

MicrobeBio®

**MICROBEBIO X1:
ADVANCED
MICROBIAL
FORMULA FOR
NEMATODE
CONTROL AND
ROOT VITALITY**





WHAT IS MICROBEBIO X1?

MicrobeBio X1 is a next-generation biological solution designed to naturally control harmful nematodes and restore soil vitality. It combines 11 powerful beneficial microbes that strengthen roots, suppress pathogens, enhance nutrient uptake, and regenerate soil life — ensuring healthier, more productive crops without chemical nematicides.



KEY MICROBES & THEIR BENEFITS

MICROBE	PRIMARY FUNCTION	BENEFITS & PROBLEMS CONTROLLED
Azospirillum brasilense	Nitrogen fixation, root growth stimulation	Enhances root elongation, improves drought tolerance, strengthens roots against nematode attack
Pseudomonas fluorescens	Antagonistic biocontrol bacterium	Inhibits nematode hatching and penetration; controls Meloidogyne and Heterodera; induces plant immunity
Bacillus subtilis	Lipopeptide producer	Forms root biofilm barrier; suppresses root-knot nematodes and damping-off pathogens
Bacillus amyloliquefaciens	Enzyme producer (chitinase, glucanase)	Destroys nematode eggs; boosts plant defense; reduces soil fatigue
Trichoderma harzianum	Mycoparasitic fungus	Attacks nematode eggs and soil fungi; stimulates strong root development
Rhizophagus intraradices	Arbuscular mycorrhizae	Expands root absorption zone; blocks nematode entry; increases phosphorus uptake
Frateuria aurantia	Potassium solubilizer	Strengthens plant tissues and improves resilience against nematode feeding
Paenibacillus polymyxa	Antibiotic-producing rhizobacterium	Fixes nitrogen, solubilizes phosphorus, suppresses lesion nematodes
Gluconacetobacter diazotrophicus	Endophytic nitrogen fixer	Boosts chlorophyll and root vigor; reduces nematode stress effects
Phanerochaete chrysosporium	Lignin- and toxin-degrading fungus	Breaks down nematode cysts; detoxifies soil for microbial balance
Azotobacter chroococcum	Free-living nitrogen fixer	Produces vitamins and growth hormones; strengthens root defense



HOW MICROBEBIO X1 WORKS

- Suppresses harmful nematodes through enzyme activity, microbial competition, and natural antagonism.
- Strengthens plant roots and cell walls to resist penetration.
- Rebuilds soil biodiversity and restores organic balance.
- Enhances nutrient use efficiency for stronger, greener growth.
- Reduces chemical inputs, protecting the environment and farmers' health.



APPLICATION METHODS

DRIP IRRIGATION

Root drenching or soil drenching
Seed coating or transplant dipping

RECOMMENDED FOR:

Vegetables, fruits, cereals, root crops, and plantation crops—especially in nematode-affected soils and monocropping systems.





WHY CHOOSE

MICROBEBIO X1?

Natural & eco-friendly nematode control
Enhances root vitality and yield
Promotes long-term soil regeneration
Compatible with organic and
sustainable farming practices.





MICROBEBIO X1 THE NATURAL SHIELD BENEATH THE SOIL

Rebuild your soil. Strengthen your roots.
Defeat nematodes naturally.

MICROBEBIO X1: ADVANCED BIOLOGICAL FORMULA FOR NEMATODE CONTROL AND ROOT VITALITY



MicrobeBio X1 represents the next generation of sustainable nematode management. Engineered with a synergistic blend of beneficial bacteria, fungi, and mycorrhizae, X1 restores soil balance, suppresses harmful nematodes, and strengthens plant immunity—naturally. Unlike chemical nematicides that damage soil life, MicrobeBio X1 builds a resilient rhizosphere where beneficial microbes outcompete pathogens and enhance root defense.

POWERFUL MICROBIAL CONSORTIUM IN MICROBEBIO X1

1. AZOSPIRILLUM BRASILENSE

- **Function:** Nitrogen-fixing and root growth-promoting bacterium.
- **Benefits:** Produces phytohormones (IAA, gibberellins) that stimulate root elongation and branching. Enhances nutrient uptake and drought tolerance.
- **Problem Controlled:** Strengthens root systems to resist nematode invasion by thickening root tissues and improving overall plant vigor.

2. PSEUDOMONAS FLUORESCENS

- **Function:** Antagonistic rhizobacterium that produces siderophores, antibiotics (like pyoluteorin), and enzymes that suppress root pathogens.
- **Benefits:** Inhibits nematode egg hatching and larval penetration through toxin and enzyme release. Improves plant immunity via induced systemic resistance (ISR).
- **Problem Controlled:** Root-knot nematodes (*Meloidogyne* spp.), cyst nematodes (*Heterodera* spp.), and fungal pathogens like *Fusarium* and *Rhizoctonia*.



