MicrobeBio®

MICROBEBIO X3:

COMPLETE BIOLOGICAL PEST DEFENSE FOR SUSTAINABLE CROP PROTECTION

Modern agriculture faces mounting challenges from pesticide resistance, declining soil health, and environmental degradation. MicrobeBio X3 provides a breakthrough solution — a scientifically formulated bio-control consortium that targets insect pests, nematodes, and pathogenic fungi through natural biological mechanisms. By integrating advanced microbial biotechnology, MicrobeBio X3 delivers effective pest control while restoring ecological balance and promoting plant resilience.

MICROBIAL COMPOSITION AND FUNCTIONS

BACILLUS THURINGIENSIS VAR. KURSTAKI (BT-K)

FUNCTION

A well-known entomopathogenic bacterium producing crystal (Cry) proteins that disrupt the digestive tract of caterpillars and lepidopteran larvae.

BENEFITS

- Highly specific to pests without harming beneficial insects.
- Biodegradable and safe for pollinators and humans.

Controls

Helicoverpa armigera, Spodoptera litura, Plutella xylostella (diamondback moth), Ostrinia furnacalis (corn borer), Cnaphalocrocis medinalis (rice leaf folder).

BACILLUS THURINGIENSIS VAR. ISRAELENSIS (BT-I)

FUNCTION

Targets dipteran larvae, releasing toxins that attack mosquito and blackfly larvae midgut cells.

BENEFITS

- Effective biological larvicide for wetland or paddy ecosystems.
- Safe for aquatic life and the environment.

Controls

Anopheles spp., Culex spp., Aedes aegypti, and other mosquito larvae.

BEAUVERIA BASSIANA

FUNCTION
An entomopathogenic fungus that infects insects through cuticle penetration, proliferates internally, and releases toxins that cause death.

BENEFITS
- Controls soft-bodied pests and soil-dwelling insects.
- Reduces pest populations over multiple generations.

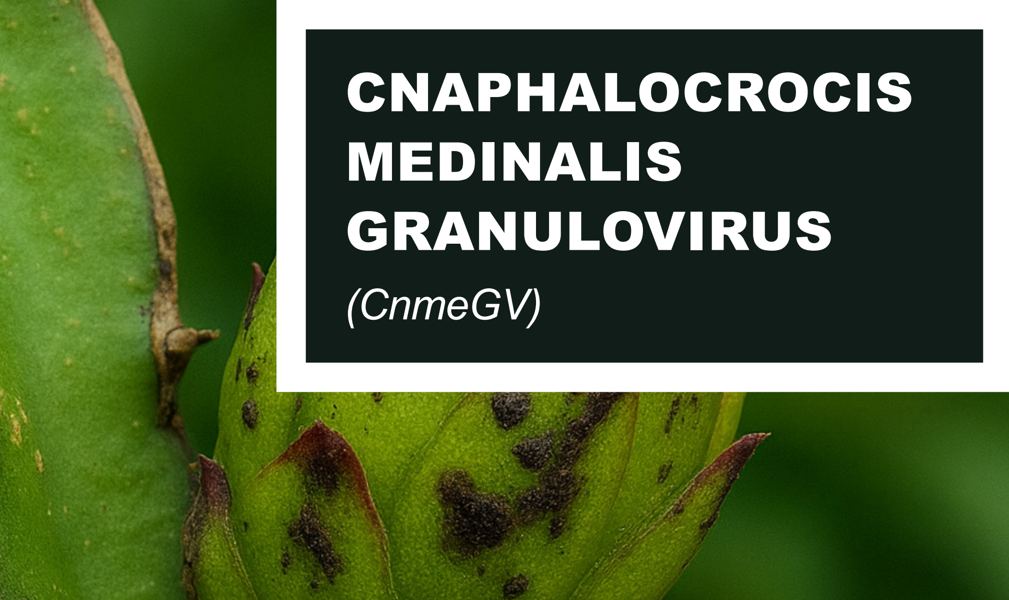
CONTROLS
Whiteflies, aphids, thrips, caterpillars, beetles, leafhoppers, weevils.

METARHIZIUM ANISOPLIAE

FUNCTION
This fungus invades pest exoskeletons, secreting enzymes and metabolites that cause systemic infection. It remains active in soil, providing long-lasting protection.

BENEFITS
- Excellent for controlling subterranean pests and locusts.
- Persists in soil ecosystems for extended pest suppression.

CONTROLS
Termites, locusts, grasshoppers, root grubs, weevils, cutworms, spittlebugs.



CNAPHALOCROCIS MEDINALIS GRANULOVIRUS

(CnmeGV)

FUNCTION:

A naturally occurring granulovirus specific to rice leaf folder (Cnaphalocrocis medinalis). It infects larvae, leading to disintegration within days.

BENEFITS:

- High efficacy and host specificity.
- Ideal for integrated pest management (IPM) in rice ecosystems.

CONTROLS:

Cnaphalocrocis medinalis (rice leaf folder).

