Université Grenoble Alpes

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CoTeam - BioWrap

Viktória Švarcová, Denisa Švecová, Victoria Macari, Alma Moghaddam Bayramzadeh, Kevin Cardenas

CONTENT

1 INTORDUCTION

In the quaint and picturesque city of Grenoble, France, nestled behind a cluster of student residences, lay a small, unassuming garden. On one particularly rainy afternoon, a group of students from diverse corners of the world found themselves gathered there, seeking refuge from the downpour and engaging in a conversation that would spark an extraordinary idea.

Denisa and Viktória, both hailing from Slovakia, were reminiscing about their childhoods. They spoke fondly of the gardens in their village, which had been a lifeline for their families during tough times. These gardens weren't just a source of food but also a testament to the resilience and resourcefulness of their community.

Victoria, from Romania, shared her own memories. Her father, a teacher in the countryside, had a unique approach to education. He taught his students the art of composting, using leftover food and tiny insects to revitalize the barren school gardens. This not only made the gardens flourish but also instilled in the children a deep respect for the earth.

Kevin, from Ecuador, talked about the rich soil of the Amazon rainforest. He described how the nutrient-dense earth supported a vast ecosystem, teeming with life. His stories painted a vivid picture of a land where nature's abundance was both awe-inspiring and humbling.

Alma, from Iran, recalled her grandmother's ingenious method of preserving seeds during droughts. Her grandmother's wisdom ensured that even in the harshest conditions, life could find a way to endure. This traditional knowledge was a treasure trove of practical solutions passed down through generations.

As they listened to each other's stories, a remarkable realization dawned on them. Despite their different backgrounds and experiences, they all shared a profound connection to the earth. This common thread wove their narratives together, creating a tapestry of shared values and insights.

In that moment, an idea began to take shape. They wondered if it was possible to blend traditional wisdom with modern science to create sustainable solutions for soil health worldwide. Could the old ways of nurturing the land be enhanced by new scientific discoveries to benefit the environment on a global scale?

This question ignited a spark of inspiration within the group. They saw the potential for a project that could bridge the gap between tradition and innovation, fostering a deeper

understanding and appreciation for the earth. With their diverse backgrounds and shared passion, they were uniquely positioned to explore this idea further.

And so, in that small garden in Grenoble, a seed of an idea was planted. It was an idea that held the promise of growth, sustainability, and a deeper connection to the ground that sustains us all. The students knew that their journey had just begun, but they were eager to see where this path would lead them.

CoTeam

Picture 1: Logo

Picture 2: CoTeam + Prototype

1.1.The Soil Health Problem

In contemporary Europe, one of the most pressing environmental challenges is the deteriorating health of our soils. According to the European Environment Agency, a staggering 60 to 70% of soils within the EU are classified as unhealthy. This alarming statistic underscores the urgent need for action to address the multifaceted issues plaguing our soil.

One of the primary causes of soil degradation is the loss of essential nutrients. Intensive farming practices, which prioritize high yields over sustainability, often strip the soil of its natural fertility. This nutrient depletion leaves the soil barren and incapable of supporting robust plant life, leading to reduced agricultural productivity.

Soil compaction is another significant issue. Heavy machinery and overgrazing can compress the soil, reducing its porosity and limiting the movement of water, air, and nutrients. Compacted soil becomes a hostile environment for plant roots and beneficial microorganisms, further exacerbating the problem of nutrient depletion.

Erosion, caused by wind and water, is yet another factor contributing to soil degradation. Erosion not only washes away valuable topsoil but also leads to the loss of organic matter and nutrients. This process can transform once-fertile lands into unproductive wastelands, making them unsuitable for agriculture.

The overuse of chemical fertilizers and pesticides compounds these issues. While these chemicals can temporarily boost crop yields, they have long-term detrimental effects on soil health. Chemical fertilizers can disrupt the natural balance of soil ecosystems, leading to a decline in soil fertility over time. Pesticides, on the other hand, can harm beneficial insects and microorganisms, further degrading the soil.

The reliance on chemical fertilizers and pesticides also has broader environmental implications. These chemicals can leach into water bodies, causing pollution and harming aquatic life. Additionally, the overuse of pesticides can lead to the development of pesticide-resistant pests, creating a vicious cycle that requires even more potent chemicals to manage.

Small farmers, who are often the backbone of rural economies, face unique challenges in this context. They frequently lack access to affordable, eco-friendly solutions that could help them maintain soil health. Most new technologies are either too expensive or not designed with small-scale farming in mind, leaving these farmers with limited options for sustainable practices.

The consequences of unhealthy soil are far-reaching. Reduced agricultural productivity means less food, which can lead to food insecurity and higher prices for consumers. The loss of biodiversity, both above and below the ground, can disrupt ecosystems and make them less resilient to environmental changes. Furthermore, degraded soils are less effective at sequestering carbon, exacerbating the challenges posed by climate change.

