

Agricultural Biotechnology Market Size Growing at 9.30% CAGR Set to Reach USD 374.5 Bn by 2034

Agricultural Biotechnology Market size is expected to USD 374.5 Billion by 2034, from USD 153.9 Billion in 2024, growing at a CAGR of 9.30% from 2025 to 2034.

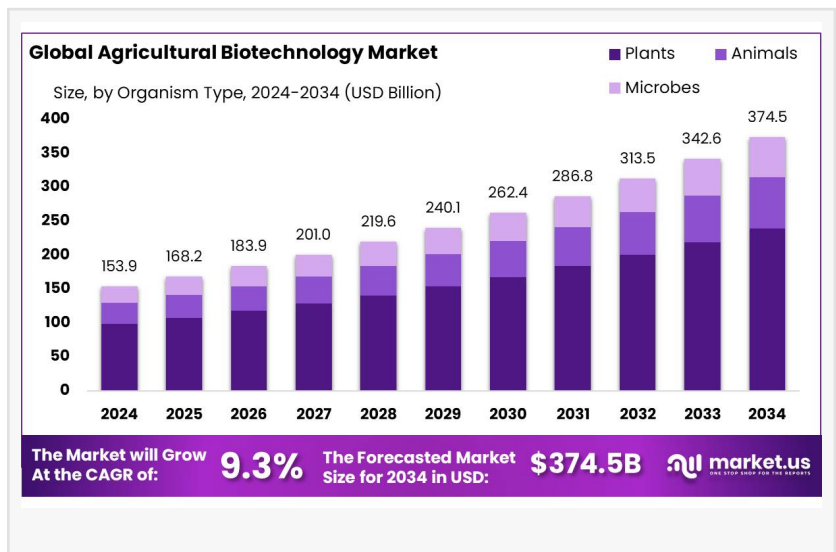
NEW YORK, NY, UNITED STATES, January 22, 2025 /EINPresswire.com/ -- The global [agricultural biotechnology market](#) has been experiencing robust growth, driven by increasing demand for sustainable agricultural practices, higher crop yields, and innovations in genetic engineering. Agricultural

biotechnology encompasses various technologies, including genetically modified (GM) crops, molecular diagnostics, bio-pesticides, and bio-fertilizers, which enhance crop productivity, disease resistance, and environmental sustainability. The market is being propelled by rapid

advancements in genetic modification techniques, genome editing tools such as CRISPR-Cas9, and the rising adoption of precision farming technologies.

Several factors drive the growth of the agricultural biotechnology market, including the rising demand for high-quality, pest-resistant crops, the need for enhanced agricultural productivity to meet global food demand, and the depletion of arable land. The adoption of bio-based agricultural inputs, such as bio-fertilizers and bio-pesticides, has been expanding as consumers and farmers

seek eco-friendly alternatives to conventional chemical-based products. Additionally, advancements in plant genomics, tissue culture, and synthetic biology have enabled the development of crops with enhanced nutritional value, drought resistance, and extended shelf life, further boosting market adoption. Governments worldwide are supporting biotechnology research and development through funding initiatives, subsidies, and favorable policies,



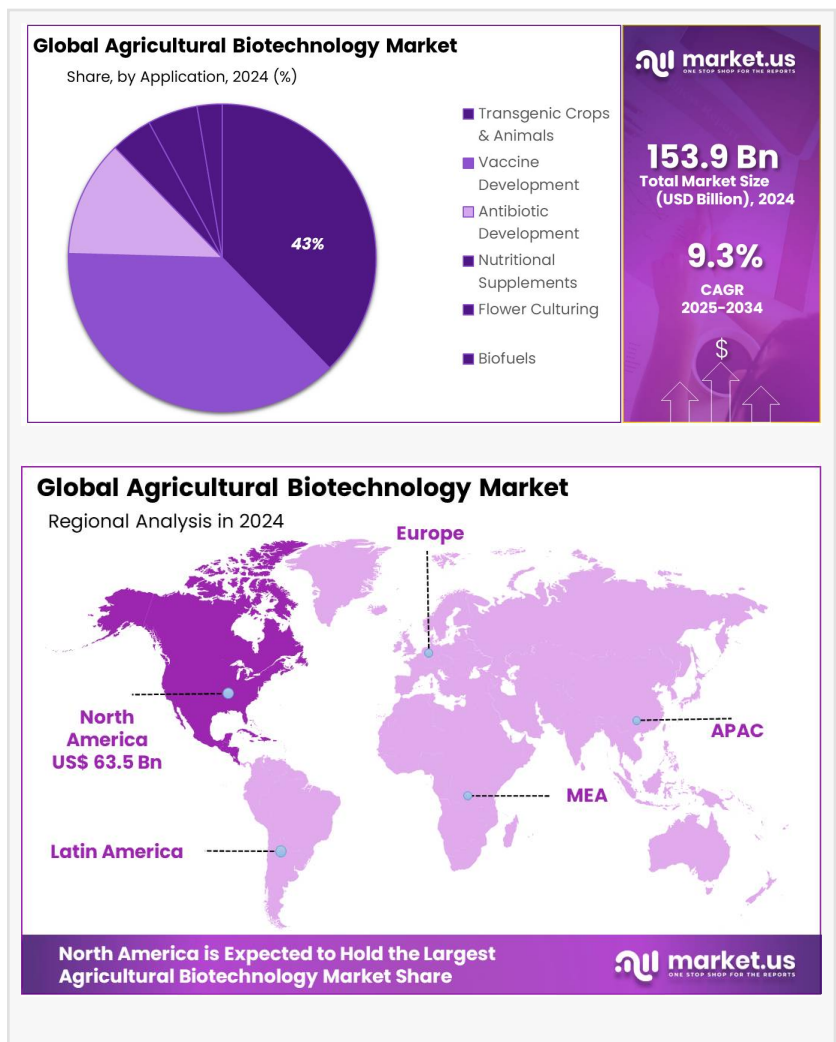
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Tajammul Pangarkar

