FICOSTERRA SL

BIOSTIMULANTS AND BIOFERTILIZERS

Market Trends

2026

ficosterra

I3-4 SEAWEED

Co-funded by

Introduction

Agricultural systems in Europe and globally are undergoing a structural transformation driven by the need to reconcile productivity with environmental sustainability. Rising mineral fertilizer prices, increased regulatory pressure on nutrient management and growing awareness of soil degradation have fundamentally reshaped fertilization strategies (European Commission, 2020). Within this evolving context, biological inputs such as biofertilizers and biostimulants are gaining prominence as tools to improve nutrient efficiency and reduce environmental externalities.

Historically, biofertilizers were primarily associated with organic agriculture and niche markets. However, since 2020, their role has expanded significantly, with increasing integration into conventional farming systems as complementary inputs rather than substitutes for mineral fertilizers (MarketsandMarkets, 2023). This shift reflects a broader understanding of soil fertility as a biologically mediated process, where microbial activity and plant–soil interactions play a critical role.

Seaweed-derived biostimulants represent one of the most rapidly growing segments within this category. Extracted mainly from brown macroalgae, these products influence plant physiology through mechanisms that include hormonal modulation, enhancement of root development and increased tolerance to abiotic stress. Their multifunctional nature and relatively consistent performance under field conditions have contributed to their growing adoption across diverse agricultural systems.

The European context provides a particularly relevant framework for analyzing these developments. Policy initiatives such as the Farm to Fork Strategy and the European Green Deal have established ambitious targets for reducing fertilizer use and improving sustainability outcomes (European Commission, 2020). At the same time, regulatory frameworks such as Regulation (EU) 2019/1009 have created clearer pathways for the commercialization of biostimulants, formally recognizing them as a distinct category of fertilizing products.

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

1. Market Size and Growth Dynamics

1.1 Global Market Evolution

The global biofertilizer market has experienced steady growth over the past decade, evolving from a marginal segment into a dynamic component of the agricultural inputs industry. According to Market and Market (2023) in terms of percentages (Compound annual growth rate, CAGR) the growth will be around 10.9% between 2022 and 2028 (Figure 1). According to Santos et al. (2024) only the USA market size was estimated to be $3.55 billion in 2024.

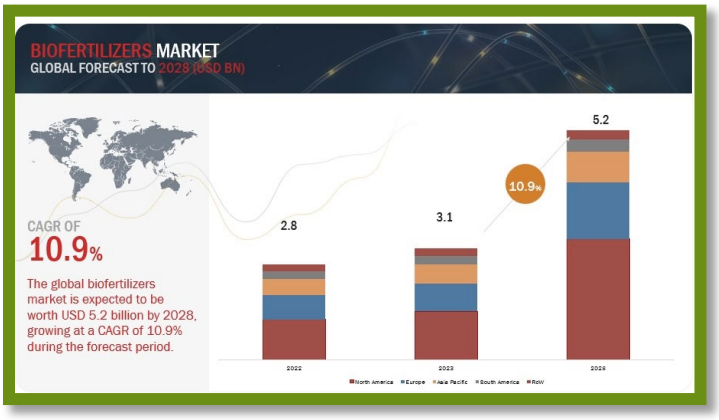

Figure 1: Biofertilizers Market, Global forecast to 2028. Source: MarketsandMarkets 2023 (04/17/2026)

This growth has been driven by structural factors, including the need to improve nutrient use efficiency, reduce dependency on synthetic inputs and mitigate environmental impacts associated with intensive agriculture. Gupta et al. (2025) indicated that one of the factors that stimulated the growth in demand is the development of organic farming that depends mostly on biofertilizers to manage nutrients and restore soil health, this joined with the advances in policy to decrease the use of synthetic fertilizers.

Notably, market expansion has remained robust despite external disruptions such as supply chain instability and energy price volatility, suggesting that demand is underpinned by long-term trends rather than short-term fluctuations. Within this broader context, the biostimulant segment particularly seaweed-based products has demonstrated even stronger growth dynamics. These products are increasingly valued for their ability to enhance crop resilience under abiotic stress conditions, a factor that is becoming more critical in the face of climate variability. Market trends include amino acids and seaweed extracts, along with new, more specific molecules. Nutrient use efficiency and stress resistance are the main applications, with fruits and vegetables dominating, although field crops are growing rapidly (Tecnología Hortícola, 2025).

