



MicrobeBio®





A WHITE PAPER ON THE HOUSTON BIOINNOVATION CAMPUS AND THE FUTURE OF INTEGRATED BIOLOGICAL MANUFACTURING

The next generation of biotechnology will not be defined by a single product category, industry, or manufacturing process. It will be defined by the ability to develop biological technologies that can be translated across multiple markets through shared scientific, manufacturing, and commercialization infrastructure.

MicrobeBio's Biology Rising™ strategy is built around this principle.

MicrobeBio proposes the development of the MicrobeBio BioInnovation Campus™ in Houston, Texas, a vertically integrated biotechnology manufacturing, research, development, and commercialization center designed to support twelve interconnected technology platforms spanning agriculture, animal health, aquaculture, environmental restoration, industrial biotechnology, water treatment, mining, circular bioeconomy applications, and climate-focused biological systems.

The proposed development begins with a \$60 million Phase 1 investment focused on technologies where MicrobeBio already has the strongest commercial foundation:

- Biological Crop Nutrition
- Biological Crop Protection
- Precision Plant Nutrition
- Seed & Plant Biotechnology
- Supporting Industrial Fermentation and Biomanufacturing

Phase 1 is intended to transition significant production from third-party OEM manufacturing into MicrobeBio-controlled facilities while building the scientific and industrial infrastructure required for future expansion.

MicrobeBio has already established products, OEM manufacturing relationships, international commercial channels, and a portfolio of contracts, memoranda of understanding, and commercial

opportunities representing more than \$60 million in potential annual agricultural product demand, subject to the specific terms and conditions of those agreements.

The importance of this commercial foundation cannot be overstated. The Houston BioInnovation Campus is not envisioned as a speculative factory that must first develop products and then search for customers. It is designed as

an infrastructure investment intended to serve existing and developing demand, improve manufacturing economics, expand production capacity, strengthen intellectual property protection, and create a scalable platform for future technologies.

Over ten years, MicrobeBio proposes approximately \$120 million in phased capital deployment:

PHASE	CAPITAL	TIMELINE	STRATEGIC FOCUS
Phase 1	\$60M	Years 1–3	Agriculture, manufacturing, fermentation, seed biotechnology and R&D
Phase 2	\$25M	Years 3–5	Aquaculture biotechnology and animal health & probiotics
Phase 3	\$35M	Years 5–10	Environmental biotechnology, water, mining, bioleaching, industrial biology and global licensing
Total	\$120M	10 Years	12-platform biotechnology enterprise



This phased structure is designed to reduce execution risk. Future capital is deployed after operational and commercial milestones have been demonstrated, rather than attempting to commercialize twelve platforms simultaneously.

Under an illustrative management growth scenario, the integrated platform has the potential to scale toward approximately \$450–500 million or more in annual revenue over a ten-year horizon, with increasing

contributions from higher-value biological technologies, contract manufacturing, environmental applications, industrial biotechnology, intellectual property, and licensing.

The long-term objective is not simply to manufacture agricultural inputs. It is to establish a biotechnology infrastructure capable of transforming biological discovery into commercially scalable solutions across industries.



A close-up photograph of a petri dish held by a hand wearing a white nitrile glove. The petri dish contains a clear agar medium with numerous bacterial colonies of varying sizes and colors, including dark brown, yellow, and white. The background is blurred, showing more petri dishes in a laboratory setting.

BIOLOGY IS BECOMING AN INDUSTRIAL PLATFORM

Biology has supported human civilization since agriculture began.

Microorganisms regulate nutrient cycles, build soil, decompose organic matter, influence plant growth, support digestion, transform minerals, degrade hydrocarbons, and contribute to the resilience of natural ecosystems.

For much of industrial history, these biological processes were difficult to understand, isolate, manufacture, and deploy at commercial scale.

That is changing.

Advances in microbiology, fermentation, molecular biology, formulation science, biological manufacturing, analytical technologies, automation, and data science are making it increasingly possible to convert naturally occurring biological processes into industrially scalable technologies.