contributing to the sector's continuous expansion.

The demand for agricultural biotechnology has witnessed significant growth due to the increasing global need for sustainable agricultural practices. The rise in climate variability, unpredictable weather patterns, and soil degradation has escalated the demand for biotech solutions that improve crop resilience and yield. Additionally, the shrinking availability of agricultural land and the need for resource optimization have driven the adoption of genetically engineered seeds that ensure higher productivity with reduced inputs. The demand for bioengineered crops is particularly high in regions where conventional farming faces challenges due to pest infestations, soil infertility, and water scarcity.



The agricultural biotechnology sector has witnessed significant technological advancements, particularly in gene editing, molecular breeding, and RNA interference (RNAi) technology. Breakthroughs in synthetic biology have enabled the creation of bioengineered crops with customized traits, including improved nutritional profiles and enhanced resistance to pests and diseases. The emergence of AI-driven precision agriculture has also facilitated real-time monitoring and genetic modifications to optimize crop production. Companies are increasingly leveraging blockchain technology to ensure transparency in the biotech supply chain, while big data analytics plays a pivotal role in predictive modeling for crop development.

Governments and regulatory bodies worldwide are recognizing the potential of agricultural biotechnology to address these issues. This recognition is reflected in the gradual relaxation of stringent regulations and increased funding and support for biotechnological research and development in agriculture. Additionally, technological advancements and the adoption of genetically modified (GM) crops in emerging economies are further fueling the growth of this market.

The future growth opportunities in the agricultural biotechnology sector are abundant, driven by continual innovations and research breakthroughs. The development of drought and salinity-resistant crops, reduction in the use of chemical pesticides through biopesticides, and the

introduction of more robust plant varieties with enhanced nutritional profiles are expected to offer new market opportunities. Moreover, the integration of information technology and biotechnology, such as precision agriculture and digital farming, presents potential for further market expansion.

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Key Takeaways

- Agricultural Biotechnology Market size is expected to be worth around USD 374.5 Billion by 2034, from USD 153.9 Billion in 2024, growing at a CAGR of 9.30%.
- plants held a dominant market position in the Agricultural Biotechnology Market, capturing more than a 64.40% share.
- Transgenic Crops & Animals held a dominant market position in the Agricultural Biotechnology Market, capturing more than a 43.40% share.
- North America emerging as the dominant player. Capturing a significant 41.30% market share, this region accounted for USD 63.5 billion

Agricultural Biotechnology Top Trends

- Regenerative Agriculture Technologies: Innovative startups are developing technologies that support regenerative agriculture practices, which enhance soil health and carbon sequestration. These technologies include AI-driven platforms that provide detailed agronomic insights and environmental performance metrics, helping to transition farms towards more sustainable practices.
- Advanced Use of Generative AI: Generative AI is set to revolutionize agriculture by transforming vast datasets into actionable insights. This will empower agronomists, farmers, and researchers to optimize productivity and sustainability through more precise data analysis and decision-making tools.
- Precision Agriculture Advancements: The integration of big data, AI, and machine learning continues to drive the precision agriculture trend. These technologies enable site-specific crop management, which optimizes resource use and enhances crop yields while reducing environmental impacts.
- Digital Twins and Synthetic Data: Digital twin technology, which creates virtual replicas of physical systems, is expected to become more prevalent in agriculture. This technology will allow for the virtual testing of agricultural variables like soil types and weather conditions, improving the precision and efficiency of field trials and product development.
- Development of Sustainable Packaging: As the demand for eco-friendly products increases,

agricultural businesses are turning to sustainable packaging solutions. Innovations include biodegradable plastics and plant-based fibers, which help reduce the reliance on single-use plastics and decrease overall environmental impact.

Key Market Segments

Organism Type Analysis

In 2024, plants held a dominant market position in the Agricultural Biotechnology Market, capturing more than a 64.40% share. This substantial segment of the market primarily benefits from advancements in genetic modification techniques that enable increased crop yield and resistance to pests and diseases. Researchers and developers have focused on creating plant varieties that can thrive in less-than-ideal soil conditions and withstand environmental stressors such as drought and frost, which are becoming increasingly prevalent due to climate change. This focus not only supports sustainable agricultural practices but also addresses the growing global food demand.