PURPUREOCILLIUM LILACINUM

(formerly Paecilomyces lilacinus)

FUNCTION:

A nematophagous fungus that parasitizes nematode eggs and juveniles, reducing population density in soil.

BENEFITS:

- Long-term biological suppression of nematodes.
- Improves soil microbial balance and root health.

CONTROLS:

Meloidogyne spp. (root-knot nematodes), Heterodera spp. (cyst nematodes), Radopholus similis (burrowing nematode).

TRICHODERMA HARZIANUM

FUNCTION:
A biocontrol fungus that parasitizes phytopathogenic fungi and secretes enzymes (chitinases, glucanases) that degrade pathogen cell walls.

BENEFITS:
- Protects against root and foliar fungal diseases.
- Enhances root growth and plant defense systems.

CONTROLS:
Fusarium spp., Rhizoctonia solani, Sclerotium rolfsii, Pythium spp., Verticillium spp.

BACILLUS SUBTILIS

FUNCTION:
A rhizobacterium that produces antimicrobial peptides (surfactin, iturin, fengycin) and enhances plant immunity.

BENEFITS:
- Prevents disease establishment in rhizosphere and foliage.
- Enhances nutrient uptake and photosynthesis.

CONTROLS:
Botrytis cinerea, Alternaria alternata, Xanthomonas spp., Colletotrichum spp., Sclerotinia spp.

PSEUDOMONAS AERUGINOSA

FUNCTION:
A metabolically versatile bacterium that produces siderophores, hydrogen cyanide, and antibiotics antagonistic to pathogenic fungi and bacteria.

BENEFITS:

- Suppresses major root pathogens.
- Promotes plant growth through phytohormone production.

CONTROLS:
Fusarium spp., Pythium spp., Rhizoctonia solani, Phytophthora infestans, Ralstonia solanacearum (bacterial wilt).

PSEUDOMONAS FLUORESCENS

FUNCTION:
Produces antifungal compounds (DAPG, pyoluteorin) and induces systemic resistance in plants.

BENEFITS:
- Protects seedlings from damping-off and wilt.
- Improves nutrient absorption and root vigor.

CONTROLS:
Fusarium oxysporum, Rhizoctonia solani, Pythium spp., Sclerotinia sclerotiorum.

ISARIA FUMOSOROSEA

FUNCTION:
An insect-pathogenic fungus that germinates on insect cuticles and releases metabolites that paralyze and kill hosts.

BENEFITS:
- Ideal for managing sucking pests in greenhouses and open fields.
- Compatible with other microbial biocontrols.

CONTROLS:
Whiteflies, aphids, thrips, leafminers, mites.

LECANICILLIUM LECANII

FUNCTION:
Parasitizes insects and mites, causing death through fungal colonization. It also exhibits antagonism against several plant pathogens.

BENEFITS:
- Highly effective against greenhouse pests.
- Reduces honeydew production and secondary infections.

CONTROLS:
Whiteflies, aphids, scales, mealybugs, spider mites.

BACILLUS SPHAERICUS

FUNCTION:
Produces binary toxins that are highly effective against mosquito larvae. Works synergistically with Bt-i for larval pest control in waterlogged conditions.

BENEFITS:
- Biodegradable mosquito larvicide safe for aquatic ecosystems.
- Long-lasting residual activity in ponds and irrigation water.

CONTROLS:
Culex, Anopheles, and Aedes species larvae.

INTEGRATED PEST AND DISEASE CONTROL SPECTRUM

MicrobeBio X3 provides a multi-layered biological defense against:

- **Insect pests:** caterpillars, leaf folders, locusts, aphids, thrips, whiteflies, weevils, leafminers, and termites.
- **Nematodes:** root-knot, cyst, and burrowing nematodes.
- **Fungal diseases:** Fusarium wilt, Rhizoctonia damping-off, Pythium root rot, Sclerotium stem rot, Alternaria leaf spot.
- **Bacterial diseases:** Ralstonia solanacearum, Xanthomonas spp., Erwinia spp.
- **Mosquito larvae:** in rice paddies, ponds, and wet fields.

WHY CHOOSE MICROBEBIO X3

- Broad-spectrum pest and pathogen suppression.
- 100% biological and eco-friendly alternative to synthetic pesticides.
- Improves soil health, root strength, and nutrient efficiency.
- Reduces pesticide resistance and environmental contamination.
- Compatible with organic and integrated pest management (IPM) programs.

MICROBEBIO X3 — TOTAL BIOLOGICAL PROTECTION FOR A HEALTHIER PLANET.

MicrobeBio X3 is a next-generation biological pest management solution that unites entomopathogenic fungi, beneficial bacteria, nematophagous agents, and viruses into a single, synergistic formula. This comprehensive blend ensures effective control of insect pests, nematodes, and fungal pathogens while improving plant health and ecological sustainability.

THIS REVIEW WAS SUPPORTED BY MICROBEBIO. FOR INQUIRIES, VISIT WWW.MICROBEBIO.COM.

MicrobeBio®

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