1.2 European Market Development

The European biofertilizer market has grown steadily since 2020, supported by a unique combination of regulatory incentives, environmental objectives and high levels of agricultural professionalization. In 2023, the **European biostimulant market** was valued at approximately **$1.47 billion,** accounting for around 40% of the global market. This growth has been consistent, with annual double-digit increases (Mordor Intelligence, 2025).

Despite discrepancies in absolute figures about the global market size, there is strong consensus that the European market is expected to at least double during the current decade. Importantly, when seaweed biostimulants are included, the effective market size increases substantially, reflecting their growing commercial relevance.

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

According to AEFA (2024), the association comprises 58 companies in Spain with a combined turnover exceeding €755 million, representing more than 80% of the agricultural sector. The **Spanish biostimulant market has reached €83 million** (20.7% of the total), showing a moderate growth of 4.4%. Within this category, non-microbial biostimulants predominate specifically amino acids (85%) and seaweed extracts (15%) while microbial biostimulants represent 15% of the market share.

Regarding geographical adoption within the EU, the largest markets are concentrated in countries with intensive, high-value agriculture. **France is currently the EU country with the highest consumption of biostimulants**, driven by the push to reduce chemical inputs in favor of biological alternatives. Italy, Spain, and Portugal also exhibit notable development, forming, along with France, the core of the most commercially significant markets for these products in Europe.

2. Policy Framework and Market Drivers in Europe

The European market for biofertilizers and biostimulants is fundamentally driven by evolving policy and regulatory frameworks. Central to this is the **Farm to Fork Strategy**, which targets a minimum 20% reduction in fertilizer use by 2030. This objective creates a structural demand for innovative solutions that enhance nutrient efficiency (European Commission, 2020), fostering favorable conditions for the widespread adoption of biological products.

As noted by Santos et al. (2024), the **previous EU Regulation 2003/2003** was limited to inorganic fertilizers and liming agents, which constrained the use of biostimulants. In contrast, the **current Regulation (EU) 2019/1009** introduces seven **Product Function Categories** (PFCs) based on specific product functions. These range from fertilizers (**PFC 1)**: inorganic, organic, and organo-mineral); (**PFC 2)** for liming materials and soil improvers (**PFC 3**) to plant biostimulants (**PFC 6**) and fertilizing product blends (**PFC 7**). Notably, this framework distinguishes between microbial (**PFC 6, A**) and non-microbial (**PFC 6, B**) biostimulants.

Under this regulation, plant biostimulants are defined as products that stimulate plant nutrition processes independently of their nutrient content to improve nutrient use efficiency, abiotic stress tolerance, quality traits, or nutrient availability in the soil and rhizosphere.

By harmonizing standards across Member States, Regulation (EU) 2019/1009 has streamlined commercialization while ensuring product quality and safety. However, stringent compliance requirements particularly for microbial products have favored the competitiveness of well-characterized inputs like seaweed extracts. Parallel to these regulatory shifts, the expansion of organic farming remains a critical driver. According to the European Environment Agency (2024), organic systems managed 10.8% of EU agricultural land in 2023, with a target of 25% by 2030. This growth directly amplifies the demand for biological inputs essential for sustaining soil fertility in organic production.

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

3. Market Structure and Key Actors

The European market is characterized by a diverse and fragmented structure that includes biotechnology companies, multinational agrochemical firms, distributors and advisory services. Within this ecosystem, companies specializing in seaweed-based biostimulants have gained increasing prominence.

Among these, the spanish company **Ficosterra** represents an important example of innovation within the European context. The company focuses on the valorization of marine biomass within a circular economy framework, aligning with broader sustainability objectives. Its development of seaweed-based solutions tailored to Mediterranean agricultural systems highlights the importance of regional adaptation in product design and market strategy. **Ficosterra pioneers in Mixed Biostimulation** as it is the first company to achieve combined products of seaweed with microorganisms and one of the first European companies to obtain CE registration for biostimulants that combine algae extracts (prebiotics) and microorganisms (probiotics) in the same formula.

Other key actors include Acadian Plant Health and Valagro, which have played a central role in scaling seaweed-based technologies globally. The increasing involvement of large agricultural companies such as UPL further indicates that biological inputs are becoming mainstream components of agricultural input portfolios.

4. Products, Applications and Technological Trends

Biofertilizers and biostimulants encompass a wide range of products with different modes of action. While microbial biofertilizers and mycorrhizal fungi remain important, seaweed biostimulants offer a distinct approach based on biochemical and physiological effects rather than direct nutrient supply.

Seaweed extracts contain bioactive compounds such as polysaccharides, phenolic compounds and hormone-like substances that influence plant metabolism. These compounds enhance root development, improve nutrient uptake efficiency and increase tolerance to environmental stress. Advances in extraction technologies have improved the consistency and stability of these products, addressing one of the main challenges associated with biological inputs.

