



# BIO SOIL

## Data Sheet



### Product Purpose

**BIO SOIL** is a specialized microbial inoculant engineered specifically for trees and woody plants, designed to support long-term root function, nutrient acquisition, soil structure, and stress resilience. While **BIO SOIL** was specifically formulated for deep-rooted, perennial systems, it has also proven very effective in shallow-root turf systems, where nutrient cycling, mycorrhizal support, and fungal disease suppression must persist over multiple growing seasons.

### Why BIO SOIL Is Different

- Supports deep perennial roots and shallow turf root systems
- Designed to function across variable oxygen, moisture, and compaction gradients
- Emphasizes long-term soil biology, not short-term cosmetic response

### Compatibility

- Compatible with most fertilizers and micronutrients
- Apply after soil sterilants or strong acids once biological activity has stabilized
- Avoid tank-mixing with broad-spectrum bactericides or fungicides at application

### Intended Use Sites

- Urban and municipal trees
- Orchards and vineyards
- Nursery stock and transplant installations
- Reforestation and restoration projects
- Windbreaks, shelterbelts, and agroforestry systems
- Trees under abiotic stress (compaction, drought, salinity, nutrient lockup)
- Turf systems (sports fields and golf courses)

### Expected Outcomes

- Improved root density and longevity
- Enhanced nutrient uptake efficiency
- Reduced transplant shock
- Greater drought and stress tolerance

- Improved soil structure and aggregation
- Lower reliance on repeated chemical interventions over time
- Decreased compaction
- Suppression of fungal pathogens and weed pressure

### Core Biological Functions (MOAs)

- Phosphorus solubilization in low-CEC and mineral-bound soils
- Biological N contribution for woody systems with limited N cycling
- Mycorrhizal support to extend effective root surface area
- Suppression of soilborne pathogens affecting fine roots and crown zones
- Organic matter mineralization in compacted or anaerobic soils
- Improved soil aggregation and porosity in the rhizosphere
- Enhanced root regeneration following planting or disturbance

### Example of bioactive microorganism function

Species	Relevant Function
<i>Bacillus megaterium</i>	Solubilizes bound phosphorus (Ca-P, Fe-P), improving long-term P availability for woody root systems
<i>Mesorhizobium alhagi</i>	Biological nitrogen fixation contributing sustained N inputs to perennial rhizospheres
<i>Clostridium chauvoei</i>	Anaerobic decomposer aiding organic matter mineralization in compacted or low-oxygen soils (indirect benefit)
<i>Penicillium pinitouense</i>	Organic acid production enhances phosphorus and micronutrient availability
<i>Penicillium oxalicum</i>	Oxalic acid production mobilizes phosphorus and calcium in forest and orchard soils
<i>Aspergillus deflectus</i>	Decomposer that releases mineral nutrients from complex organic substrates
<i>Trichoderma polysporum</i>	Suppresses root pathogens; promotes fine root regeneration and stress tolerance
<i>Trichoderma harzianum</i>	Competitive exclusion of soilborne pathogens; induces systemic resistance in trees
<i>Trichoderma viride</i>	Enhances root surface area and nutrient absorption efficiency
<i>Pseudomonas fluorescens</i>	Siderophore production improves iron availability while suppressing pathogens
<i>Azotobacter chroococcum</i>	Free-living nitrogen fixation supporting background N availability
<i>Azospirillum brasilense</i>	Stimulates root elongation and branching; improves water uptake
<i>Paenibacillus polymyxa</i>	Phosphorus solubilization and biological nitrogen fixation
<i>Streptomyces lydicus</i>	Produces antifungal compounds suppressing root-rot pathogens
<i>Burkholderia phytofirmans</i>	Endophytic support for abiotic stress tolerance
<i>Arthrobacter globiformis</i>	Degrades complex organic residues; supports long-term soil carbon cycling
<i>Mortierella elongata</i>	Improves phosphorus cycling and soil aggregation
<i>Bacillus subtilis</i>	Root colonization and disease suppression
<i>Rhizophagus irregularis</i>	Expands effective root zone and micronutrient uptake
<i>Laccaria bicolor</i>	Ectomycorrhizal fungus critical for forest and shade trees
<i>Pisolithus tinctorius</i>	Enhances tree establishment in disturbed or acidic soils
<i>Suillus luteus</i>	Ectomycorrhizal partner improving nutrient uptake in conifers
<i>Frankia alni</i>	Nitrogen-fixing actinobacterium associated with woody plants
<i>Glomus intraradices</i>	Arbuscular mycorrhizal fungus improving phosphorus uptake



**BIO SOIL** is a biological foundation product for arborists who manage trees as long-term living systems—not short-term inputs.