening, and promote vigorous root growth. Ultimately, this leads to improved crop productivity and overall plant health.

Specifications :

Base	Powder
Viable cell count	Minimum 1×10^6 spore/gm
Contamination level	1×10^3 cells/gm
pH	6.0 – 7.7
Efficiency character	The strain should be capable of solubilizing at least 30 mg/liter of phosphorus in liquid broth when tested as per the method given using tricalcium phosphate or aluminum phosphate as phosphate source.

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Soil application

Benefits Of Phosphate Solubilizing Fungal :

Fulfilling Deficiencies: These fungi help in addressing phosphorus deficiencies in plants, ensuring the plants have an adequate supply of this essential nutrient.

Enhancing Plant Activities: Phosphorus-solubilizing fungi facilitate important plant activities such as photosynthesis, root development, stalk and stem strength, flower and seed formation, and overall growth.

Early Ripening and Root Growth: These fungi aid in the early ripening of fruits and promote the growth of young plants with deeper and more abundant root systems.

Auxin and Gibberellin Production: Phosphorus-solubilizing fungi stimulate plant growth by producing growth-promoting substances like auxins and gibberellins.

Increased Phosphorus Availability: These fungi enhance phosphorus availability in the soil without disturbing its biochemical composition, ensuring that plants can efficiently acquire and utilize this nutrient.

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Sulphur Oxidizing Bacteria

Description :

Sulphur oxidizers play a crucial role in converting elemental sulphur into plant-available sulfate. Sulphur is an essential element for pulse production and is involved in the formation of proteins, vitamins, and enzymes. It is a key component of amino acids such as cystine, cysteine, and methionine.

Sulphur oxidizers facilitate the conversion of various sulfur forms, including elemental sulphur and reduced sulfur compounds, into sulphate through the process of oxidation in the soil. The chemolithotrophic bacteria of the Thiobacillus genus are particularly important in this process. By utilizing sulphur oxidizers, the natural oxidation of sulfur is enhanced, leading to an accelerated production of sulfate.

The availability of sulphate in the soil is vital for plants to acquire the necessary sulphur for their growth and development. Therefore, the use of sulfur oxidizers is beneficial as it helps in increasing sulphate production, ensuring an adequate supply of sulphur for plants. This, in turn, supports the formation of important molecules like proteins, vitamins, and enzymes, ultimately contributing to improved crop productivity and quality.

Specifications :

Base	Powder
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 105 dilution
pH	6.5-7.5
Efficiency character	Sulphur oxidizing Bacteria has capacity in the range of minimum 30% when tested spectrophotometrically. In terms of zone formation, 5 mm solubilization zone in prescribed media having at least 3 mm thickness

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Soil application

Benefits Of Sulphur Oxidizing Bacteria :

Essential Secondary Nutrients: Sulfur is classified as a secondary nutrient, but it is vital for plant growth and metabolism.

Indispensable for Growth: Sulfur is essential for all plants, playing a crucial role in their growth and metabolic processes.

Enhances Micronutrient Solubility: It increases the solubility of key micronutrients like iron, zinc, and manganese, facilitating better nutrient uptake by plants.

Chlorophyll Formation: Sulfur is involved in the formation of chlorophyll, which is essential for photosynthesis and overall plant health.

Role in Protein Synthesis: Known for its role in protein synthesis, sulfur performs numerous oxidizing functions in plant nutrition, contributing to robust and healthy plant development.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Powder

Calcium Solubilizing Bacteria

Description :

Calcium-solubilizing bacteria are microorganisms that convert insoluble calcium into soluble forms, enhancing soil fertility and plant health. They possess enzymes like organic acids that break down calcium compounds in the soil, making them available for plants. Calcium is essential for plant growth and development, and these bacteria contribute to soil fertility and nutrient uptake. They can be found naturally in soil, the rhizosphere, and plant roots, forming a symbiotic relationship with plants.

Their presence in the soil ecosystem increases calcium bioavailability and promotes soil structure, nutrient cycling, and plant resistance to stress. These bacteria can be commercially isolated, cultured, and applied as biofertilizers or bioinoculants, improving crop yield and reducing reliance on chemical fertilizers. In summary, calcium-solubilizing bacteria are vital for sustainable agriculture and eco-friendly farming practices, as they enhance calcium availability, improve soil fertility, and reduce reliance on chemical fertilizers.

Specifications :

Base	Powder
Spore count	Minimum 1×10^6 spore/gm
Contamination level	1×10^3 cells/gm
pH	6.0 – 7.7

Packing :

1 lt, 5 lt, 50 lt

Dosage:

1 kg/acre

Recommended Crops :

Some recommended crops for the application of calcium-solubilizing bacteria are Tomatoes, Peppers, Potatoes, Cucumbers, Strawberries, Grapes, Apples, Cabbage, Broccoli, Lettuce, Carrots, Spinach, Cauliflower, Beans, Peas, Citrus Fruits (e.g., oranges, lemons), Melons (e.g., watermelons, cantaloupes), Brassicas (e.g., Brussels sprouts, kale), Root Vegetables (e.g., beets, radishes), and flowering plants (e.g., roses, chrysanthemums). These crops benefit from improved calcium availability, which enhances cell wall structure, nutrient absorption, and overall plant health.

Benefits of Calcium Solubilizing Bacteria :

- 1. Improved plant growth:** Calcium solubilizing bacteria enhance the availability of calcium, an essential nutrient for plant growth and development. This leads to improved root development, stronger stems, and increased overall plant growth.
- 2. Increased nutrient uptake:** By solubilizing calcium, these bacteria also improve the availability of other nutrients in the soil. Calcium is necessary for the efficient uptake of other nutrients, such as nitrogen and phosphorus, so increased calcium availability benefits plants' overall nutrient uptake.
- 3. Enhanced soil fertility:** Calcium solubilizing bacteria contribute to the overall fertility of the soil by improving the availability of calcium. This helps maintain a balanced soil pH, supports soil structure, and promotes nutrient cycling.
- 4. Disease resistance:** Calcium plays a crucial role in plant defense mechanisms. By increasing calcium availability, these bacteria help plants develop stronger cell walls, improving their resistance to diseases and pests.
- 5. Drought tolerance:** Calcium solubilization facilitates the efficient use of water by plants, leading to improved drought tolerance. This is particularly important in regions with limited water availability or during periods of water scarcity.
- 6. Reduced chemical fertilizer dependency:** By enhancing calcium availability, these bacteria reduce the reliance on synthetic chemical fertilizers. This can lead to more sustainable agriculture practices, reduce environmental pollution, and promote ecological balance.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.



Talc Base Bio Fertilizer Granule

Bio Fertilizer Talc Base Bio Fertilizer Granule **Azotobacter**

Description :

Azotobacter is a genus of free-living, nitrogen-fixing bacteria that plays a vital role in the nitrogen cycle. These bacteria are found in various soil environments and can thrive in both aerobic (oxygen-rich) and anaerobic (oxygen-depleted) conditions. They possess the unique ability to convert atmospheric nitrogen into a form usable by plants, thereby reducing the dependency on synthetic nitrogen fertilizers.

Azotobacter also promotes plant growth through the production of growth-promoting substances, enhancing nutrient availability and root development. Additionally, they contribute to soil fertility by producing enzymes that degrade organic matter, releasing nutrients for plants. As a natural biofertilizer, Azotobacter offers sustainable and eco-friendly solutions for agriculture, improving soil health and crop productivity. Azotobacter can accomplish nitrogen fixation by using three different enzymes, which are termed nitrogenases. The enhanced versatility of Azotobacter bacteria makes the microbe attractive for agricultural purposes.

Benefits of Azotobacter :

Nitrogen fixation: Azotobacter has the unique ability to convert atmospheric nitrogen into ammonia, a form usable by plants. This process, known as nitrogen fixation, helps reduce the need for synthetic nitrogen fertilizers and promotes sustainable crop production.

Growth promotion: Azotobacter produces growth-promoting substances like auxins, cytokinins, and gibberellins, which stimulate plant growth and development. This leads to enhanced root growth, nutrient uptake, and overall plant vigor.

Improved nutrient availability: These bacteria secrete enzymes that break down organic matter, releasing nutrients such as phosphorus, potassium, and micronutrients into the soil. This process improves nutrient availability for plants and supports healthy root development.

Enhances soil fertility: Azotobacter contributes to soil fertility by increasing organic matter content, improving soil structure, and enhancing cation exchange capacity. It helps create a favorable environment for beneficial soil microorganisms and supports the overall health of the soil ecosystem.

Strengthened plant resistance: Azotobacter can stimulate the production of certain compounds in plants that enhance their defense mechanisms against pathogens and pests. This can lead to improved disease resistance and reduced reliance on chemical pesticides.

Environmental sustainability: By reducing the need for synthetic nitrogen fertilizers, Azotobacter biofertilizers help minimize the negative impacts of nitrogen runoff into water bodies. This mitigates pollution and improves environmental sustainability in agricultural practices.

It thrives even in alkaline soils.

Biological Control Agent: Azotobacter produces substances that inhibit plant pathogens, thus acting as a biological control agent.

Method Of Application :

Soil application



Specifications :

Base	Granule
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 10^5 dilution
pH	5.0 – 7.0
Efficiency character	The strain should be capable of fixing at least 10 mg of nitrogen per g of sucrose consumed

Packing :

50 Kgs HDPE Bags

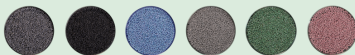
Dosage :

50–100 liters kg / acre

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Available In A Variety Of Colors :



Bio Fertilizer
Talc Base Bio Fertilizer Granule

Rhizobium

Description :

Rhizobium is a genus of nitrogen-fixing bacteria that forms a symbiotic relationship with leguminous plants. Rhizobium forms an endosymbiotic nitrogen-fixing association with the roots of legumes. These bacteria play a crucial role in biological nitrogen fixation, converting atmospheric nitrogen into a form that can be used by plants. Rhizobium bacteria colonize the roots of legumes and form specialized structures called nodules. Within these nodules, the bacteria establish a mutually beneficial relationship with the plant. The bacteria supply the plant with fixed nitrogen, while the plant provides the bacteria with carbohydrates and an appropriate environment for growth.

This symbiosis leads to increased nitrogen availability for the legume plant, promoting its growth and productivity. Rhizobium also contributes to soil fertility, as the fixed nitrogen enriches the soil and benefits other non-leguminous plants. By reducing the dependence on synthetic nitrogen fertilizers, Rhizobium plays a significant role in sustainable agriculture and ecological balance. The plant provides organic compounds to the bacteria, which are made by photosynthesis.

Specifications :

Base	Granule
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 10^6 dilution
pH	5.0 – 7.0
Efficiency character	Should show effective nodulation on all the species listed on the packet and there should be minimum of 25% increase in dry matter yield in test plant, after 25 days after sowing (DAS) when tested as per the method given under controlled condition.

Packing :

50 Kgs HDPE Bags

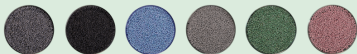
Dosage :

50–100 liters kg / acre

Method Of Application :

Soil application

Available In A Variety Of Colors :



Benefits Of Rhizobium :

Nitrogen fixation: Rhizobium bacteria have the ability to fix atmospheric nitrogen, converting it into ammonia that can be utilized by leguminous plants. This reduces the reliance on synthetic nitrogen fertilizers, saving costs and reducing environmental pollution.

Enhanced plant growth: The symbiotic relationship between Rhizobium and leguminous plants leads to increased plant growth and yield. The fixed nitrogen supplied by the bacteria promotes vigorous vegetative growth, improved root development, and overall plant health.

Improved soil fertility: The process of nitrogen fixation by Rhizobium results in the accumulation of fixed nitrogen in the soil. This not only benefits the associated leguminous plants but also provides a nutrient source for other non-leguminous plants in the vicinity, improving overall soil fertility.

Reduce environmental impact: By reducing the use of synthetic nitrogen fertilizers, which can contribute to environmental issues such as water pollution and greenhouse gas emissions, the use of Rhizobium promotes sustainable agricultural practices and reduces the environmental impact of farming.

Lower cost input: Incorporating Rhizobium in agricultural practices can lead to cost savings for farmers. As the bacteria fix nitrogen from the air, it eliminates or reduces the need for nitrogenous fertilizers, which can be expensive.

Disease suppression: Rhizobium bacteria have been found to possess biological control properties, suppressing the growth of certain plant pathogens. This can help in reducing the occurrence and severity of plant diseases, enhancing crop health, and reducing the need for chemical pesticides.

Drought tolerance: Rhizobium can enhance a plant's tolerance to drought stress due to its ability to improve root development. The symbiotic association between Rhizobium and legumes can result in increased water and nutrient uptake efficiency, helping plants withstand periods of water scarcity.

Recommended Crops :

Gram, lentil, pea, pigeon pea, Soyabean, green gram, black gram, ground nut etc.

Bio Fertilizer
Talc Base Bio Fertilizer Granule

Azospirillum



Specifications :

Base	Granule
Viable cell count	CFU minimum 5 x 10 ⁷ cell/ml
Contamination level	No contamination at 10 ⁶ dilution
pH	5.0 – 7.0
Efficiency character	Formulation of white pellicle in semisolid nitrogen free bromothymol blue media.

Packing :

50 Kgs HDPE Bags

Dosage :

50-100 liters kg / acre

Method Of Application :

Soil application

Available In A Variety Of Colors :



Description :

Azospirillum is a genus of beneficial, plant growth-promoting bacteria commonly found in soil and rhizosphere environments. This gram-negative, motile bacterium is commonly found in the roots of monocots. It plays a crucial role in nitrogen fixation by converting atmospheric nitrogen into a form that plants can use, significantly reducing the need for chemical nitrogen fertilizers by up to 50%. These bacteria play a crucial role in agriculture by promoting plant growth and health through various mechanisms. Azospirillum is known for its ability to fix atmospheric nitrogen, converting it into a plant-usable form through a symbiotic association with plant roots. This reduces the dependency on synthetic nitrogen fertilizers, making it environmentally sustainable. Additionally, Azospirillum produces growth-promoting substances like auxins and cytokinins, which stimulate root development and enhance nutrient uptake.

It also increases nutrient availability by solubilizing and mineralizing nutrients in the soil. Furthermore, Azospirillum can induce systemic resistance in plants, making them more resistant to pathogens and alleviating biotic stress. This combination of benefits makes Azospirillum a valuable tool for sustainable agriculture and improving crop yields. In addition to its nitrogen-fixing capabilities, Azospirillum secretes small amounts of fungicides and enzymes, which contribute to plant health and protection. This combination of benefits makes Azospirillum an essential component in sustainable agriculture practices.

Benefits Of Azospirillum :

Nitrogen Fixation: Azospirillum is a nitrogen-fixing bacterium that converts atmospheric nitrogen into a usable form for plants.

Reduced Fertilizer Usage: It reduces the need for nitrogen fertilizers by up to 50%, promoting cost-effective and environmentally friendly farming.

Production of Fungicides and Enzymes: Produces small amounts of fungicides and enzymes, contributing to plant health and disease resistance.

Enhanced Crop Productivity: Increases crop productivity on a large scale, supporting higher yields and better-quality produce.

Specificity for Monocots: Primarily used for monocot vegetables, making it highly effective for crops like wheat, rice, and maize.

Biologically Active Substances: Produces vitamins, nicotinic acids, indole acetic acid, gibberellins, and other biologically active substances that improve flowering retention and enhance overall plant growth.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Granule

Acetobacter

Description :

Acetobacter is a versatile genus of bacteria known for its dual role in agriculture and industry. In agriculture, it functions as an aerobic nitrogen-fixing bacterium, thriving in the roots, stems, and leaves of plants like sugarcane and coffee. It produces growth-promoting substances such as Indole Acetic Acid and Gibberellic Acid, stimulating root proliferation and enhancing nutrient uptake, water absorption, and phosphate solubilization. This promotes robust growth and improves sugar recovery in sugarcane crops.

Benefits Of Acetobacter :

Better Crop Growth and Seedling Establishment: Acetobacter enhances crop growth and promotes robust seedling establishment by improving nutrient uptake, water absorption, and mineral utilization.

Increased Crop Yield (25%-35%): It significantly boosts crop yields by 25%-35%, ensuring higher productivity and better returns for farmers.

Production of Vitamins and Hormones: Acetobacter produces essential vitamins such as thiamine, riboflavin, nicotinic acid, and pantothenic acid. It also synthesizes hormones like Indole Acetic Acid (IAA) and Gibberellic Acid (GA), which promote plant growth and development.

Unique Physiological Properties: The bacterium possesses unique physiological traits, including tolerance to low pH levels, and high sugar and salt concentrations. It lacks nitrate reductase and nitrogenase activity, enabling it to tolerate short-term exposure to ammonia without compromising its function.

Enhanced Root System Development: Acetobacter increases the number of rootlets and stimulates root proliferation, facilitating improved uptake of minerals, phosphate, and water. This strengthens the plant's root system, enhancing overall nutrient absorption and resilience to environmental stresses.

Specifications :

Base	Granule
Viable cell count	CFU minimum 5×10^7 cell/ml
Contamination level	No contamination at 10^5 dilution
pH	5.5 – 6.0
Efficiency character	Formulation of yellowish pellicle in semisolid medium N free medium.

Packing :

50 Kgs HDPE Bags

Dosage :

50-100 liters kg / acre

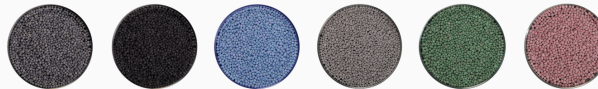
Method Of Application :

Soil application

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Available in a variety of colors :



Bio Fertilizer
Talc Base Bio Fertilizer Granule

Phosphate Solubilizing Bacteria

Description :

Phosphorus, second only to nitrogen, is one of the most crucial mineral nutrients limiting crop growth. It is essential for plant development and growth but is often insoluble and unavailable to plants. Consequently, the amount of phosphorus accessible to plants is typically a small fraction of its total presence in the soil. Phosphate Solubilizing Bacteria (PSB) play a vital role by converting insoluble phosphates into soluble forms, making phosphorus available to plants, and enhancing crop growth. They secrete organic acids and enzymes that dissolve bound phosphates, improving nutrient uptake and promoting plant health. PSBs are crucial for sustainable agriculture, reducing the need for chemical fertilizers, enhancing root development, increasing crop yield, and supporting environmentally friendly farming practices. By harnessing PSB, farmers can achieve better productivity and contribute to ecological balance.