This creates an important shift. Biology is no longer limited to agriculture or medicine.

It is increasingly becoming a general-purpose technology platform capable of addressing challenges across:

- Agriculture
- Food production
- Animal health
- Aquaculture
- Environmental restoration
- Water management
- Waste treatment
- Mining
- Natural-resource recovery
- Industrial manufacturing
- Climate resilience

MicrobeBio refers to this transition as:

BIOLOGY RISING™

Biology Rising™ represents the Company's long-term strategy to harness beneficial microorganisms and natural biological systems, manufacture them at scale, and apply them across multiple industries.





THE PROBLEM WITH FRAGMENTED BIOTECHNOLOGY DEVELOPMENT



Biological technology companies are often structured around one specific market. One company develops agricultural inoculants. Another manufactures animal probiotics. Another focuses on wastewater treatment. Another develops microbes for oil-contaminated soil. Another investigates organisms involved in mineral recovery.

Yet many of these applications require similar scientific infrastructure:

- Microbial isolation
- Microbial libraries
- Fermentation
- Strain screening
- Formulation
- Stabilization
- Quality control
- Analytical laboratories
- Molecular biology

- Pilot testing
- Field validation
- Regulatory documentation
- Manufacturing scale-up

Building these capabilities independently for every market can be inefficient.

MicrobeBio proposes a different model.

Instead of constructing separate scientific organizations for each opportunity, the Company intends to create a shared biological technology engine capable of supporting multiple commercial platforms.

The Houston BioInnovation Campus is the physical embodiment of this strategy.

FROM OEM MANUFACTURING TO VERTICAL INTEGRATION





MicrobeBio's current manufacturing model has provided an efficient pathway to commercialization.

Rather than initially investing large amounts of capital into manufacturing infrastructure, MicrobeBio has utilized qualified third-party OEM manufacturers to produce commercial products.

This strategy has allowed the Company to:

- Develop its product portfolio;
- Establish international relationships;
- Enter new markets;
- Build distribution;
- Validate customer demand;
- Reduce early capital expenditure;
- Maintain manufacturing flexibility.

OEM manufacturing is particularly useful during the early development of a biotechnology company.

However, as volume increases, outsourcing can create strategic limitations.



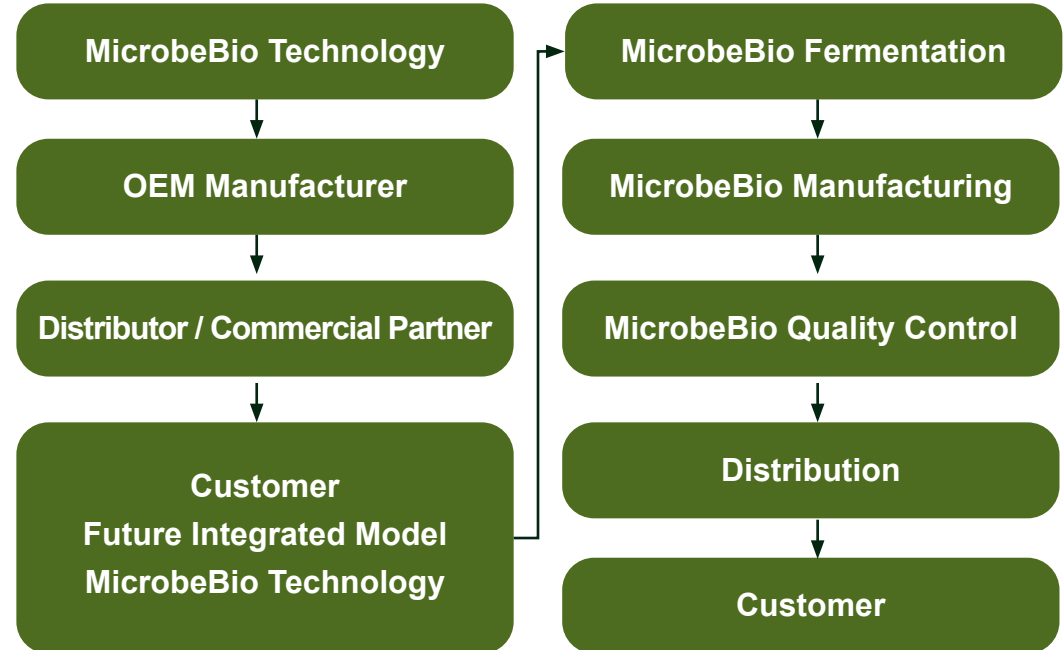
These may include:

