

# Molecular Breeding Market Forecasts to 2030 – Global Analysis By Product Type (Seeds, Aquatic Species, Livestock Genetics, and Other Product Types), Trait Type, Technology, Method, Application, End User and By Geography

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## Abstracts

According to Statistics MRC, the Global Molecular Breeding Market is accounted for \$4.70 billion in 2024 and is expected to reach \$13.42 billion by 2030 growing at a CAGR of 19.1% during the forecast period. Molecular breeding is the process of improving the genetic characteristics of microbes, plants, or animals by applying sophisticated molecular biology techniques. Compared to conventional breeding techniques, it uses technologies like gene editing, genomic selection, and marker-assisted selection (MAS) to more effectively find, modify, and incorporate advantageous genes. In order to overcome agricultural issues, molecular breeding expedites the production of crops and livestock with improved traits like increased yield, disease resistance, drought tolerance, and improved nutritional content.

Market Dynamics:

Driver:

Increasing demand for food security

The growing need for food security is one of the main factors propelling the molecular breeding industry. The demand for increased agricultural resilience and production is become more urgent as the world's population continues to rise, especially in emerging nations. Through molecular breeding, it is possible to create crops and livestock that are more resilient to pests, illnesses, and harsh weather conditions like heat or drought,

which are becoming more common as a result of climate change. Molecular breeding is a vital respond to guarantee a steady, wholesome food supply by enhancing yield, quality, and sustainability, making it indispensable to addressing upcoming issues with food security.

#### Restraint:

##### Lack of skilled workforce

Complex methods like genomic selection, CRISPR gene editing, and next-generation sequencing are used in molecular breeding, and they call for specific expertise in genetics, bioinformatics, and biotechnology. Companies and research institutes are unable to fully utilize the promise of molecular breeding due to a lack of qualified personnel with experience in these cutting-edge technologies. This lack of expertise might hinder the implementation of molecular breeding technologies, raise operating expenses, and postpone research and development activities. In order to close this workforce gap, it will be essential to make investments in training initiatives and academic collaborations as the demand for these technologies increases.

#### Opportunity:

##### Rising adoption of GMOs and gene editing

Gene editing and genetic modification methods like CRISPR/Cas9 provide accurate and effective solutions to the growing demand for increased crop yields, better resistance to pests and diseases. In a fraction of the time needed by conventional breeding techniques, these technologies allow the growth of crops with desired qualities. GMOs and gene-edited crops are becoming increasingly prevalent in agriculture due to increasing regulatory approval. This trend is assisting in addressing issues related to sustainability, climate change resilience, and food security, which is further propelling the development of molecular breeding in agriculture.

#### Threat:

##### Slow adoption in traditional farming practices

Many farmers still use traditional breeding methods because they are familiar with them as well as are less expensive initially, particularly in rural or underdeveloped areas. Even though molecular breeding has many benefits, such as increased yields and

resistance to disease, it frequently necessitates a large investment in infrastructure, skilled labor, and equipment. Farmers may also be cautious of new technology because of ethical concerns about genetically modified organisms (GMOs), regulatory barriers, or doubts about their efficacy. This resistance to molecular breeding hinders its broad use and reduces its ability to solve important issues with agricultural sustainability and food security.

### Covid-19 Impact

The COVID-19 pandemic had a mixed impact on the molecular breeding market. Some molecular breeding efforts were slowed down by the disruption of global supply chains, decreased research funding, and stopped field experiments. Interest in technologies like molecular breeding increased as a result of the pandemic's emphasis on the necessity of resilient agricultural systems and food security. After the epidemic, governments and private businesses realized how crucial it was to increase crop yields and resilience in order to guarantee food stability, which sparked a renewed focus on agricultural advances and investment.

