

RNA Interference Crop Protection Market Forecasts to 2034 – Global Analysis By RNAi Type (Exogenous RNA, Small Interfering RNA, Double-Stranded RNA, Hairpin RNA, Host-Induced Gene Silencing and Other RNAi Types), Delivery Method, Target Pest, Crop Type, Development Stage, and Geography

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Abstracts

According to Statistics MRC, the Global RNA Interference Crop Protection Market is accounted for \$0.3 billion in 2026 and is expected to reach \$2.1 billion by 2034 growing at a CAGR of 27.6% during the forecast period. RNA Interference Crop Protection encompasses agricultural technologies that use RNA molecules to selectively suppress specific genes in crop pests or pathogens, reducing their ability to damage plants. The approach can target insects, fungi, viruses, or other biological threats through gene-specific mechanisms. RNA-based products may be delivered through foliar applications, plant uptake, seed treatments, or genetically engineered crops. Their high target specificity can support pest management while potentially reducing effects on beneficial organisms and lowering dependence on broad-spectrum pesticides. Applications include insect control, disease management, and protection of high-value crops. Growing demand for precise and sustainable crop protection is supporting development. Advances in RNA formulation, delivery systems, molecular biology, and field stability are improving the commercial potential of RNA-based agricultural solutions.

Market Dynamics

Driver:

Growing demand for sustainable crop protection

Increasing demand for sustainable, targeted crop protection solutions is driving adoption of RNA interference technologies that offer species-specific pest control. Growing regulatory restrictions on conventional pesticides support market expansion. Rising pest resistance to chemical pesticides drives adoption of novel modes of action. Advances in RNAi delivery and formulation enhance product efficacy. Sustainable agriculture is becoming mainstream across global farming systems.

Restraint:

Regulatory uncertainty and high development costs

Regulatory uncertainty for RNAi-based crop protection products and high development costs present barriers to market growth. Limited public acceptance of RNAi technology may affect adoption in certain regions. Technical challenges in RNAi delivery and stability constrain product development. High costs of RNAi production may limit commercial viability. Regulatory frameworks for RNAi products vary significantly across regions.

Opportunity:

Innovation in delivery and formulation technologies

Innovation in RNAi delivery and formulation technologies presents significant growth opportunities. Development of cost-effective production methods is improving commercial viability. Growing investment in RNAi research accelerates product development. Partnerships between RNAi companies and agricultural companies expand market reach. Technology advances continue improving product efficacy and stability.

Threat:

Competition from conventional and biological pesticides

Competition from conventional pesticides and other biological crop protection products may limit RNAi adoption. Economic pressures may affect farmer willingness to adopt premium technologies. Regulatory changes affecting RNAi approval may impact market development. Consumer skepticism regarding RNAi technology may affect adoption. Rapid growth of RNAi attracts new entrants and intensifies competition.

Covid-19 Impact:

The COVID-19 pandemic highlighted the importance of resilient and sustainable food

systems, accelerating interest in RNAi crop protection. Supply chain disruptions affecting conventional pesticide availability increased interest in alternative products. The post-pandemic period has witnessed sustained investment in RNAi research and development. Food system transformation continues driving innovation. Consumer awareness of sustainable crop protection continues growing.

The small interfering RNA segment is expected to be the largest during the forecast period

The small interfering RNA segment is expected to account for the largest market share during the forecast period as siRNA offers highly specific gene silencing for targeted pest control. Growing demand for species-specific crop protection drives market expansion. Advances in siRNA design and delivery improve efficacy. Established research and development support segment leadership. siRNA is the most widely used RNAi type for crop protection.

The foliar spray segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the foliar spray segment is predicted to witness the highest growth rate driven by ease of application and compatibility with existing spraying equipment. Growing farmer preference for familiar application methods supports market expansion. Advances in foliar RNAi formulations improve stability and uptake. Consumer demand for convenient delivery methods continues growing. Foliar spray is a key focus area for RNAi product development.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share owing to advanced agricultural technology adoption, strong research infrastructure, and supportive regulatory environment. The United States hosts major RNAi companies with established research and development capabilities. High farmer awareness of sustainable practices reinforces regional market leadership. Growing investment in agricultural biotechnology drives adoption across the region.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest

CAGR driven by large agricultural area, growing pest resistance concerns, and increasing adoption of sustainable crop protection. China, India, and Australia are expanding RNAi crop protection capabilities. Growing food security concerns accelerate market growth. Government support for agricultural innovation creates favorable market environment.

