

Biological Seed Treatment Market Forecasts to 2032 – Global Analysis By Crop Type (Cereals & grains, Oilseeds, Pulses & legumes, Fruits & vegetables, Forage & turf and Other Crop Types), Formulation Type, Distribution Channel, Application, End User and By Geography

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Abstracts

According to Statistics MRC, the Global Biological Seed Treatment Market is accounted for \$1.7 billion in 2025 and is expected to reach \$2.8 billion by 2032 growing at a CAGR of 7.4% during the forecast period. Biological seed treatment refers to the application of natural organisms or biologically derived substances to seeds before planting to enhance crop growth, protect against pests, and improve yield potential. Unlike chemical treatments, it uses beneficial microbes such as bacteria, fungi, or natural compounds that promote germination, strengthen plant health, and create resistance against diseases and environmental stresses. These treatments help establish a healthy root system, improve nutrient uptake, and reduce dependency on synthetic chemicals, making farming more sustainable. Biological seed treatment is gaining importance in modern agriculture due to its eco-friendly nature, cost-effectiveness, and ability to support long-term soil health.

Market Dynamics:

Driver:

Rising demand for chemical-free

Farmers and consumers are increasingly preferring sustainable and eco-friendly

practices that reduce dependence on synthetic chemicals. Biological seed treatments offer natural protection against pests and diseases while enhancing crop health and yield. Growing awareness about soil health preservation and biodiversity conservation further supports this shift. Regulatory push for reduced chemical usage in agriculture also drives adoption of biological alternatives. As a result, the market is witnessing strong growth fuelled by the global movement toward safer, chemical-free farming practices.

Restraint:

Variable field efficacy

Farmers may experience unpredictable protection levels, reducing confidence in adopting these solutions. Unlike chemical treatments, biologicals often show variability in performance, which limits their large-scale acceptance. This inconsistency makes it harder for companies to demonstrate consistent value to growers. As a result, market penetration slows down despite growing demand for sustainable practices. Overall, variable field efficacy remains a key restraint to the wider adoption of biological seed treatments.

Opportunity:

Advances in biological formulations and new tech

Improved microbial strains and natural bio-based solutions are enhancing seed protection and boosting crop productivity. Advanced encapsulation and coating methods provide accurate delivery while extending the shelf life of treatments. The use of biotechnology and AI-driven screening is speeding up the creation of novel seed solutions. Such innovations also minimize dependence on synthetic chemicals, supporting eco-friendly agricultural practices. Collectively, these technological and formulation advancements are making biological seed treatments more effective, scalable, and broadly accepted.

Threat:

Higher per-unit cost

Biological seed treatments are generally priced higher than conventional chemical options, which creates hesitation in adoption. The elevated costs are particularly

burdensome for small and medium-scale growers. Such price disparity limits competitiveness in markets where affordability is crucial. Insufficient awareness of long-term benefits further weakens willingness to invest in these solutions. Consequently, the adoption pace remains restricted despite clear environmental and yield-related advantages.

Covid-19 Impact

The Covid-19 pandemic significantly impacted the Biological Seed Treatment Market by disrupting supply chains, delaying raw material availability, and creating logistical challenges in seed distribution. Restrictions on trade and transportation slowed down product deliveries, affecting farmers' access to biological treatments during critical planting seasons. However, the crisis also highlighted the importance of sustainable agricultural practices, boosting interest in eco-friendly solutions like biological seed treatments. Increased awareness of food security and resilience accelerated research, innovation, and adoption of natural alternatives, supporting long-term growth prospects despite short-term setbacks.

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, due to the high demand for staple crops like wheat, maize, and rice worldwide. Farmers increasingly adopt biological treatments to enhance germination, nutrient uptake, and disease resistance in these crops. Growing concerns over chemical pesticide residues push the market toward eco-friendly and sustainable solutions. Large-scale cultivation of cereals ensures a consistent and scalable market for biological seed products. Additionally, ongoing research and innovation in microbial and bio-fertilizer technologies further strengthen this segment's growth.

