

# Gene-Edited Seeds Market Forecasts to 2032 – Global Analysis By Crop Type (Cereals & Grains, Oilseeds & Pulses, Fruits & Vegetables and Other Crop Types), Trait, Mode of Deployment, Technology, End User and By Geography

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## Abstracts

According to Statistics MRC, the Global Gene-Edited Seeds Market is accounted for \$3.3 billion in 2025 and is expected to reach \$11.2 billion by 2032 growing at a CAGR of 19% during the forecast period. Gene-edited seeds are plant seeds whose DNA has been precisely modified using advanced genome-editing tools such as CRISPR-Cas9, TALENs, or zinc-finger nucleases. Unlike traditional genetically modified organisms (GMOs), gene editing does not necessarily introduce foreign genes; instead, it makes targeted changes—such as deleting, inserting, or altering specific DNA sequences—to improve traits already present in the plant. These edits can enhance yield, disease resistance, drought tolerance, nutrient content, and overall crop performance. Gene-edited seeds enable faster, more accurate crop improvement, offering farmers sustainable, resilient, and high-quality planting options without the long development timelines of conventional breeding.

### Market Dynamics:

Driver:

Rising demand for high-yield crops

Farmers and agribusinesses are increasingly adopting gene-editing technologies to enhance productivity and meet global food requirements. CRISPR and other advanced tools enable precise modifications that improve nutrient efficiency, pest resistance, and

yield potential. Growing population pressures and shrinking arable land are amplifying the need for high-output crop varieties. Governments and research institutions are supporting innovation to strengthen food security, reinforcing adoption of gene-edited seeds. As a result, rising demand for high-yield crops is emerging as a primary driver of market growth.

#### Restraint:

##### Stringent approval and bio-safety regulations

Gene-edited seeds must undergo rigorous testing and compliance checks before commercialization, slowing time-to-market. Regulatory frameworks vary across regions, creating complexity for global seed companies. Public concerns about genetic modification and ecological risks further intensify scrutiny. These challenges discourage smaller firms from entering the market due to high compliance costs. Consequently, stringent regulations remain a significant restraint to widespread market penetration.

#### Opportunity:

##### Need for climate-resilient crop varieties

Gene-editing technologies enable the development of seeds that withstand drought, heat, and salinity stress. Rising climate variability and extreme weather events are driving demand for resilient crops to ensure stable yields. Farmers benefit from reduced losses and improved adaptability, reinforcing adoption of gene-edited solutions. Advances in biotechnology are accelerating innovation in climate-resilient traits, strengthening commercialization pipelines. Governments and NGOs are promoting resilient agriculture to safeguard food systems against climate risks.

#### Threat:

##### Limited awareness among small-scale farmers

Many farmers remain unfamiliar with the benefits and applications of gene-editing technologies, slowing adoption in fragmented agricultural systems. Lack of access to training and extension services further exacerbates this challenge. High complexity and perceived risks discourage smallholders from experimenting with advanced seed varieties. Limited awareness also restricts demand in emerging economies where traditional practices dominate. Consequently, limited awareness among small-scale

farmers continues to act as a critical threat to market growth.

### **Covid-19 Impact:**

The COVID-19 pandemic had a mixed impact on the Gene-Edited Seeds market. Supply chain disruptions delayed research projects and restricted access to seed inputs, slowing adoption in several regions. Farmers faced financial uncertainty, reducing investment in advanced seed technologies during the crisis. However, the pandemic highlighted the importance of resilient and high-yield crops, driving renewed interest in gene-editing. Remote collaboration and digital platforms supported ongoing research and commercialization despite restrictions. Governments emphasized food security, accelerating funding for innovative agricultural technologies.

The cereals & grains segment is expected to be the largest during the forecast period

The cereals & grains segment is expected to account for the largest market share during the forecast period driven by global reliance on staple crops such as wheat, rice, and corn. Gene-editing technologies enhance yield potential and resilience in these essential crops, reinforcing demand. Farmers benefit from improved nutrient efficiency and reduced losses, strengthening adoption of gene-edited cereals and grains. The segment's dominance is further supported by strong investment from biotech firms and seed companies. Rising population growth and food demand amplify the importance of cereals and grains in global agriculture. Governments are promoting innovation in staple crops to ensure food security.