Key players in the market

Some of the key players in the RNA Interference Crop Protection Market include Alnylam Pharmaceuticals, Inc., Bayer AG, BASF SE, Syngenta Group, Corteva, Inc., Bioceres Crop Solutions Corp., AgroSpheres, Inc., GreenLight Biosciences, Precision BioSciences, Inc., Protix B.V., Pairwise, Bioceres Crop Solutions, Provivi, Inc., AgBiome and AgroSpheres.

Key Developments:

In February 2026, Corteva, Inc. announced the commercial launch of an RNAi-based seed treatment targeting soil-dwelling insect pests in corn. The product represented one of the first commercially available RNAi crop protection solutions.

In September 2025, Syngenta Group announced a significant breakthrough in RNAi delivery technology enabling enhanced stability and uptake through foliar applications. The innovation was expected to accelerate product development timelines.

In December 2024, Bayer AG launched a research collaboration with leading agricultural universities to develop next-generation RNAi formulations for fungal disease control in cereals. The partnership aimed to accelerate commercialization of RNAi technology.

RNAi Types Covered:

Exogenous RNA

Small Interfering RNA

Double-Stranded RNA

Hairpin RNA

Host-Induced Gene Silencing

Other RNAi Types

Delivery Methods Covered:

Foliar Spray

Root Application

Seed Treatment

Soil Application

Trunk Injection

Other Delivery Methods

Target Pests Covered:

Insect Pests

Fungal Pathogens

Viral Pathogens

Nematodes

Weeds

Other Target Pests

Crop Types Covered:

Cereals & Grains

Fruits & Vegetables

Oilseeds & Pulses

Cash Crops

Plantation Crops

Other Crop Types

Development Stages Covered:

Research Stage

Laboratory Validation

Greenhouse Trials

Field Trials

Commercial Products

Other Development Stages

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of 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 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

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

- 1.1 Market Snapshot and Key Highlights
- 1.2 Growth Drivers, Challenges, and Opportunities
- 1.3 Competitive Landscape Overview
- 1.4 Strategic Insights and Recommendations

2 RESEARCH FRAMEWORK

- 2.1 Study Objectives and Scope
- 2.2 Stakeholder Analysis
- 2.3 Research Assumptions and Limitations
- 2.4 Research Methodology
 - 2.4.1 Data Collection (Primary and Secondary)
 - 2.4.2 Data Modeling and Estimation Techniques
 - 2.4.3 Data Validation and Triangulation
 - 2.4.4 Analytical and Forecasting Approach

3 MARKET DYNAMICS AND TREND ANALYSIS

- 3.1 Market Definition and Structure
- 3.2 Key Market Drivers
- 3.3 Market Restraints and Challenges
- 3.4 Growth Opportunities and Investment Hotspots
- 3.5 Industry Threats and Risk Assessment
- 3.6 Technology and Innovation Landscape
- 3.7 Emerging and High-Growth Markets
- 3.8 Regulatory and Policy Environment
- 3.9 Impact of COVID-19 and Recovery Outlook

4 COMPETITIVE AND STRATEGIC ASSESSMENT

- 4.1 Porter's Five Forces Analysis
 - 4.1.1 Supplier Bargaining Power
 - 4.1.2 Buyer Bargaining Power
 - 4.1.3 Threat of Substitutes
 - 4.1.4 Threat of New Entrants

- 4.1.5 Competitive Rivalry
- 4.2 Market Share Analysis of Key Players
- 4.3 Product Benchmarking and Performance Comparison

5 GLOBAL RNA INTERFERENCE CROP PROTECTION MARKET, BY RNAI TYPE

- 5.1 Exogenous RNA
- 5.2 Small Interfering RNA
- 5.3 Double-Stranded RNA
- 5.4 Hairpin RNA
- 5.5 Host-Induced Gene Silencing
- 5.6 Other RNAi Types