Adoption patterns vary across crop systems, with higher uptake observed in horticulture, vineyards and fruit production. These systems are characterized by higher economic margins and greater sensitivity to quality parameters, making them more conducive to the adoption of innovative inputs. In contrast, adoption in large-scale arable systems remains more limited but is gradually increasing.

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

5. Adoption, Barriers and System Integration

The adoption of biofertilizers and biostimulants is influenced by multiple factors, including agronomic performance, economic considerations and risk perception. Farmers tend to prioritize reliability and ease of integration when evaluating new inputs, particularly in highly mechanized systems.

One of the main barriers to adoption is the variability of field performance, especially for microbial products. In this context, Seaweed-based biostimulants, typically derived from brown algae have gained particular attention due to their multifaceted modes of action (Craigie, 2011; Sharma et al., 2014). Their relatively stable performance across different environmental conditions has been highlighted in several studies, although responses can still vary depending on crop type, formulation, application timing, and environmental context (Craigie, 2011).

A key trend is the integration of biological inputs into broader nutrient management systems. Rather than being used in isolation, they are increasingly combined with mineral fertilizers and organic amendments to optimize overall system performance. This integrated approach reflects both policy objectives and practical farming considerations (Rouphael and Colla, 2020).

6. Innovation, Standardization and Trust

Innovation in the biofertilizer and biostimulant sector extends beyond the discovery of new active substances to encompass advances in formulation technologies, quality control systems, and methods for demonstrating product efficacy under field conditions. Increasingly, research supported by European programs is focusing on enhancing the robustness, reproducibility, and scalability of biological inputs, with particular attention to reducing variability across different agroecological contexts (Rouphael and Colla, 2020; du Jardin, 2015). This includes the development of improved extraction techniques, carrier systems, and stabilization processes that preserve bioactive compounds while extending shelf life and ensuring ease of application.

Standardization and quality assurance remain central challenges for the sector. Unlike mineral fertilizers, whose composition and effects are relatively predictable, biological inputs are inherently influenced by environmental conditions, raw material variability, and production processes, which can result in inconsistent field performance (du Jardin, 2015). To address this, there is a growing emphasis on establishing harmonized protocols for raw material sourcing, processing, and characterization, as well as on the use of biochemical and molecular markers to ensure batch-to-batch consistency (Sharma et al., 2014). Transparent labeling, clear usage guidelines, and the generation of region-specific efficacy data are also essential components for building farmer confidence and supporting advisory services.

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

Seaweed-based biostimulants provide a particularly strong case in this context due to their relatively well-characterized composition and long history of agricultural use. Extracts derived from species such as *Ascophyllum nodosum* have been extensively studied, leading to a better understanding of their bioactive constituents, including polysaccharides, phenolic compounds, and hormone-like substances (Craigie, 2011; Khan et al., 2009). Advances in extraction technologies, such as alkaline, enzymatic, and cold-processing methods have enabled greater control over the composition and functionality of final products, thereby improving reproducibility and facilitating standardization (Sharma et al., 2014).

Moreover, seaweed biostimulants have demonstrated relatively stable performance across a range of crops and environmental conditions compared to some microbial-based products, which contributes to their perception as lower-risk inputs among farmers (Rouphael and Colla, 2020). This perceived reliability, combined with increasing regulatory clarity particularly under the European Union framework for plant biostimulants supports their growing integration into conventional and sustainable farming systems (European Commission, 2019).

At the same time, ongoing innovation is increasingly focused on identifying specific modes of action and linking them to measurable agronomic outcomes. This includes the use of omics technologies (e.g., transcriptomics and metabolomics) to better understand plant responses, as well as the development of standardized bioassays and field trial methodologies to substantiate product claims (du Jardin, 2015). Strengthening the scientific evidence base in this way is critical not only for regulatory compliance but also for reinforcing trust among farmers, distributors, and policymakers.

7. Long-Term Outlook

The long-term outlook for the European biofertilizer and biostimulant market is strongly positive. Growth is expected to continue at a steady pace, supported by policy alignment, technological innovation and increasing demand for sustainable agricultural practices. Seaweed biostimulants are likely to play an increasingly important role within this landscape, particularly in regions facing climatic stress and resource constraints.

Future development will depend on the ability to integrate these products into practical farming systems, supported by effective advisory services and robust validation frameworks. From a policy perspective, maintaining coherence between regulatory frameworks and innovation efforts will be essential to ensure sustained market growth.