3. BACILLUS SUBTILIS

- **Function:** Endospore-forming bacterium producing antifungal and nematicidal lipopeptides such as surfactin and fengycin.
- **Benefits:** Colonizes the rhizosphere and roots, forming a protective barrier against nematodes. Stimulates root exudates that attract beneficial microbes.
- **Problem Controlled:** Root-knot and lesion nematodes, damping-off, and soilborne fungi.

4. BACILLUS AMYLOLIQUEFACIENS

- **Function:** Produces enzymes (chitinase, glucanase) and antimicrobial compounds that dissolve nematode egg shells and inhibit larval development.
- **Benefits:** Boosts plant resistance, decomposes organic matter, and enhances nutrient cycling.
- **Problem Controlled:** Root-knot nematodes, bacterial wilt, and soil fatigue from continuous cropping.

5. TRICHODERMA HARZIANUM

- **Function:** Mycoparasitic fungus that directly attacks nematode eggs and pathogenic fungi through enzyme secretion and competition.
- **Benefits:** Stimulates root growth, induces systemic resistance, and improves nutrient absorption.
- **Problem Controlled:** Root-knot, burrowing, and cyst nematodes; soil fungi such as Pythium and Sclerotium.





6. RHIZOPHAGUS INTRARADICES

(*Arbuscular Mycorrhizae*)

- **Function:** Forms symbiotic relationships with plant roots, expanding root surface area for nutrient and water uptake.
- **Benefits:** Improves phosphorus, zinc, and micronutrient absorption. Strengthens root structure, limiting nematode penetration and secondary infections.
- **Problem Controlled:** Nematode entry points and root damage caused by soil compaction and nutrient stress.

7. FRATEURIA AURANTIA

- **Function:** Potassium-solubilizing bacterium that mobilizes bound K in the soil, making it bioavailable to plants.
- **Benefits:** Strengthens cell walls and enhances plant metabolism, improving resistance to nematode feeding damage.
- **Problem Controlled:** Nutrient imbalance and secondary infections caused by nematode wounds.

8. PAENIBACILLUS POLYMYXA

- **Function:** Produces antibiotics, enzymes, and plant hormones; forms biofilms that protect roots.
- **Benefits:** Fixes nitrogen, solubilizes phosphorus, and suppresses nematode activity through antimicrobial peptides.
- **Problem Controlled:** Root-lesion nematodes and bacterial root rot complexes.

9. GLUCONACETOBACTER DIAZOTROPHICUS

- **Function:** Endophytic nitrogen-fixer living inside plant tissues, contributing to internal nitrogen enrichment.
- **Benefits:** Enhances chlorophyll formation and overall plant health, reducing vulnerability to nematode-induced stress.
- **Problem Controlled:** Indirect control of nematode damage through improved root nutrient flow and vigor.

10. PHANEROCHAETE CHRYSOSPORIUM

- **Function:** White-rot fungus known for degrading lignin, complex organic pollutants, and nematode eggshells via oxidative enzymes.
- **Benefits:** Detoxifies soil and enhances organic matter breakdown, improving soil aeration and microbial diversity.
- **Problem Controlled:** Decomposes nematode cysts and suppresses soilborne toxins harmful to beneficial microbes.

11. AZOTOBACTER CHROOCOCCUM

- **Function:** Free-living nitrogen fixer and growth-promoting rhizobacterium.
- **Benefits:** Produces vitamins, IAA, and siderophores that enhance plant metabolism and root robustness.
- **Problem Controlled:** Soil degradation, nutrient loss, and root weakness exploited by nematodes.





SYNERGISTIC POWER OF MICROBEBIO X1

The MicrobeBio X1 formula builds a self-sustaining soil ecosystem. Together, these microbes:

- Suppress harmful nematodes through enzymatic lysis, competition, and biological antagonism.
- Enhance root health by increasing nutrient uptake, strengthening cell walls, and promoting rapid regeneration after damage.
- Improve soil fertility through nitrogen fixation, phosphorus and potassium solubilization, and organic matter decomposition.
- Restore soil biodiversity by reintroducing beneficial microbes that dominate pathogens through competitive exclusion.
- Reduce dependency on chemical nematicides, improving environmental safety and long-term productivity.



APPLICATIONS

- Suitable for vegetables, fruits, cereals, root crops, and plantation crops.
- Apply via drip irrigation, root drenching, or seed coating for maximum efficacy.
- Recommended for use in nematode-prone soils and continuous monocropping systems.



THE MICROBEBIO X1 ADVANTAGE

MicrobeBio X1 is not just a biocontrol product—it's a regenerative solution that transforms the soil from the inside out. By promoting root resilience and restoring microbial harmony, it ensures healthier plants, higher yields, and nematode-free fields.

GROW CLEANER. GROW STRONGER. GROW WITH MICROBEBIO.

#MicrobeBioX1 #NematodeControl #SoilHealth
#BiologicalFarming #RegenerativeAgriculture
#MicrobialDefense #RootProtection
#SustainableFarming #EcoFriendlyAgriculture
#PlantImmunity

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