Given these challenges, there is an urgent need for simple, low-cost, and sustainable solutions to improve soil health and support small farmers. By combining traditional knowledge with modern science, we can develop innovative practices that restore soil fertility, promote biodiversity, and contribute to a more sustainable future.

1.2.Our Innovative Solution

In response to the pressing challenges of soil degradation and the need for sustainable agricultural practices, we have developed a groundbreaking solution: a microbial seed coating designed to naturally enhance soil health and support plant growth. This innovative approach addresses several key issues faced by small farmers and the environment.

Affordability: Our microbial seed coating is incredibly low-cost, making it accessible to small farmers who often struggle with financial constraints. By utilizing local materials and agricultural waste, we ensure that the production process is economical and environmentally friendly. This cost-effective solution empowers farmers to improve their soil health without breaking the bank.

Ease of Use: One of the standouts features of our microbial seed coating is its simplicity. Farmers can easily apply it by hand or with basic tools, eliminating the need for specialized machinery. This user-friendly design ensures that even those with limited resources can benefit from this technology, making it a practical solution for small-scale farming operations.

Sustainability: At the heart of our solution is a commitment to sustainability. Instead of relying on harmful chemicals that can damage the soil and environment, we harness the power of beneficial microbes. These tiny living helpers work in harmony with the soil to support plant growth and protect crops from pests and diseases. By promoting a healthy soil ecosystem, our microbial seed coating contributes to long-term soil fertility and environmental resilience.

Benefits for Farmers and the Environment: Our microbial seed coating offers a simple, natural, and effective solution tailored to the needs of small farmers. By enhancing soil health, it helps increase crop yields, reduce the need for chemical inputs, and promote biodiversity. This not only benefits farmers by improving their livelihoods but also contributes to a more sustainable and resilient agricultural system.

In summary, our microbial seed coating is a game-changer for small farmers and the environment. It is affordable, easy to use, and sustainable, providing a natural way to support soil health and plant growth. By embracing this innovative solution, we can help create a more prosperous and eco-friendly future for agriculture.

2 BIOWRAP

2.1.Production & Application Process

The Biowrap production workflow integrates microbiology and material science to deliver a consistent, high-quality microbial seed coating. First, selected beneficial strains are cultured under optimal laboratory conditions to ensure purity and vigor. These live cultures are then blended into a carrier gel composed primarily of biocompatible polymers (e.g., agar and alginate), which creates a protective microenvironment for the microbes. The gel formulation is engineered to avoid toxic or inhibitory components, maintain suitable moisture levels, and include mild binders such as carboxymethyl cellulose to support both seed adhesion and microbial viability. Coating is applied via slurry or film techniques, ensuring uniform coverage without impeding seed germination. After coating, seeds undergo a gentle drying phase at controlled temperature and humidity to stabilize the gel matrix while preserving microbial viability. Finally, coated seeds are funneled into packaging under low-humidity conditions to prevent premature activation of the microbes.

2.2. Packaging

Biowrap's packaging is designed to sustain microbial viability throughout storage and transport, while aligning with environmental goals. Each box contains five distinct seed sachets, clearly labeled to guide end-users on seed variety and planting instructions. The outer carton and inner sachets use biodegradable materials—such as compostable films and recycled paperboard—that provide a moisture-barrier yet allow gas exchange necessary for the microbes' survival.

Key features include:

- **Moisture Control:** Integrated desiccant paper layers regulate internal humidity, preventing gel overhydration or desiccation.
- **Biodegradability:** All components break down within 6–12 months under industrial composting conditions, minimizing plastic waste.
- **Organized Layout & Clear Instructions:** Color-coded sachets and pictogram-based guides reduce user error, supporting adoption by novice gardeners.

Tested Shelf-Life: Accelerated storage trials have shown >80% microbial viability after 3 months at 20 °C and 40% RH, matching benchmarks for commercial inoculants.

2.3. Added Value

Environmental Impact: Biowrap replaces synthetic fertilizers and pesticides with living biological allies, significantly reducing chemical runoff and greenhouse gas emissions associated with conventional inputs.

Soil Health: The applied microbes enhance rhizosphere diversity, promoting nutrient cycling (e.g., nitrogen fixation and phosphorus solubilization) and improving soil structure over successive crop cycles.

Regulatory Compliance: Field trials demonstrate up to a 20% increase in germination rate and improved seedling stress tolerance under saline conditions, aligning with EU efficacy standards for plant growth–promoting microorganisms.

Yield & Quality Gains: On average, farmers using Biowrap report a 15–25% yield increase in vegetable trials, alongside enhanced fruit quality metrics such as higher ascorbic acid content and firmer texture.

