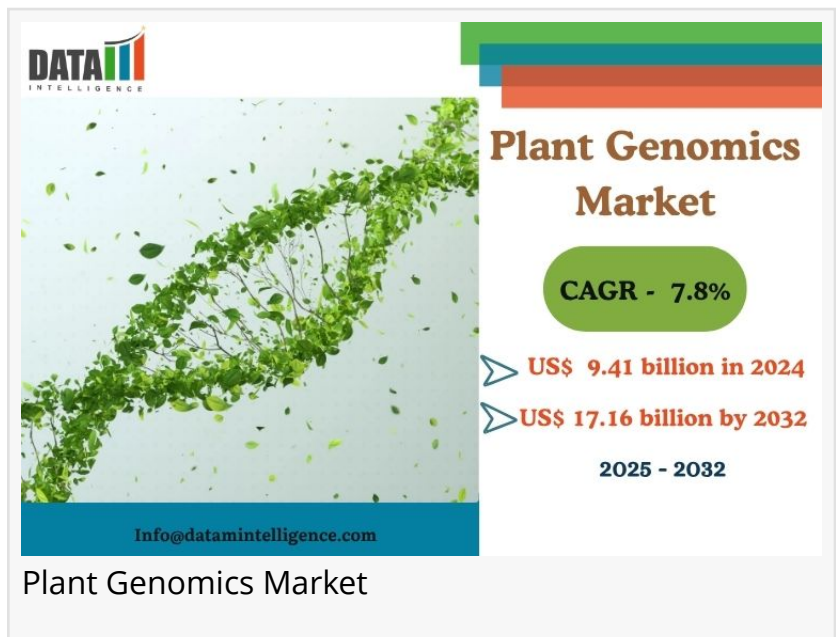


Plant Genomics Market to Hit \$17.16B by 2032, Driven by CRISPR Advances & Sustainable Farming Demand | DataM Intelligence

Gene editing, single-cell omics, and expanded sequencing power the next wave of breakthroughs in plant genomics and sustainable farming.

AUSTIN, TX, UNITED STATES, July 31, 2025 /EINPresswire.com/ -- The [Plant Genomics Market](#) reached USD 9.41 billion in 2024 and is expected to grow to USD 17.16 billion by 2032, registering a CAGR of 7.8% during the forecast period from 2025 to 2032. This impressive growth reflects the increasing role of plant genetics in ensuring food security, enhancing crop resilience, and enabling sustainable agricultural practices across the world.



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Plant genomics is rewriting the future of agriculture where gene edits unlock resilient, high-yield crops that thrive in a changing climate."

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Market Dynamics:

Key Drivers:

1. One of the primary forces propelling the plant genomics market is the rising demand for high-yield and disease-resistant crops. As climate change intensifies and arable land becomes more constrained, genetic innovations are proving critical for enhancing crop productivity and

nutritional value.

The declining cost of next-generation sequencing and the adoption of technologies like CRISPR-Cas9 have accelerated gene discovery and editing in plants. These tools have allowed researchers to develop varieties resistant to pests, drought, salinity, and extreme weather conditions.

2. Government and private sector investments in agricultural biotechnology are also surging. Countries are funding research initiatives focused on molecular breeding, genome mapping, and trait-based crop improvement to tackle growing food demands, especially in rapidly urbanizing regions.

Additionally, public awareness around sustainable farming, reduced pesticide usage, and climate-smart agriculture has created a favorable ecosystem for plant genomics innovation.

Recent technological advancements in plant genomics:

1. Standardization of CRISPR Editing Methods in Plants: Researchers compared seven different methods for detecting and quantifying CRISPR edits across 20 targets, providing guidelines to improve accuracy, sensitivity, and cost-effectiveness in plant genome editing research. This standardization enhances reproducibility and selection of appropriate methods for different uses in plant biology.

2. Expanded Applications of CRISPR-Cas9: Successful genetic transformation and editing have been achieved in diverse plant species such as *Melia volkensii* (a drought-resistant African timber tree), *Platycodon grandiflorum* (medicinal and ornamental), and tomatoes, targeting traits such as compact plant architecture suitable for vertical farming and improved fiber quality for sustainable materials. Novel gene knockouts have revealed roles in growth, stress tolerance, and starch metabolism with implications for crop yield and quality.

