

Plant Genomics Market Size, Share, Trends, Analysis, and Forecast 2025-2034 | Global Industry Growth, Competitive Landscape, Opportunities, and Challenges

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Abstracts

Global Plant Genomics Market is valued at USD 10.5 billion in 2025. Further, the market is expected to grow at a CAGR of 9.4% to reach USD 23.7 billion by 2034.

Plant Genomics Market Overview

The plant genomics market is experiencing rapid growth, driven by increasing research in crop improvement, genetic modification, and sustainable agriculture. Plant genomics involves the study of plant DNA structures, genetic variations, and molecular breeding techniques to enhance crop traits such as yield, disease resistance, and environmental adaptability. With global food security concerns and climate change challenges, scientists and agribusinesses are investing heavily in genomic technologies to develop resilient and high-yielding crops. Advancements in gene sequencing, CRISPR gene editing, and bioinformatics are accelerating breakthroughs in plant breeding and genetic research. Governments and agricultural institutions are supporting genomic research initiatives to reduce reliance on chemical inputs and improve food supply chains. However, ethical concerns, regulatory hurdles, and high costs associated with genomic research and technology implementation continue to shape market dynamics, influencing the speed of adoption in different regions.

In 2024, the plant genomics market is witnessing significant advancements in genome sequencing techniques, genetic trait identification, and AI-driven crop breeding. The cost of sequencing has decreased, enabling researchers to conduct large-scale genomic studies on major food crops such as wheat, rice, and maize. AI and machine

learning algorithms are being integrated into genomic data analysis, enhancing the accuracy and efficiency of plant trait selection for breeding programs. The application of CRISPR gene editing is expanding, with researchers developing genetically enhanced crops that are resistant to extreme weather conditions, pests, and diseases. The demand for non-GMO genome-edited crops is rising, particularly in Europe and North America, where consumer preferences and regulatory frameworks favor minimal genetic modification. Additionally, the growing interest in personalized nutrition and functional foods is driving research into plant-based nutrigenomics, where genomic insights are being used to enhance the nutritional content of crops. Despite these advancements, concerns over intellectual property rights, data privacy in genomic research, and equitable access to genetic resources remain critical areas of discussion among policymakers and industry stakeholders.

Looking ahead to 2025 and beyond, the plant genomics market is expected to witness greater integration of precision agriculture, AI-powered gene discovery, and sustainable crop development. The convergence of genomics with digital farming technologies, such as smart sensors and blockchain-enabled supply chains, will improve traceability and transparency in agricultural practices. Climate-resilient crops engineered through genomics will play a crucial role in addressing food security challenges, particularly in regions vulnerable to extreme weather events. Synthetic biology approaches will gain traction, enabling the creation of designer crops with tailored traits such as enhanced protein content, improved shelf life, and increased bioavailability of nutrients. The commercialization of gene-edited crops will accelerate, provided that regulatory frameworks evolve to distinguish genome editing from traditional GMOs. Additionally, collaborations between agritech firms, research institutions, and biotech startups will drive the rapid scaling of genomic innovations, ensuring that technological advancements reach farmers worldwide. As plant genomics continues to revolutionize agriculture, the market will be shaped by scientific breakthroughs, regulatory shifts, and consumer acceptance of genetically optimized crops.

Key Trends in the Plant Genomics Market

****Expansion of CRISPR and Gene Editing Technologies**:** The growing adoption of CRISPR-based gene editing is enabling precise genetic modifications in crops, improving yield, resistance, and nutritional content.

****Integration of AI and Big Data in Genomic Research**:** AI-powered data analysis is accelerating plant trait identification and breeding strategies, optimizing crop development for climate resilience and efficiency.

****Rise of Non-GMO Genome-Edited Crops**:** Consumer demand for naturally modified, non-GMO crops is increasing, pushing researchers to develop gene-edited plants that maintain regulatory and market acceptance.

****Advancements in High-Throughput Genome Sequencing**:** The declining costs of sequencing technologies are making large-scale genomic studies more feasible, enabling broader applications in crop improvement.

****Development of Functional and Nutrigenomic Crops**:** Research into plant genomics is driving the creation of biofortified crops with enhanced nutritional benefits, supporting personalized nutrition trends and functional food markets.

Market Drivers

****Rising Global Food Demand and Agricultural Sustainability Goals**:** The need for higher-yielding, resilient crops is driving investments in plant genomics to ensure long-term food security.

****Supportive Government Policies and Research Funding**:** Governments and research institutions are increasing investments in genomic research to develop climate-resilient and disease-resistant crops.

****Technological Advancements in Bioinformatics and Synthetic Biology**:** Improved computational tools and genome editing techniques are enhancing the speed and accuracy of genetic research in plants.