The agricultural cooperatives segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the agricultural cooperatives segment is predicted to witness the highest growth rate due to its role in driving collective adoption of advanced seeds. Cooperatives provide shared resources, training, and financial support, enabling small-scale farmers to access gene-edited technologies. Rising awareness of sustainable farming practices is accelerating adoption through cooperative networks. Governments and NGOs are increasingly partnering with cooperatives to promote resilient and high-yield crops. The segment benefits from scalability and collective bargaining power, strengthening its growth trajectory.

### **Region with largest share:**

During the forecast period, the Asia Pacific region is expected to hold the largest market share driven by rising demand for high-yield crops. Countries such as China, India, and Japan are increasingly adopting gene-edited seeds to strengthen food security. Expanding populations and growing food demand reinforce adoption of advanced seed technologies. Farmers in the region are becoming more aware of the benefits of resilient and high-output crops. Strong presence of biotech firms and research institutions further strengthens regional leadership.

### **Region with highest CAGR:**

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR by strong investment in biotechnology and rising need for climate-resilient crops. Farmers in the United States and Canada are leveraging gene-editing technologies to enhance productivity and sustainability. The presence of leading biotech firms and seed companies accelerates commercialization of advanced traits. Rising awareness of sustainable agriculture solutions further strengthens demand. Investment in research institutions and collaborations reinforces innovation pipelines.

### **Key players in the market**

Some of the key players in Gene-Edited Seeds Market include Bayer AG, Corteva Agriscience, Syngenta Group, BASF SE, KWS Saat SE, Sakata Seed Corporation, Rijk Zwaan, Bejo Zaden, Ginkgo Bioworks, Benson Hill, Evogene, Tropic Biosciences, GreenLight Biosciences, Pairwise and Inari Agriculture.

### **Key Developments:**

In February 2024, Bayer's Crop Science Division entered a strategic collaboration with Kimmeridge, a life sciences discovery company, to discover and develop novel gene-editing elements for agricultural applications. This partnership aims to leverage Kimmeridge's discovery platform to identify new CRISPR-associated nucleases and other editing tools, potentially accelerating the development of next-generation, precision-bred crops with enhanced traits like disease resistance and yield.

In September 2023, Corteva announced a multi-year licensing agreement with MS Technologies, granting access to Corteva's proprietary precision breeding, gene-editing technologies, and enabling traits. This collaboration aims to accelerate the development of higher-yielding and more sustainable soybean varieties, combining MS Technologies' germplasm with Corteva's advanced R&D capabilities to bring improved products to

farmers faster.

#### Crop Types Covered:

Cereals & Grains

Oilseeds & Pulses

Fruits & Vegetables

Greenhouse & Hydroponic Crops

Other Crop Types

#### Traits Covered:

Shelf-Life Extension

Heat & Salinity Tolerance

Nitrogen Use Efficiency

Carbon Sequestration & Climate Traits

Other Traits

#### Mode of Deployments Covered:

Soil Microbial Application

Foliar Trait Expression Systems

In-Field Sprayable RNA Solutions

Tissue Culture–Based Crop Improvement

Other Mode of Deployments

**Technologies Covered:**

RNA-Based Trait Modulation

Synthetic Biology Platforms

Microbial Trait Delivery

Other Technologies

**End Users Covered:**

Large-Scale Commercial Farms

Medium Farms

Smallholder Farms

Agricultural Cooperatives

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 2024, 2025, 2026, 2028, and 2032
- 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

## Contents

### **1 EXECUTIVE SUMMARY**

### **2 PREFACE**

- 2.1 Abstract
- 2.2 Stake Holders
- 2.3 Research Scope
- 2.4 Research Methodology
  - 2.4.1 Data Mining
  - 2.4.2 Data Analysis
  - 2.4.3 Data Validation
  - 2.4.4 Research Approach
- 2.5 Research Sources
  - 2.5.1 Primary Research Sources
  - 2.5.2 Secondary Research Sources
  - 2.5.3 Assumptions