- Manufacturing margins paid to third parties;
- Production scheduling constraints;
- Capacity limitations;
- Supply-chain dependence;
- Longer production lead times;
- Reduced manufacturing flexibility;
- Greater exposure of proprietary formulations;
- Less direct control over quality systems.

The proposed Houston Campus represents the next stage in MicrobeBio's evolution.



CURRENT MODEL



Through this transition, MicrobeBio intends to capture a greater portion of the value chain while building the production capacity required for continued growth.

A woman with a ponytail, wearing a tan baseball cap, a plaid shirt, and denim overalls, stands in a large greenhouse. She is holding a tablet and looking down at it. The greenhouse has a high, arched ceiling made of translucent plastic over a metal frame. Rows of green plants are visible on the ground, stretching into the distance. The lighting is bright, suggesting daytime.

COMMERCIAL DEMAND AS THE FOUNDATION



A central component of the MicrobeBio investment thesis is existing commercial demand.

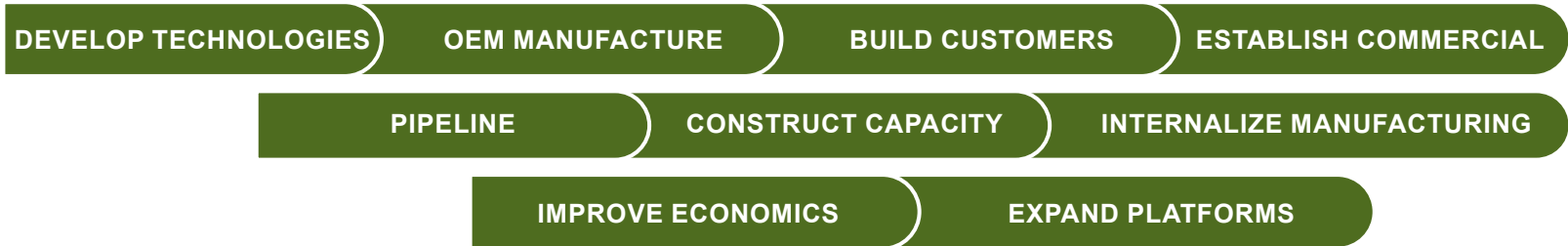
The Company has developed multiple contracts, MOUs, distribution relationships, strategic partnerships, and international opportunities that collectively represent more than \$60 million in potential annual agricultural business, subject to individual agreement terms, order volumes, regulatory approvals, and customer performance.

This commercial pipeline changes the nature of the proposed investment.

A typical early-stage industrial biotechnology project follows the sequence:



The MicrobeBio strategy is designed around a different progression:



This significantly strengthens the rationale for Phase 1.

The initial facility is intended primarily to serve a growing business rather than create production capacity without a defined commercialization pathway.

For investor diligence, MicrobeBio

intends to classify the commercial pipeline according to the strength of each opportunity.

- These categories may include:
- Executed purchase contracts;
 - Minimum purchase commitments;
 - Purchase orders;
 - Distribution agreements;
 - Memoranda of understanding;

- Letters of intent;
- Government programs;
- Strategic commercial projects.

This classification allows contracted demand to be distinguished from probability-weighted opportunities.