The genomic selection (GS) segment is expected to be the largest during the forecast period

The genomic selection (GS) segment is estimated to be the largest, due to its ability to enhance breeding efficiency and precision. By utilizing genome-wide markers, genomic selection enables faster identification of desirable traits, such as disease resistance and yield improvement, without the need for extensive phenotypic testing. This accelerates the breeding process, reduces costs, and allows for the development of superior crops and livestock. As the demand for high-yielding, resilient, and sustainable agricultural products increases, genomic selection is becoming an essential tool for breeders worldwide.

The research institutes segment is expected to have the highest CAGR during the forecast period

The research institutes segment is anticipated to witness the highest CAGR during the forecast period, due to their contribution to the development of breeding techniques and genetic technologies. Their work accelerates the development of crops and livestock with improved traits, such as higher yield, disease resistance, and climate resilience. By fostering collaboration with governments, private sectors, and academia, these institutes play a crucial role in scaling molecular breeding techniques, addressing food

security challenges, and promoting sustainable agricultural practices globally.

Region with largest share:

Asia Pacific is expected to have the largest market share during the forecast period fuelled by the increasing demand for food security, a large agricultural base, and the need for climate-resilient crops. Countries like China and India are investing heavily in biotechnology and molecular breeding to improve crop yields, disease resistance, and drought tolerance. Additionally, rising awareness of sustainable farming practices, government support, and growing adoption of genetically modified and gene-edited crops are further accelerating the market's growth in this region.

Region with highest CAGR:

During the forecast period, the North America region is anticipated to register the highest CAGR, owing to the region's advanced research infrastructure, high adoption of biotechnology, and strong government support for agricultural innovation. The U.S. and Canada are leading the development of genetically modified crops, utilizing molecular breeding techniques to enhance crop yields, pest resistance, and climate adaptability. Additionally, increasing demand for sustainable farming practices and the need for food security are encouraging investments in molecular breeding, making North America a key hub for innovation in agriculture.

Key players in the market

Some of the key players profiled in the Molecular Breeding Market include Kaltura, Inc., Syngenta AG, DuPont de Nemours, Inc., Corteva Agriscience, BASF SE, Limagrain, KWS SAAT SE & Co. KGaA, Bayer CropScience, Inari Agriculture, Evogene Ltd., Genezen Laboratories, Ceres, Inc., Bioceres Crop Solutions, Phytocontrol, Vilmorin & Cie, AgBiome, Inc., Zymergen, and Plant Health Care Plc.

Key Developments:

In September 2023, Corteva Agriscience introduced a new insect-resistant trait in corn, leveraging molecular breeding technologies to improve the resistance of corn against major pests.

In May 2023, Syngenta announced the launch of a soybean variety developed through molecular breeding techniques for enhanced tolerance to drought and extreme

temperatures. The new variety is designed to help farmers in regions affected by climate change, ensuring better productivity under stress conditions.

In February 2023, Bayer CropScience launched a new seed applied technology for wheat that integrates molecular breeding techniques to improve disease resistance and overall plant health. The technology aims to address the challenges of wheat rusts and other fungal diseases, thus increasing yields for wheat farmers.

#### Product Types Covered:

Seeds

Aquatic Species

Livestock Genetics

Other Product Types

#### Trait Types Covered:

Yield Improvement

Abiotic Stress Tolerance

Quality Traits

Biotic Stress Resistance

#### Technologies Covered:

Genomic Selection (GS)

CRISPR/Cas9

Marker-Assisted Selection (MAS)

Next-Generation Sequencing (NGS)

Single Nucleotide Polymorphism (SNP) Genotyping

Quantitative Trait Loci (QTL) Mapping

DNA Barcoding

Methods Covered:

Conventional Breeding Techniques

Biotechnology-Assisted Breeding

Hybrid Breeding Techniques

Applications Covered:

Crop Breeding

Aquaculture Breeding

Livestock Breeding

Horticultural Breeding

Other Applications

End Users Covered:

Research Institutes

Agricultural Biotechnology Companies

Veterinary and Animal Genetics Firms

Farmers/Commercial Growers

Aquaculture Farms

Other End Users

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends

- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

#### Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

##### Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

##### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

##### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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