Benefits Of Phosphate Solubilizing Bacteria :

Improves Resistance of Crop Plants: PSB helps strengthen the natural defenses of crop plants, making them more resilient to diseases and pests. This improved resistance reduces the reliance on chemical pesticides and enhances overall plant health, leading to more robust and healthy crops.

Resistance to Varying Soil pH and Temperatures: PSBs are adaptable to different soil pH levels and temperatures, allowing them to function effectively in diverse environmental conditions. This versatility ensures that plants can benefit from phosphorus solubilization even in challenging soil and climatic conditions.

Suitable for All Crops: PSB can be used across a wide range of crops, making it a versatile solution for farmers. Whether cultivating cereals, vegetables, fruits, or legumes, PSB can improve phosphorus availability and promote healthy plant growth.

Improves Crop Growth and Yield by 20-30%: By enhancing phosphorus availability, PSB significantly boosts crop growth and yield. Studies have shown that the use of PSB can increase crop yields by 20-30%, making it a valuable tool for improving agricultural productivity and profitability.

Compatible with Other Biofertilizers: PSB works well in conjunction with other biofertilizers, creating a synergistic effect that further enhances soil fertility and plant health. This compatibility allows farmers to adopt integrated nutrient management practices, optimizing the benefits of various biofertilizers.

Better Nutrient Uptake and Vigorous Crop Growth: PSB improves the efficiency of nutrient uptake by plants, ensuring that essential nutrients like phosphorus are readily available. This enhanced nutrient absorption leads to vigorous crop growth, stronger root systems, and improved overall plant development, resulting in healthier and more productive crops.

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.



Specifications :

Base	Granule
Viable cell count	CFU minimum 5 x 10 ⁷ cell/ml
Contamination level	No contamination at 10 ⁵ dilution
pH	5.0 – 7.0
Efficiency character	The strain should have Phosphate solubilizing capacity in the range of minimum 30mg/liter of phosphorus in liquid broth when tested as per the method given using tri calcium phosphate, or aluminum phosphate or iron phosphate as phosphate source.

Packing :

50 Kgs HDPE Bags

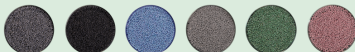
Dosage :

50-100 liters kg / acre

Method Of Application :

Soil application

Available In A Variety Of Colors :



Bio Fertilizer
Talc Base Bio Fertilizer Granule

Potassium Mobilizing Bacteria

Description :

Potassium mobilizing bacteria (KMB) are beneficial microorganisms that play a vital role in improving crop growth. These bacteria have the unique ability to mobilize insoluble forms of potassium, making it more readily available for plants. By doing so, they enhance the nutrient uptake efficiency of crops, leading to faster and healthier growth.

When KMB is applied to the soil, it helps release several percent of insoluble potassium within just 25 days. This significantly reduces the need for expensive potash fertilizers, ultimately cutting down costs by 50-60%.

The bacteria produce organic acids and enzymes, which aid in solubilizing fixed potassium and converting it into an exchangeable form that can be easily absorbed by plants. This ability protects crops against potassium deficiency and ensures their optimal growth.

One of the remarkable traits of KMB is its high tolerance level, which allows it to thrive at various soil pH levels and temperatures. Additionally, KMB colonizes the rhizosphere, which is the soil zone around the roots of plants. This colonization further strengthens the bacteria-plant interaction and enhances nutrient availability for the crops.

Benefits Of Potassium Mobilizing Bacteria :

Resistance to a wide range of soil pH and temperature: Potassium mobilizing bacteria (KMB) exhibit high tolerance to different soil pH levels and temperature variations, allowing them to thrive in diverse agricultural environments.

Improves resistance capacity of crop plants: KMB enhances the natural defense mechanisms of crop plants, making them more resilient against various environmental stresses, such as drought, salinity, and disease.

Suitable to apply to all crops: KMB can be applied to a wide range of crop species, including cereals, fruits, vegetables, and legumes. It adapts well to different crop systems and helps maximize nutrient availability regardless of the crop type.

Improves crop growth and yield by 20-30%: By mobilizing insoluble forms of potassium and increasing nutrient uptake efficiency, KMB promotes vigorous crop growth and enhances overall yield potential. Studies have shown significant yield increases ranging from 20% to 30% in various crops.

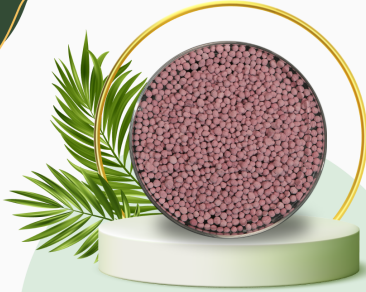
Reduce cost of potash application by 50-60%: With the help of KMB, farmers can reduce their reliance on expensive potash fertilizers. The bacteria mobilize insoluble potassium, making it more accessible to plants, thereby reducing the need for costly potash applications.

It increases fruit sweetness, color, and size: KMB's ability to enhance nutrient uptake and promote healthier plant growth can lead to improved fruit quality. This includes increased sweetness, enhanced color development, and even larger fruit sizes in certain crop varieties.

Compatible with other biofertilizers: KMB is compatible with other biofertilizers, allowing farmers to easily combine its benefits with those of other beneficial microorganisms. This synergistic effect can further enhance nutrient availability, improve soil health, and promote sustainable agriculture practices.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.



Specifications :

Base	Granule
Viable cell count	CFU minimum 5 x 10 ⁷ cell/ml
Contamination level	No contamination at 10 ⁵ dilution
pH	5.0 - 7.0
Efficiency character	The strain should be capable of solubilizing at least 20 mg/liter of potash in liquid when tested as per the method given using aluminum potassium silicate as source.

Packing :

50 Kgs HDPE Bags

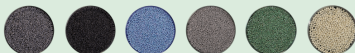
Dosage :

50-100 liters kg / acre

Method Of Application :

Soil application

Available In A Variety Of Colors :





Specifications :

Base	Granule
Viable cell count	CFU minimum in a mixer of any 2 or maximum three of the following microorganisms
Azotobacter	1×10^7 Cell/ gram
Rhizobium	1×10^7 Cell/ gram
Azospirillum	1×10^7 Cell/ gram
Total Viable Count	CFU minimum 3×10^7 Cell/ gram
Contamination level	No contamination at any dilution
pH	5.0 – 7.0
Efficiency character	The efficiency character of individual microorganism to be determined as mentioned in case of individual bio fertilizer quantitative estimation method.

Packing :

50 Kgs HDPE Bags

Dosage :

50–100 liters kg / acre

Method Of Application :

Soil application

Bio Fertilizer

Talc Base Bio Fertilizer Granule

Consortia (Bio NPK)

Description :

Consortia is a combination of more than one microorganism that, being in the rhizosphere, directly or indirectly influences the composition and productivity of natural plant communities. Consortia, also known as Bio NPK (Nitrogen, Phosphorus, and Potassium), are a combination of multiple beneficial microorganisms that work together to provide a comprehensive nutrient management solution for plants. These consortia consist of different strains of bacteria, fungi, and other beneficial microbes.

Each microorganism plays a unique role in fixing nitrogen, solubilizing phosphorus, and mobilizing potassium, thereby promoting the availability and uptake of these vital nutrients by plants. By utilizing Bio NPK consortia, farmers can optimize nutrient utilization, improve soil fertility, enhance crop growth and yield, and reduce their reliance on chemical fertilizers, thereby promoting sustainable and environmentally friendly agricultural practices. Bio NPK is a combination of Azotobacter, Phosphate Solubilizing Bacteria, and Potash Mobilizing Bacteria; combined they give a wholesome nutritional solution for the crop.

Benefits Of Consortia (Bio NPK) :

Azotobacter: This microorganism has the ability to fix atmospheric nitrogen, reducing the dependency on synthetic fertilizers. It can fix nitrogen up to 20–40 kg per hectare, providing an important source of nitrogen for plant growth.

PSB (Phosphorus Solubilizing Bacteria): PSB produces organic acids that assist in the uptake of phosphate, leading to increased maturity and enhanced yield. The production of organic acids such as malic, succinic, fumaric, citric tartaric acid, and acetic acid accelerates phosphate availability and uptake by plants.

KMB (Potassium Mobilizing Bacteria): KMB enhances crop resistance against diseases and stress conditions. It also secretes growth hormones, which can increase crop productivity. By mobilizing insoluble potassium, KMB reduces the need for potash fertilizers by 50–60%.

Supply of Essential Nutrients: The Bio NPK consortia ensures the supply of essential nutrients in optimal quantities to the crops. This balanced nutrient availability promotes healthy plant growth and development.

Prevention of Micronutrient Deficiency: The consortia helps prevent micronutrient deficiencies that may occur at different growth stages of crops. By supplying a complete range of nutrients, it ensures that the crops have access to the necessary elements throughout their growth cycle.

Chelation with EDTA: The presence of EDTA (Ethylene Diamine Tetraacetic Acid) chelates in the consortia facilitates the fast absorption of all individual microelements by plants. This improves the efficiency of nutrient uptake, ensuring that plants receive the required microelements for optimal growth and development.

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Bio Fertilizer
Talc Base Bio Fertilizer Granule

Zinc Solubilizing Bacteria

Description :

Zinc solubilizing bacteria play a crucial role in enhancing plant growth and productivity by mobilizing zinc in the soil. These bacteria employ various mechanisms, one of which involves acidification. They secrete organic acids into the soil, which effectively sequester zinc cations, making them more available to plants. Additionally, the organic acids released by these microbes contribute to a decrease in the pH of the nearby soil, promoting zinc solubility. This acidification process helps break down the complex forms of zinc in the soil, ensuring better absorption and utilization by plants. Consequently, the increased availability of zinc leads to improved crop yield and quality. The beneficial effects of zinc-solubilizing bacteria on plant growth make them valuable allies in sustainable agriculture practices, especially in zinc-deficient soils.

Specifications :

Base	Granule
Viable cell count	CFU minimum 5×10^7 cell/ml
Contamination level	No contamination at 10^5 dilution
pH	5.0 – 7.0
Efficiency character	The strain should be capable of solubilizing at least 20 mg/liter of potash in liquid broth when tested as per the method given using zinc oxide/zinc carbonate / zinc phosphate as zinc source

Packing :

50 Kgs HDPE Bags

Dosage :

50–100 liters kg / acre

Method Of Application :

Soil application

Benefits Of Zinc Solubilizing Bacteria :

Reduces Chemical Fertilizer Usage: The use of this biological zinc fertilizer can decrease the reliance on chemical zinc-based fertilizers by up to 40%, promoting a more sustainable approach to agriculture.

Promotes Plant Growth: The bacteria in the fertilizer secrete plant growth promoters, which aid in better and faster plant development.

Enhances Soil Fertility: This fertilizer improves soil fertility, with effects that extend into the next crop season due to bacterial multiplication and persistence.

Increases Crop Yield and Quality: By using this fertilizer, farmers can expect an increase in both crop yield and the quality of the produce.

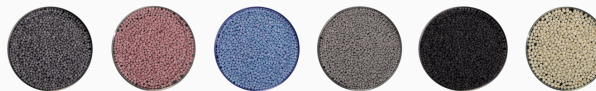
Boosts Soil Health and Activates Hormones: The fertilizer contributes to overall soil health and activates essential plant hormones, ensuring robust plant growth.

Improves Photosynthesis: The enhanced photosynthesis activity facilitated by this fertilizer leads to healthier and more productive plants.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Available in a variety of colors :



Bio Fertilizer
Talc Base Bio Fertilizer Granule

Phosphate Solubilizing Fungal

Description :

Phosphorus-solubilizing fungi are a beneficial group of microorganisms that play a vital role in converting insoluble phosphorus compounds into soluble forms that can be readily absorbed by plants. They achieve this by employing various mechanisms such as lowering the pH level of the soil, chelation, and mineralization processes. This transformation makes phosphorus more accessible for plant uptake and utilization.

Furthermore, phosphorus-solubilizing fungi provide protection to plants by suppressing phytopathogens, thereby enhancing plant health and reducing the risk of diseases. Additionally, a sufficient supply of phosphate facilitated by these fungi promotes seed formation and aids in the early maturation of crops. Moreover, it can contribute to early ripening and stimulate young plants to develop deeper, more abundant root systems, improving nutrient uptake efficiency.

The presence of phosphorus-solubilizing fungi in the soil promotes the availability of essential phosphorus for plant growth through pH regulation, chelation, and mineralization processes. Their activities provide protection against phytopathogens, aid in seed formation and maturation, encourage early ripening, and promote vigorous root growth. Ultimately, this leads to improved crop productivity and overall plant health.

Benefits Of Phosphate Solubilizing Fungal :

Fulfilling Deficiencies: These fungi help in addressing phosphorus deficiencies in plants, ensuring the plants have an adequate supply of this essential nutrient.

Enhancing Plant Activities: Phosphorus-solubilizing fungi facilitate important plant activities such as photosynthesis, root development, stalk and stem strength, flower and seed formation, and overall growth.

Early Ripening and Root Growth: These fungi aid in the early ripening of fruits and promote the growth of young plants with deeper and more abundant root systems.

Auxin and Gibberellin Production: Phosphorus-solubilizing fungi stimulate plant growth by producing growth-promoting substances like auxins and gibberellins.

Increased Phosphorus Availability: These fungi enhance phosphorus availability in the soil without disturbing its biochemical composition, ensuring that plants can efficiently acquire and utilize this nutrient.

Recommended Crops :

It should be used along with Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soybean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.



Specifications :

Base	Granule
Viable cell count	Minimum 1×10^6 spore/gm
Contamination level	1×10^3 cells/gm
pH	6.0 – 7.7
Efficiency character	The strain should be capable of solubilizing at least 30 mg/liter of phosphorus in liquid broth when tested as per the method given using tricalcium phosphate or aluminum phosphate or iron phosphate as phosphate source.

Packing :

50 Kgs HDPE Bags

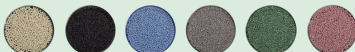
Dosage :

50–100 liters kg / acre

Method Of Application :

Soil application

Available In A Variety Of Colors :



Bio Fertilizer
Talc Base Bio Fertilizer Granule

Sulphur Oxidizing Bacteria

Description :

Sulphur oxidizers play a crucial role in converting elemental sulphur into plant-available sulfate. Sulphur is an essential element for pulse production and is involved in the formation of proteins, vitamins, and enzymes. It is a key component of amino acids such as cystine, cysteine, and methionine.

Sulphur oxidizers facilitate the conversion of various sulfur forms, including elemental sulphur and reduced sulfur compounds, into sulphate through the process of oxidation in the soil. The chemolithotrophic bacteria of the Thiobacillus genus are particularly important in this process. By utilizing sulphur oxidizers, the natural oxidation of sulfur is enhanced, leading to an accelerated production of sulfate.

The availability of sulphate in the soil is vital for plants to acquire the necessary sulphur for their growth and development. Therefore, the use of sulfur oxidizers is beneficial as it helps in increasing sulphate production, ensuring an adequate supply of sulphur for plants. This, in turn, supports the formation of important molecules like proteins, vitamins, and enzymes, ultimately contributing to improved crop productivity and quality.

Specifications :

Base	Granule
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 10^5 dilution
pH	6.5-7.5
Efficiency character	Sulphur oxidizing Bacteria has capacity in the range of minimum 30% when tested spectrophotometrically. In terms of zone formation, 5 mm solubilization zone in prescribed media having at least 3 mm thickness

Packing :

50 Kgs HDPE Bags

Dosage :

50-100 liters kg / acre

Method Of Application :

Soil application

Benefits Of Sulphur Oxidizing Bacteria :

Essential Secondary Nutrients: Sulfur is classified as a secondary nutrient, but it is vital for plant growth and metabolism.

Indispensable for Growth: Sulfur is essential for all plants, playing a crucial role in their growth and metabolic processes.

Enhances Micronutrient Solubility: It increases the solubility of key micronutrients like iron, zinc, and manganese, facilitating better nutrient uptake by plants.

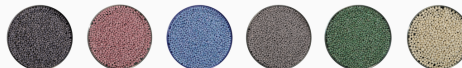
Chlorophyll Formation: Sulfur is involved in the formation of chlorophyll, which is essential for photosynthesis and overall plant health.

Role in Protein Synthesis: Known for its role in protein synthesis, sulfur performs numerous oxidizing functions in plant nutrition, contributing to robust and healthy plant development.

Recommended Crops :

Grapes & Banana, Citrus, Mango, Tomato, Corn, Pomegranate, Groundnut, Cotton, Soyabean, Coconut, Potato, Brinjal, Onion, Garlic, Cumin, Chillies, Beans, Okra, Pea, Tomato, Cabbage, Cauliflower, Sugarcane, Paddy, Rice, Wheat, Oat, Barley, Mustard, Sunflower, Carrot, Sorghum, Bajra, Lawns, Gardens, Green House, Etc.

Available in a variety of colors :



Bio Fertilizer
Talc Base Bio Fertilizer Granule

Calcium Solubilizing Bacteria

Description :

Calcium-solubilizing bacteria are microorganisms that convert insoluble calcium into soluble forms, enhancing soil fertility and plant health. They possess enzymes like organic acids that break down calcium compounds in the soil, making them available for plants. Calcium is essential for plant growth and development, and these bacteria contribute to soil fertility and nutrient uptake. They can be found naturally in soil, the rhizosphere, and plant roots, forming a symbiotic relationship with plants.

Their presence in the soil ecosystem increases calcium bioavailability and promotes soil structure, nutrient cycling, and plant resistance to stress. These bacteria can be commercially isolated, cultured, and applied as biofertilizers or bioinoculants, improving crop yield and reducing reliance on chemical fertilizers. In summary, calcium-solubilizing bacteria are vital for sustainable agriculture and eco-friendly farming practices, as they enhance calcium availability, improve soil fertility, and reduce reliance on chemical fertilizers.

Specifications :

Base	Granule
Viable cell count	CFU minimum 5×10^7 cell/g
Contamination level	No contamination at 10^5 dilution
pH	6.5 – 7.5

Packing :

1 lt, 5 lt, 50 lt

Dosage:

50–100 liters kg / acre

Recommended Crops :

Some recommended crops for the application of calcium-solubilizing bacteria are Tomatoes, Peppers, Potatoes, Cucumbers, Strawberries, Grapes, Apples, Cabbage, Broccoli, Lettuce, Carrots, Spinach, Cauliflower, Beans, Peas, Citrus Fruits (e.g., oranges, lemons), Melons (e.g., watermelons, cantaloupes), Brassicas (e.g., Brussels sprouts, kale), Root Vegetables (e.g., beets, radishes), and flowering plants (e.g., roses, chrysanthemums). These crops benefit from improved calcium availability, which enhances cell wall structure, nutrient absorption, and overall plant health.