### **3 MARKET TREND ANALYSIS**

- 3.1 Introduction
- 3.2 Drivers
- 3.3 Restraints
- 3.4 Opportunities
- 3.5 Threats
- 3.6 Technology Analysis
- 3.7 End User Analysis
- 3.8 Emerging Markets
- 3.9 Impact of Covid-19

### **4 PORTERS FIVE FORCE ANALYSIS**

- 4.1 Bargaining power of suppliers
- 4.2 Bargaining power of buyers
- 4.3 Threat of substitutes
- 4.4 Threat of new entrants
- 4.5 Competitive rivalry

## **5 GLOBAL GENE-EDITED SEEDS MARKET, BY CROP TYPE**

- 5.1 Introduction
- 5.2 Cereals & Grains
- 5.3 Oilseeds & Pulses
- 5.4 Fruits & Vegetables
- 5.5 Greenhouse & Hydroponic Crops
- 5.6 Other Crop Types

## **6 GLOBAL GENE-EDITED SEEDS MARKET, BY TRAIT**

- 6.1 Introduction
- 6.2 Shelf-Life Extension
- 6.3 Heat & Salinity Tolerance
- 6.4 Nitrogen Use Efficiency
- 6.5 Carbon Sequestration & Climate Traits
- 6.6 Other Traits

## **7 GLOBAL GENE-EDITED SEEDS MARKET, BY MODE OF DEPLOYMENT**

- 7.1 Introduction
- 7.2 Soil Microbial Application
- 7.3 Foliar Trait Expression Systems
- 7.4 In-Field Sprayable RNA Solutions
- 7.5 Tissue Culture–Based Crop Improvement
- 7.6 Other Mode of Deployments

## **8 GLOBAL GENE-EDITED SEEDS MARKET, BY TECHNOLOGY**

- 8.1 Introduction
- 8.2 RNA-Based Trait Modulation
- 8.3 Synthetic Biology Platforms
- 8.4 Microbial Trait Delivery
- 8.5 Other Technologies

## **9 GLOBAL GENE-EDITED SEEDS MARKET, BY END USER**

- 9.1 Introduction
- 9.2 Large-Scale Commercial Farms

- 9.3 Medium Farms
- 9.4 Smallholder Farms
- 9.5 Agricultural Cooperatives
- 9.6 Other End Users

## **10 GLOBAL GENE-EDITED SEEDS MARKET, BY GEOGRAPHY**

- 10.1 Introduction
- 10.2 North America
  - 10.2.1 US
  - 10.2.2 Canada
  - 10.2.3 Mexico
- 10.3 Europe
  - 10.3.1 Germany
  - 10.3.2 UK
  - 10.3.3 Italy
  - 10.3.4 France
  - 10.3.5 Spain
  - 10.3.6 Rest of Europe
- 10.4 Asia Pacific
  - 10.4.1 Japan
  - 10.4.2 China
  - 10.4.3 India
  - 10.4.4 Australia
  - 10.4.5 New Zealand
  - 10.4.6 South Korea
  - 10.4.7 Rest of Asia Pacific
- 10.5 South America
  - 10.5.1 Argentina
  - 10.5.2 Brazil
  - 10.5.3 Chile
  - 10.5.4 Rest of South America
- 10.6 Middle East & Africa
  - 10.6.1 Saudi Arabia
  - 10.6.2 UAE
  - 10.6.3 Qatar
  - 10.6.4 South Africa
  - 10.6.5 Rest of Middle East & Africa

## **11 KEY DEVELOPMENTS**

- 11.1 Agreements, Partnerships, Collaborations and Joint Ventures
- 11.2 Acquisitions & Mergers
- 11.3 New Product Launch
- 11.4 Expansions
- 11.5 Other Key Strategies