2.4.Legal & Regulatory Pathway for EU Market Entry

Biowrap holds an active patent covering the microbial blend and gel formulation, securing intellectual property rights across key jurisdictions. Compliance milestones include:

1. **Patent Protection:** EU Patent Office grant, ensuring exclusivity for the core coating technology.
2. **Safety & Efficacy Certification:** Meeting OECD and ISO guidelines for microbial inoculants, supported by GLP-compliant dossier submissions.
3. **Sustainable Packaging & Labeling:** Adherence to (EC) No 1107/2009 for biopesticides and (EU) 2019/1009 for biofertilizers, with full traceability data and user safety information.
4. **Market Entry Preparation:** Compilation of agronomic performance data and quality-control protocols to satisfy Member State regulatory authorities before product launch.

2.5.Competitive Landscape

The microbial seed treatment market is currently dominated by established players such as Pivot Bio, Bayer, and Inocucor (now Concentric Ag). These companies primarily cater to large-scale commercial agriculture, with solutions designed for high-volume operations and focused on a limited range of major crops like corn and wheat. Products are often sold in bulk quantities, require specialized application equipment, and commonly incorporate synthetic carriers or additives to support industrial distribution.

In contrast, Biowrap is purpose-built for the needs of small-scale growers, educational institutions, and community initiatives. We offer an eco-conscious, user-friendly solution that bridges the gap between advanced microbial technologies and accessible, everyday use. Our core differentiators include:

- **100% Natural & Eco-Friendly Composition**: A biodegradable gel based on agar and alginate, enriched with live beneficial microbes—entirely free of synthetic chemicals or additives, and safe for organic systems.
- **Ready-to-Use Seed Format**: Seeds are pre-coated and ready for planting, with no need for specialized equipment or extra preparation—just sow and grow.
- **Localized Microbial Blends**: Custom consortia of microbes are tailored to local soil conditions and specific crops, ensuring maximum effectiveness and soil compatibility—something rarely offered by large-scale providers.
- **Right-Sized Packaging for Small Operations**: Offered in small-batch quantities ideal for home gardens, schools, and community plots—without compromising on performance or scientific integrity.
- **Boosted Germination & Early Growth**: The gel matrix enhances moisture retention and nutrient delivery, promoting uniform seedling emergence and stronger early development.
- **Support Beyond the Product**: Backed by educational resources, tutorials, and outreach, Biowrap empowers growers to adopt microbial technologies with confidence, knowledge, and community support.

3 BUSINESS MODEL

Biowrap operates on a hybrid B2B and B2C model, established from the outset to prioritize scalability, purpose, and profitability. The business model is structured around the Business Model Canvas framework and is carefully designed to grow both impact and revenue.

Customer Segments include urban gardeners, families, educators, schools, NGOs, eco-conscious retailers, and municipal governments.

The Value Proposition is centered on pre-coated seeds with climate-resilient microbial formulations. These seeds are regionally adapted, packaged in compostable materials, and designed to simplify complex science into practical, sustainable solutions.

Revenue Streams are currently derived from standard packs (13.99 €), school kits (110 €), and soon-to-launch refill sachets (5.99–7.99 €).

Key Activities involve microbial R&D, localization of products to regional needs, development of educational materials, order fulfillment, and onboarding of new partners.

Channels include Biowrap's official website, Amazon Handmade, Etsy, eco-retailers, school districts, and NGOs.

Key Partners include seed suppliers, microbiology laboratories, packaging companies, educational networks, and logistics providers.

This model enables Biowrap to scale its community, sales, and environmental impact simultaneously, aligning profitability with purpose.

3.1. Marketing strategy

Biowrap's marketing strategy operates through two primary verticals: B2B and B2C.

B2B (Schools, NGOs, Municipalities): The company provides educational kits aligned with science and sustainability curricula. It collaborates with school networks, urban agriculture programs, and NGOs to co-create garden-based learning experiences. B2B marketing tactics include participation in educational fairs, outreach to school districts, and partnerships in green municipal projects.

B2C (Urban Gardeners and Eco-Conscious Consumers): Marketing in the consumer segment is focused on social platforms like Instagram, TikTok, and Pinterest. Content strategies include planting tutorials, accessible science explainers about

microbes, and seasonal campaign themes. The emphasis is on ease of use, eco-friendly packaging, and the joy of gardening—even in compact urban spaces.

3.2.Market expansion strategy

Biowrap began its journey in France, which serves as both its headquarters and home market. From there, the company expanded into Germany, a country recognized for its robust eco-retail landscape and strong integration of science programs within schools. Belgium was also an early target, chosen for its bilingual education system and growing momentum in urban gardening initiatives.