****Growing Consumer Preference for Nutritionally Enhanced Crops**:** The demand for healthier, functional foods is pushing research toward genomic innovations that improve the nutritional quality of crops.

Market Challenge

****Regulatory Uncertainty and Ethical Concerns Around Gene Editing**:** Differing regulations on genome editing, intellectual property rights, and ethical considerations are slowing market expansion and commercial adoption in some regions.

Market Segmentation

By Type

Molecular Engineering

Genetic Engineering

Genome Editing

By Trait

Yield Improvement

Disease Resistance

Herbicide Tolerance

By Technology

DNA And RNA Sequencing

Genotyping

Marker-Assisted Selection

MAS

Bioinformatics

By Application

Cereals And Grains

Oilseeds And Pulses

Fruits And Vegetables

By Geography

North America (USA, Canada, Mexico)

Europe (Germany, UK, France, Spain, Italy, Rest of Europe)

Asia-Pacific (China, India, Japan, Australia, Vietnam, Rest of APAC)

The Middle East and Africa (Middle East, Africa)

South and Central America (Brazil, Argentina, Rest of SCA)

What You Receive

Global Plant Genomics market size and growth projections (CAGR), 2024- 2034

Impact of recent changes in geopolitical, economic, and trade policies on the demand and supply chain of Plant Genomics.

Plant Genomics market size, share, and outlook across 5 regions and 27 countries, 2025- 2034.

Plant Genomics market size, CAGR, and Market Share of key products, applications, and end-user verticals, 2025- 2034.

Short and long-term Plant Genomics market trends, drivers, restraints, and opportunities.

Porter's Five Forces analysis, Technological developments in the Plant Genomics market, Plant Genomics supply chain analysis.

Plant Genomics trade analysis, Plant Genomics market price analysis, Plant Genomics Value Chain Analysis.

Profiles of 5 leading companies in the industry- overview, key strategies, financials, and products.

Latest Plant Genomics market news and developments.

The Plant Genomics Market international scenario is well established in the report with separate chapters on North America Plant Genomics Market, Europe Plant Genomics

Market, Asia-Pacific Plant Genomics Market, Middle East and Africa Plant Genomics Market, and South and Central America Plant Genomics Markets. These sections further fragment the regional Plant Genomics market by type, application, end-user, and country.

Who can benefit from this research

The research would help top management/strategy formulators/business/product development/sales managers and investors in this market in the following ways

1. The report provides 2024 Plant Genomics market sales data at the global, regional, and key country levels with a detailed outlook to 2034, allowing companies to calculate their market share and analyze prospects, uncover new markets, and plan market entry strategy.
2. The research includes the Plant Genomics market split into different types and applications. This segmentation helps managers plan their products and budgets based on the future growth rates of each segment
3. The Plant Genomics market study helps stakeholders understand the breadth and stance of the market giving them information on key drivers, restraints, challenges, and growth opportunities of the market and mitigating risks
4. This report would help top management understand competition better with a detailed SWOT analysis and key strategies of their competitors, and plan their position in the business
5. The study assists investors in analyzing Plant Genomics business prospects by region, key countries, and top companies' information to channel their investments.

Available Customizations

The standard syndicate report is designed to serve the common interests of Plant Genomics Market players across the value chain and include selective data and analysis from entire research findings as per the scope and price of the publication.

However, to precisely match the specific research requirements of individual clients, we offer several customization options to include the data and analysis of interest in the final deliverable.

Some of the customization requests are as mentioned below –

Segmentation of choice – Our clients can seek customization to modify/add a market division for types/applications/end-uses/processes of their choice.

Plant Genomics Pricing and Margins Across the Supply Chain, Plant Genomics Price Analysis / International Trade Data / Import-Export Analysis

Supply Chain Analysis, Supply–Demand Gap Analysis, PESTLE Analysis, Macro-Economic Analysis, and other Plant Genomics market analytics

Processing and manufacturing requirements, Patent Analysis, Technology Trends, and Product Innovations

Further, the client can seek customization to break down geographies as per their requirements for specific countries/country groups such as South East Asia, Central Asia, Emerging and Developing Asia, Western Europe, Eastern Europe, Benelux, Emerging and Developing Europe, Nordic countries, North Africa, Sub-Saharan Africa, Caribbean, The Middle East and North Africa (MENA), Gulf Cooperation Council (GCC) or any other.

Capital Requirements, Income Projections, Profit Forecasts, and other parameters to prepare a detailed project report to present to Banks/Investment Agencies.

Customization of up to 10% of the content can be done without any additional charges.

Note: Latest developments will be updated in the report and delivered within 2 to 3 working days.

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