6 GLOBAL RNA INTERFERENCE CROP PROTECTION MARKET, BY DELIVERY METHOD

- 6.1 Foliar Spray
- 6.2 Root Application
- 6.3 Seed Treatment
- 6.4 Soil Application
- 6.5 Trunk Injection
- 6.6 Other Delivery Methods

7 GLOBAL RNA INTERFERENCE CROP PROTECTION MARKET, BY TARGET PEST

- 7.1 Insect Pests
- 7.2 Fungal Pathogens
- 7.3 Viral Pathogens
- 7.4 Nematodes
- 7.5 Weeds
- 7.6 Other Target Pests

8 GLOBAL RNA INTERFERENCE CROP PROTECTION MARKET, BY CROP TYPE

- 8.1 Cereals & Grains
- 8.2 Fruits & Vegetables
- 8.3 Oilseeds & Pulses
- 8.4 Cash Crops

8.5 Plantation Crops

8.6 Other Crop Types

9 GLOBAL RNA INTERFERENCE CROP PROTECTION MARKET, BY DEVELOPMENT STAGE

9.1 Research Stage

9.2 Laboratory Validation

9.3 Greenhouse Trials

9.4 Field Trials

9.5 Commercial Products

9.6 Other Development Stages

10 GLOBAL RNA INTERFERENCE CROP PROTECTION MARKET, BY GEOGRAPHY

10.1 North America

10.1.1 United States

10.1.2 Canada

10.1.3 Mexico

10.2 Europe

10.2.1 United Kingdom

10.2.2 Germany

10.2.3 France

10.2.4 Italy

10.2.5 Spain

10.2.6 Netherlands

10.2.7 Belgium

10.2.8 Sweden

10.2.9 Switzerland

10.2.10 Poland

10.2.11 Rest of Europe

10.3 Asia Pacific

10.3.1 China

10.3.2 Japan

10.3.3 India

10.3.4 South Korea

10.3.5 Australia

10.3.6 Indonesia

- 10.3.7 Thailand
- 10.3.8 Malaysia
- 10.3.9 Singapore
- 10.3.10 Vietnam
- 10.3.11 Rest of Asia Pacific
- 10.4 South America
 - 10.4.1 Brazil
 - 10.4.2 Argentina
 - 10.4.3 Colombia
 - 10.4.4 Chile
 - 10.4.5 Peru
 - 10.4.6 Rest of South America
- 10.5 Rest of the World (RoW)
 - 10.5.1 Middle East
 - 10.5.1.1 Saudi Arabia
 - 10.5.1.2 United Arab Emirates
 - 10.5.1.3 Qatar
 - 10.5.1.4 Israel
 - 10.5.1.5 Rest of Middle East
 - 10.5.2 Africa
 - 10.5.2.1 South Africa
 - 10.5.2.2 Egypt
 - 10.5.2.3 Morocco
 - 10.5.2.4 Rest of Africa

11 STRATEGIC MARKET INTELLIGENCE

- 11.1 Industry Value Network and Supply Chain Assessment
- 11.2 White-Space and Opportunity Mapping
- 11.3 Product Evolution and Market Life Cycle Analysis
- 11.4 Channel, Distributor, and Go-to-Market Assessment

12 INDUSTRY DEVELOPMENTS AND STRATEGIC INITIATIVES

- 12.1 Mergers and Acquisitions
- 12.2 Partnerships, Alliances, and Joint Ventures
- 12.3 New Product Launches and Certifications
- 12.4 Capacity Expansion and Investments
- 12.5 Other Strategic Initiatives

13 COMPANY PROFILES

13.1 Alnylam Pharmaceuticals, Inc.

13.2 Bayer AG

13.3 BASF SE

13.4 Syngenta Group

13.5 Corteva, Inc.

13.6 Bioceres Crop Solutions Corp.

13.7 AgroSpheres, Inc.

13.8 GreenLight Biosciences

13.9 Precision BioSciences, Inc.

13.10 Protix B.V.

13.11 Pairwise

13.12 Bioceres Crop Solutions

13.13 Provivi, Inc.

13.14 AgBiome

13.15 AgroSpheres

List of Tables

Table 1 Global RNA Interference Crop Protection Market Outlook, By Region
(2023-2034) (\$MN)

