

CONTINUUM™

IMPROVE PLANT GROWTH & QUALITY

Continuum™ is the evolution of high-performance microbial inoculants. Continuum™ enhances nutrient and water uptake, improving plant nutrition and protection against abiotic stress for enhanced plant growth and yields. Continuum™ contains a unique consortium of *Bacillus* and *Paenibacillus* bacteria in both their resilient endospore-form and as actively growing cells, providing fast-acting results and long-lasting performance. To maximize the full plant growth promoting rhizobacterial (PGPR) power of this consortium, Continuum™ retains all of the potent bioactive metabolites produced by the bacteria during their advanced co-fermentation process. Continuum™ is ideal for high-intensity, large-scale growers and is compatible in all irrigation systems, environments, fertilization programs, medias, and crop types.



Contains: *Bacillus subtilis*, *Bacillus pumilus*, *Bacillus amyloliquefaciens*, *Paenibacillus chitinolyticus*, and bioactive fermentation broth

CONTINUUM™ FEATURES & BENEFITS

- Co-cultured fermentation process makes Continuum™ one of the most bioactive microbial products commercially available.
- Active and sporulated cells enable fast and long-lasting results
- Solubilizes phosphorus and potassium for greater plant availability
- Siderophore production chelates iron and aids in micronutrient uptake
- Active under a wide pH range (5.5 - 9.0) to increase nutrient availability and uptake in soil and hydroponic systems
- Compatible with synthetic nutrients and common horticultural sterilizing agents
- 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	0.5-2 L
Vegetables	0.5 - 1 mL	0.5-2 L
Fruit	0.5 - 1 mL	0.5-2 L
Row Crops	-	0.5-2 L
Nut Trees	-	0.5-2 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

- Continuum™ is recommended for use as a soil inoculant and can be applied via overhead irrigation, drip irrigation, hand watering, or other hydroponic systems
- Continuum™ can be applied throughout the growing season at all stages of the plant lifecycle, including the seedling and pre-harvest (flushing) stages
- Mix well before use! *Bacillus* and *Paenibacillus* spores settle naturally in container
- Flush drip irrigation lines with clean water after injecting Continuum™
- 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)

APPLICATION NOTES

Apply Continuum™ early in the plant's lifecycle for rapid establishment of *Bacillus* and *Paenibacillus* colonies on and near plant roots. Continued applications of Continuum™ as a supplement to normal fertilization practices maintains high populations of beneficial bacteria in the root zone, improving plant growth from planting through harvest. Continuum™ will not burn plants, even when frequently applied at high rates.

DIRECTIONS FOR USE

Shake well! *Bacillus* and *Paenibacillus* spores settle naturally. Use once per week, or as frequently as every watering during the entire plant growth cycle. May be used up to and on the day of harvest. Use mixed, plant-useable nutrient solutions within 24 hours for best results. Continuum™ may be mixed directly into most nutrient stock/concentrate tanks and injected via fertigation. Use a jar test if there is uncertainty. For use in hydroponic, soilless, soil-based, and field cultivation systems. Continuum™ may be applied as a root drench or as a foliar spray and can be used in all types of irrigation systems.

TANK MIXING

- Continuum™ should be used within 24 – 48 hours of tank mixing with fertilizers or nutrient solutions for best results. This is mostly relevant for organic (no chemical inputs) agriculture, as with conventional (uses chemicals) agriculture Continuum™ can be mixed in the tank simultaneously.

STORAGE CONDITIONS

Continuum™ is stable for at least 24 months when stored in a cool, dry location in a tightly sealed container. Exposure to high heat and humidity are not recommended. This product is alive! Some fermentation odor and color changes are normal. To maximize bacterial longevity, refrigeration is optional. Avoid freezing.



WHAT'S INSIDE?

Bacillus subtilis (1x10⁸ CFU/mL)

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

Bacillus amyloliquefaciens (1x10⁸ CFU/mL)

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

Bacillus pumilus (1x10⁶ CFU/mL)

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

Paenibacillus chitinolyticus (1x10⁶ CFU/mL)

- Produces chitinase, a chitin-degrading enzyme
- Tolerant to a wide range of chemicals and environments
- Produces a diverse range of growth-promoting peptides
- Can induce systemic resistance (ISR) in plants

● 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.
- **Chitinase** - Degrades chitin into low molecular weight, soluble and insoluble oligosaccharides.
- **Glucanase** - Helps the microorganisms degrade and use polysaccharides from their environment as an energy source.