Benefits of Calcium Solubilizing Bacteria :

- 1. Improved plant growth:** Calcium solubilizing bacteria enhance the availability of calcium, an essential nutrient for plant growth and development. This leads to improved root development, stronger stems, and increased overall plant growth.
- 2. Increased nutrient uptake:** By solubilizing calcium, these bacteria also improve the availability of other nutrients in the soil. Calcium is necessary for the efficient uptake of other nutrients, such as nitrogen and phosphorus, so increased calcium availability benefits plants' overall nutrient uptake.
- 3. Enhanced soil fertility:** Calcium solubilizing bacteria contribute to the overall fertility of the soil by improving the availability of calcium. This helps maintain a balanced soil pH, supports soil structure, and promotes nutrient cycling.
- 4. Disease resistance:** Calcium plays a crucial role in plant defense mechanisms. By increasing calcium availability, these bacteria help plants develop stronger cell walls, improving their resistance to diseases and pests.
- 5. Drought tolerance:** Calcium solubilization facilitates the efficient use of water by plants, leading to improved drought tolerance. This is particularly important in regions with limited water availability or during periods of water scarcity.
- 6. Reduced chemical fertilizer dependency:** By enhancing calcium availability, these bacteria reduce the reliance on synthetic chemical fertilizers. This can lead to more sustainable agriculture practices, reduce environmental pollution, and promote ecological balance.

Method Of Application :

Seed treatment, seedling treatment, soil application, and Drip irrigation.

Available in a variety of colors :





Bio Pesticide

The background features a dark green base with a large, flowing white shape in the center. This white shape is bordered by a thick orange line. Various organic, leaf-like shapes in light green and yellow are scattered around the central text. A circular area with diagonal hatching is visible on the right side.

Bio Pesticide Culture Liquid

Bio Pesticides
Bio Pesticide Culture Liquid

Trichoderma Viride

Description :

Trichoderma viride is a high-efficiency organic biological agent. It produces antibiotics, nutrient competition, parasitic, cell-wall degradation, enzymes, and induced plant resistance mechanisms, which have antagonism effect on a variety of plant pathogenic fungi. Protection and treatment can effectively control soil spread fungus diseases with dual effect.

Use Trichoderma viride products, which can enhance the survival rate of seedling and transplant, keep the seedlings robust growth. It can also be used to prevent grey mold.

Features of Trichoderma viride:

- Through the protection and treatment, can effectively prevent and control root rot, cataplexy, blight, wilt, verticillium wilt, anthrax, and other soil-borne diseases;
- Improve the soil, break the knot, improve the soil permeability and oxygen supply of the root system;
- Promote root growth, make crop growth more vigorous and increase crop yield, etc.

Mechanism of Action of Trichoderma viride :

- **Competitive effect:** Trichoderma viride has a fast growth and reproduction rate, and can quickly absorb and utilize nutrients, water, space and oxygen in the soil, thus worsening the living environment of plant pathogens;
- **Antibiosis:** It secretes antibacterial substances to inhibit the growth of plant pathogens;
- **Symbiosis and resistance induction:** the co-growth of Trichoderma viride and plant roots activates the plant's internal defense system and improves the plant's disease resistance;
- **Heavy parasitism:** Trichoderma viride mycelium will grow, twine and Pierce along the mycelium of plant pathogens and absorb the nutrients in the mycelium of plant pathogens, leading to the death of plant pathogens;



Specifications :

1 X 10¹⁰ CFU/ML

Packing :

1 Kgs Silver Pouch

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Usage:

1 litre of our culture = 100 litre of culture or 100 kg of powder

Promote Plant Growth :

- Increase plant growth and yield.
- Increase the systemic disease resistance of plants.
- Increase root growth and tolerance to drought.
- Increase the absorption of nutrients and the effective use of fertilizers
- Improve the light and efficiency of plants.
- Increase the rate and percentage of seed germination.

Bio Pesticides
Bio Pesticide Culture Liquid

Trichoderma Harzianum

Description :

Trichoderma grows on the surface of roots, where it provides disease control and enhances root growth. Its spores survive in the soil, but the food it lives on is mostly secreted from the root surface. Since the fungus multiplies on its own, it is different from seed-applied fungicides.

First, only a little needs to be applied because it will grow to continually cover the roots.

Second, because it grows, it protects all the roots for the whole growing season. Chemical controls protect only the seed where they are applied, and their protection lasts, at most, a few weeks.

Once Trichoderma has colonized roots, it can improve growth in two main ways.
First, it kills the fungi that cause root rot.

Second, it protects roots from certain physical stresses, allowing the roots to grow faster.

Trichoderma kills several major root rot fungi: Pythium, Rhizoctonia, and Fusarium. The process is called mycoparasitism.

Trichoderma secretes an enzyme that dissolves the cell wall of the other fungi. It can then get inside the bad fungi and consume them. It allows it to protect crop roots against root rot fungi in the field.

Trichoderma Harzianum Uses in Agriculture :

- **Improve Soil Condition:** Trichoderma harzianum products have outstanding soil adaptability in soil, control soil-borne pathogens and help soil build a stable crumb structure, which is porous & full of nutrition and preserve moisture and fertility. Improve soil problems such as soil salinization, hardening, and acidification conditions. Reduce heavy metals & organic pollutants. Significantly improve soil micro-environment and fertility.
- **Bio Diseases Control:** Trichoderma harzianum products can eliminate damaging fungal pathogens, such as *Phytophthora*, *Rhizoctonia solani*, *Pythium*, *Fusarium*. It will form a nature defensive bond to "Guard" your crop's roots. After we used the Trichoderma harzianum, it will produce mycelia to grow along with the roots, will form a physical bond on the surface of the plant's root system, establishing itself in the rhizosphere (root zone) and protects the roots against soil-borne diseases.
- **Stimulate Root Growth**
Trichoderma harzianum promotes crop growth in three main ways:
Control the fungus which causes root rot
Reduces the physical stress on the crop and makes it grow better
Secrete organic acids and natural growth hormones to promote the growth of crop roots system
Researches show that Trichoderma harzianum is one of the most effective microbes to colonize the roots.
- **Increase Plant Resistance Ability:** Trichoderma harzianum is capable of systemically activating plant defense mechanisms. In actual use, it can increase the ability of the plant against abiotic stresses such as drought, salinity, high temperature.



Specifications :

1 X 10¹⁰ CFU/ML

Packing :

1 Kgs Silver Pouch

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides
Bio Pesticide Culture Liquid

Beauveria Bassiana

Description :

Beauveria Bassiana fungus is a fungus that grows naturally in soils around the world. Acting as a parasite on various arthropod species, causing white muscardine disease; It widely used as a sprayed biological insecticide to control a great many pests such as bed bugs, termites, thrips, whiteflies, aphids, and different beetles.

Once Beauveria Bassiana infects the host insects, the fungus grows fast inside of the insect's body. Feeding on the nutrients present in the host's body and producing toxins continuously.

Main Features :

- **Wide Spectrum:** Beauveria Bassiana can parasitize more than 700 species of insects and mites of 15 orders and 149 families, such as Lepidoptera, Hymenoptera, Homoptera, with wings mesh and Orthoptera, such as adult, corn borer, moth, soybean sorghum budworm, weevil, potato beetle, small tea green leafhoppers, rice shell pest rice planthopper and rice leafhopper, mole, grubs, wireworm, cutworms, garlic, leek, maggot maggots variety of underground and ground, etc .
- **Non-Drug Resistance:** Beauveria Bassiana is a microbial fungicide, which mainly kills pests through parasitic reproduction. Therefore, it can be used continuously for many years without drug resistance.
- **Safe To Use :** Beauveria Bassiana is a microbial fungus that only acts on host pests. No matter how much concentration is used in production, there will be no drug damage, is the most assured insecticide.
- **Low Toxicity And No Pollution:** Beauveria Bassiana is a preparation produced by fermentation. It has no chemical components and is a green, safe and reliable biological pesticide. It has no pollution to the environment and can improve soil conditions.

Beauveria Bassiana Fungus Product Description :

- **No pesticide residue:** Today, agricultural goods are frequently rejected due to excessive pesticide residues. Even if the crop is harvested immediately after the use of Beauveria bassiana, then it won't cause any pesticide residue.
- **No resistance:** Pests' immunity to chemical pesticides leaves their insecticidal effects to diminish year by year. Beauveria bassiana murdered bugs by contact with the body of the insect under normal conditions, along with the pest does not develop any resistance to it. The effect has been getting higher and greater with consecutive years of use.
- **Regrowth:** The new biological pesticide of Beauveria bassiana includes living pollutants and parasites. After being applied to the area inappropriate temperature and humidity, it can continue to grow and multiply, then enhancing insecticidal results.
- **High selectivity:** Different from chemical pesticides, which kill toxic insects and insects that are beneficial together, Beauveria bassiana attack target insects, and has less impact on non-target organisms such as ladybirds, grasshoppers, and aphids. Therefore, the overall field control effect is better.
- **Insecticide Beauveria Bassiana Control target:** It may control tadpoles, locusts, potato beetles, aphids, leafhoppers, planthoppers, an assortment of lepidopteran larvae like corn borer/pine caterpillar/peach heartworm / diploid borer.



Specifications :

1 X 10¹⁰ CFU/ML

Packing :

1 Kgs Silver Pouch

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Usage:

1 litre of our culture = 100 litre of culture or 100 kg of powder

Insecticidal Mechanism :

Beauveria Bassiana is a pathogenic fungus. Applying under suitable environmental conditions, it can be subdivided to produce the spores. After the spores are in contact with pests, they can adhere to the epidermis of the pests. It can dissolve the outer shell of the insect and invade the host body to grow and reproduce. It will begin to consume lots of nutrients in the body of pests and form a large number of mycelium and spores inside the body of insects. In the meantime, Beauveria Bassiana also can also produce toxins such as Bassiana, Bassiana Oosporin, and Oosporin , which disturb the metabolism of the pests and eventually lead to death.

Bio Pesticides
Bio Pesticide Culture Liquid

Metarhizium Anisopliae

Description :

Metarhizium species (Metschnikoff) Sorokin, also known as green muscardine fungi, have long been recognized for their biological control potential against arthropods. The species level name of one of the more widely researched Metarhizium species (M. anisopliae) was derived from this beetle. Morphological features for identifying Metarhizium species can be imprecise as there can often be overlap of characters among species. Molecular techniques have shown that what used to be called M. anisopliae represents a complex of nine species.

Appearance:

Infections of arthropods by Metarhizium species are easily recognized a few days after death, when the fungus grows out of the arthropod integument and forms reproductive structures. Initially, one only sees fungal hyphae that appear white, but, as conidia form and mature they often take on a characteristic olive green color. However, depending on the species and strain of Metarhizium, spores can range in color from white to yellow to brown and green.

Habitat (Crops):

Metarhizium species are commonly thought of as soil saprophytes and are most frequently found in disturbed habitats like agricultural fields as compared to forest ecosystems. Additionally, recent findings suggest that these fungi form associations with plant roots in the rhizosphere and survive better in that environment than in surrounding potting soil over extended periods of time.

Pests Attacked:

Metarhizium species are known to attack a wide range of arthropods: greater than 200 species in over 50 families. These include many species of agricultural, medical and veterinary importance. include "various ticks and beetles; root weevils, flies, gnats, thrips," and locusts and grasshoppers. Additionally, Metarhizium species have been developed in other countries for use against cockchafer, spittlebugs, grubs, borers, and for control of mosquitoes that vector malaria.



Specifications :

1 X 10¹⁰ CFU/ML

Packing :

1 Kgs Silver Pouch

Usage:

1 litre of our culture = 100 litre of culture or 100 kg of powder

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops



Specifications :

1 X 10¹⁰ CFU/ML

Packing :

1 Kgs Silver Pouch

Usage:

1 litre of our culture = 100 litre of culture or 100 kg of powder

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides
Bio Pesticide Culture Liquid

Nematodes Free

Description :

The nematophagous fungus *Pochonia chlamydosporia* var. *chlamydosporia* is one of the most studied biological control agents against plant (semi-) endo-parasitic nematodes of the genera *Globodera*, *Heterodera*, *Meloidogyne*, *Nacobbus* and, more recently, *Rotylenchulus*. In this paper we present highlights from more than three decades of worldwide research on this biological control agent. We cover different aspects and key components of the complex plant-fungus-nematode tri-trophic interaction, an interaction that needs to be addressed to ensure the efficient use of *P. chlamydosporia* as a biopesticide as part of an integrated pest management approach.

Mode of action of fungal and bacterial nematicides

- Fungi group may be divided into nematode-trapping, endoparasitic, egg- and female-parasitic, and toxin-producing fungi. For example, for the nematode-trapping fungus, entangled nematode with adhesive network of *Monacrosporium megalosporum* hypha is illustrated. *Catenaria anguillulae*, an endoparasitic fungus, is a member of the Chytridiomycota, the only major group of true (chitin-walled) fungi that produce motile spores, termed zoospores.
- This fungus is often found as a facultative (non-specialized) parasite of nematodes and other small organisms. Phase-contrast microscopy was used to show the single and double chain of mature and immature fungal sporangium on parasitized nematodes.
- Based on their modes of action, the nematophagous bacteria can also be broadly grouped into parasitic bacteria and non-parasitic rhizobacteria.

Product Benefits :

- Protects Against Plant-Parasitic Nematodes
- Stops Nematode Damage and Enhances Soil Microbes
- Promotes Healthy Root Development for More Efficient Uptake of Water and Nutrients
- Farm-Friendly - Biological Product for Organic Production

Bio Pesticides
Bio Pesticide Culture Liquid

Pseudomonas

Description :

Fluorescent Pseudomonads belong to plant Growth Promoting Rhizobacteria (PGPR), the important group of bacteria that play a major role in the plant growth promotion, induced systemic resistance, biological control of pathogens etc. Many strains of *Pseudomonas fluorescens* are known to enhance plant growth promotion and reduce severity of various diseases.

The efficacy of bacterial antagonists in controlling fungal diseases was often better as alone, and sometimes in combination with fungicides. The present review refers to occurrence, distribution, mechanism, growth requirements of *Pseudomonas fluorescens* and diseases controlled by the bacterial antagonist in different agricultural and horticultural crops were discussed. The literature in this review helps in future research programmes that aim to promote *Pseudomonas fluorescens* as a potential bio-pesticide for augmentative biological control of many diseases of agriculture and horticultural importance.

Environmental and consumer concerns have heightened interest in developing biological control agents as environmentally-friendly alternatives to protect agricultural and horticultural crops against phytopathogens. *Pseudomonas fluorescens* is a proven biological control agent with numerous success stories from scientists globally. Various strains of *Pseudomonas* have been shown to significantly control fungal, bacterial, and nematode diseases in cereals, horticultural crops, oil seeds, and more. The efficacy of bacterial antagonism in controlling diseases often surpasses that of fungicides, and combining bacterial antagonism with fungicides sometimes enhances disease control efficacy.

Additionally, treatments with *Pseudomonas fluorescens* improve seedling health and crop yields. Peat soil has been identified as the best substrate for colonization, followed by farmyard manure and gobar gas. Polysaccharides enhance the adhesion of *Pseudomonas fluorescens*, promoting plant growth through increased antibiotic activity.

This review aims to support future research promoting *Pseudomonas fluorescens* as a potential bio-pesticide for augmentative biological control of various agricultural and horticultural diseases. However, a deeper understanding of the factors involved, including the signaling interactions among antagonists, pathogens, soil, and plants, is necessary to promote these biocontrol agents as widely applicable bio-pesticides in the future.



Specifications :

1 X 10¹⁰ CFU/ML

Packing :

1 Kgs Silver Pouch

Usage:

1 litre of our culture = 100 litre of culture or 100 kg of powder

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides
Bio Pesticide Culture Liquid

Verticillium Lecanii

Description :

Chemical insecticides play an important role in the control of plant damage and plant diseases. However, extensive use of these products has led to the disruption of ecosystems because of several reasons such as death of non-target species, accumulation of pesticide residues in the environment and food, and buildup of pesticide resistance in the target species. Biological control is one of the alternatives to chemical pesticides and it can be described as the limitation of the abundance of living organisms and their products by other living organisms. Predators, parasitoids, fungi and other beneficial organisms can be used for the biocontrol of insect pests. The fungus *Verticillium lecanii* is one of the members of Deuteromycetes and it can be used for crop protection.

Verticillium Lecanii, a Bio-insecticide is used against sucking pest in an entomopathogenic fungus to kill the sucking pests. These fungi invade insects by penetrating their cuticle or skin and rapidly multiply throughout the body.

Death of insects is caused by tissue destruction and toxins produced by the fungi. *Verticillium wilt*, caused by two species of soil-borne fungi- *Verticillium dahliae* and *Verticillium albo-atrum*, infects more than 200 species of plants, including many vegetables. *Verticillium albo-atrum* prefers cooler soils while *Verticillium dahliae* can become a problem in greenhouse vegetable production. Sometimes, both species will occur in the same field.

Verticillium can be used against soft bodied pests. This is effective against aphids, jassids, thrips, white flies, mites, mealy bugs, scale insects, leaf webber, green semi looper, flower webber, leaf minors, leaf hoppers, pod fly etc. *Verticillium wilt* is caused by a soil-borne fungus.

Enzyme & Metabolite action : *Verticillium lecanii* mycelia produces toxins which have insecticidal properties. These toxins weaken the hosts immune system (of insect) and aid in eventually killing it. *Verticillium lecanii* is developed by a unique process wherein metabolites of *Verticillium lecanii* are extracted and added back to the spores and formulated. Thus metabolites work effectively in high temperature and low humidity conditions and spores multiply and work in high humidity and low temperature conditions.

Growth : Once inside, *Verticillium lecanii* replicates and consumes the insects' internal contents eventually killing it. The fungus eventually grows out of the insect's cuticle and starts sporulating. Infected insects appear as white to yellowish cottony particles. *Verticillium lecanii* infects the insect on contact and does not need to be consumed by the host to cause infection.

