

## Technical Data Sheet

### **Pseudomonas protegens**

#### Rhizosphere Probiotic for Plant Resilience & Root Growth

*Pseudomonas protegens* is a fast-colonizing, non-spore-forming soil probiotic and plant growth-promoting rhizobacterium (PGPR) widely used as a biostimulant and biofertilizer to enhance plant nutrition, root development, and stress tolerance. This beneficial soil bacteria supports rhizosphere balance, solubilizes key nutrients like phosphorus and iron, and activates systemic signaling for improved crop performance. Suitable for regenerative and conventional agriculture, especially where growers aim to reduce synthetic inputs.

- Primes plant immune signaling via ISR-associated pathways to support defense readiness under environmental and microbial stress
- Reinforces rhizosphere health by promoting microbial diversity and producing biosurfactants that shape beneficial soil microbe interactions
- Stimulates root elongation, branching, and seedling establishment through hormone-like microbial metabolites characteristic of PGPR
- Increases nutrient bioavailability as a phosphate-solubilizing bacterium, producing siderophores and organic acids that mobilize iron, phosphorus, and trace elements
- Supports plant metabolism and resilience under salinity, drought, and nutrient-deficient conditions with active microbial synergy

#### Technical Data

##### **Concentration (CFU/g):**

- 10 billion ( $1 \times 10^{10}$ ) CFU/g dry powder
- Custom concentrations available upon request

##### **Particle Size (Mesh):**

- Passes through 100 mesh sieve

##### **Packaging Options:**

- 22 lb (10 kg) pails
- 44 lb (20 kg) pails
- 340 lb (155 kg) drums
- Smaller custom packaging available on request

##### **Shelf-life:**

- 1 month at room temperature
- 1 year refrigerated
- 2 years in freezer

##### **Storage Recommendations:**

- Store in a cool, dry location, ideally refrigerated, away from direct sunlight.
- Reseal container tightly after each use.

## Application Rates

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

Dosage:

- 100–250 grams per acre (250-625 grams 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 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

### In-Furrow

Dosage:

- 20–50 grams per acre (50–125 grams per hectare)

Frequency:

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

Application Method:

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

When tank-mixing with fertilizers:

- Dilute fertilizer fully in water first before adding *Bacillus coagulans*
- Do not mix with herbicides, fungicides, bactericides, or pesticides

### Seed Treatment

Dosage:

- 10–15 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
4. **Do not** allow coated seed to sit for extended periods, sow within 24 hours

### Foliar Spray

Dosage:

- 100–250 grams per acre (250-625 grams per hectare)

Frequency:

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

Application Method:

- Apply in the early morning or evening to reduce UV exposure
- Use a non-ionic surfactant or wetting agent for improved adhesion
- Ensure thorough coverage of foliage, including undersides of leaves
- 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.