WHY HOUSTON, TEXAS

Houston is a particularly compelling location for MicrobeBio because the Company's long-term strategy extends beyond conventional agriculture.

Houston connects several industries that align directly with the Biology Rising™ roadmap.

INTERNATIONAL TRADE

Houston provides access to one of the most important logistics and export systems in North America. The Gulf Coast creates efficient access to:

Latin America

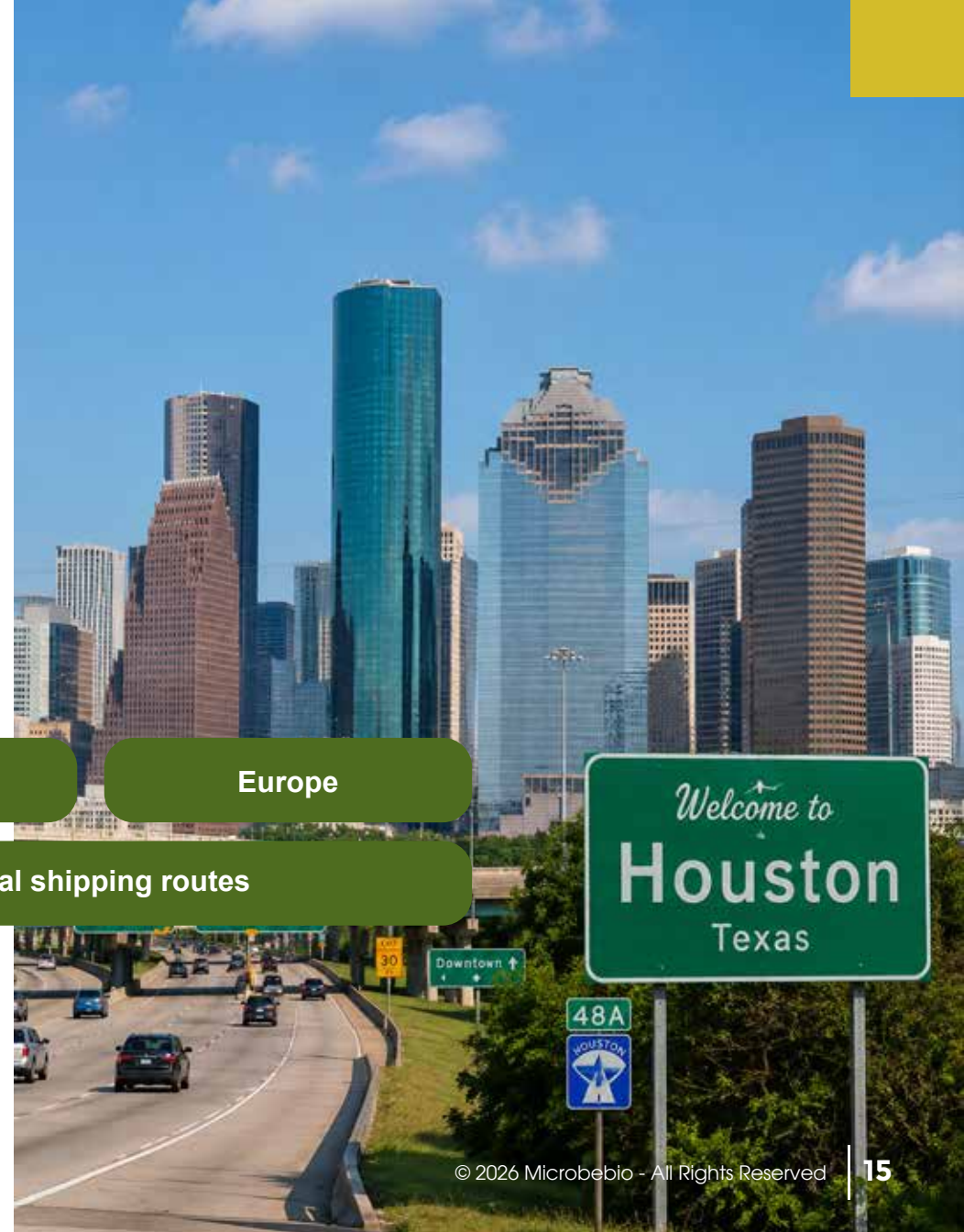
The Caribbean

Europe

Africa

Global shipping routes

This is strategically relevant because international markets are expected to represent a significant portion of MicrobeBio's future commercial expansion.





