

TRIBUS® ORIGINAL

ALL PURPOSE PLANT GROWTH PROMOTER

Tribus® Original is a highly concentrated blend of three growth-promoting rhizobacteria species. The bacteria within Tribus help mobilize, solubilize, and chelate macro and micronutrients in the rhizosphere region of the soil for greater plant availability. The result? Rapid plant growth, increased yields, robust root development, and more efficient water uptake. Tribus also increases plant tolerance to abiotic stressors like hypersalinity, extreme temperatures, deficient or excessive water, heavy metals, and more. In each milliliter of liquid, there are 10 billion colony-forming units of bacteria (CFUs).



The high concentration of bacteria allows for low application rates and low application frequencies without sacrificing performance. The unique combination of bacteria in Tribus work together as a team and for the plant like no other consortia of microbes. Of the 10 billion CFUs per milliliter, 4 billion are *Bacillus subtilis*, 4 billion are *Bacillus pumilus*, and 2 billion are *Bacillus amyloliquefaciens*. Tribus can be used with conventional and all other fertilizer programs from the seedling stage up to the day of harvest. It can be used in soil or soilless growing medias including hydroponic systems and rockwool. **If it has roots, Tribus will help!**

PROVEN RESULTS

+15%
increase dry yield

+16%
in stem diameter ^{1,3}

+14%
in growth rate ^{1,2}

¹ Compared to non-treated control plants

² Measuring number of nodes w/ unfolded leaves

³ Measuring stem diameter @ first node above cotyledons using a digital caliper

TRIBUS FEATURES & BENEFITS

- Monoculture fermentation process enables a high concentration of *Bacillus* endospores
- Solubilizes phosphorus and potassium for greater plant availability
- Siderophore production chelates iron and aids in micronutrient uptake
- Compatible with synthetic nutrients and common horticultural sterilizing agents
- Active under a wide pH range (5.5 - 9.0) to increase nutrient availability and uptake in soil and hydroponic systems
- Biofilm formation on roots protects plants from biotic and physical stress and aids growth
- Extracellular enzyme production provides both fast-acting and long-lasting enzymes for nutrient breakdown
- Activates Induced Systemic Resistance (ISR) mechanisms in the plant, enhancing natural immunity and resistance to stress
- Non-phytotoxic

APPLICATION RATES

CROP	Container (mL/Gal)	Field (L/Acre)
Cannabis	0.5 - 1 mL	1-2 L
Vegetables	0.5 - 1 mL	1-2 L
Fruit	0.5 - 1 mL	1-2 L
Row Crops	-	1-2 L
Nut Trees	-	1-2 L
Ornamental / House Plant	0.5 - 1 mL	-

Can increase to 2mL/Gallon during flowering phase and under intense growth conditions (e.g., CO₂ injection, mid-flower phase, high light levels)

APPLICATION GUIDELINES

- Tribus Original is recommended for use as a soil inoculant and can be applied via overhead irrigation, drip irrigation, hand watering, or other hydroponic systems
- Tribus Original can be applied throughout the growing season at all stages of the plant life cycle, including the seedling and pre-harvest (flushing) stages
- Mix well before use! *Bacillus* spores settle naturally in container
- Flush drip irrigation lines with clean water after injecting Tribus Original
- Can be mixed with tap or reverse osmosis (RO) water-Intended to be used as a plant growth promoting rhizobacteria (PGPR) inoculant
- Not intended to be used as or in place of chemical plant growth regulators (PGRs)

TANK MIXING

- Tribus Original should be used within 24 - 48 hours of tank mixing with fertilizers or nutrient solutions for best results (applies mostly to growers using organic inputs - with conventional inputs can leave tank mixed).
- Tribus Original Can be mixed with most fertilizers, pesticides, herbicides, and fungicides - always test compatibility first.

STORAGE CONDITIONS

Bacillus spore liquids are stable for at least 18 months when stored in a cool, dry location in a closed container. Exposure to high humidity and temperature is not recommended.



WHAT'S INSIDE?

Bacillus subtilis (4.0x10⁹ CFU/mL)

- Solubilizes K
- Releases soil-bound macro and micro nutrients
- Improves root growth
- Produces siderophores that chelate micronutrients

Bacillus amyloliquefaciens (2.0x10⁹ CFU/mL)

- Mobilizes P
- Promotes growth of roots + shoots
- Improves abiotic stress tolerance
- Enhances Water Uptake

Bacillus pumilus (4.0x10⁹ CFU/mL)

- Fixes N in deficient conditions
- Improves nutrient availability + uptake
 - Cycles nutrients
- Degrades organic material for plant uptake

TOGETHER:

- Promote vigorous root growth;
- Naturally increase plant tolerance to abiotic stress;
- Encourage fast + prolonged nutrient mobilization;
 - Restore soil health;
 - Increase plant yield

ENZYMES AND THEIR FUNCTIONS

- **Cellulose** - Decomposition of cellulose (i.e., plant matter like dead roots and leaves) into glucose and other sugars boosts plant productivity.
- **Urease** - Catalyses the hydrolysis of urea into CO₂ and nitrate (NO₃) which increases nutrient availability.
- **Xylanase** - Degrades plant matter into useable nutrients. Found in numerous horticultural enzyme products.
- **Tannase** - Degrades plant polyphenols into water and gallic acid, a phenolic/antioxidant compound that plants use to synthesize new compounds with functions like herbivore and pathogen defense, iron, copper, and zinc chelation, and inhibition of pathogenic microbes.
- **Amylase** - Decomposition of complex carbohydrates into sugars across a wide pH range (4.0-7.0) boosts rhizosphere and plant productivity.
- **Protease** - Protein decomposition, which is particularly important to maximize nutrient availability in organic fertilizer programs.
- **Lipase** - Fat and oil decomposition, which is particularly important to maximize nutrient availability in organic fertilizer programs.