Environment factors : *Verticillium lecanii* is developed by a unique process wherein metabolites of *Verticillium lecanii* are extracted and added back to the spores and formulated. Thus metabolites work effectively in high temperature and low humidity conditions and spores multiply and work in high humidity and low temperature conditions.

Specifications :

1 X 10¹⁰ CFU/ML

Packing :

1 Kgs Silver Pouch

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides
Bio Pesticide Culture Liquid

Bacillus Thuringiensis

Description :

Bacillus thuringiensis is a naturally occurring soil bacterium that causes disease on insect pests. It is accepted in organic farming and is considered ideal for pest management due to its low cost, ease of application, high virulence and narrow host specificity. Thus, Bacillus thuringiensis is regarded as environmentally friendly with no toxic effects on natural enemies and humans. The activity of Bacillus thuringiensis is due to toxins produced by this bacterium.

Bacillus thuringiensis is commercially available in most agricultural suppliers. It is sold in various formulations (spray, dust, and granule) and strains. Note that not all Bacillus thuringiensis can be used for control of caterpillars. Bt. israelensis is used for control of mosquitoes and Bt. tenebrionis for control of beetles.

How does it work?

Bacillus thuringiensis must be ingested by a susceptible host to be effective. When ingested, Bacillus thuringiensis produces proteins that react with the cells of the stomach lining. These (proteins) poison and paralyse the insect's digestive system causing the insect to stop feeding within hours. Bt-infested insects will live for several days but will cause no further damage to the plant. They will die eventually from starvation.

How to use Bacillus thuringiensis (Bt)

- Spray thoroughly, covering all the plant surfaces.
- Apply when larvae are less than 5 mm long or when the eggs begin to hatch. Bt works best on young larvae.
- In the hot tropics, it is more effective to spray Bt in the late afternoon as there are longer and cooler hours ahead. This enables Bt to remain longer on the leaves' surfaces. Bt survives better in cooler temperature. Whereas, spraying in the morning provides a shorter and hotter environment.
- Do not mix the Bt concentrate with alkaline water (pH 8 or higher). Alkalinity reduces its effectiveness. To make the water acidic, add a few tablespoons of white vinegar in a gallon of water before adding Bt.

Advantages

Unlike most insecticides, which target a broad spectrum of species, including both pests and beneficial insects, Bt is toxic to a narrow range of insects. Research suggests that Bt does not harm the natural enemies of insects, nor does it impair honeybees and other pollinators critical to agroecological systems.

Bt integrates well with other natural controls and is used for integrated pest management by many organic farmers.

The use of insect-resistant Bt plants can potentially reduce use of chemical insecticide sprays, which are extremely toxic and expensive.

Although lethal to certain insect species, Bt toxin applied as an insecticide or consumed with GMO food crops is considered nontoxic to humans and other mammals because they lack the digestive enzymes needed to activate the Bt protein crystals. However, any introduction of new genetic material is potentially a source for allergens, and, for this reason, certain strains of Bt are not approved for human consumption.



Specifications :

1 X 10¹⁰ CFU/ML

Packing :

1 Kgs Silver Pouch

Usage :

1 litre of our culture = 100 litre of culture or 100 kg of powder

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

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Bacillus thuringiensis kurstaki

Description :

Bacillus thuringiensis kurstaki (Btk) is a strain of Bt specifically used for controlling caterpillars in agricultural and garden settings. This strain produces crystal proteins (Cry proteins) that are toxic to caterpillars. When ingested by caterpillars, these proteins paralyze the insect's digestive system, causing them to stop feeding and eventually die from starvation.

Benefits Of Bacillus thuringiensis kurstaki:

- **Targeted Action:** BTK specifically targets caterpillar pests. It is highly selective in its toxicity towards insects in the order Lepidoptera, including caterpillars, while posing little to no harm to beneficial insects, pollinators, mammals, birds, or aquatic life. This specificity allows for targeted pest control while minimizing adverse effects on non-target organisms.
- **Environmental Safety:** BTK has a long history of safe use in pest management. It is considered safe for humans, as well as mammals, birds, and aquatic life. It quickly breaks down in the environment and does not persist, reducing the risk of accumulation or long-term ecological impact.
- **Resistance Management:** BTK is an effective tool for managing and preventing resistance in pest populations. By integrating Btk with other pest control measures, such as crop rotation, cultural practices, and the use of different insecticides with distinct modes of action, the development of resistance can be slowed or prevented. This is crucial for maintaining the long-term efficacy of pest control strategies.

Recommended stage of usage of Bacillus thuringiensis kurstaki

- **Application:** Spray thoroughly, ensuring all plant surfaces are covered.
- **Timing:** Apply when larvae are less than 5 mm long or when eggs begin to hatch. Btk is most effective on young larvae.
- **Temperature Considerations:** Apply in the late afternoon in hot climates to maximize effectiveness during cooler hours.
- **Water pH:** Do not mix Btk concentrate with alkaline water (pH 8 or higher). Acidify water by adding white vinegar if necessary.

How It Works

1. **Ingestion:** Caterpillars consume Btk spores that are naturally found on plant surfaces. These spores can be ingested when caterpillars feed on plants.
2. **Activation:** Once the Btk spores enter the caterpillar's alkaline gut, they undergo a transformation. Btk spores release Cry proteins, which are toxic proteins produced by the bacterium.
3. **Toxin Binding:** The Cry proteins bind specifically to receptors present on the gut cell membranes of the caterpillar. This binding process leads to the formation of pores or channels in the cell membranes.
4. **Gut Paralysis:** The formation of these pores disrupts the integrity of the caterpillar's gut cells. As a result, the gut cells start to lyse or break down. This leads to paralysis of the digestive system, as the gut is no longer able to function properly.
5. **Death:** Due to the paralysis of the digestive system, the caterpillar's ability to feed is severely compromised. Within hours of ingesting Btk and experiencing gut paralysis, the caterpillar stops feeding. This ultimately leads to starvation. In addition, the breakdown of gut cells can also release bacterial toxins into the caterpillar's body, causing septicemia. The combination of starvation and septicemia generally leads to the death of caterpillars within a few days.



Specifications :

Nutrient Content	Wt/Wt
CULTURE LIQUID:	1 X 10 ¹⁰ SPORES/ML

Dosage :

1kg/acre

Packing :

- **Liquid:** 50 ltr/200 ltr HDPE Barrel
- **Powder:** 25 Kgs HDPE Bags
- **Technical:** 1 Kg Silver Pouch
- **Granule:** 50 kg HDPE Bags

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

- Vegetables, fruits, ornamentals, and field crops.

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Bacillus thuringiensis israelensis (BTI)

Description :

Bacillus thuringiensis israelensis (Bti) is a strain of Bacillus thuringiensis that specifically targets mosquito larvae and other dipteran insects. It has gained recognition as an effective and environmentally friendly tool for mosquito control.

Bti produces toxins known as Cry toxins, which are ingested by mosquito larvae during feeding. These toxins are specifically activated in the alkaline environment of the larvae's digestive system. Once activated, the Cry toxins disrupt the integrity of the gut cells, leading to gut paralysis and ultimately causing the larvae to stop feeding. As a result, the mosquito larvae become unable to obtain the nutrients they need for growth and development, leading to their death.

Benefits Of Bacillus thuringiensis israelensis (BTI)

- The targeted action of this mosquito control method specifically aims to affect mosquito and fly larvae. This means it focuses on disrupting the life cycle of these pests, preventing them from maturing into adult mosquitoes or flies.
- Unlike traditional insecticides, this method is designed to be selective in its impact. It is specifically formulated to target mosquito and fly larvae while minimizing harm to beneficial insects and non-target species. This is important as beneficial insects play a crucial role in natural pest control and maintaining ecological balance.
- One of the key benefits of this method is its environmental safety. It poses no significant risks to humans, mammals, birds, fish, or other aquatic life. This is particularly valuable when considering the potential harmful effects that traditional insecticides can have on non-target organisms in ecosystems.
- By helping to reduce mosquito populations, this control method can contribute to lowering the incidence of mosquito-borne diseases. Mosquitoes are carriers of various diseases, such as malaria, dengue fever, Zika virus, and West Nile virus, which can be transmitted to humans through their bites. By targeting mosquito larvae, this method can help disrupt their breeding cycle and overall reduce the number of adult mosquitoes, thereby mitigating the risk of disease transmission to humans.
- It is important to note that while this mosquito control method can be effective in reducing mosquito populations and lowering disease risks, it is often used as one component of a comprehensive mosquito control strategy. This may include additional measures such as source reduction, habitat modification, and personal protective measures to achieve optimal results in mosquito control efforts.

How It Works

- 1. Ingestion:** To be effective, mosquito larvae need to consume Bti spores present in their aquatic environment, typically in water sources such as ponds, puddles, or stagnant water.
- 2. Activation:** Once inside the larvae's alkaline gut environment, the Bti spores undergo activation. This activation process leads to the release of specific toxins produced by Bti.
- 3. Toxin Binding:** The released toxins, known as Cry toxins, bind to specific receptors located on the gut cells of the mosquito larvae. This binding process triggers a cascade of events.
- 4. Gut Paralysis:** Once the Cry toxins bind to the receptors on the gut cell membranes, they puncture or create pores in these membranes. This disruption weakens the integrity of the gut cells and compromises their functionality.
- 5. Death:** As the gut cells continue to lyse or break down due to the formation of pores, the mosquito larvae's digestive system becomes paralyzed. The larvae are no longer able to feed and obtain nutrients necessary for their survival. Consequently, within a few days, the larvae die from a combination of starvation and the inability of their digestive system to function properly.



Specifications :

Nutrient Content	Wt/Wt
CULTURE LIQUID:	1 X 10 ¹⁰ SPORES/ML

Packing :

- **Liquid:** 50 ltr/200 ltr HDPE Barrel
- **Powder:** 25 Kgs HDPE Bags
- **Technical:** 1 Kg Silver Pouch
- **Granule:** 50 kg HDPE Bags

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

- Stagnant water bodies, ponds, marshes, and other areas with standing water where mosquitoes breed.

Recommended stage of usage of Bacillus thuringiensis israelensis (BTI)

- **Application:** Spray thoroughly, ensuring all plant surfaces are covered.
- **Timing:** Apply when larvae are less than 5 mm long or when eggs begin to hatch. Btk is most effective on young larvae.
- **Temperature Considerations:** Apply in the late afternoon in hot climates to maximize effectiveness during cooler hours.
- **Water pH:** Do not mix Btk concentrate with alkaline water (pH 8 or higher). Acidify water by adding white vinegar if necessary.



Bio Pesticide Liquid

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Trichoderma Viride

Description :

Trichoderma viride is a high-efficiency organic biological agent. It produces antibiotics, nutrient competition, parasitic, cell-wall degradation, enzymes, and induced plant resistance mechanisms, which have antagonism effect on a variety of plant pathogenic fungi. Protection and treatment can effectively control soil spread fungus diseases with dual effect.

Use Trichoderma viride products, which can enhance the survival rate of seedling and transplant, keep the seedlings robust growth. It can also be used to prevent grey mold.

Specifications :

1 X 10⁸ CFU/ML

Packing :

50 ltr/ 200 ltr HDPE Barrel

Dosage:

1 litre/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Promote Plant Growth :

- Increase plant growth and yield.
- Increase the systemic disease resistance of plants.
- Increase root growth and tolerance to drought.
- Increase the absorption of nutrients and the effective use of fertilizers
- Improve the light and efficiency of plants.
- Increase the rate and percentage of seed germination.

Features of Trichoderma viride:

- Through the protection and treatment, can effectively prevent and control root rot, cataplexy, blight, wilt, verticillium wilt, anthrax, and other soil-borne diseases;
- Improve the soil, break the knot, improve the soil permeability and oxygen supply of the root system;
- Promote root growth, make crop growth more vigorous and increase crop yield, etc.

Mechanism of Action of Trichoderma viride :

- **Competitive effect:** Trichoderma viride has a fast growth and reproduction rate, and can quickly absorb and utilize nutrients, water, space and oxygen in the soil, thus worsening the living environment of plant pathogens;
- **Antibiosis:** It secretes antibacterial substances to inhibit the growth of plant pathogens;
- **Symbiosis and resistance induction:** the co-growth of Trichoderma viride and plant roots activates the plant's internal defense system and improves the plant's disease resistance;
- **Heavy parasitism:** Trichoderma viride mycelium will grow, twine and Pierce along the mycelium of plant pathogens and absorb the nutrients in the mycelium of plant pathogens, leading to the death of plant pathogens;

Bio Pesticides
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Trichoderma Harzianum



Trichoderma
Harzianum

Specifications :

1 X 10⁸ CFU/ML

Packing :

50 ltr/ 200 ltr HDPE Barrel

Dosage:

1 litre/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Description :

Trichoderma grows on the surface of roots, where it provides disease control and enhances root growth. Its spores survive in the soil, but the food it lives on is mostly secreted from the root surface. Since the fungus multiplies on its own, it is different from seed-applied fungicides.

First, only a little needs to be applied because it will grow to continually cover the roots.

Second, because it grows, it protects all the roots for the whole growing season. Chemical controls protect only the seed where they are applied, and their protection lasts, at most, a few weeks.

Once Trichoderma has colonized roots, it can improve growth in two main ways. First, it kills the fungi that cause root rot.

Second, it protects roots from certain physical stresses, allowing the roots to grow faster.

Trichoderma kills several major root rot fungi: Pythium, Rhizoctonia, and Fusarium. The process is called mycoparasitism.

Trichoderma secretes an enzyme that dissolves the cell wall of the other fungi. It can then get inside the bad fungi and consume them. It allows it to protect crop roots against root rot fungi in the field.

Trichoderma Harzianum Uses in Agriculture :

- **Improve Soil Condition:** Trichoderma harzianum products have outstanding soil adaptability in soil, control soil-borne pathogens and help soil build a stable crumb structure, which is porous & full of nutrition and preserve moisture and fertility. Improve soil problems such as soil salinization, hardening, and acidification conditions. Reduce heavy metals & organic pollutants. Significantly improve soil micro-environment and fertility.
- **Bio Diseases Control:** Trichoderma harzianum products can eliminate damaging fungal pathogens, such as *Phytophthora*, *Rhizoctonia solani*, *Pythium*, *Fusarium*. It will form a nature defensive bond to "Guard" your crop's roots. After we used the Trichoderma harzianum, it will produce mycelia to grow along with the roots, will form a physical bond on the surface of the plant's root system, establishing itself in the rhizosphere (root zone) and protects the roots against soil-borne diseases.
- **Stimulate Root Growth**
Trichoderma harzianum promotes crop growth in three main ways:
Control the fungus which causes root rot
Reduces the physical stress on the crop and makes it grow better
Secrete organic acids and natural growth hormones to promote the growth of crop roots system
Researches show that Trichoderma harzianum is one of the most effective microbes to colonize the roots.
- **Increase Plant Resistance Ability:** Trichoderma harzianum is capable of systemically activating plant defense mechanisms. In actual use, it can increase the ability of the plant against abiotic stresses such as drought, salinity, high temperature.

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Beauveria Bassiana

Description :

Beauveria Bassiana fungus is a fungus that grows naturally in soils around the world. Acting as a parasite on various arthropod species, causing white muscardine disease; It widely used as a sprayed biological insecticide to control a great many pests such as bed bugs, termites, thrips, whiteflies, aphids, and different beetles.

Once Beauveria Bassiana infects the host insects, the fungus grows fast inside of the insect's body. Feeding on the nutrients present in the host's body and producing toxins continuously.

Main Features :

- **Wide Spectrum:** Beauveria Bassiana can parasitize more than 700 species of insects and mites of 15 orders and 149 families, such as Lepidoptera, Hymenoptera, Homoptera, with wings mesh and Orthoptera, such as adult, corn borer, moth, soybean sorghum budworm, weevil, potato beetle, small tea green leafhoppers, rice shell pest rice planthopper and rice leafhopper, mole, grubs, wireworm, cutworms, garlic, leek, maggot maggots variety of underground and ground, etc .
- **Non-Drug Resistance:** Beauveria Bassiana is a microbial fungicide, which mainly kills pests through parasitic reproduction. Therefore, it can be used continuously for many years without drug resistance.
- **Safe To Use :** Beauveria Bassiana is a microbial fungus that only acts on host pests. No matter how much concentration is used in production, there will be no drug damage, is the most assured insecticide.
- **Low Toxicity And No Pollution:** Beauveria Bassiana is a preparation produced by fermentation. It has no chemical components and is a green, safe and reliable biological pesticide. It has no pollution to the environment and can improve soil conditions.

Beauveria Bassiana Fungus Product Description :

- **No pesticide residue:** Today, agricultural goods are frequently rejected due to excessive pesticide residues. Even if the crop is harvested immediately after the use of Beauveria bassiana, then it won't cause any pesticide residue.
- **No resistance:** Pests' immunity to chemical pesticides leaves their insecticidal effects to diminish year by year. Beauveria bassiana murdered bugs by contact with the body of the insect under normal conditions, along with the pest does not develop any resistance to it. The effect has been getting higher and greater with consecutive years of use.
- **Regrowth:** The new biological pesticide of Beauveria bassiana includes living pollutants and parasites. After being applied to the area inappropriate temperature and humidity, it can continue to grow and multiply, then enhancing insecticidal results.
- **High selectivity:** Different from chemical pesticides, which kill toxic insects and insects that are beneficial together, Beauveria bassiana attack target insects, and has less impact on non-target organisms such as ladybirds, grasshoppers, and aphids. Therefore, the overall field control effect is better.
- **Insecticide Beauveria Bassiana Control target:** It may control tadpoles, locusts, potato beetles, aphids, leafhoppers, planthoppers, an assortment of lepidopteran larvae like corn borer/pine caterpillar/peach heartworm / diploid borer.



Specifications :

1 X 10⁸ CFU/ML

Packing :

50 ltr/ 200 ltr HDPE Barrel

Dosage:

1 litre/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Insecticidal Mechanism :

Beauveria Bassiana is a pathogenic fungus. Applying under suitable environmental conditions, It can be subdivided to produce the spores. After the spores are in contact with pests, they can adhere to the epidermis of the pests. It can dissolve the outer shell of the insect and invade the host body to grow and reproduce. It will begin to consume lots of nutrients in the body of pests and form a large number of mycelium and spores inside the body of insects. In the meantime, Beauveria Bassiana also can also produce toxins such as

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Metarhizium Anisopliae

Description :

Metarhizium species (Metschnikoff) Sorokin, also known as green muscardine fungi, have long been recognized for their biological control potential against arthropods. The species level name of one of the more widely researched Metarhizium species (M. anisopliae) was derived from this beetle. Morphological features for identifying Metarhizium species can be imprecise as there can often be overlap of characters among species. Molecular techniques have shown that what used to be called M. anisopliae represents a complex of nine species.