Table 2 Global RNA Interference Crop Protection Market, By RNAi Type (2023–2034)
(\$MN)

Table 3 Global RNA Interference Crop Protection Market, By Exogenous RNA
(2023–2034) (\$MN)

Table 4 Global RNA Interference Crop Protection Market, By Small Interfering RNA
(2023–2034) (\$MN)

Table 5 Global RNA Interference Crop Protection Market, By Double-Stranded RNA
(2023–2034) (\$MN)

Table 6 Global RNA Interference Crop Protection Market, By Hairpin RNA (2023–2034)
(\$MN)

Table 7 Global RNA Interference Crop Protection Market, By Host-Induced Gene
Silencing (2023–2034) (\$MN)

Table 8 Global RNA Interference Crop Protection Market, By Other RNAi Types
(2023–2034) (\$MN)

Table 9 Global RNA Interference Crop Protection Market, By Delivery Method
(2023–2034) (\$MN)

Table 10 Global RNA Interference Crop Protection Market, By Foliar Spray (2023–2034)
(\$MN)

Table 11 Global RNA Interference Crop Protection Market, By Root Application
(2023–2034) (\$MN)

Table 12 Global RNA Interference Crop Protection Market, By Seed Treatment
(2023–2034) (\$MN)

Table 13 Global RNA Interference Crop Protection Market, By Soil Application
(2023–2034) (\$MN)

Table 14 Global RNA Interference Crop Protection Market, By Trunk Injection
(2023–2034) (\$MN)

Table 15 Global RNA Interference Crop Protection Market, By Other Delivery Methods
(2023–2034) (\$MN)

Table 16 Global RNA Interference Crop Protection Market, By Target Pest (2023–2034)
(\$MN)

Table 17 Global RNA Interference Crop Protection Market, By Insect Pests (2023–2034)
(\$MN)

Table 18 Global RNA Interference Crop Protection Market, By Fungal Pathogens
(2023–2034) (\$MN)

Table 19 Global RNA Interference Crop Protection Market, By Viral Pathogens
(2023–2034) (\$MN)

Table 20 Global RNA Interference Crop Protection Market, By Nematodes (2023–2034)
(\$MN)

Table 21 Global RNA Interference Crop Protection Market, By Weeds (2023–2034)
(\$MN)

Table 22 Global RNA Interference Crop Protection Market, By Other Target Pests
(2023–2034) (\$MN)

Table 23 Global RNA Interference Crop Protection Market, By Crop Type (2023–2034)
(\$MN)

Table 24 Global RNA Interference Crop Protection Market, By Cereals & Grains
(2023–2034) (\$MN)

Table 25 Global RNA Interference Crop Protection Market, By Fruits & Vegetables
(2023–2034) (\$MN)

Table 26 Global RNA Interference Crop Protection Market, By Oilseeds & Pulses
(2023–2034) (\$MN)

Table 27 Global RNA Interference Crop Protection Market, By Cash Crops (2023–2034)
(\$MN)

Table 28 Global RNA Interference Crop Protection Market, By Plantation Crops
(2023–2034) (\$MN)

Table 29 Global RNA Interference Crop Protection Market, By Other Crop Types
(2023–2034) (\$MN)

Table 30 Global RNA Interference Crop Protection Market, By Development Stage

(2023–2034) (\$MN)

Table 31 Global RNA Interference Crop Protection Market, By Research Stage

(2023–2034) (\$MN)

Table 32 Global RNA Interference Crop Protection Market, By Laboratory Validation

(2023–2034) (\$MN)

Table 33 Global RNA Interference Crop Protection Market, By Greenhouse Trials

(2023–2034) (\$MN)

Table 34 Global RNA Interference Crop Protection Market, By Field Trials (2023–2034)

(\$MN)

Table 35 Global RNA Interference Crop Protection Market, By Commercial Products

(2023–2034) (\$MN)

Table 36 Global RNA Interference Crop Protection Market, By Other Development

Stages (2023–2034) (\$MN)

Note: Tables for North America, Europe, APAC, South America, and Rest of the World (RoW) are also represented in the same manner as above.

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