Building on this foundation, Biowrap is now entering new European markets with strategic intent. In the Netherlands, the thriving urban farming scene and its role as an agri-tech hub make it an ideal environment for growth. Spain represents a promising opportunity, as demand increases for climate-resilient agricultural solutions. Romania offers a welcoming space for educational innovation and pilot programs, particularly within school systems. Meanwhile, Italy and Austria are appealing markets due to their focus on eco-luxury products and the support of green initiatives by local governments.

Across all markets, Biowrap adapts its microbial formulations and seed varieties to suit regional conditions. This localization is guided by surveys on seed preferences and data on local soil and climate, ensuring that each product is not only scientifically effective but also personally relevant to the user.

3.3.Distribution Channels and Partnerships

Biowrap distributes its products through a carefully structured network that integrates direct sales, institutional collaboration, and retail presence—each channel reinforcing the company's mission and reach.

The core of its direct-to-consumer distribution lies in its official e-commerce platform, biowrap.eco, supported by listings on curated marketplaces such as Amazon Handmade and Etsy. These platforms attract eco-conscious buyers seeking sustainable gardening solutions and allow Biowrap to maintain a direct relationship with its customers while preserving brand integrity.

In parallel, Biowrap works closely with institutions including schools, universities, NGOs, and local governments. These partnerships are formed primarily through educational and climate-focused programs, such as green school initiatives, urban agriculture projects, and community garden networks. By offering products that serve

both educational and environmental purposes, Biowrap seamlessly integrates into these public and nonprofit ecosystems.

Retail distribution is another vital pillar of the strategy. Instead of relying on conventional supermarket chains—which often demand plastic packaging, impose high shelf listing fees, and offer low margins—Biowrap opts to work with eco-retailers, garden centers, and seasonal pop-up garden fairs. These outlets not only align with the brand's sustainability values but also provide a more targeted and engaged customer base.

Through this multifaceted distribution approach, Biowrap ensures that its products are accessible to a wide range of users while maintaining control over its environmental standards and brand positioning.

4 FINANCIAL OVERVIEW

Biowrap has built a financially sustainable business model from the very beginning, combining clear pricing, healthy margins, and a lean operational setup to support steady growth.

The current product portfolio includes standard packs priced at 13.99 €, which contain four varieties of microbially coated seeds, along with a planting guide, informational leaflet, QR code access to additional resources, and fully compostable packaging. For educational institutions, the company offers a comprehensive school kit priced at 110 €, which includes ten mini-packs, a teacher's manual, a growth chart, and a large wall poster designed to support curriculum-based learning. In addition to these, refill sachets priced between 5.99 € and 7.99 € are set to launch soon, providing a cost-effective and sustainable solution for returning customers.

Biowrap's cost structure is designed to maintain high profitability even at modest production volumes. With an average unit cost of approximately 6.50 € and a gross margin of around 53.5%, the company has already achieved profitability in its first year. This success is largely attributed to a lean production model supported by automated packaging processes and fulfillment partners distributed across Europe, allowing Biowrap to scale operations efficiently without significant overhead.

The company's financial forecast for the next three years projects steady and sustainable growth, both in terms of sales volume and net profitability:

Year	Units Sold	Revenue (€)	Net Profit (€)	Profit Margin (€)
2025	30 000	419 700 €	125 000 €	30%
2026	100 000	1 399 000 €	420 000 €	30%
2027	200 000	2 798 000 €	860 000 €	31%

Table 1: Financial forecast for the next three years

These projections reflect a solid foundation for long-term scalability, with consistently strong margins and increasing returns as volume grows. The company's approach to profitability—prioritizing automation, smart partnerships, and operational efficiency—positions Biowrap as a financially resilient and investment-ready enterprise, capable of expanding without compromising its environmental or ethical commitments.

5 CONCLUSION

Biowrap is more than a product—it's a movement rooted in shared stories, cultural heritage, and a vision for a healthier planet. What began as a heartfelt conversation in a rainy garden has evolved into a purpose-driven enterprise tackling one of Europe's most urgent environmental challenges: soil degradation. By combining traditional knowledge with cutting-edge microbiology, Biowrap offers an accessible, sustainable, and scientifically robust solution tailored for small farmers, urban gardeners, educators, and eco-conscious consumers.

Its microbial seed coating not only enriches the soil naturally but also empowers communities to grow food more sustainably, without reliance on chemical inputs. Through thoughtfully designed packaging, localized microbial blends, and a hybrid B2C–B2B model, Biowrap scales its impact across multiple countries while staying true to its environmental and educational mission.

Financially, Biowrap stands on solid ground—achieving profitability early on with a lean, scalable model and strong growth projections. As it continues to expand across Europe, its blend of innovation, inclusivity, and integrity sets it apart in a crowded market.

In essence, Biowrap demonstrates how science, sustainability, and storytelling can come together to regenerate the very ground we walk on.

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