Appearance:

Infections of arthropods by Metarhizium species are easily recognized a few days after death, when the fungus grows out of the arthropod integument and forms reproductive structures. Initially, one only sees fungal hyphae that appear white, but, as conidia form and mature they often take on a characteristic olive green color. However, depending on the species and strain of Metarhizium, spores can range in color from white to yellow to brown and green.

Habitat (Crops):

Metarhizium species are commonly thought of as soil saprophytes and are most frequently found in disturbed habitats like agricultural fields as compared to forest ecosystems. Additionally, recent findings suggest that these fungi form associations with plant roots in the rhizosphere and survive better in that environment than in surrounding potting soil over extended periods of time.

Pests Attacked:

Metarhizium species are known to attack a wide range of arthropods: greater than 200 species in over 50 families. These include many species of agricultural, medical and veterinary importance. include "various ticks and beetles; root weevils, flies, gnats, thrips," and locusts and grasshoppers. Additionally, Metarhizium species have been developed in other countries for use against cockchafer, spittlebugs, grubs, borers, and for control of mosquitoes that vector malaria.

Specifications :

1 X 10⁸ CFU/ML

Packing :

50 ltr/ 200 ltr HDPE Barrel

Dosage:

1 litre/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

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Nematodes Free

Description :

The nematophagous fungus *Pochonia chlamydosporia* var. *chlamydosporia* is one of the most studied biological control agents against plant (semi-) endo-parasitic nematodes of the genera *Globodera*, *Heterodera*, *Meloidogyne*, *Nacobbus* and, more recently, *Rotylenchulus*. In this paper we present highlights from more than three decades of worldwide research on this biological control agent. We cover different aspects and key components of the complex plant-fungus-nematode tri-trophic interaction, an interaction that needs to be addressed to ensure the efficient use of *P. chlamydosporia* as a biopesticide as part of an integrated pest management approach.

Mode of action of fungal and bacterial nematicides

- Fungi group may be divided into nematode-trapping, endoparasitic, egg- and female-parasitic, and toxin-producing fungi. For example, for the nematode-trapping fungus, entangled nematode with adhesive network of *Monacrosporium megalosporum* hypha is illustrated. *Catenaria anguillulae*, an endoparasitic fungus, is a member of the Chytridiomycota, the only major group of true (chitin-walled) fungi that produce motile spores, termed zoospores.
- This fungus is often found as a facultative (non-specialized) parasite of nematodes and other small organisms. Phase-contrast microscopy was used to show the single and double chain of mature and immature fungal sporangium on parasitized nematodes.
- Based on their modes of action, the nematophagous bacteria can also be broadly grouped into parasitic bacteria and non-parasitic rhizobacteria.

Product Benefits :

- Protects Against Plant-Parasitic Nematodes
- Stops Nematode Damage and Enhances Soil Microbes
- Promotes Healthy Root Development for More Efficient Uptake of Water and Nutrients
- Farm-Friendly - Biological Product for Organic Production



Specifications :

1 X 10⁹ CFU/ML

Packing :

50 ltr/ 200 ltr HDPE Barrel

Dosage:

1 litre/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

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Pseudomonas



Pseudomonas
Fluorescens

Specifications :

1 X 10⁸ CFU/ML

Packing :

50 ltr/ 200 ltr HDPE Barrel

Dosage:

1 litre/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Description :

Fluorescent Pseudomonads belong to plant Growth Promoting Rhizobacteria (PGPR), the important group of bacteria that play a major role in the plant growth promotion, induced systemic resistance, biological control of pathogens etc. Many strains of Pseudomonas fluorescens are known to enhance plant growth promotion and reduce severity of various diseases.

The efficacy of bacterial antagonists in controlling fungal diseases was often better as alone, and sometimes in combination with fungicides. The present review refers to occurrence, distribution, mechanism, growth requirements of Pseudomonas fluorescens and diseases controlled by the bacterial antagonist in different agricultural and horticultural crops were discussed. The literature in this review helps in future research programmes that aim to promote Pseudomonas fluorescens as a potential bio-pesticide for augmentative biological control of many diseases of agriculture and horticultural importance.

Environmental and consumer concerns have heightened interest in developing biological control agents as environmentally-friendly alternatives to protect agricultural and horticultural crops against phytopathogens. Pseudomonas fluorescens is a proven biological control agent with numerous success stories from scientists globally. Various strains of Pseudomonas have been shown to significantly control fungal, bacterial, and nematode diseases in cereals, horticultural crops, oil seeds, and more. The efficacy of bacterial antagonism in controlling diseases often surpasses that of fungicides, and combining bacterial antagonism with fungicides sometimes enhances disease control efficacy.

Additionally, treatments with Pseudomonas fluorescens improve seedling health and crop yields. Peat soil has been identified as the best substrate for colonization, followed by farmyard manure and gobar gas. Polysaccharides enhance the adhesion of Pseudomonas fluorescens, promoting plant growth through increased antibiotic activity.

This review aims to support future research promoting Pseudomonas fluorescens as a potential bio-pesticide for augmentative biological control of various agricultural and horticultural diseases. However, a deeper understanding of the factors involved, including the signaling interactions among antagonists, pathogens, soil, and plants, is necessary to promote these biocontrol agents as widely applicable bio-pesticides in the future.

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Verticillium Lecanii

Description :

Chemical insecticides play an important role in the control of plant damage and plant diseases. However, extensive use of these products has led to the disruption of ecosystems because of several reasons such as death of non-target species, accumulation of pesticide residues in the environment and food, and buildup of pesticide resistance in the target species. Biological control is one of the alternatives to chemical pesticides and it can be described as the limitation of the abundance of living organisms and their products by other living organisms. Predators, parasitoids, fungi and other beneficial organisms can be used for the biocontrol of insect pests. The fungus *Verticillium lecanii* is one of the members of Deuteromycetes and it can be used for crop protection.

Verticillium Lecanii, a Bio-insecticide is used against sucking pest in an entomopathogenic fungus to kill the sucking pests. These fungi invade insects by penetrating their cuticle or skin and rapidly multiply throughout the body.

Death of insects is caused by tissue destruction and toxins produced by the fungi. *Verticillium wilt*, caused by two species of soil-borne fungi- *Verticillium dahliae* and *Verticillium albo-atrum*, infects more than 200 species of plants, including many vegetables. *Verticillium albo-atrum* prefers cooler soils while *Verticillium dahliae* can become a problem in greenhouse vegetable production. Sometimes, both species will occur in the same field.

Verticillium can be used against soft bodied pests. This is effective against aphids, jassids, thrips, white flies, mites, mealy bugs, scale insects, leaf webber, green semi looper, flower webber, leaf minors, leaf hoppers, pod fly etc. *Verticillium wilt* is caused by a soil-borne fungus.

Enzyme & Metabolite action : *Verticillium lecanii* mycelia produces toxins which have insecticidal properties. These toxins weaken the hosts immune system (of insect) and aid in eventually killing it. *Verticillium lecanii* is developed by a unique process wherein metabolites of *Verticillium lecanii* are extracted and added back to the spores and formulated. Thus metabolites work effectively in high temperature and low humidity conditions and spores multiply and work in high humidity and low temperature conditions.

Growth : Once inside, *Verticillium lecanii* replicates and consumes the insects' internal contents eventually killing it. The fungus eventually grows out of the insect's cuticle and starts sporulating. Infected insects appear as white to yellowish cottony particles. *Verticillium lecanii* infects the insect on contact and does not need to be consumed by the host to cause infection.

Environment factors : *Verticillium lecanii* is developed by a unique process wherein metabolites of *Verticillium lecanii* are extracted and added back to the spores and formulated. Thus metabolites work effectively in high temperature and low humidity conditions and spores multiply and work in high humidity and low temperature conditions.

Specifications :

1 X 10⁸ CFU/ML

Packing :

50 ltr/ 200 ltr HDPE Barrel

Dosage:

1 litre/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides
Bio Pesticide Liquid

Bacillus Thuringiensis

Description :

Bacillus thuringiensis is a naturally occurring soil bacterium that causes disease on insect pests. It is accepted in organic farming and is considered ideal for pest management due to its low cost, ease of application, high virulence and narrow host specificity. Thus, *Bacillus thuringiensis* is regarded as environmentally friendly with no toxic effects on natural enemies and humans. The activity of *Bacillus thuringiensis* is due to toxins produced by this bacterium. *Bacillus thuringiensis* is commercially available in most agricultural suppliers. It is sold in various formulations (spray, dust, and granule) and strains. Note that not all *Bacillus thuringiensis* can be used for control of caterpillars. *Bt. israelensis* is used for control of mosquitoes and *Bt. tenebrionis* for control of beetles.

How does it work?

Bacillus thuringiensis must be ingested by a susceptible host to be effective. When ingested, *Bacillus thuringiensis* produces proteins that react with the cells of the stomach lining. These (proteins) poison and paralyse the insect's digestive system causing the insect to stop feeding within hours. *Bt*-infested insects will live for several days but will cause no further damage to the plant. They will die eventually from starvation.

How to use *Bacillus thuringiensis* (Bt)

- Spray thoroughly, covering all the plant surfaces.
- Apply when larvae are less than 5 mm long or when the eggs begin to hatch. *Bt* works best on young larvae.
- In the hot tropics, it is more effective to spray *Bt* in the late afternoon as there are longer and cooler hours ahead. This enables *Bt* to remain longer on the leaves' surfaces. *Bt* survives better in cooler temperature. Whereas, spraying in the morning provides a shorter and hotter environment.
- Do not mix the *Bt* concentrate with alkaline water (pH 8 or higher). Alkalinity reduces its effectiveness. To make the water acidic, add a few tablespoons of white vinegar in a gallon of water before adding *Bt*.

Advantages

Unlike most insecticides, which target a broad spectrum of species, including both pests and beneficial insects, *Bt* is toxic to a narrow range of insects. Research suggests that *Bt* does not harm the natural enemies of insects, nor does it impair honeybees and other pollinators critical to agroecological systems.

Bt integrates well with other natural controls and is used for integrated pest management by many organic farmers.

The use of insect-resistant *Bt* plants can potentially reduce use of chemical insecticide sprays, which are extremely toxic and expensive.

Although lethal to certain insect species, *Bt* toxin applied as an insecticide or consumed with GMO food crops is considered nontoxic to humans and other mammals because they lack the digestive enzymes needed to activate the *Bt* protein crystals. However, any introduction of new genetic material is potentially a source for allergens, and, for this reason, certain strains of *Bt* are not approved for human consumption.



Specifications :

1 X 10⁸ CFU/ML

Packing :

50 ltr/ 200 ltr HDPE Barrel

Dosage:

1 litre/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops



Specifications :

Nutrient Content	Wt/Wt
LIQUID:	1x10 ⁸ CFU/ML

Dosage :

1kg/acre

Packing :

- **Liquid:** 50 ltr/200 ltr HDPE Barrel
- **Powder:** 25 Kgs HDPE Bags
- **Technical:** 1 Kg Silver Pouch
- **Granule:** 50 kg HDPE Bags

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

- Vegetables, fruits, ornamentals, and field crops.

Bio Pesticide
Bio Pesticide Liquid

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Bacillus thuringiensis kurstaki

Description :

Bacillus thuringiensis kurstaki (Btk) is a strain of Bt specifically used for controlling caterpillars in agricultural and garden settings. This strain produces crystal proteins (Cry proteins) that are toxic to caterpillars. When ingested by caterpillars, these proteins paralyze the insect's digestive system, causing them to stop feeding and eventually die from starvation.

Benefits Of Bacillus thuringiensis kurstaki:

- **Targeted Action:** BTK specifically targets caterpillar pests. It is highly selective in its toxicity towards insects in the order Lepidoptera, including caterpillars, while posing little to no harm to beneficial insects, pollinators, mammals, birds, or aquatic life. This specificity allows for targeted pest control while minimizing adverse effects on non-target organisms.
- **Environmental Safety:** BTK has a long history of safe use in pest management. It is considered safe for humans, as well as mammals, birds, and aquatic life. It quickly breaks down in the environment and does not persist, reducing the risk of accumulation or long-term ecological impact.
- **Resistance Management:** BTK is an effective tool for managing and preventing resistance in pest populations. By integrating Btk with other pest control measures, such as crop rotation, cultural practices, and the use of different insecticides with distinct modes of action, the development of resistance can be slowed or prevented. This is crucial for maintaining the long-term efficacy of pest control strategies.

Recommended stage of usage of Bacillus thuringiensis kurstaki

- **Application:** Spray thoroughly, ensuring all plant surfaces are covered.
- **Timing:** Apply when larvae are less than 5 mm long or when eggs begin to hatch. Btk is most effective on young larvae.
- **Temperature Considerations:** Apply in the late afternoon in hot climates to maximize effectiveness during cooler hours.
- **Water pH:** Do not mix Btk concentrate with alkaline water (pH 8 or higher). Acidify water by adding white vinegar if necessary.

How It Works

1. **Ingestion:** Caterpillars consume Btk spores that are naturally found on plant surfaces. These spores can be ingested when caterpillars feed on plants.
2. **Activation:** Once the Btk spores enter the caterpillar's alkaline gut, they undergo a transformation. Btk spores release Cry proteins, which are toxic proteins produced by the bacterium.
3. **Toxin Binding:** The Cry proteins bind specifically to receptors present on the gut cell membranes of the caterpillar. This binding process leads to the formation of pores or channels in the cell membranes.
4. **Gut Paralysis:** The formation of these pores disrupts the integrity of the caterpillar's gut cells. As a result, the gut cells start to lyse or break down. This leads to paralysis of the digestive system, as the gut is no longer able to function properly.
5. **Death:** Due to the paralysis of the digestive system, the caterpillar's ability to feed is severely compromised. Within hours of ingesting Btk and experiencing gut paralysis, the caterpillar stops feeding. This ultimately leads to starvation. In addition, the breakdown of gut cells can also release bacterial toxins into the caterpillar's body, causing septicemia. The combination of starvation and septicemia generally leads to the death of caterpillars within a few days.

Bio Pesticide
Bio Pesticide Liquid

Bacillus thuringiensis israelensis (BTI)

Description :

Bacillus thuringiensis israelensis (Bti) is a strain of Bacillus thuringiensis that specifically targets mosquito larvae and other dipteran insects. It has gained recognition as an effective and environmentally friendly tool for mosquito control.

Bti produces toxins known as Cry toxins, which are ingested by mosquito larvae during feeding. These toxins are specifically activated in the alkaline environment of the larvae's digestive system. Once activated, the Cry toxins disrupt the integrity of the gut cells, leading to gut paralysis and ultimately causing the larvae to stop feeding. As a result, the mosquito larvae become unable to obtain the nutrients they need for growth and development, leading to their death.

Benefits Of Bacillus thuringiensis israelensis (BTI)

- The targeted action of this mosquito control method specifically aims to affect mosquito and fly larvae. This means it focuses on disrupting the life cycle of these pests, preventing them from maturing into adult mosquitoes or flies.
- Unlike traditional insecticides, this method is designed to be selective in its impact. It is specifically formulated to target mosquito and fly larvae while minimizing harm to beneficial insects and non-target species. This is important as beneficial insects play a crucial role in natural pest control and maintaining ecological balance.
- One of the key benefits of this method is its environmental safety. It poses no significant risks to humans, mammals, birds, fish, or other aquatic life. This is particularly valuable when considering the potential harmful effects that traditional insecticides can have on non-target organisms in ecosystems.
- By helping to reduce mosquito populations, this control method can contribute to lowering the incidence of mosquito-borne diseases. Mosquitoes are carriers of various diseases, such as malaria, dengue fever, Zika virus, and West Nile virus, which can be transmitted to humans through their bites. By targeting mosquito larvae, this method can help disrupt their breeding cycle and overall reduce the number of adult mosquitoes, thereby mitigating the risk of disease transmission to humans.
- It is important to note that while this mosquito control method can be effective in reducing mosquito populations and lowering disease risks, it is often used as one component of a comprehensive mosquito control strategy. This may include additional measures such as source reduction, habitat modification, and personal protective measures to achieve optimal results in mosquito control efforts.

How It Works

- 1. Ingestion:** To be effective, mosquito larvae need to consume Bti spores present in their aquatic environment, typically in water sources such as ponds, puddles, or stagnant water.
- 2. Activation:** Once inside the larvae's alkaline gut environment, the Bti spores undergo activation. This activation process leads to the release of specific toxins produced by Bti.
- 3. Toxin Binding:** The released toxins, known as Cry toxins, bind to specific receptors located on the gut cells of the mosquito larvae. This binding process triggers a cascade of events.
- 4. Gut Paralysis:** Once the Cry toxins bind to the receptors on the gut cell membranes, they puncture or create pores in these membranes. This disruption weakens the integrity of the gut cells and compromises their functionality.
- 5. Death:** As the gut cells continue to lyse or break down due to the formation of pores, the mosquito larvae's digestive system becomes paralyzed. The larvae are no longer able to feed and obtain nutrients necessary for their survival. Consequently, within a few days, the larvae die from a combination of starvation and the inability of their digestive system to function properly.



Specifications :

Nutrient Content	Wt/Wt
LIQUID:	1x10 ⁸ CFU/ML

Packing :

- **Liquid:** 50 ltr/200 ltr HDPE Barrel
- **Powder:** 25 Kgs HDPE Bags
- **Technical:** 1 Kg Silver Pouch
- **Granule:** 50 kg HDPE Bags

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

- Stagnant water bodies, ponds, marshes, and other areas with standing water where mosquitoes breed.

Recommended stage of usage of Bacillus thuringiensis israelensis (BTI)

- **Application:** Spray thoroughly, ensuring all plant surfaces are covered.
- **Timing:** Apply when larvae are less than 5 mm long or when eggs begin to hatch. Bti is most effective on young larvae.
- **Temperature Considerations:** Apply in the late afternoon in hot climates to maximize effectiveness during cooler hours.
- **Water pH:** Do not mix Bti concentrate with alkaline water (pH 8 or higher). Acidify water by adding white vinegar if necessary.