INDUSTRIAL EXPERTISE

Houston has extensive engineering and manufacturing capabilities in:

- Chemical processing;
- Process engineering;
- Industrial automation;
- Environmental engineering;
- Energy;
- Water systems;
- Industrial plant design.

These capabilities can support both agricultural manufacturing and future industrial biotechnology applications.



ENVIRONMENTAL & ENERGY MARKETS

MicrobeBio's future environmental platforms include:

- Oil remediation;
- Hydrocarbon biodegradation;
- Wastewater;
- Industrial biological treatment.

Houston's concentration of energy and industrial companies creates opportunities for strategic partnerships, field validation, and commercialization.

RESEARCH & TALENT

Texas provides access to major research institutions, agricultural research networks, scientific talent, engineering expertise, and biotechnology workforce development.

Potential collaborations may include:

- Texas A&M University;
- Texas A&M AgriLife Research;
- University of Houston;
- Texas Tech University;
- Texas State University;
- UTRGV;
- USDA Agricultural Research Service;
- International academic institutions.

MICROBEBIO
BIOTECH SOLUTIONS

CLEANER TOMORROW, POWERED BY MICROBIOLOGY

UNLOCKING NATURE'S
MICRO POWER
FOR A HEALTHIER PLANET

SMALL MICROBES.
BIG IMPACT.
SUSTAINABLE FUTURE.



THE MICROBEBIO BIOINNOVATION CAMPUS™

The proposed Campus is designed as a vertically integrated ecosystem rather than a conventional manufacturing plant.

Core components may include:

Industrial Fermentation Center

Designed to support:

- Bacterial fermentation;
- Fungal fermentation;
- Microbial inoculants;
- Concentrates;
- Downstream processing;
- Drying;
- Formulation;
- Pilot fermentation;
- Commercial fermentation;
- Contract fermentation.

Fermentation is the technological foundation that connects many of MicrobeBio's twelve platforms.

AGRICULTURAL BIOLOGICAL MANUFACTURING

Manufacturing capabilities are intended to support:

- Biofertilizers;
- Soil biological products;
- Plant biostimulants;
- Biological crop-protection products;
- Precision nutrient technologies;
- Biological seed treatments.





ORGANIC FERTILIZER MANUFACTURING

Potential systems may transform locally sourced organic feedstocks into higher-value agricultural inputs.

Possible feedstocks include poultry litter and other organic materials.

MicrobeBio biological technologies can be incorporated into these products to develop advanced biologically enhanced fertilizers.



AGRICULTURAL BIOLOGICAL MANUFACTURING

Manufacturing capabilities are intended to support:

- Biofertilizers;
- Soil biological products;
- Plant biostimulants;
- Biological crop-protection products;
- Precision nutrient technologies;
- Biological seed treatments.

SEED & PLANT BIOTECHNOLOGY CENTER

The center may include:

- Seed treatment;
- Seed coating;
- Plant tissue culture;
- Germplasm development;
- Plant breeding;
- Hybrid research;
- Crop screening;
- Plant propagation.

R&D LABORATORIES

Integrated scientific laboratories may support:

- Microbiology;
- Soil biology;
- Plant pathology;
- Molecular biology;
- Analytical chemistry;
- Formulation;
- Biological screening;
- Environmental microbiology.

QUALITY-CONTROL & REGULATORY CENTER

Quality systems are critical to biological manufacturing.

