

TECHNOLOGY PROFILE

Vigor™

A broad-spectrum PGPR consortium for legumes — building root systems, unlocking bound soil phosphorus, and improving drought and salinity tolerance.

-25%

Applied phosphorus

+12%

Root biomass

+7-9%

Legume yield response

210+

Demonstration sites

Headline effects across the Huasheng Bio multi-site demonstration program; standalone yield response versus uninoculated controls. Field performance varies with soil, climate, variety, cropping system and management.

Developed and supplied worldwide by Huasheng Bio Limited.

1 About Huasheng Bio & the Legume-Inoculant System

Huasheng Bio Limited develops and supplies a complementary three-part legume-inoculant technology for food and forage legumes. The three products are designed to co-apply at sowing, each addressing a different limiting factor:

- **Nodu™ (rhizobial)** — supplies the crop-matched nitrogen-fixer that forms active, effective root nodules.
- **Vigor™ (PGPR)** — builds root systems and solubilizes bound soil phosphorus, improving drought and salinity tolerance.
- **Orvan™ (coupled biocontrol & nitrogen fixation)** — amplifies nodulation while suppressing aflatoxin-producing *Aspergillus flavus*.

This profile introduces the Vigor™ technology, its mechanism, evidence and positioning. Full formulation specifications, rates, compatibility and storage are given in the separate Vigor™ Technical Data Sheet.

2 The Vigor™ Approach

Vigor™ is a broad-spectrum PGPR (plant-growth-promoting rhizobacteria) consortium — a single formulation that works across all eight target legumes. It complements the nitrogen-fixers rather than replacing them: a bigger, healthier root system supports more nodulation and better nutrient uptake. Vigor™ builds root systems, solubilizes bound soil phosphorus, and improves drought and salinity tolerance.

3 The Consortium

A four-strain plant-growth-promoting rhizobacteria consortium, guaranteed to $\geq 2 \times 10^9$ CFU per gram (or per mL) to expiry:

Strain	Primary function
<i>Bacillus subtilis</i>	Root colonization and plant-growth promotion
<i>Pseudomonas fluorescens</i>	Phosphate solubilization and biocontrol
<i>Bacillus megaterium</i>	Phosphate solubilization
<i>Azospirillum brasilense</i>	Ab-V5 / Ab-V6-type; associative nitrogen fixation and auxin (IAA) production

Non-GMO; naturally isolated. Strain deposit / identity documentation is available to qualified partners under NDA.

4 Field Evidence

Headline effects across the demonstration program: **applied phosphorus -25%** and **root biomass +12%**. Standalone yield response and demonstration scale by crop (Vigor™ vs. uninoculated control), from Huasheng Bio multi-site demonstration trials:

Crop	Avg. yield response	Demonstration scale
Peanut	+7.3%	44 sites
Soybean	+7.1%	40 sites
Common bean	+8.3%	22 sites
Cowpea	+9.2%	22 sites
Pigeon pea	+8.6%	14 sites
Mung bean	+7.8%	24 sites
Black gram	+8.2%	16 sites
Alfalfa	+8.6%	34 sites

Site-specific performance may vary with soil, climate, crop variety, cropping system and management, and should be validated through local trials. Vigor™ is used where roots, phosphorus availability, or drought / salinity tolerance are the limiting factors.

5 Formats & Fit

Vigor™ is available in four formats — granule, liquid, water-dispersible granule and a talc seed powder — for soil, in-furrow, tank-mix and seed-treatment use. Per-format guaranteed counts, application rates and compatibility are specified in the Vigor™ Technical Data Sheet.

How Vigor™ fits an existing program

A stronger root system supports the rhizobia rather than competing with them. Vigor™ is additive with Nodu™ and Orvan™ at sowing and compatible with neutral-pH NPK — used where roots, phosphorus availability or stress tolerance are the limiting factors.

6 Registration & Assurance

- **Registration:** China Ministry of Agriculture and Rural Affairs — microbial inoculant registration No. 16355 (2026). Destination-market registration is confirmed per country.
- **GMO status:** Non-GMO; naturally isolated strains.
- **Biosafety:** handled as low-risk (Risk Group 1) agricultural microorganisms.
- **Documentation:** full specifications sit in the Vigor™ Technical Data Sheet; strain deposit / identity documentation is available to qualified partners under NDA.

Contact & Support

Huasheng Biosciences

Huasheng Biosciences develops and supplies Vigor™ and its companion legume-inoculant technologies (Nodu™ and Orvan™) to growers worldwide.

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For trial materials, samples, formulation selection, and regulatory dossiers, contact us by email or WhatsApp. Technical dossiers, safety data sheets, and regulatory-grade strain documentation are available to qualified partners under a mutual non-disclosure agreement.

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Performance disclaimer. Field performance data derive from Huasheng Bio Limited multi-site demonstration trials. Actual field performance may vary with soil, climate, crop variety, native rhizobial background, cropping system, water regime and management. Users are responsible for ensuring the product is registered and permitted in the destination market, for validating performance through local trials, and for verifying compatibility with their own seed treatments and fertilizers before commercial deployment.

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