Application Analysis

In 2024, Transgenic Crops & Animals held a dominant market position in the Agricultural Biotechnology Market, capturing more than a 43.40% share. This segment's strength lies in its ability to introduce new genetic material into plants and animals to enhance traits such as yield, nutritional value, and resistance to pests and diseases. These modifications not only help farmers reduce crop losses but also ensure more efficient use of land and resources.

Key Market Segments List

By Organism Type

- Plants
- Animals
- Microbes

By Application

- Vaccine Development
- Transgenic Crops & Animals
- Antibiotic Development
- Nutritional Supplements
- Flower Culturing
- Biofuels

- Other Applications

Regulations On the Agricultural Biotechnology Market

- **FDA Oversight:** The FDA plays a significant role in regulating both plant and animal biotechnology products. It ensures that foods derived from GMOs meet strict safety standards similar to conventional foods, focusing on the safety of the food rather than the process of genetic modification.
- **USDA Regulations:** The USDA, through its Animal and Plant Health Inspection Service (APHIS), sets regulations to ensure that GMO plants do not harm other plants. This includes overseeing the introduction and testing of new GMO crops to prevent cross-contamination with traditional crops.
- **EPA's Role:** The EPA regulates the environmental safety of biotech products, including biopesticides and plant-incorporated protectants used in GMOs. This ensures that the substances used to protect GMO plants from pests and diseases are safe for the environment.
- **Educational Initiatives:** To increase public understanding of GMOs, initiatives like the FDA's "Feed Your Mind" program provide science-based information about the safety and regulation of GMOs.
- **Ongoing Updates and Public Involvement:** Regulatory agencies continually update guidelines and engage with stakeholders to improve the transparency and efficiency of the regulatory process. This includes public consultations where stakeholders can submit feedback on biotechnology regulations.

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Regional Analysis

In 2024, the North America region emerged as the dominant player in the agricultural biotechnology market, capturing a significant 41.30% market share, valued at approximately USD 63.5 billion. This growth was driven by robust investments in biotechnology research and a favorable regulatory environment, which encourages the development of genetically modified crops and bioengineered solutions. The region's strong infrastructure, coupled with a commitment to agricultural innovation, supports its continued leadership in the market.

Europe also displayed strong growth, with a focus on sustainability and reducing the environmental impact of agriculture. The region's emphasis on eco-friendly farming practices, alongside substantial government funding for agricultural science, has accelerated advancements in crop yield, disease resistance, and sustainable farming techniques. Europe is

investing heavily in sustainable biotech solutions to address climate challenges and improve agricultural productivity.

The Asia Pacific region is experiencing rapid growth, driven by increasing demand for food security and high-quality crop yields. Countries like China and India are at the forefront, making substantial investments in biotechnological research to enhance agricultural productivity and tackle challenges such as pest infestations, climate change, and erratic weather patterns. The Asia Pacific market is projected to expand rapidly due to these continued investments and the increasing adoption of biotech solutions.

In the Middle East & Africa and Latin America, agricultural biotechnology is seeing gradual growth. These regions are focusing on biotech solutions to improve crop resilience and agricultural output, crucial for enhancing economic development and achieving food self-sufficiency. The adoption of modern biotechnological techniques is seen as a critical step towards improving agricultural practices and supporting local economies in these regions.

Key Players Analysis

- BASF SE
- ADAMA Ltd
- Bayer AG
- ChemChina
- Corteva
- Evogene Ltd.
- KWS SAAT SE & Co. KGaA
- Limagrain
- Marrone Bio Innovations
- MITSUI & CO., LTD
- Nufarm
- Performance Plants Inc.
- Valent BioSciences LLC
- Other Key Players

Conclusion

Agricultural biotechnology is set to transform farming by making it more resilient, sustainable, and productive. As we advance, the integration of sophisticated tools like genome editing, synthetic biology, and data analytics will continue to drive significant improvements in crop yields and resilience. This is evident from the substantial investments flowing into the sector, supporting both existing agricultural practices and pioneering new methods that promise to redefine farming.

In regions like North America, the robust infrastructure and supportive governmental policies

continue to facilitate advancements in biotech crops, maintaining its leadership in the global market. Meanwhile, the Asia Pacific region is rapidly emerging as a significant market, driven by increasing food security needs and diverse technological adoption ranging from high-tech practices in countries like Japan to more traditional approaches in regions like India.

Strategic Initiatives

— Product Portfolio Expansion: Companies are investing in R&D to develop advanced formulations that meet regulatory and consumer demands.

— Geographic Expansion: Focus on high-growth regions like Asia-Pacific and the Middle East to capitalize on industrialization trends.

— Sustainability Initiatives: Efforts to align with global sustainability goals and minimize environmental impact.

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