Capabilities may include:

- Microbial enumeration;
- Purity testing;
- Contaminant analysis;
- Stability testing;
- Nutrient analysis;
- Product specification;
- International registration support;
- Batch documentation.



GREENHOUSE & VALIDATION COMPLEX

Greenhouses and controlled research facilities can accelerate commercialization by allowing technologies to be tested under controlled conditions before full field deployment.

Applications may include:

- Plant nutrition;
- Disease resistance;
- Root development;
- Seed technologies;
- Biological pest management;
- Soil health.



PILOT ENVIRONMENTAL BIOTECHNOLOGY CENTER

The Campus may also reserve infrastructure for future research and pilot testing involving:

- Hydrocarbon remediation;
- Wastewater;
- Mining;
- Bioleaching;
- Waste valorization.

This enables future platforms to progress through validation without requiring independent facilities.



TWELVE TECHNOLOGY PLATFORMS

The long-term Biology Rising™
strategy consists of twelve
interconnected technology platforms.



PLATFORM 1

BIOLOGICAL CROP NUTRITION

The first platform focuses on improving nutrient efficiency and soil biological performance.

Potential technologies include:

- Biofertilizers;
- Microbial inoculants;
- Soil probiotics;
- Root-zone technologies;
- Rhizosphere activation;
- Organic fertilizer enhancement;
- Biological nutrient cycling.

This platform provides one of the Company's most immediate commercial opportunities.

PLATFORM 2

BIOLOGICAL CROP PROTECTION

Microorganisms can influence plant disease, pest populations, rhizosphere competition, and plant defense. MicrobeBio's crop-protection platform is designed around biological technologies addressing:

- Soil pathogens;
- Fungal diseases;
- Nematodes;
- Insects;
- Integrated pest management.

The goal is not necessarily to eliminate conventional crop protection, but to provide growers with biological tools that can improve integrated management strategies.



PLATFORM 3

PRECISION PLANT NUTRITION

Modern plant nutrition increasingly requires greater precision.

This platform includes:

- Micronutrients;
- Crop-specific nutrient systems;
- Foliar nutrition;
- Advanced delivery systems;
- Precision nutrient technologies.

Combined with biological crop nutrition, this allows MicrobeBio to develop integrated crop-performance programs rather than isolated products.



PLATFORM 4

SEED & PLANT BIOTECHNOLOGY

The seed determines much of a crop's biological potential before it enters the soil.

MicrobeBio intends to combine microbial technologies with:

- Biological seed treatments;
- Seed coatings;
- Tissue culture;
- Germplasm;
- Hybrid development;
- Crop improvement;
- Climate resilience;
- Nutritional quality.

Seed biotechnology also creates opportunities for valuable intellectual property and long-term licensing.



PLATFORM 5

ANIMAL HEALTH & PROBIOTICS

Beneficial microorganisms play an important role in digestive and animal production systems.

Potential markets include:

- Poultry;
- Dairy cattle;
- Beef cattle;
- Swine;
- Small ruminants;
- Companion animals.

Future applications may include:

- Probiotics;
- Direct-fed microbial systems;
- Gut-health technologies;
- Feed-efficiency support;
- Biological waste management.



PLATFORM 6

AQUACULTURE BIOTECHNOLOGY

Aquaculture presents significant opportunities for biological systems because water quality, microbial balance, organic waste, and animal health are closely connected.

Potential applications include:

- Shrimp probiotics;
- Fish probiotics;
- Pond biological management;
- Biofloc enhancement;
- Ammonia management;
- Sludge decomposition;
- Hatchery biology;
- Water-quality improvement.



PLATFORM 7

WATER & WASTEWATER BIOTECHNOLOGY

Microbial systems already perform essential functions in wastewater treatment.

MicrobeBio intends to research and commercialize biological technologies addressing:

- Agricultural wastewater;
- Municipal wastewater;
- Industrial wastewater;
- Nutrient removal;
- Organic-load reduction;
- Sludge management;
- Water restoration.

