

Bioremediation Through Bacillus: Enhancing Soil Health Using The Water Cleanser Pellets

A natural, sustainable approach to restoring contaminated soils using beneficial bacteria.



The Problem: Widespread Soil Contamination

Industrial Pollutants

Heavy metals (cadmium, lead, mercury) from industrial runoff

Agricultural Damage

Pesticides, herbicides (atrazine, glyphosate), excess nutrients from overfertilization

Petroleum Products

Hydrocarbons from spills and leaks contaminating soil ecosystems

These contaminants damage microbial ecosystems, reduce plant productivity, and render large areas unsuitable for sustainable cultivation.

Traditional Remediation vs. Bioremediation

Traditional Methods

- Excavation ("dig and dump")
- Thermal desorption
- Chemical leaching

Drawbacks: Costly, disruptive to ecosystems, often relocates rather than solves the problem

Bioremediation Approach

- Enhances natural biological processes
- Uses microorganisms to degrade pollutants
- Self-sustaining and gentle on ecosystems

Benefits: Cost-effective, environmentally friendly, supports ecosystem recovery



The Power of Bacillus Bacteria

Resilient Microorganisms

Form protective spores to survive harsh conditions until favorable environments return

Metabolic Versatility

Capable of breaking down diverse pollutants through various enzymatic pathways

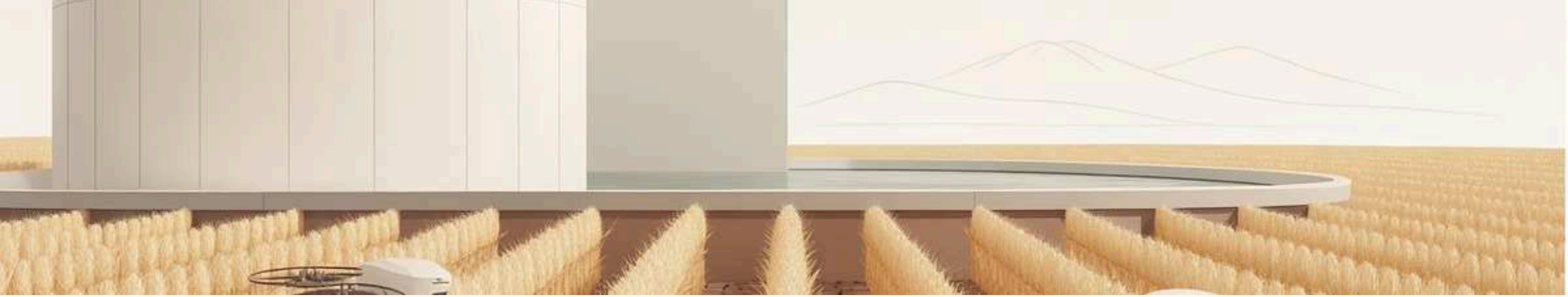
Safety Profile

GRAS (Generally Recognized As Safe) status, do not persist unnaturally in environments

Plant Growth Promotion

Support plant development while remediating soil, creating dual benefits

For over a decade, Bacillus has been central to The Water Cleanser's success in aquatic environments.



From Water to Land: TWC's Evolution

The Water Cleanser (TWC) has successfully used *Bacillus* to improve water quality and restore natural microbial balance in aquatic environments for over a decade.

Now, TWC is applying this proven technology to soil with specially designed 12-gram bioremediation pellets that enhance *Bacillus* populations directly within the soil matrix.

How TWC's Soil Pellets Work

Bacillus Activation

Pellets create microenvironments that stimulate dormant Bacillus to become active

Biofilm Formation

Bacteria form protective communities that accelerate remediation processes

Enzymatic Degradation

Bacillus produce enzymes that break down complex pollutants into harmless compounds

Heavy Metal Immobilization

Bacteria bind metals, reducing their bioavailability and toxicity

Pathogen Suppression

Beneficial Bacillus outcompete harmful microorganisms, restoring balance

Application Guidelines

Spacing

1 pellet per square meter for moderately contaminated soil

Depth

Bury pellets 5–10 cm beneath the soil surface

Timing

Apply at the start of growing season or during remediation phases



The 12-gram pellets are designed for ease of use in various environments, from agricultural plots to heavily contaminated industrial zones.



Field Trial Results

60%

Nitrate Reduction

WA Wheatbelt trials showed significant decrease in nitrate runoff and improved crop vigor

30-...

Lead Reduction

South Australia mining site demonstrated substantial heavy metal reduction with native grass recovery

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Microbial Biomass

Brisbane estate showed hydrocarbon reduction and increased beneficial microbial activity

Key Benefits of TWC's Bioremediation Approach

Cost-Effective

Lower implementation costs than traditional remediation methods



Eco-Friendly

Minimal ecological footprint with no harmful chemicals



Productivity

Improves soil structure and fertility for enhanced plant growth



Sustainable

Self-perpetuating process that continues after initial application



From Dead Soil to Living Systems

Soil health underpins food security and ecosystem resilience. TWC's bioremediation pellets enhance *Bacillus* bacteria — nature's cleanup crew — to turn dead soils into living, productive systems.

The Water Cleanser bridges its aquatic legacy into the terrestrial realm, offering a practical way to restore soil health and balance for a sustainable future.