Talc Base Bio Pesticide Powder

Bio Pesticides
Talc Base Bio Pesticide Powder

Trichoderma Viride

Description :

Trichoderma viride is a high-efficiency organic biological agent. It produces antibiotics, nutrient competition, parasitic, cell-wall degradation, enzymes, and induced plant resistance mechanisms, which have antagonism effect on a variety of plant pathogenic fungi. Protection and treatment can effectively control soil spread fungus diseases with dual effect.

Use Trichoderma viride products, which can enhance the survival rate of seedling and transplant, keep the seedlings robust growth. It can also be used to prevent grey mold.

Specifications :

1 X 10⁷ CFU/ML

Packing :

25 Kgs HDPE Bags

Dosage :

1 kg/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seedling or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Promote Plant Growth :

- Increase plant growth and yield.
- Increase the systemic disease resistance of plants.
- Increase root growth and tolerance to drought.
- Increase the absorption of nutrients and the effective use of fertilizers
- Improve the light and efficiency of plants.
- Increase the rate and percentage of seed germination.

Features of Trichoderma viride:

- Through the protection and treatment, can effectively prevent and control root rot, cataplexy, blight, wilt, verticillium wilt, anthrax, and other soil-borne diseases;
- Improve the soil, break the knot, improve the soil permeability and oxygen supply of the root system;
- Promote root growth, make crop growth more vigorous and increase crop yield, etc.

Mechanism of Action of Trichoderma viride :

- **Competitive effect:** Trichoderma viride has a fast growth and reproduction rate, and can quickly absorb and utilize nutrients, water, space and oxygen in the soil, thus worsening the living environment of plant pathogens;
- **Antibiosis:** It secretes antibacterial substances to inhibit the growth of plant pathogens;
- **Symbiosis and resistance induction:** the co-growth of Trichoderma viride and plant roots activates the plant's internal defense system and improves the plant's disease resistance;
- **Heavy parasitism:** Trichoderma viride mycelium will grow, twine and Pierce along the mycelium of plant pathogens and absorb the nutrients in the mycelium of plant pathogens, leading to the death of plant pathogens;

Bio Pesticides
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Trichoderma Harzianum

Description :

Trichoderma grows on the surface of roots, where it provides disease control and enhances root growth. Its spores survive in the soil, but the food it lives on is mostly secreted from the root surface. Since the fungus multiplies on its own, it is different from seed-applied fungicides.

First, only a little needs to be applied because it will grow to continually cover the roots.

Second, because it grows, it protects all the roots for the whole growing season. Chemical controls protect only the seed where they are applied, and their protection lasts, at most, a few weeks.

Once Trichoderma has colonized roots, it can improve growth in two main ways. First, it kills the fungi that cause root rot.

Second, it protects roots from certain physical stresses, allowing the roots to grow faster.

Trichoderma kills several major root rot fungi: Pythium, Rhizoctonia, and Fusarium. The process is called mycoparasitism.

Trichoderma secretes an enzyme that dissolves the cell wall of the other fungi. It can then get inside the bad fungi and consume them. It allows it to protect crop roots against root rot fungi in the field.

Trichoderma Harzianum Uses in Agriculture :

- **Improve Soil Condition:** Trichoderma harzianum products have outstanding soil adaptability in soil, control soil-borne pathogens and help soil build a stable crumb structure, which is porous & full of nutrition and preserve moisture and fertility. Improve soil problems such as soil salinization, hardening, and acidification conditions. Reduce heavy metals & organic pollutants. Significantly improve soil micro-environment and fertility.
- **Bio Diseases Control:** Trichoderma harzianum products can eliminate damaging fungal pathogens, such as *Phytophthora*, *Rhizoctonia solani*, *Pythium*, *Fusarium*. It will form a nature defensive bond to "Guard" your crop's roots. After we used the Trichoderma harzianum, it will produce mycelia to grow along with the roots, will form a physical bond on the surface of the plant's root system, establishing itself in the rhizosphere (root zone) and protects the roots against soil-borne diseases.
- **Stimulate Root Growth**
Trichoderma harzianum promotes crop growth in three main ways:
Control the fungus which causes root rot
Reduces the physical stress on the crop and makes it grow better
Secrete organic acids and natural growth hormones to promote the growth of crop roots system
Researches show that Trichoderma harzianum is one of the most effective microbes to colonize the roots.
- **Increase Plant Resistance Ability:** Trichoderma harzianum is capable of systemically activating plant defense mechanisms. In actual use, it can increase the ability of the plant against abiotic stresses such as drought, salinity, high temperature.



Specifications :

1 X 10⁷ CFU/ML

Packing :

25 Kgs HDPE Bags

Dosage:

1 kg/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides
Talc Base Bio Pesticide Powder

Beauveria Bassiana

Description :

Beauveria Bassiana fungus is a fungus that grows naturally in soils around the world. Acting as a parasite on various arthropod species, causing white muscardine disease; It widely used as a sprayed biological insecticide to control a great many pests such as bed bugs, termites, thrips, whiteflies, aphids, and different beetles.

Once Beauveria Bassiana infects the host insects, the fungus grows fast inside of the insect's body. Feeding on the nutrients present in the host's body and producing toxins continuously.

Main Features :

- **Wide Spectrum:** Beauveria Bassiana can parasitize more than 700 species of insects and mites of 15 orders and 149 families, such as Lepidoptera, Hymenoptera, Homoptera, with wings mesh and Orthoptera, such as adult, corn borer, moth, soybean sorghum budworm, weevil, potato beetle, small tea green leafhoppers, rice shell pest rice planthopper and rice leafhopper, mole, grubs, wireworm, cutworms, garlic, leek, maggot maggots variety of underground and ground, etc .
- **Non-Drug Resistance:** Beauveria Bassiana is a microbial fungicide, which mainly kills pests through parasitic reproduction. Therefore, it can be used continuously for many years without drug resistance.
- **Safe To Use :** Beauveria Bassiana is a microbial fungus that only acts on host pests. No matter how much concentration is used in production, there will be no drug damage, is the most assured insecticide.
- **Low Toxicity And No Pollution:** Beauveria Bassiana is a preparation produced by fermentation. It has no chemical components and is a green, safe and reliable biological pesticide. It has no pollution to the environment and can improve soil conditions.

Beauveria Bassiana Fungus Product Description :

- **No pesticide residue:** Today, agricultural goods are frequently rejected due to excessive pesticide residues. Even if the crop is harvested immediately after the use of Beauveria bassiana, then it won't cause any pesticide residue.
- **No resistance:** Pests' immunity to chemical pesticides leaves their insecticidal effects to diminish year by year. Beauveria bassiana murdered bugs by contact with the body of the insect under normal conditions, along with the pest does not develop any resistance to it. The effect has been getting higher and greater with consecutive years of use.
- **Regrowth:** The new biological pesticide of Beauveria bassiana includes living pollutants and parasites. After being applied to the area inappropriate temperature and humidity, it can continue to grow and multiply, then enhancing insecticidal results.
- **High selectivity:** Different from chemical pesticides, which kill toxic insects and insects that are beneficial together, Beauveria bassiana attack target insects, and has less impact on non-target organisms such as ladybirds, grasshoppers, and aphids. Therefore, the overall field control effect is better.
- **Insecticide Beauveria Bassiana Control target:** It may control tadpoles, locusts, potato beetles, aphids, leafhoppers, planthoppers, an assortment of lepidopteran larvae like corn borer/pine caterpillar/peach heartworm / diploid borer.



Specifications :

1 X 10⁷ CFU/ML

Packing :

25 Kgs HDPE Bags

Dosage:

1 kg/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Insecticidal Mechanism :

Beauveria Bassiana is a pathogenic fungus. Applying under suitable environmental conditions, it can be subdivided to produce the spores. After the spores are in contact with pests, they can adhere to the epidermis of the pests. It can dissolve the outer shell of the insect and invade the host body to grow and reproduce.

It will begin to consume lots of nutrients in the body of pests and form a large number of mycelium and spores inside the body of insects. In the meantime, Beauveria Bassiana also can produce toxins such as Bassiana, Bassiana Oosporin, and Oosporin , which



Specifications :

1 X 10⁷ CFU/ML

Packing :

25 Kgs HDPE Bags

Dosage:

1 kg/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides

Talc Base Bio Pesticide Powder

Metarhizium Anisopliae

Description :

Metarhizium species (Metschnikoff) Sorokin, also known as green muscardine fungi, have long been recognized for their biological control potential against arthropods. The species level name of one of the more widely researched Metarhizium species (M. anisopliae) was derived from this beetle. Morphological features for identifying Metarhizium species can be imprecise as there can often be overlap of characters among species. Molecular techniques have shown that what used to be called M. anisopliae represents a complex of nine species.

Appearance:

Infections of arthropods by Metarhizium species are easily recognized a few days after death, when the fungus grows out of the arthropod integument and forms reproductive structures. Initially, one only sees fungal hyphae that appear white, but, as conidia form and mature they often take on a characteristic olive green color. However, depending on the species and strain of Metarhizium, spores can range in color from white to yellow to brown and green.

Habitat (Crops):

Metarhizium species are commonly thought of as soil saprophytes and are most frequently found in disturbed habitats like agricultural fields as compared to forest ecosystems. Additionally, recent findings suggest that these fungi form associations with plant roots in the rhizosphere and survive better in that environment than in surrounding potting soil over extended periods of time.

Pests Attacked:

Metarhizium species are known to attack a wide range of arthropods: greater than 200 species in over 50 families. These include many species of agricultural, medical and veterinary importance. include "various ticks and beetles; root weevils, flies, gnats, thrips," and locusts and grasshoppers. Additionally, Metarhizium species have been developed in other countries for use against cockchafers, spittlebugs, grubs, borers, and for control of mosquitoes that vector malaria.



Specifications :

1 X 10⁷ CFU/ML

Packing :

25 Kgs HDPE Bags

Dosage:

1 kg/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides

Talc Base Bio Pesticide Powder

Nematodes Free

Description :

The nematophagous fungus *Pochonia chlamydosporia* var. *chlamydosporia* is one of the most studied biological control agents against plant (semi-) endo-parasitic nematodes of the genera *Globodera*, *Heterodera*, *Meloidogyne*, *Nacobbus* and, more recently, *Rotylenchulus*. In this paper we present highlights from more than three decades of worldwide research on this biological control agent. We cover different aspects and key components of the complex plant-fungus-nematode tri-trophic interaction, an interaction that needs to be addressed to ensure the efficient use of *P. chlamydosporia* as a biopesticide as part of an integrated pest management approach.

Mode of action of fungal and bacterial nematicides

- Fungi group may be divided into nematode-trapping, endoparasitic, egg- and female-parasitic, and toxin-producing fungi. For example, for the nematode-trapping fungus, entangled nematode with adhesive network of *Monacrosporium megalosporum* hypha is illustrated. *Catenaria anguillulae*, an endoparasitic fungus, is a member of the Chytridiomycota, the only major group of true (chitin-walled) fungi that produce motile spores, termed zoospores.
- This fungus is often found as a facultative (non-specialized) parasite of nematodes and other small organisms. Phase-contrast microscopy was used to show the single and double chain of mature and immature fungal sporangium on parasitized nematodes.
- Based on their modes of action, the nematophagous bacteria can also be broadly grouped into parasitic bacteria and non-parasitic rhizobacteria.

Product Benefits :

- Protects Against Plant-Parasitic Nematodes
- Stops Nematode Damage and Enhances Soil Microbes
- Promotes Healthy Root Development for More Efficient Uptake of Water and Nutrients
- Farm-Friendly - Biological Product for Organic Production

Bio Pesticides
Talc Base Bio Pesticide Powder

Pseudomonas

Description :

Fluorescent Pseudomonads belong to plant Growth Promoting Rhizobacteria (PGPR), the important group of bacteria that play a major role in the plant growth promotion, induced systemic resistance, biological control of pathogens etc. Many strains of *Pseudomonas fluorescens* are known to enhance plant growth promotion and reduce severity of various diseases.

The efficacy of bacterial antagonists in controlling fungal diseases was often better as alone, and sometimes in combination with fungicides. The present review refers to occurrence, distribution, mechanism, growth requirements of *Pseudomonas fluorescens* and diseases controlled by the bacterial antagonist in different agricultural and horticultural crops were discussed. The literature in this review helps in future research programmes that aim to promote *Pseudomonas fluorescens* as a potential bio-pesticide for augmentative biological control of many diseases of agriculture and horticultural importance.

Environmental and consumer concerns have heightened interest in developing biological control agents as environmentally-friendly alternatives to protect agricultural and horticultural crops against phytopathogens. *Pseudomonas fluorescens* is a proven biological control agent with numerous success stories from scientists globally. Various strains of *Pseudomonas* have been shown to significantly control fungal, bacterial, and nematode diseases in cereals, horticultural crops, oil seeds, and more. The efficacy of bacterial antagonism in controlling diseases often surpasses that of fungicides, and combining bacterial antagonism with fungicides sometimes enhances disease control efficacy.

Additionally, treatments with *Pseudomonas fluorescens* improve seedling health and crop yields. Peat soil has been identified as the best substrate for colonization, followed by farmyard manure and gobar gas. Polysaccharides enhance the adhesion of *Pseudomonas fluorescens*, promoting plant growth through increased antibiotic activity.

This review aims to support future research promoting *Pseudomonas fluorescens* as a potential bio-pesticide for augmentative biological control of various agricultural and horticultural diseases. However, a deeper understanding of the factors involved, including the signaling interactions among antagonists, pathogens, soil, and plants, is necessary to promote these biocontrol agents as widely applicable bio-pesticides in the future.

Specifications :

1 X 10⁷ CFU/ML

Packing :

25 Kgs HDPE Bags

Dosage:

1 kg/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides
Talc Base Bio Pesticide Powder

Verticillium Lecanii

Description :

Chemical insecticides play an important role in the control of plant damage and plant diseases. However, extensive use of these products has led to the disruption of ecosystems because of several reasons such as death of non-target species, accumulation of pesticide residues in the environment and food, and buildup of pesticide resistance in the target species. Biological control is one of the alternatives to chemical pesticides and it can be described as the limitation of the abundance of living organisms and their products by other living organisms. Predators, parasitoids, fungi and other beneficial organisms can be used for the biocontrol of insect pests. The fungus *Verticillium lecanii* is one of the members of Deuteromycetes and it can be used for crop protection.

Verticillium Lecanii, a Bio-insecticide is used against sucking pest in an entomopathogenic fungus to kill the sucking pests. These fungi invade insects by penetrating their cuticle or skin and rapidly multiply throughout the body.

Death of insects is caused by tissue destruction and toxins produced by the fungi. *Verticillium wilt*, caused by two species of soil-borne fungi- *Verticillium dahliae* and *Verticillium albo-atrum*, infects more than 200 species of plants, including many vegetables. *Verticillium albo-atrum* prefers cooler soils while *Verticillium dahliae* can become a problem in greenhouse vegetable production. Sometimes, both species will occur in the same field.

Verticillium can be used against soft bodied pests. This is effective against aphids, jassids, thirps, white flies, mites, mealy bugs, scale insects, leaf webber, green semi lopper, flower webber, leaf minors, leaf hoppers, pod fly etc. *Verticillium wilt* is caused by a soil-borne fungus.

Enzyme & Metabolite action : *Verticillium lecanii* mycelia produces toxins which have insecticidal properties. These toxins weaken the hosts immune system (of insect) and aid in eventually killing it. *Verticillium lecanii* is developed by a unique process wherein metabolites of *Verticillium lecanii* are extracted and added back to the spores and formulated. Thus metabolites work effectively in high temperature and low humidity conditions and spores multiply and work in high humidity and low temperature conditions.

Growth : Once inside, *Verticillium lecanii* replicates and consumes the insects' internal contents eventually killing it. The fungus eventually grows out of the insect's cuticle and starts sporulating. Infected insects appear as white to yellowish cottony particles. *Verticillium lecanii* infects the insect on contact and does not need to be consumed by the host to cause infection.

Environment factors : *Verticillium lecanii* is developed by a unique process wherein metabolites of *Verticillium lecanii* are extracted and added back to the spores and formulated. Thus metabolites work effectively in high temperature and low humidity conditions and spores multiply and work in high humidity and low temperature conditions.

Specifications :

1 X 10⁷ CFU/ML

Packing :

25 Kgs HDPE Bags

Dosage:

1 kg/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides
Talc Base Bio Pesticide Powder

Bacillus Thuringiensis

Description :

Bacillus thuringiensis is a naturally occurring soil bacterium that causes disease on insect pests. It is accepted in organic farming and is considered ideal for pest management due to its low cost, ease of application, high virulence and narrow host specificity. Thus, Bacillus thuringiensis is regarded as environmentally friendly with no toxic effects on natural enemies and humans. The activity of Bacillus thuringiensis is due to toxins produced by this bacterium. Bacillus thuringiensis is commercially available in most agricultural suppliers. It is sold in various formulations (spray, dust, and granule) and strains. Note that not all Bacillus thuringiensis can be used for control of caterpillars. Bt. israelensis is used for control of mosquitoes and Bt. tenebrionis for control of beetles.

How does it work?

Bacillus thuringiensis must be ingested by a susceptible host to be effective. When ingested, Bacillus thuringiensis produces proteins that react with the cells of the stomach lining. These (proteins) poison and paralyse the insect's digestive system causing the insect to stop feeding within hours. Bt-infested insects will live for several days but will cause no further damage to the plant. They will die eventually from starvation.

How to use Bacillus thuringiensis (Bt)

- Spray thoroughly, covering all the plant surfaces.
- Apply when larvae are less than 5 mm long or when the eggs begin to hatch. Bt works best on young larvae.
- In the hot tropics, it is more effective to spray Bt in the late afternoon as there are longer and cooler hours ahead. This enables Bt to remain longer on the leaves' surfaces. Bt survives better in cooler temperature. Whereas, spraying in the morning provides a shorter and hotter environment.
- Do not mix the Bt concentrate with alkaline water (pH 8 or higher). Alkalinity reduces its effectiveness. To make the water acidic, add a few tablespoons of white vinegar in a gallon of water before adding Bt.

Advantages

Unlike most insecticides, which target a broad spectrum of species, including both pests and beneficial insects, Bt is toxic to a narrow range of insects. Research suggests that Bt does not harm the natural enemies of insects, nor does it impair honeybees and other pollinators critical to agroecological systems.