## **12 COMPANY PROFILING**

- 12.1 Bayer AG
- 12.2 Corteva Agriscience
- 12.3 Syngenta Group
- 12.4 BASF SE
- 12.5 KWS Saat SE
- 12.6 Sakata Seed Corporation
- 12.7 Rijk Zwaan
- 12.8 Bejo Zaden
- 12.9 Ginkgo Bioworks
- 12.10 Benson Hill
- 12.11 Evogene
- 12.12 Tropic Biosciences
- 12.13 GreenLight Biosciences
- 12.14 Pairwise
- 12.15 Inari Agriculture

## List Of Tables

### LIST OF TABLES

Table 1 Global Gene-Edited Seeds Market Outlook, By Region (2024-2032) (\$MN)

Table 2 Global Gene-Edited Seeds Market Outlook, By Crop Type (2024-2032) (\$MN)

Table 3 Global Gene-Edited Seeds Market Outlook, By Cereals & Grains (2024-2032) (\$MN)

Table 4 Global Gene-Edited Seeds Market Outlook, By Oilseeds & Pulses (2024-2032) (\$MN)

Table 5 Global Gene-Edited Seeds Market Outlook, By Fruits & Vegetables (2024-2032) (\$MN)

Table 6 Global Gene-Edited Seeds Market Outlook, By Greenhouse & Hydroponic Crops (2024-2032) (\$MN)

Table 7 Global Gene-Edited Seeds Market Outlook, By Other Crop Types (2024-2032) (\$MN)

Table 8 Global Gene-Edited Seeds Market Outlook, By Trait (2024-2032) (\$MN)

Table 9 Global Gene-Edited Seeds Market Outlook, By Shelf-Life Extension (2024-2032) (\$MN)

Table 10 Global Gene-Edited Seeds Market Outlook, By Heat & Salinity Tolerance (2024-2032) (\$MN)

Table 11 Global Gene-Edited Seeds Market Outlook, By Nitrogen Use Efficiency (2024-2032) (\$MN)

Table 12 Global Gene-Edited Seeds Market Outlook, By Carbon Sequestration & Climate Traits (2024-2032) (\$MN)

Table 13 Global Gene-Edited Seeds Market Outlook, By Other Traits (2024-2032) (\$MN)

Table 14 Global Gene-Edited Seeds Market Outlook, By Mode of Deployment (2024-2032) (\$MN)

Table 15 Global Gene-Edited Seeds Market Outlook, By Soil Microbial Application (2024-2032) (\$MN)

Table 16 Global Gene-Edited Seeds Market Outlook, By Foliar Trait Expression Systems (2024-2032) (\$MN)

Table 17 Global Gene-Edited Seeds Market Outlook, By In-Field Sprayable RNA Solutions (2024-2032) (\$MN)

Table 18 Global Gene-Edited Seeds Market Outlook, By Tissue Culture–Based Crop Improvement (2024-2032) (\$MN)

Table 19 Global Gene-Edited Seeds Market Outlook, By Other Mode of Deployments (2024-2032) (\$MN)

Table 20 Global Gene-Edited Seeds Market Outlook, By Technology (2024-2032) (\$MN)

Table 21 Global Gene-Edited Seeds Market Outlook, By RNA-Based Trait Modulation (2024-2032) (\$MN)

Table 22 Global Gene-Edited Seeds Market Outlook, By Synthetic Biology Platforms (2024-2032) (\$MN)

Table 23 Global Gene-Edited Seeds Market Outlook, By Microbial Trait Delivery (2024-2032) (\$MN)

Table 24 Global Gene-Edited Seeds Market Outlook, By Other Technologies (2024-2032) (\$MN)

Table 25 Global Gene-Edited Seeds Market Outlook, By End User (2024-2032) (\$MN)

Table 26 Global Gene-Edited Seeds Market Outlook, By Large-Scale Commercial Farms (2024-2032) (\$MN)

Table 27 Global Gene-Edited Seeds Market Outlook, By Medium Farms (2024-2032) (\$MN)

Table 28 Global Gene-Edited Seeds Market Outlook, By Smallholder Farms (2024-2032) (\$MN)

Table 29 Global Gene-Edited Seeds Market Outlook, By Agricultural Cooperatives (2024-2032) (\$MN)

Table 30 Global Gene-Edited Seeds Market Outlook, By Other End Users (2024-2032) (\$MN)

Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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