# Technical Data Sheet

## Bacillus licheniformis

High-CFU Soil Probiotic for Plant Resilience & Fertility

Our Bacillus licheniformis powder is a high-CFU, spore-forming plant growth-promoting rhizobacterium (PGPR) widely used in agriculture. This microbial inoculant and biofertilizer enhances nutrient availability, improves root development, and increases crop resilience to environmental stress. It produces phytohormones, organic acids, and beneficial enzymes that unlock bound nutrients. This Bacillus licheniformis biofertilizer is ideal for use where plant health, soil fertility, and abiotic stress tolerance are critical.

- Stimulates root growth and early seedling vigor
- Activates natural plant defense responses (ISR)
- Improves uptake of phosphorus, potassium, nitrogen, and key micronutrients
- Enhances resilience to drought, salinity, and heat stress
- Boosts soil microbial activity, organic matter decomposition, and rhizosphere health

### Technical Data

**Concentration (CFU/g):**
- 300 billion ($3.0 \times 10^{11}$) CFU/g dry powder
- Custom concentrations available upon request

**Particle Size (Mesh):**
- Passes through 100 mesh sieve

**Packaging Options:**
- 11 lb (5 kg) pails
- 22 lb (10 kg) pails
- 187 lb (85 kg) drums
- Smaller custom packaging available on request

**Shelf-life:**
- 1.5 years at room temperature
- 2+ years refrigerated

**Storage Recommendations:**
- Store in a cool, dry location away from direct sunlight.
- Reseal container tightly after each use.

# Application Rates

## Soil Application (Drip, Drench, or Fertigation)

Dosage:

- 20–40 g per acre (50–100 g per hectare)

Frequency:

- Apply during early root establishment or transplanting
- Reapply every 2–4 weeks during active growth stages as needed

Application Method:

1. Dissolve powder thoroughly in water (use enough water to reach the root zone)
2. Use an agitation tank or manual stirring to maintain microbial suspension
3. Apply through drip irrigation lines, micro-sprayers, or fertigation systems, positioning flow as close to the root zone as possible
4. Flush the system after application to prevent clogging or residue buildup

**Do not** tank mix with herbicides, fungicides, bactericides, or chemical pesticides.

## Seed Treatment

Dosage:

- 1–2 grams per kg of seed

Frequency:

- Single application before planting

Application Method:

1. Mix thoroughly with a sticking agent (e.g., sugar solution, gum arabic)
2. Coat seeds evenly, ensuring full surface coverage
3. Allow seeds to dry gently in the shade before sowing

## In-Furrow

Dosage:

- 4–8 grams per acre (10–20 grams per hectare)

Frequency:

- Apply once at planting to target root initiation and early growth stages.

Application Method:

1. Dissolve microbial powder thoroughly in water.
2. Apply directly into the seed furrow or planting trench at seeding time.
3. If using irrigation systems for delivery, ensure solution contacts the root zone.
4. Maintain agitation to prevent settling.

When tank-mixing with fertilizers:

- Dilute fertilizer fully in water first before adding microbial powder
- Do not mix with herbicides, fungicides, bactericides, or pesticides

## Foliar Spray

Dosage:

- 10–20 grams per acre (25–50 grams per hectare)

Frequency:

- Begin at vegetative or pre-flowering stages
- Reapply every 7–14 days, especially during periods of high stress

Application Method:

1. Apply in the early morning or evening to reduce UV exposure
2. Use a non-ionic surfactant or wetting agent for improved adhesion
3. Ensure thorough coverage of foliage, including undersides of leaves
4. Agitate spray solution continuously during application

**Disclaimer:** Results may vary depending on environmental conditions, application rates, and management practices. The manufacturer makes no guarantee of specific results. Seller's liability is limited to replacement of product or refund of purchase price. Manufacturer is not responsible for misuse, mishandling, or application under adverse conditions beyond its control. This product is not registered for pesticidal use with the U.S. Environmental Protection Agency. It is intended as a soil amendment / microbial inoculant only. Keep out of reach of children.