Bt integrates well with other natural controls and is used for integrated pest management by many organic farmers.

The use of insect-resistant Bt plants can potentially reduce use of chemical insecticide sprays, which are extremely toxic and expensive.

Although lethal to certain insect species, Bt toxin applied as an insecticide or consumed with GMO food crops is considered nontoxic to humans and other mammals because they lack the digestive enzymes needed to activate the Bt protein crystals. However, any introduction of new genetic material is potentially a source for allergens, and, for this reason, certain strains of Bt are not approved for human consumption.



Specifications :

1 X 10⁷ CFU/ML

Packing :

25 Kgs HDPE Bags

Dosage:

1 kg/acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops



Specifications :

Nutrient Content

Wt/Wt

POWDER:

1×10^7 CFU/GRAM

Dosage :

1kg/acre

Packing :

- **Liquid:** 50 ltr/200 ltr HDPE Barrel
- **Powder:** 25 Kgs HDPE Bags
- **Technical:** 1 Kg Silver Pouch
- **Granule:** 50 kg HDPE Bags

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

- Vegetables, fruits, ornamentals, and field crops.

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Bacillus thuringiensis kurstaki

Description :

Bacillus thuringiensis kurstaki (Btk) is a strain of Bt specifically used for controlling caterpillars in agricultural and garden settings. This strain produces crystal proteins (Cry proteins) that are toxic to caterpillars. When ingested by caterpillars, these proteins paralyze the insect's digestive system, causing them to stop feeding and eventually die from starvation.

Benefits Of Bacillus thuringiensis kurstaki:

- **Targeted Action:** BTK specifically targets caterpillar pests. It is highly selective in its toxicity towards insects in the order Lepidoptera, including caterpillars, while posing little to no harm to beneficial insects, pollinators, mammals, birds, or aquatic life. This specificity allows for targeted pest control while minimizing adverse effects on non-target organisms.
- **Environmental Safety:** BTK has a long history of safe use in pest management. It is considered safe for humans, as well as mammals, birds, and aquatic life. It quickly breaks down in the environment and does not persist, reducing the risk of accumulation or long-term ecological impact.
- **Resistance Management:** BTK is an effective tool for managing and preventing resistance in pest populations. By integrating Btk with other pest control measures, such as crop rotation, cultural practices, and the use of different insecticides with distinct modes of action, the development of resistance can be slowed or prevented. This is crucial for maintaining the long-term efficacy of pest control strategies.

Recommended stage of usage of Bacillus thuringiensis kurstaki

- **Application:** Spray thoroughly, ensuring all plant surfaces are covered.
- **Timing:** Apply when larvae are less than 5 mm long or when eggs begin to hatch. Btk is most effective on young larvae.
- **Temperature Considerations:** Apply in the late afternoon in hot climates to maximize effectiveness during cooler hours.
- **Water pH:** Do not mix Btk concentrate with alkaline water (pH 8 or higher). Acidify water by adding white vinegar if necessary.

How It Works

1. **Ingestion:** Caterpillars consume Btk spores that are naturally found on plant surfaces. These spores can be ingested when caterpillars feed on plants.
2. **Activation:** Once the Btk spores enter the caterpillar's alkaline gut, they undergo a transformation. Btk spores release Cry proteins, which are toxic proteins produced by the bacterium.
3. **Toxin Binding:** The Cry proteins bind specifically to receptors present on the gut cell membranes of the caterpillar. This binding process leads to the formation of pores or channels in the cell membranes.
4. **Gut Paralysis:** The formation of these pores disrupts the integrity of the caterpillar's gut cells. As a result, the gut cells start to lyse or break down. This leads to paralysis of the digestive system, as the gut is no longer able to function properly.
5. **Death:** Due to the paralysis of the digestive system, the caterpillar's ability to feed is severely compromised. Within hours of ingesting Btk and experiencing gut paralysis, the caterpillar stops feeding. This ultimately leads to starvation. In addition, the breakdown of gut cells can also release bacterial toxins into the caterpillar's body, causing septicemia. The combination of starvation and septicemia generally leads to the death of caterpillars within a few days.



Specifications :

Nutrient Content	Wt/Wt
POWDER:	1x10 ⁷ CFU/GRAM

Packing :

- **Liquid:** 50 ltr/200 ltr HDPE Barrel
- **Powder:** 25 Kgs HDPE Bags
- **Technical:** 1 Kg Silver Pouch
- **Granule:** 50 kg HDPE Bags

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

- Stagnant water bodies, ponds, marshes, and other areas with standing water where mosquitoes breed.

Recommended stage of usage of Bacillus thuringiensis israelensis (BTI)

- **Application:** Spray thoroughly, ensuring all plant surfaces are covered.
- **Timing:** Apply when larvae are less than 5 mm long or when eggs begin to hatch. Btk is most effective on young larvae.
- **Temperature Considerations:** Apply in the late afternoon in hot climates to maximize effectiveness during cooler hours.
- **Water pH:** Do not mix Btk concentrate with alkaline water (pH 8 or higher). Acidify water by adding white vinegar if necessary.

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Bacillus thuringiensis israelensis (BTI)

Description :

Bacillus thuringiensis israelensis (Bti) is a strain of Bacillus thuringiensis that specifically targets mosquito larvae and other dipteran insects. It has gained recognition as an effective and environmentally friendly tool for mosquito control.

Bti produces toxins known as Cry toxins, which are ingested by mosquito larvae during feeding. These toxins are specifically activated in the alkaline environment of the larvae's digestive system. Once activated, the Cry toxins disrupt the integrity of the gut cells, leading to gut paralysis and ultimately causing the larvae to stop feeding. As a result, the mosquito larvae become unable to obtain the nutrients they need for growth and development, leading to their death.

Benefits Of Bacillus thuringiensis israelensis (BTI)

- The targeted action of this mosquito control method specifically aims to affect mosquito and fly larvae. This means it focuses on disrupting the life cycle of these pests, preventing them from maturing into adult mosquitoes or flies.
- Unlike traditional insecticides, this method is designed to be selective in its impact. It is specifically formulated to target mosquito and fly larvae while minimizing harm to beneficial insects and non-target species. This is important as beneficial insects play a crucial role in natural pest control and maintaining ecological balance.
- One of the key benefits of this method is its environmental safety. It poses no significant risks to humans, mammals, birds, fish, or other aquatic life. This is particularly valuable when considering the potential harmful effects that traditional insecticides can have on non-target organisms in ecosystems.
- By helping to reduce mosquito populations, this control method can contribute to lowering the incidence of mosquito-borne diseases. Mosquitoes are carriers of various diseases, such as malaria, dengue fever, Zika virus, and West Nile virus, which can be transmitted to humans through their bites. By targeting mosquito larvae, this method can help disrupt their breeding cycle and overall reduce the number of adult mosquitoes, thereby mitigating the risk of disease transmission to humans.
- It is important to note that while this mosquito control method can be effective in reducing mosquito populations and lowering disease risks, it is often used as one component of a comprehensive mosquito control strategy. This may include additional measures such as source reduction, habitat modification, and personal protective measures to achieve optimal results in mosquito control efforts.

How It Works

- 1. Ingestion:** To be effective, mosquito larvae need to consume Bti spores present in their aquatic environment, typically in water sources such as ponds, puddles, or stagnant water.
- 2. Activation:** Once inside the larvae's alkaline gut environment, the Bti spores undergo activation. This activation process leads to the release of specific toxins produced by Bti.
- 3. Toxin Binding:** The released toxins, known as Cry toxins, bind to specific receptors located on the gut cells of the mosquito larvae. This binding process triggers a cascade of events.
- 4. Gut Paralysis:** Once the Cry toxins bind to the receptors on the gut cell membranes, they puncture or create pores in these membranes. This disruption weakens the integrity of the gut cells and compromises their functionality.
- 5. Death:** As the gut cells continue to lyse or break down due to the formation of pores, the mosquito larvae's digestive system becomes paralyzed. The larvae are no longer able to feed and obtain nutrients necessary for their survival. Consequently, within a few days, the larvae die from a combination of starvation and the inability of their digestive system to function properly.



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Trichoderma Viride

Description :

Trichoderma viride is a high-efficiency organic biological agent. It produces antibiotics, nutrient competition, parasitic, cell-wall degradation, enzymes, and induced plant resistance mechanisms, which have antagonism effect on a variety of plant pathogenic fungi. Protection and treatment can effectively control soil spread fungus diseases with dual effect.

Use Trichoderma viride products, which can enhance the survival rate of seedling and transplant, keep the seedlings robust growth. It can also be used to prevent grey mold.

Specifications :

1 X 10⁷ CFU/ML

Packing :

50 kg HDPE Bags

Dosage :

50-100 liters kg / acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Promote Plant Growth :

- Increase plant growth and yield.
- Increase the systemic disease resistance of plants.
- Increase root growth and tolerance to drought.
- Increase the absorption of nutrients and the effective use of fertilizers
- Improve the light and efficiency of plants.
- Increase the rate and percentage of seed germination.

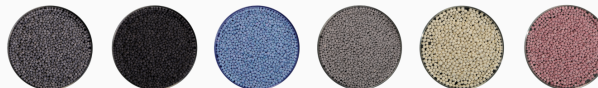
Features of Trichoderma viride:

- Through the protection and treatment, can effectively prevent and control root rot, cataplexy, blight, wilt, verticillium wilt, anthrax, and other soil-borne diseases;
- Improve the soil, break the knot, improve the soil permeability and oxygen supply of the root system;
- Promote root growth, make crop growth more vigorous and increase crop yield, etc.

Mechanism of Action of Trichoderma viride :

- **Competitive effect:** Trichoderma viride has a fast growth and reproduction rate, and can quickly absorb and utilize nutrients, water, space and oxygen in the soil, thus worsening the living environment of plant pathogens;
- **Antibiosis:** It secretes antibacterial substances to inhibit the growth of plant pathogens;
- **Symbiosis and resistance induction:** the co-growth of Trichoderma viride and plant roots activates the plant's internal defense system and improves the plant's disease resistance;
- **Heavy parasitism:** Trichoderma viride mycelium will grow, twine and Pierce along the mycelium of plant pathogens and absorb the nutrients in the mycelium of plant pathogens, leading to the death of plant pathogens;

Available in a variety of colors :



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Trichoderma Harzianum

Description :

Trichoderma grows on the surface of roots, where it provides disease control and enhances root growth. Its spores survive in the soil, but the food it lives on is mostly secreted from the root surface. Since the fungus multiplies on its own, it is different from seed-applied fungicides.

First, only a little needs to be applied because it will grow to continually cover the roots.

Second, because it grows, it protects all the roots for the whole growing season. Chemical controls protect only the seed where they are applied, and their protection lasts, at most, a few weeks.

Once Trichoderma has colonized roots, it can improve growth in two main ways. First, it kills the fungi that cause root rot.

Second, it protects roots from certain physical stresses, allowing the roots to grow faster.

Trichoderma kills several major root rot fungi: Pythium, Rhizoctonia, and Fusarium. The process is called mycoparasitism.

Trichoderma secretes an enzyme that dissolves the cell wall of the other fungi. It can then get inside the bad fungi and consume them. It allows it to protect crop roots against root rot fungi in the field.

Trichoderma Harzianum Uses in Agriculture :

- **Improve Soil Condition:** Trichoderma harzianum products have outstanding soil adaptability in soil, control soil-borne pathogens and help soil build a stable crumb structure, which is porous & full of nutrition and preserve moisture and fertility. Improve soil problems such as soil salinization, hardening, and acidification conditions. Reduce heavy metals & organic pollutants. Significantly improve soil micro-environment and fertility.
- **Bio Diseases Control:** Trichoderma harzianum products can eliminate damaging fungal pathogens, such as *Phytophthora*, *Rhizoctonia solani*, *Pythium*, *Fusarium*. It will form a nature defensive bond to "Guard" your crop's roots. After we used the Trichoderma harzianum, it will produce mycelia to grow along with the roots, will form a physical bond on the surface of the plant's root system, establishing itself in the rhizosphere (root zone) and protects the roots against soil-borne diseases.
- **Stimulate Root Growth**
Trichoderma harzianum promotes crop growth in three main ways:
Control the fungus which causes root rot
Reduces the physical stress on the crop and makes it grow better
Secrete organic acids and natural growth hormones to promote the growth of crop roots system
Researches show that Trichoderma harzianum is one of the most effective microbes to colonize the roots.
- **Increase Plant Resistance Ability:** Trichoderma harzianum is capable of systemically activating plant defense mechanisms. In actual use, it can increase the ability of the plant against abiotic stresses such as drought, salinity, high temperature.

Specifications :

1 X 10⁷ CFU/ML

Packing :

50 kg HDPE Bags

Dosage:

50-100 liters kg / acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Available In A Variety Of Colors :





Specifications :

1 X 10⁷ CFU/ML

Packing :

50 kg HDPE Bags

Dosage:

50-100 liters kg / acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Insecticidal Mechanism :

Beauveria Bassiana is a pathogenic fungus. Applying under suitable environmental conditions, it can be subdivided to produce the spores. After the spores are in contact with pests, they can adhere to the epidermis of the pests. It can dissolve the outer shell of the insect and invade the host body to grow and reproduce. It will begin to consume lots of nutrients in the body of pests and form a large number of mycelium and spores inside the body of insects. In the meantime, Beauveria Bassiana also can also produce toxins such as

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Beauveria Bassiana

Description :

Beauveria Bassiana fungus is a fungus that grows naturally in soils around the world. Acting as a parasite on various arthropod species, causing white muscardine disease; It widely used as a sprayed biological insecticide to control a great many pests such as bed bugs, termites, thrips, whiteflies, aphids, and different beetles.

Once Beauveria Bassiana infects the host insects, the fungus grows fast inside of the insect's body. Feeding on the nutrients present in the host's body and producing toxins continuously.

Main Features :

- **Wide Spectrum:** Beauveria Bassiana can parasitize more than 700 species of insects and mites of 15 orders and 149 families, such as Lepidoptera, Hymenoptera, Homoptera, with wings mesh and Orthoptera, such as adult, corn borer, moth, soybean sorghum budworm, weevil, potato beetle, small tea green leafhoppers, rice shell pest rice planthopper and rice leafhopper, mole, grubs, wireworm, cutworms, garlic, leek, maggot maggots variety of underground and ground, etc .
- **Non-Drug Resistance:** Beauveria Bassiana is a microbial fungicide, which mainly kills pests through parasitic reproduction. Therefore, it can be used continuously for many years without drug resistance.
- **Safe To Use :** Beauveria Bassiana is a microbial fungus that only acts on host pests. No matter how much concentration is used in production, there will be no drug damage, is the most assured insecticide.
- **Low Toxicity And No Pollution:** Beauveria Bassiana is a preparation produced by fermentation. It has no chemical components and is a green, safe and reliable biological pesticide. It has no pollution to the environment and can improve soil conditions.

Beauveria Bassiana Fungus Product Description :

- **No pesticide residue:** Today, agricultural goods are frequently rejected due to excessive pesticide residues. Even if the crop is harvested immediately after the use of Beauveria bassiana, then it won't cause any pesticide residue.
- **No resistance:** Pests' immunity to chemical pesticides leaves their insecticidal effects to diminish year by year. Beauveria bassiana murdered bugs by contact with the body of the insect under normal conditions, along with the pest does not develop any resistance to it. The effect has been getting higher and greater with consecutive years of use.
- **Regrowth:** The new biological pesticide of Beauveria bassiana includes living pollutants and parasites. After being applied to the area inappropriate temperature and humidity, it can continue to grow and multiply, then enhancing insecticidal results.
- **High selectivity:** Different from chemical pesticides, which kill toxic insects and insects that are beneficial together, Beauveria bassiana attack target insects, and has less impact on non-target organisms such as ladybirds, grasshoppers, and aphids. Therefore, the overall field control effect is better.
- **Insecticide Beauveria Bassiana Control target:** It may control tadpoles, locusts, potato beetles, aphids, leafhoppers, planthoppers, an assortment of lepidopteran larvae like corn borer/pine caterpillar/peach heartworm / diploid borer.

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Metarhizium Anisopliae

Description :

Metarhizium species (Metschnikoff) Sorokin, also known as green muscardine fungi, have long been recognized for their biological control potential against arthropods. The species level name of one of the more widely researched Metarhizium species (*M. anisopliae*) was derived from this beetle. Morphological features for identifying Metarhizium species can be imprecise as there can often be overlap of characters among species. Molecular techniques have shown that what used to be called *M. anisopliae* represents a complex of nine species.

Appearance:

Infections of arthropods by Metarhizium species are easily recognized a few days after death, when the fungus grows out of the arthropod integument and forms reproductive structures. Initially, one only sees fungal hyphae that appear white, but, as conidia form and mature they often take on a characteristic olive green color. However, depending on the species and strain of Metarhizium, spores can range in color from white to yellow to brown and green.

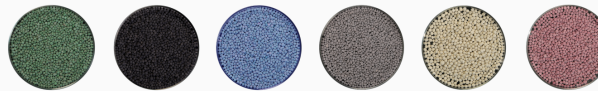
Habitat (Crops):

Metarhizium species are commonly thought of as soil saprophytes and are most frequently found in disturbed habitats like agricultural fields as compared to forest ecosystems. Additionally, recent findings suggest that these fungi form associations with plant roots in the rhizosphere and survive better in that environment than in surrounding potting soil over extended periods of time.

Pests Attacked:

Metarhizium species are known to attack a wide range of arthropods: greater than 200 species in over 50 families. These include many species of agricultural, medical and veterinary importance. include "various ticks and beetles; root weevils, flies, gnats, thrips," and locusts and grasshoppers. Additionally, Metarhizium species have been developed in other countries for use against cockchafer, spittlebugs, grubs, borers, and for control of mosquitoes that vector malaria.

Available in a variety of colors :



Specifications :

1 X 10⁷ CFU/ML

Packing :

50 kg HDPE Bags

Dosage:

50-100 liters kg / acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

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Nematodes Free

Description :

The nematophagous fungus *Pochonia chlamydosporia* var. *chlamydosporia* is one of the most studied biological control agents against plant (semi-) endo-parasitic nematodes of the genera *Globodera*, *Heterodera*, *Meloidogyne*, *Nacobbus* and, more recently, *Rotylenchulus*. In this paper we present highlights from more than three decades of worldwide research on this biological control agent. We cover different aspects and key components of the complex plant-fungus-nematode tri-trophic interaction, an interaction that needs to be addressed to ensure the efficient use of *P. chlamydosporia* as a biopesticide as part of an integrated pest management approach.