The online platforms segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the online platforms segment is predicted to witness the highest growth rate by increasing accessibility to a wide range of products for farmers. They provide detailed product information, enabling informed decision-making and building trust. E-commerce channels facilitate direct sales, reducing dependency on intermediaries and lowering costs. Digital platforms also support targeted marketing, reaching niche farmer segments effectively. Additionally, online reviews and ratings enhance transparency, encouraging higher adoption rates of biological seed treatments.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share due to the growing adoption of sustainable agriculture and increasing awareness of eco-friendly crop protection solutions. Farmers are increasingly turning to biological treatments to enhance soil health, improve crop yield, and reduce dependency on chemical pesticides. The region benefits from supportive government initiatives and rising investment in agricultural biotechnology. Rapid population growth and demand for high-quality food are accelerating market expansion. Challenges include lack of awareness in rural areas and limited access to advanced products.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, owing to technological advancements in agricultural biotech and widespread farmer awareness of environmental sustainability. Adoption is supported by strong regulatory frameworks, research-driven innovations, and the presence of leading market players. Emphasis on organic farming and soil health enhancement is driving usage. However, high costs and the need for region-specific formulations remain challenges. Market growth is further fueled by precision agriculture trends, integration with digital farming tools, and increasing interest in reducing chemical pesticide dependence across large-scale commercial farms.

Key players in the market

Some of the key players profiled in the Biological Seed Treatment Market include Bayer AG, BASF SE, Syngenta, Corteva Agriscience, Novozymes, Pro Farm Group Inc., Certis USA LLC, Koppert Biological Systems, Verdesian Life Sciences, BioWorks Inc., Biostadt India Limited, Plant Health Care plc, Bionema Ltd., NewLeaf Symbiotics, Concentric Agriculture Inc., Andermatt Group AG, BioAtlantis Ltd. and Terramera Inc.

Key Developments:

In August 2025, Corteva and Insecticides (India) Ltd launched SPARCLE, targeting brown plant hopper in rice. Though chemical-based, the partnership aligns with Corteva's strategy to blend advanced chemistry and biologicals for integrated seed-applied pest management solutions.

In December 2024, Syngenta acquired Intrinsyx Bio to strengthen its biological seed treatment capabilities. The startup's microbial NUE technologies enhance nutrient uptake and root development, directly supporting Syngenta's pipeline for sustainable seed-applied solutions in cereals and legume crops.

In March 2024, BASF partnered with Vivagro to co-develop microbial seed treatments and foliar biostimulants targeting cereals and vegetables. The collaboration enhances root vitality, nutrient uptake, and stress resilience, strengthening BASF's biological seed treatment footprint across European markets.

Crop Types Covered:

Cereals & grains

Oilseeds

Pulses & legumes

Fruits & vegetables

Forage & turf

Other Crop Types

Formulation Types Covered:

Liquid formulations

Powder

Granules

Other Formulation Types

Distribution Channels Covered:

Direct sales (B2B)

Distributors

Online platforms

Applications Covered:

Commercial seed treatment

On-farm seed treatment

Other Applications

End Users Covered:

Seed producers

Independent growers

Contract farming

Retailers

Co-operatives

Other End Users

Regions Covered:

North America

SUS

SCanada

SMexico

Europe

SGermany

SUK

SItaly

SFrance

SSpain

SRest of Europe

Asia Pacific

SJapan

SChina

SIndia

SAustralia

SNew Zealand

SSouth Korea

SRest of Asia Pacific

South America

SArgentina

SBrazil

SChile

SRest of South America

Middle East & Africa

SSaudi Arabia

SUAE

SQatar

SSouth Africa

SRest 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

SComprehensive profiling of additional market players (up to 3)

SSWOT 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 Application 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 BIOLOGICAL SEED TREATMENT MARKET, BY CROP TYPE

- 5.1 Introduction
- 5.2 Cereals & grains
- 5.3 Oilseeds
- 5.4 Pulses & legumes
- 5.5 Fruits & vegetables
- 5.6 Forage & turf
- 5.7 Other Crop Types

6 GLOBAL BIOLOGICAL SEED TREATMENT MARKET, BY FORMULATION TYPE

- 6.1 Introduction
- 6.2 Liquid formulations
- 6.3 Powder
- 6.4 Granules
- 6.5 Other Formulation Types

7 GLOBAL BIOLOGICAL SEED TREATMENT MARKET, BY DISTRIBUTION CHANNEL

- 7.1 Introduction
- 7.2 Direct sales (B2B)
- 7.3 Distributors
- 7.4 Online platforms