PLATFORM 8

ENVIRONMENTAL REMEDIATION

Microorganisms have demonstrated the ability to transform or degrade many naturally occurring and industrial compounds.

Potential applications include:

- Oil remediation;
- Hydrocarbon degradation;
- Petroleum-contaminated soil;
- Industrial sites;
- Contaminated water;
- Soil restoration.

Houston creates a strategically relevant location for developing partnerships in this field.



PLATFORM 9 MINING & BIOLEACHING

Certain microorganisms interact directly with minerals and metals.

This creates potential applications in:

- Bioleaching;
- Mineral recovery;
- Mine wastewater;
- Tailings;
- Acid mine drainage;
- Environmental restoration.

Commercial development within mining requires substantial technical validation, pilot programs, and industry partnerships. For this reason, MicrobeBio places mining within the later phases of the roadmap.

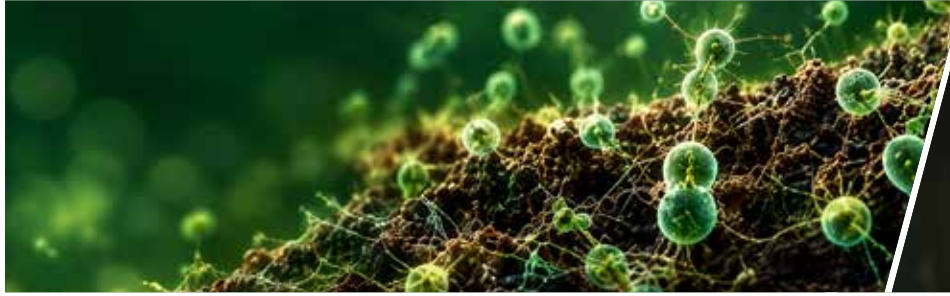
PLATFORM 10: INDUSTRIAL FERMENTATION & BIOMANUFACTURING

Industrial fermentation is both a MicrobeBio platform and an enabling infrastructure supporting the other platforms.

Potential revenue includes:

- Contract fermentation;
- Custom microbial manufacturing;
- Specialty biological ingredients;
- Enzymes;
- Metabolites;
- Formulation services;
- Technology scale-up.

This creates the opportunity to monetize unused capacity while strengthening internal manufacturing.



PLATFORM 11: CIRCULAR BIOECONOMY & WASTE VALORIZATION BIOTECHNOLOGY

The circular bioeconomy seeks to keep biological materials in productive use rather than treating them solely as waste.

Potential applications include:

- Poultry litter;
- Agricultural residues;
- Organic waste;
- Biological composting;
- Nutrient recovery;
- Waste-to-input technologies.

This platform connects agriculture, manufacturing, environmental sustainability, and resource efficiency.



PLATFORM 12: CLIMATE, CARBON & ECOSYSTEM BIOTECHNOLOGY

MicrobeBio's long-term environmental research strategy may include:

- Soil carbon;
- Soil biology;
- Ecosystem restoration;
- Regenerative agriculture;
- Biological decomposition;
- Biodiversity;
- Climate-resilient biological production systems.

This platform represents a long-term extension of the Company's soil-health and environmental expertise.

The logo features the text "MicrobeBio" in a bold, green, sans-serif font, with a registered trademark symbol (®) to the upper right of the "o". This text is centered on a white, ribbon-like banner that has a slight 3D effect with shadows on its sides. The banner is positioned horizontally across the middle of the image, partially overlapping a dark green background and a background image of wheat stalks.

MicrobeBio®

www.microbebio.com
info@microbebio.com

*#MicrobeBio #OrganicFarming #RegenerativeAgriculture #Intercropping #SustainableAgriculture #Biofertilizer #SoilHealth #PremiumCrops
#OrganicMicrobes #FarmFuture #MicrobialSolutions #HighYieldFarming #NaturalPestControl #SoilRegeneration #CleanAgriculture GenerationalFarming #OrganicProduce*