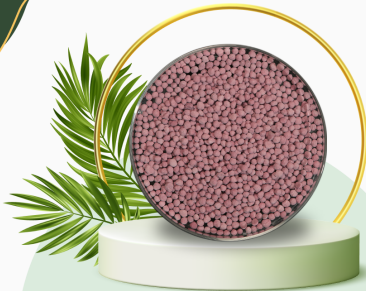
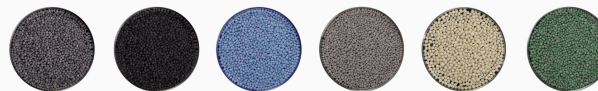
Mode of action of fungal and bacterial nematicides

- Fungi group may be divided into nematode-trapping, endoparasitic, egg- and female-parasitic, and toxin-producing fungi. For example, for the nematode-trapping fungus, entangled nematode with adhesive network of *Monacrosporium megalosporum* hypha is illustrated. *Catenaria anguillulae*, an endoparasitic fungus, is a member of the Chytridiomycota, the only major group of true (chitin-walled) fungi that produce motile spores, termed zoospores.
- This fungus is often found as a facultative (non-specialized) parasite of nematodes and other small organisms. Phase-contrast microscopy was used to show the single and double chain of mature and immature fungal sporangium on parasitized nematodes.
- Based on their modes of action, the nematophagous bacteria can also be broadly grouped into parasitic bacteria and non-parasitic rhizobacteria.

Product Benefits :

- Protects Against Plant-Parasitic Nematodes
- Stops Nematode Damage and Enhances Soil Microbes
- Promotes Healthy Root Development for More Efficient Uptake of Water and Nutrients
- Farm-Friendly - Biological Product for Organic Production

Available in a variety of colors :



Specifications :

1 X 10⁷ CFU/ML

Packing :

50 kg HDPE Bags

Dosage:

50-100 liters kg / acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

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Pseudomonas

Description :

Fluorescent Pseudomonads belong to plant Growth Promoting Rhizobacteria (PGPR), the important group of bacteria that play a major role in the plant growth promotion, induced systemic resistance, biological control of pathogens etc. Many strains of *Pseudomonas fluorescens* are known to enhance plant growth promotion and reduce severity of various diseases.

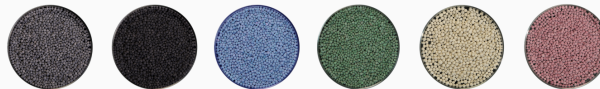
The efficacy of bacterial antagonists in controlling fungal diseases was often better as alone, and sometimes in combination with fungicides. The present review refers to occurrence, distribution, mechanism, growth requirements of *Pseudomonas fluorescens* and diseases controlled by the bacterial antagonist in different agricultural and horticultural crops were discussed. The literature in this review helps in future research programmes that aim to promote *Pseudomonas fluorescens* as a potential bio-pesticide for augmentative biological control of many diseases of agriculture and horticultural importance.

Environmental and consumer concerns have heightened interest in developing biological control agents as environmentally-friendly alternatives to protect agricultural and horticultural crops against phytopathogens. *Pseudomonas fluorescens* is a proven biological control agent with numerous success stories from scientists globally. Various strains of *Pseudomonas* have been shown to significantly control fungal, bacterial, and nematode diseases in cereals, horticultural crops, oil seeds, and more. The efficacy of bacterial antagonism in controlling diseases often surpasses that of fungicides, and combining bacterial antagonism with fungicides sometimes enhances disease control efficacy.

Additionally, treatments with *Pseudomonas fluorescens* improve seedling health and crop yields. Peat soil has been identified as the best substrate for colonization, followed by farmyard manure and gobar gas. Polysaccharides enhance the adhesion of *Pseudomonas fluorescens*, promoting plant growth through increased antibiotic activity.

This review aims to support future research promoting *Pseudomonas fluorescens* as a potential bio-pesticide for augmentative biological control of various agricultural and horticultural diseases. However, a deeper understanding of the factors involved, including the signaling interactions among antagonists, pathogens, soil, and plants, is necessary to promote these biocontrol agents as widely applicable bio-pesticides in the future.

Available in a variety of colors :



Specifications :

1 X 10⁷ CFU/ML

Packing :

50 kg HDPE Bags

Dosage:

50-100 liters kg / acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

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Verticillium Lecanii

Description :

Chemical insecticides play an important role in the control of plant damage and plant diseases. However, extensive use of these products has led to the disruption of ecosystems because of several reasons such as death of non-target species, accumulation of pesticide residues in the environment and food, and buildup of pesticide resistance in the target species. Biological control is one of the alternatives to chemical pesticides and it can be described as the limitation of the abundance of living organisms and their products by other living organisms. Predators, parasitoids, fungi and other beneficial organisms can be used for the biocontrol of insect pests. The fungus *Verticillium lecanii* is one of the members of Deuteromycetes and it can be used for crop protection.

Verticillium Lecanii, a Bio-insecticide is used against sucking pest in an entomopathogenic fungus to kill the sucking pests. These fungi invade insects by penetrating their cuticle or skin and rapidly multiply throughout the body.

Death of insects is caused by tissue destruction and toxins produced by the fungi. *Verticillium wilt*, caused by two species of soil-borne fungi- *Verticillium dahliae* and *Verticillium albo-atrum*, infects more than 200 species of plants, including many vegetables. *Verticillium albo-atrum* prefers cooler soils while *Verticillium dahliae* can become a problem in greenhouse vegetable production. Sometimes, both species will occur in the same field.

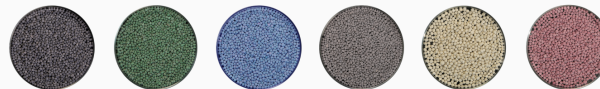
Verticillium can be used against soft bodied pests. This is effective against aphids, jassids, thrips, white flies, mites, mealy bugs, scale insects, leaf webber, green semi lopper, flower webber, leaf minors, leaf hoppers, pod fly etc. *Verticillium wilt* is caused by a soil-borne fungus.

Enzyme & Metabolite action : *Verticillium lecanii* mycelia produces toxins which have insecticidal properties. These toxins weaken the hosts immune system (of insect) and aid in eventually killing it. *Verticillium lecanii* is developed by a unique process wherein metabolites of *Verticillium lecanii* are extracted and added back to the spores and formulated. Thus metabolites work effectively in high temperature and low humidity conditions and spores multiply and work in high humidity and low temperature conditions.

Growth : Once inside, *Verticillium lecanii* replicates and consumes the insects' internal contents eventually killing it. The fungus eventually grows out of the insect's cuticle and starts sporulating. Infected insects appear as white to yellowish cottony particles. *Verticillium lecanii* infects the insect on contact and does not need to be consumed by the host to cause infection.

Environment factors : *Verticillium lecanii* is developed by a unique process wherein metabolites of *Verticillium lecanii* are extracted and added back to the spores and formulated. Thus metabolites work effectively in high temperature and low humidity conditions and spores multiply and work in high humidity and low temperature conditions.

Available in a variety of colors :



Specifications :

1 X 10⁷ CFU/ML

Packing :

50 kg HDPE Bags

Dosage:

50-100 liters kg / acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Bio Pesticides

Talc Based Bio Pesticide Granule

Bacillus Thuringiensis

Description :

Bacillus thuringiensis is a naturally occurring soil bacterium that causes disease on insect pests. It is accepted in organic farming and is considered ideal for pest management due to its low cost, ease of application, high virulence and narrow host specificity. Thus, Bacillus thuringiensis is regarded as environmentally friendly with no toxic effects on natural enemies and humans. The activity of Bacillus thuringiensis is due to toxins produced by this bacterium. Bacillus thuringiensis is commercially available in most agricultural suppliers. It is sold in various formulations (spray, dust, and granule) and strains. Note that not all Bacillus thuringiensis can be used for control of caterpillars. Bt. israelensis is used for control of mosquitoes and Bt. tenebrionis for control of beetles.

How does it work?

Bacillus thuringiensis must be ingested by a susceptible host to be effective. When ingested, Bacillus thuringiensis produces proteins that react with the cells of the stomach lining. These (proteins) poison and paralyse the insect's digestive system causing the insect to stop feeding within hours. Bt-infested insects will live for several days but will cause no further damage to the plant. They will die eventually from starvation.

How to use Bacillus thuringiensis (Bt)

- Spray thoroughly, covering all the plant surfaces.
- Apply when larvae are less than 5 mm long or when the eggs begin to hatch. Bt works best on young larvae.
- In the hot tropics, it is more effective to spray Bt in the late afternoon as there are longer and cooler hours ahead. This enables Bt to remain longer on the leaves' surfaces. Bt survives better in cooler temperature. Whereas, spraying in the morning provides a shorter and hotter environment.
- Do not mix the Bt concentrate with alkaline water (pH 8 or higher). Alkalinity reduces its effectiveness. To make the water acidic, add a few tablespoons of white vinegar in a gallon of water before adding Bt.

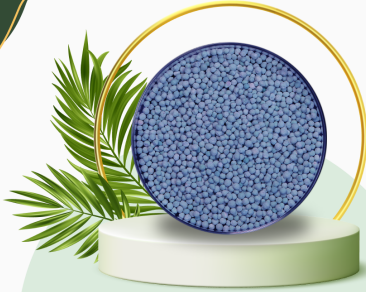
Advantages

Unlike most insecticides, which target a broad spectrum of species, including both pests and beneficial insects, Bt is toxic to a narrow range of insects. Research suggests that Bt does not harm the natural enemies of insects, nor does it impair honeybees and other pollinators critical to agroecological systems.

Bt integrates well with other natural controls and is used for integrated pest management by many organic farmers.

The use of insect-resistant Bt plants can potentially reduce use of chemical insecticide sprays, which are extremely toxic and expensive.

Although lethal to certain insect species, Bt toxin applied as an insecticide or consumed with GMO food crops is considered nontoxic to humans and other mammals because they lack the digestive enzymes needed to activate the Bt protein crystals. However, any introduction of new genetic material is potentially a source for allergens, and, for this reason, certain strains of Bt are not approved for human consumption.



Specifications :

1 X 10⁷ CFU/ML

Packing :

50 kg HDPE Bags

Dosage:

50-100 liters kg / acre

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

For All crops

Available In A Variety Of Colors :





Specifications :

Nutrient Content	Wt/Wt
GRANULE:	1x10 ⁷ CFU/GRAM

Dosage :

1kg/acre

Packing :

- **Liquid:** 50 ltr/200 ltr HDPE Barrel
- **Powder:** 25 Kgs HDPE Bags
- **Technical:** 1 Kg Silver Pouch
- **Granule:** 50 kg HDPE Bags

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

- Vegetables, fruits, ornamentals, and field crops.

Bio Pesticide
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Description :

Bacillus thuringiensis kurstaki (Btk) is a strain of Bt specifically used for controlling caterpillars in agricultural and garden settings. This strain produces crystal proteins (Cry proteins) that are toxic to caterpillars. When ingested by caterpillars, these proteins paralyze the insect's digestive system, causing them to stop feeding and eventually die from starvation.

Benefits Of Bacillus thuringiensis kurstaki:

- **Targeted Action:** BTK specifically targets caterpillar pests. It is highly selective in its toxicity towards insects in the order Lepidoptera, including caterpillars, while posing little to no harm to beneficial insects, pollinators, mammals, birds, or aquatic life. This specificity allows for targeted pest control while minimizing adverse effects on non-target organisms.
- **Environmental Safety:** BTK has a long history of safe use in pest management. It is considered safe for humans, as well as mammals, birds, and aquatic life. It quickly breaks down in the environment and does not persist, reducing the risk of accumulation or long-term ecological impact.
- **Resistance Management:** BTK is an effective tool for managing and preventing resistance in pest populations. By integrating Btk with other pest control measures, such as crop rotation, cultural practices, and the use of different insecticides with distinct modes of action, the development of resistance can be slowed or prevented. This is crucial for maintaining the long-term efficacy of pest control strategies.

Recommended stage of usage of Bacillus thuringiensis kurstaki

- **Application:** Spray thoroughly, ensuring all plant surfaces are covered.
- **Timing:** Apply when larvae are less than 5 mm long or when eggs begin to hatch. Btk is most effective on young larvae.
- **Temperature Considerations:** Apply in the late afternoon in hot climates to maximize effectiveness during cooler hours.
- **Water pH:** Do not mix Btk concentrate with alkaline water (pH 8 or higher). Acidify water by adding white vinegar if necessary.

How It Works

1. **Ingestion:** Caterpillars consume Btk spores that are naturally found on plant surfaces. These spores can be ingested when caterpillars feed on plants.
2. **Activation:** Once the Btk spores enter the caterpillar's alkaline gut, they undergo a transformation. Btk spores release Cry proteins, which are toxic proteins produced by the bacterium.
3. **Toxin Binding:** The Cry proteins bind specifically to receptors present on the gut cell membranes of the caterpillar. This binding process leads to the formation of pores or channels in the cell membranes.
4. **Gut Paralysis:** The formation of these pores disrupts the integrity of the caterpillar's gut cells. As a result, the gut cells start to lyse or break down. This leads to paralysis of the digestive system, as the gut is no longer able to function properly.
5. **Death:** Due to the paralysis of the digestive system, the caterpillar's ability to feed is severely compromised. Within hours of ingesting Btk and experiencing gut paralysis, the caterpillar stops feeding. This ultimately leads to starvation. In addition, the breakdown of gut cells can also release bacterial toxins into the caterpillar's body, causing septicemia. The combination of starvation and septicemia generally leads to the death of caterpillars within a few days.



Specifications :

Nutrient Content

Wt/Wt

GRANULE:

1x10⁷ CFU/GRAM

Packing :

- **Liquid:** 50 ltr/200 ltr HDPE Barrel
- **Powder:** 25 Kgs HDPE Bags
- **Technical:** 1 Kg Silver Pouch
- **Granule:** 50 kg HDPE Bags

Method Of Application :

Foliar sprays, pre-planting applications to seed, post-pruning treatments, incorporation in the soil during seeding or transplant, watering by irrigation, or applied as a root drench or dip.

Recommended Crops :

- Stagnant water bodies, ponds, marshes, and other areas with standing water where mosquitoes breed.

Recommended stage of usage of Bacillus thuringiensis israelensis (BTI)

- **Application:** Spray thoroughly, ensuring all plant surfaces are covered.
- **Timing:** Apply when larvae are less than 5 mm long or when eggs begin to hatch. Btk is most effective on young larvae.
- **Temperature Considerations:** Apply in the late afternoon in hot climates to maximize effectiveness during cooler hours.
- **Water pH:** Do not mix Btk concentrate with alkaline water (pH 8 or higher). Acidify water by adding white vinegar if necessary.

Bio Pesticide

Talc Base Bio Pesticide Granule

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Bacillus thuringiensis israelensis (BTI)

Description :

Bacillus thuringiensis israelensis (Bti) is a strain of Bacillus thuringiensis that specifically targets mosquito larvae and other dipteran insects. It has gained recognition as an effective and environmentally friendly tool for mosquito control.

Bti produces toxins known as Cry toxins, which are ingested by mosquito larvae during feeding. These toxins are specifically activated in the alkaline environment of the larvae's digestive system. Once activated, the Cry toxins disrupt the integrity of the gut cells, leading to gut paralysis and ultimately causing the larvae to stop feeding. As a result, the mosquito larvae become unable to obtain the nutrients they need for growth and development, leading to their death.

Benefits Of Bacillus thuringiensis israelensis (BTI)

- The targeted action of this mosquito control method specifically aims to affect mosquito and fly larvae. This means it focuses on disrupting the life cycle of these pests, preventing them from maturing into adult mosquitoes or flies.
- Unlike traditional insecticides, this method is designed to be selective in its impact. It is specifically formulated to target mosquito and fly larvae while minimizing harm to beneficial insects and non-target species. This is important as beneficial insects play a crucial role in natural pest control and maintaining ecological balance.
- One of the key benefits of this method is its environmental safety. It poses no significant risks to humans, mammals, birds, fish, or other aquatic life. This is particularly valuable when considering the potential harmful effects that traditional insecticides can have on non-target organisms in ecosystems.
- By helping to reduce mosquito populations, this control method can contribute to lowering the incidence of mosquito-borne diseases. Mosquitoes are carriers of various diseases, such as malaria, dengue fever, Zika virus, and West Nile virus, which can be transmitted to humans through their bites. By targeting mosquito larvae, this method can help disrupt their breeding cycle and overall reduce the number of adult mosquitoes, thereby mitigating the risk of disease transmission to humans.
- It is important to note that while this mosquito control method can be effective in reducing mosquito populations and lowering disease risks, it is often used as one component of a comprehensive mosquito control strategy. This may include additional measures such as source reduction, habitat modification, and personal protective measures to achieve optimal results in mosquito control efforts.

How It Works

- 1. Ingestion:** To be effective, mosquito larvae need to consume Bti spores present in their aquatic environment, typically in water sources such as ponds, puddles, or stagnant water.
- 2. Activation:** Once inside the larvae's alkaline gut environment, the Bti spores undergo activation. This activation process leads to the release of specific toxins produced by Bti.
- 3. Toxin Binding:** The released toxins, known as Cry toxins, bind to specific receptors located on the gut cells of the mosquito larvae. This binding process triggers a cascade of events.
- 4. Gut Paralysis:** Once the Cry toxins bind to the receptors on the gut cell membranes, they puncture or create pores in these membranes. This disruption weakens the integrity of the gut cells and compromises their functionality.
- 5. Death:** As the gut cells continue to lyse or break down due to the formation of pores, the mosquito larvae's digestive system becomes paralyzed. The larvae are no longer able to feed and obtain nutrients necessary for their survival. Consequently, within a few days, the larvae die from a combination of starvation and the inability of their digestive system to function properly.



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Feeding The **Future**



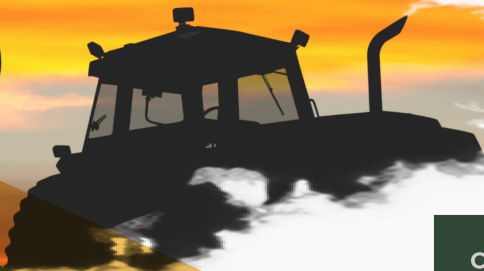
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