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

Conclusion

The growth of biofertilizers and biostimulants in Europe is strongly underpinned by supportive policy frameworks, particularly the Farm to Fork Strategy and Regulation (EU) 2019/1009, which have created clearer regulatory pathways and market incentives. At the same time, progress in standardization, quality assurance, and efficacy validation is essential to reduce performance variability and enhance credibility. The consolidation of these elements will be critical for building trust among farmers and advisors, thereby enabling large-scale adoption and sustained market development.

Within the biological inputs sector, seaweed-derived biostimulants stand out as a highly dynamic and commercially robust segment. Their multifunctional properties, relatively stable performance under field conditions, and compatibility with existing agronomic practices have facilitated their rapid uptake. Coupled with advances in extraction technologies and product formulation, these characteristics position seaweed biostimulants as a central driver of both innovation and market growth across diverse cropping systems.

The evolution of the biofertilizer and biostimulant market since 2020 reflects a broader structural shift towards more sustainable, resource-efficient, and resilient agricultural systems. In this context, seaweed-based biostimulants have emerged as a key enabling technology, offering scientifically supported solutions to enhance plant performance, improve nutrient use efficiency, and mitigate environmental constraints. Their continued development and integration into nutrient management strategies will play an important role in shaping the future of agricultural production.

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

Reference list

AEFA 2024. El mercado de bioestimulantes en España. Nov 21, 2024 | Noticias del sector agrícola. https://aefa-agronutrientes.org/el-mercado-de-bioestimulantes-en-espana

Craigie, J. S. (2011). Seaweed extract stimuli in plant science and agriculture. Journal of Applied Phycology, 23, 371–393.

du Jardin, P. (2015). Plant biostimulants: Definition, concept, main categories and regulation. Scientia Horticulturae, 196, 3–14.

du Jardin, P. (2015). Plant biostimulants: Definition, concept, main categories and regulation. Scientia Horticulturae, 196, 3–14.

European Commission (2019). Regulation (EU) 2019/1009 laying down rules on the making available on the market of EU fertilising products.

European Commission. (2020). A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system.

European Environment Agency. (2024). Organic farming in the EU.

Fortune Business Insights. (2025). Biofertilizers Market Size, Share & Forecast 2024–2032.

Grand View Research. (2024). Europe Biofertilizers Market Outlook.

Gupta, M. M., Kumari, A., & Sharma, A. (2025). Economics of biofertilizers. En Agrifood waste as biofertilizer. CABI. doI: 10.1079/9781836991021.0010.

IMARC Group. (2024). Europe Biofertilizer Market Forecast 2025–2033.

Khan, W. et al. (2009). Seaweed extracts as biostimulants of plant growth and development. Journal of Plant Growth Regulation, 28, 386–399

Tecnología Hortícola (2025). 27 de Noviembre de 2025. "El mercado global de bioestimulantes alcanza 4470 millones de USD mientras la industria señala madurez". https://www.tecnologiahorticola.com/es/cultivos/el-mercado-global-de-bioestimulantes-alcanza-4470-millones-de-usd-mientras-la-industria-senala-madurez. Tecnología Hortícola.

MarketsandMarkets. (2023). Biofertilizers Market – Global Forecast to 2028. (consulted: 04/17/2026)

Mordor Intelligence. (2025). Europe Biofertilizers Market Analysis.

Rouphael, Y., and Colla, G. (2020). Biostimulants in agriculture. Frontiers in Plant Science, 11, 40.

Santos, F., Melkani, S., Oliveira-Paiva, C. et al. Biofertilizer use in the United States: definition, regulation, and prospects. Appl Microbiol Biotechnol 108, 511 (2024). https://doi.org/10.1007/s00253-024-13347-4.

Sharma, H. S. S. et al. (2014). Seaweed extracts as biostimulants of plant growth: A review. Journal of Applied Phycology, 26, 465–490.

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.

Acknowledgements

Cuesta-Gomez, DM. and Fernandez, R. (2026). Biostimulants and biofertilizers: Market trends. Ficosterra S.L. (I3-4-Seaweed Project Knowledge Hub Reports)

Ficosterra S.L

Luis Lombana, CEO
luis@ficosterra.com
Diana Cuesta, R+D+I Project Manager
diana.cuesta@ficosterra.com
Ruben Fernandez, Sales and Marketing
ruben.fernandez@ficosterra.com

Funded by the European Union. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or European Innovation Council and SMEs Executive Agency (EISMEA). Neither the European Union nor the granting authority can be held responsible for them.