3. Telomere-to-Telomere (T2T) Genomics: T2T genome assemblies provide complete and high-quality chromosome-level plant genomes, which delivers an exhaustive genetic map capturing previously elusive information. These advancements allow deeper insight into gene functions, genome structure, and genetic diversity. For example, tobacco genome assemblies have significantly improved, facilitating precision breeding and the creation of pan-genomes. Discovery of Biosynthetic Gene Clusters (BGCs) in Medicinal Plants: Genome mining has revealed clusters controlling specialized metabolite biosynthesis, such as triterpene saponins, alkaloids, and diterpenoids in species like *Aesculus chinensis* and *Salvia officinalis*. These insights help in understanding and enhancing the production of pharmacologically important natural products.

4. Single-Cell and Spatial Omics Technologies: Cutting-edge single-cell RNA sequencing and spatial transcriptomics are revolutionizing our understanding of gene regulation at cellular resolution, especially for specialized metabolites in medicinal plants. This enables reconstruction of biosynthetic pathways with unprecedented precision and opens avenues for genetic engineering production systems.

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Investment and Innovation Outlook:

The plant genomics space is seeing robust inflows of capital from venture funds, agritech firms, and multinational seed companies. Strategic collaborations between agricultural universities, biotech startups, and genomic research centers are fueling breakthroughs in hybrid development, marker-assisted selection, and genome-wide association studies.

Many companies are investing in integrated digital platforms that combine gene editing with data analytics and AI-powered crop modeling. This convergence is expected to redefine breeding strategies, reduce crop development time, and increase success rates.

With precision agriculture becoming mainstream, plant genomics is fast becoming the backbone of future farming systems. From lab to field trials to full-scale cultivation, innovation is accelerating at every stage.

Competitive Landscape:

Agilent Technologies Inc

BGI Genomics

Eurofins Scientific SE

Florogenex Inc.

GENEWIZ Inc.

Illumina Inc.

Keygene N.V.

Neogen Corporation

L.C. Sciences

Novogene Co. Ltd

Market Segmentation:

By Type: Genetic Engineering , Molecular Engineering, Others.

By Trait: Yield Improvement, Disease Resistance, Herbicide Tolerance, Others.

By Application: Cereals/ Grains, Oilseeds/ Pulses, Fruits/ Vegetables, Others.

By Region: North America, Latin America, Europe, Asia Pacific, Middle East, and Africa.

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Latest News - USA: Driving Innovation and Commercialization:

The United States continues to lead the plant genomics industry through a combination of private investment, government support, and academic excellence.

In 2025, several U.S.-based biotech firms announced partnerships to develop climate-resilient soybean and corn varieties using CRISPR-Cas9 and machine learning-based selection tools.

Public research agencies have launched long-term funding programs to promote crop adaptation to extreme weather and to reduce nitrogen dependency in plants.

The USDA has relaxed certain regulatory requirements for gene-edited crops, accelerating commercialization without compromising safety.

Startups across agricultural regions like California, the Midwest, and North Carolina are scaling up greenhouse trials for newly sequenced varieties, aiming for rapid market entry by 2026–2027.

These developments signal a shift from pure research to tangible, market-ready plant innovations that could transform U.S. agriculture in the coming years.

Latest News - Japan: Strategic Policy and Genomic Excellence:

Japan is emerging as a critical player in Asia's plant genomics ecosystem, driven by regulatory openness and academic progress.

The Japanese government recently clarified that gene-edited crops without foreign DNA will be exempt from GMO regulations, clearing a major hurdle for domestic biotech companies.

Leading research institutes have enhanced genome sequencing programs for native crops like rice and barley to improve yield, stress resistance, and nutrient content.

Collaborations between universities and private seed companies are fast-tracking commercial trials for new rice hybrids with higher iron and protein levels.

With a rapidly aging farming population, Japan is investing in genomic solutions to reduce labor dependency and enhance crop reliability.

By combining advanced R&D with favorable policy, Japan is setting itself up as a genomic innovation hub for Asia's food future.

Conclusion:

The plant genomics market is entering a transformative decade, reshaping global agriculture with tools that decode, edit, and enhance life at the genetic level. With powerful technologies and rising global demand for sustainable farming, the market is poised for long-term growth.

Backed by strong government support, expanding research capabilities, and commercial partnerships, regions like the USA and Japan are leading the way. Meanwhile, the rest of the world is catching up, ensuring that the benefits of plant genomics can be leveraged globally to feed future generations.

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