

Global Plant Genomics Market Size, Share, Trends & Analysis by Type (Genetic Engineering, Molecular Engineering, Others), by Trait (Yield Improvement, Herbicide Tolerance, Disease Resistance, Others), by Application (Cereals and Grains, Fruits and Vegetables, Oilseeds and Pulses, Others) and Region, with Forecasts from 2025 to 2034.

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Abstracts

The Global Plant Genomics Market is poised for robust growth from 2025 to 2034, driven by increasing demand for high-yield, stress-tolerant, and disease-resistant crops. Plant genomics supports crop productivity, quality improvement, and food security amid population growth and climate-related challenges. Through precise genetic modifications and molecular breeding, these technologies optimize plant traits for improved yield and resilience. Valued at USD XX.XX billion in 2025, the market is projected to grow at a CAGR of XX.XX%, reaching USD XX.XX billion by 2034.

Definition and Scope of Plant Genomics

Plant genomics refers to the study of genes, gene functions, and interactions within plant genomes. It includes technologies such as genetic engineering, molecular marker-assisted selection, and genome sequencing used to enhance traits including yield, pest resistance, and environmental adaptability. The market covers tools, technologies, and services supporting genomic research and applications across cereals, grains, fruits, vegetables, oilseeds, and pulses.

Market Drivers

Rising Demand for High-Yield and Resilient Crops: Growing global food demand and limited arable land are increasing investments in genomic technologies that improve crop productivity and stress tolerance.

Advancements in Genetic and Molecular Engineering: Improvements in sequencing technologies, CRISPR gene-editing, and marker-assisted selection are accelerating plant genomics adoption in agricultural research.

Climate Change and Environmental Stress: Changing climatic conditions and abiotic stresses, including drought and salinity, are driving demand for genomically enhanced crop varieties.

Government Support and Research Funding: Increased public and private funding for agricultural biotechnology research is supporting the development of genomic tools for food security and sustainable agriculture.

Market Restraints

High Costs of Genomic Research and Implementation: The cost-intensive nature of sequencing, bioinformatics analysis, and genetic modification limits broader adoption, particularly in developing economies.

Regulatory and Ethical Challenges: Stringent genetically modified organism (GMO) regulations and public skepticism toward genetically engineered crops can hinder market expansion.

Complexity in Data Interpretation: Large-scale genomic data require advanced analytical tools and expertise, which can delay practical implementation in crop improvement programs.

Opportunities

Precision Breeding and Smart Agriculture: Integration of plant genomics with AI, big data, and precision agriculture tools can accelerate breeding programs and improve crop management decision-making.

Emergence of Genome Editing Technologies: Increasing acceptance of CRISPR-

Cas9 and other advanced editing techniques creates opportunities for high-performance and climate-resilient crop development.

Expansion in Developing Economies: Growing agricultural sectors in Asia-Pacific, Latin America, and Africa offer new avenues for genomic technology adoption in staple crop enhancement.

Sustainable and Organic Crop Production: Genomic tools supporting sustainable and eco-friendly agricultural practices are expected to gain traction amid demand for non-toxic and high-nutrition food products.

Market Segmentation Analysis

By Type

Genetic Engineering

Molecular Engineering

Others

By Trait

Yield Improvement

Herbicide Tolerance

Disease Resistance

Others

By Application

Cereals and Grains

Fruits and Vegetables

Oilseeds and Pulses

Others

Regional Analysis

North America: Dominates the global market due to advanced research infrastructure, strong agricultural biotechnology funding, and early adoption of genomic tools in crop breeding.

Europe: Witnessing significant growth through government-backed genomic research projects and a focus on sustainable agriculture and non-GMO crop development.

Asia-Pacific: Expected to register the fastest growth, led by China, India, and Japan, which are investing heavily in crop genomics to improve food production and resource efficiency.

Latin America: Expanding agricultural production and rising demand for genetically improved crops in Brazil, Argentina, and Mexico are fueling regional market growth.

Middle East & Africa: Increasing agricultural innovation, food security initiatives, and partnerships with global biotechnology companies are contributing to steady growth in plant genomics applications.

Competitive Landscape

The Global Plant Genomics Market is moderately competitive, with companies focusing on innovation, collaborations, and strategic partnerships to enhance their genomic portfolios. Key players in the market include:

Illumina Inc.

Bayer AG

Corteva Agriscience

Thermo Fisher Scientific Inc.

Eurofins Scientific SE

Agilent Technologies Inc.

QIAGEN N.V.
Syngenta AG
Novogene Co. Ltd.
KeyGene N.V.

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