8 GLOBAL BIOLOGICAL SEED TREATMENT MARKET, BY APPLICATION

- 8.1 Introduction
- 8.2 Commercial seed treatment
- 8.3 On-farm seed treatment
- 8.4 Other Applications

9 GLOBAL BIOLOGICAL SEED TREATMENT MARKET, BY END USER

- 9.1 Introduction
- 9.2 Seed producers
- 9.3 Independent growers
- 9.4 Contract farming

9.5 Retailers

9.6 Co-operatives

9.7 Other End Users

10 GLOBAL BIOLOGICAL SEED TREATMENT 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 BASF SE
- 12.3 Syngenta
- 12.4 Corteva Agriscience
- 12.5 Novozymes
- 12.6 Pro Farm Group Inc.
- 12.7 Certis USA LLC
- 12.8 Koppert Biological Systems
- 12.9 Verdesian Life Sciences
- 12.10 BioWorks Inc.
- 12.11 Biostadt India Limited
- 12.12 Plant Health Care plc
- 12.13 Bionema Ltd.
- 12.14 NewLeaf Symbiotics
- 12.15 Concentric Agriculture Inc.
- 12.16 Andermatt Group AG
- 12.17 BioAtlantis Ltd.
- 12.18 Terramera Inc.

List Of Tables

LIST OF TABLES

Table 1 Global Biological Seed Treatment Market Outlook, By Region (2024-2032) (\$MN)

Table 2 Global Biological Seed Treatment Market Outlook, By Crop Type (2024-2032) (\$MN)

Table 3 Global Biological Seed Treatment Market Outlook, By Cereals & grains (2024-2032) (\$MN)

Table 4 Global Biological Seed Treatment Market Outlook, By Oilseeds (2024-2032) (\$MN)

Table 5 Global Biological Seed Treatment Market Outlook, By Pulses & legumes (2024-2032) (\$MN)

Table 6 Global Biological Seed Treatment Market Outlook, By Fruits & vegetables (2024-2032) (\$MN)

Table 7 Global Biological Seed Treatment Market Outlook, By Forage & turf (2024-2032) (\$MN)

Table 8 Global Biological Seed Treatment Market Outlook, By Other Crop Types (2024-2032) (\$MN)

Table 9 Global Biological Seed Treatment Market Outlook, By Formulation Type (2024-2032) (\$MN)

Table 10 Global Biological Seed Treatment Market Outlook, By Liquid formulations (2024-2032) (\$MN)

Table 11 Global Biological Seed Treatment Market Outlook, By Powder (2024-2032) (\$MN)

Table 12 Global Biological Seed Treatment Market Outlook, By Granules (2024-2032) (\$MN)

Table 13 Global Biological Seed Treatment Market Outlook, By Other Formulation Types (2024-2032) (\$MN)

Table 14 Global Biological Seed Treatment Market Outlook, By Distribution Channel (2024-2032) (\$MN)

Table 15 Global Biological Seed Treatment Market Outlook, By Direct sales (B2B) (2024-2032) (\$MN)

Table 16 Global Biological Seed Treatment Market Outlook, By Distributors (2024-2032) (\$MN)

Table 17 Global Biological Seed Treatment Market Outlook, By Online platforms (2024-2032) (\$MN)

Table 18 Global Biological Seed Treatment Market Outlook, By Application (2024-2032)

(\$MN)

Table 19 Global Biological Seed Treatment Market Outlook, By Commercial seed treatment (2024-2032) (\$MN)

Table 20 Global Biological Seed Treatment Market Outlook, By On-farm seed treatment (2024-2032) (\$MN)

Table 21 Global Biological Seed Treatment Market Outlook, By Other Applications (2024-2032) (\$MN)

Table 22 Global Biological Seed Treatment Market Outlook, By End User (2024-2032) (\$MN)

Table 23 Global Biological Seed Treatment Market Outlook, By Seed producers (2024-2032) (\$MN)

Table 24 Global Biological Seed Treatment Market Outlook, By Independent growers (2024-2032) (\$MN)

Table 25 Global Biological Seed Treatment Market Outlook, By Contract farming (2024-2032) (\$MN)

Table 26 Global Biological Seed Treatment Market Outlook, By Retailers (2024-2032) (\$MN)

Table 27 Global Biological Seed Treatment Market Outlook, By Co-operatives (2024-2032) (\$MN)

Table 28 Global Biological Seed Treatment 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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