

## **Global Biopesticides Market - Types, Sources and Applications**

Market Report | 2025-07-09 | 328 pages | Industry Experts

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### **Report description:**

Global Biopesticides Market Trends and Outlook

Biopesticides, derived from natural sources such as microorganisms, plant-based compounds, and beneficial organisms, are emerging as vital components of sustainable pest management. Microbial biopesticides employ bacteria, fungi, viruses, or protozoa to control pests through infection or toxin production, while biochemical variants - like essential oils, pheromones, and plant extracts - disrupt pest behavior without harming beneficial species. Predators, parasitoids, and entomopathogenic nematodes are also used as biological control agents in pest suppression. These eco-friendly alternatives are increasingly integrated into organic farming and Integrated Pest Management (IPM) programs due to their target specificity, biodegradability, and lower risk of resistance development. Though challenges remain - such as limited shelf life, narrow pest spectrum, and regulatory complexity - the benefits of reduced toxicity and environmental safety make biopesticides an attractive substitute for synthetic pesticides in agriculture, forestry, and public health.

The global biopesticides market is gaining momentum, estimated at US\$7.1 billion in 2024 and projected to reach US\$14.7 billion by 2030, registering a CAGR of 12.7% during 2024-2030. Market expansion is underpinned by rising demand for organic, residue-free produce, growing environmental awareness, and tightening regulations on synthetic pesticide use. Supportive regulatory frameworks - such as the EU's expedited approval process and the EPA's backing of biological products - are accelerating adoption. Government incentives promoting organic agriculture, alongside mounting retailer and consumer pressure for safer inputs, are reshaping crop protection strategies. Advances in microbial fermentation, RNAi-based technologies, and improved formulations are enhancing product performance and broadening applicability. Coupled with increasing R&D investments, strategic public-private collaborations, and heightened farmer awareness, especially in emerging markets, the outlook for biopesticides remains strong, with sustained growth anticipated across global agricultural systems.

Biopesticides Regional Market Analysis

North America holds the largest share of the global biopesticides market at 36.6%, driven by a mature agricultural infrastructure, strong regulatory frameworks, and rising consumer demand for organic produce. The United States and Canada are key contributors within this region's market, driven by stricter regulations on chemical pesticide use, rising environmental awareness,

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and the strong presence of major biopesticide manufacturers investing in research and development. Regulatory bodies such as the U.S. EPA and Canada's PMRA support market growth by streamlining approval processes and implementing policies that encourage the adoption of biopesticides. In contrast, Asia Pacific is the fastest-growing region, projected to record a 14.6% CAGR from 2024 to 2030. Rapid population growth, food security concerns, and the transition toward sustainable agriculture are accelerating market expansion, particularly in India and China. Government investments in bio-agriculture, bans on hazardous agrochemicals, rising organic farming acreage, and increased consumer awareness about chemical residues are creating a highly opportunistic environment for biopesticide adoption across the region.

#### Biopesticides Market Analysis by Type

The bioinsecticides segment is the largest in the global biopesticides market with a 43% share in 2024, driven by their lower development costs, faster registration, and high efficacy in pest control. Products based on *Bacillus thuringiensis* and *Beauveria bassiana* are widely used due to their target specificity and environmental safety, aligning with the rising demand for organic and residue-free produce. This market dominance is driven by growing consumer preference for organic produce, stricter regulations on chemical pesticide use, and increasing awareness of the need to preserve ecological balance. Meanwhile, biofungicides are the fastest-growing segment, projected at a 13.8% CAGR through 2030, as resistance to chemical fungicides increases and regulatory bans on synthetic ingredients tighten. Formulations containing *Trichoderma*, *Bacillus*, and *Pseudomonas* offer dual benefits of disease suppression and soil health improvement, making them key tools in sustainable farming and integrated pest management strategies. As farmers shift to holistic and sustainable crop protection, biofungicides are gaining strong traction in disease-prone regions and high-value crop systems.

#### Biopesticides Market Analysis by Source

The microbial segment leads the biopesticides market by source, accounting for 61.4% share in 2024 and projected to grow at a CAGR of 13% through 2030. This growth is driven by its suitability for organic and residue-free farming, strong regulatory backing, and environmental safety profile. Sourced from bacteria, fungi, and viruses, microbial biopesticides offer broad-spectrum and target-specific pest control with minimal impact on beneficial organisms. Microbial pesticides, when integrated into IPM systems, contribute to improved soil health and lower toxicity, which also facilitates smoother regulatory approvals. The rising demand for organic food and increasing restrictions on synthetic pesticides further accelerate adoption. Technological advancements in formulation and delivery systems improved microbial pesticide efficacy and shelf life. Additionally, biochemical biopesticides such as plant extracts, pheromones, and growth regulators are also gaining momentum due to their non-toxic pest disruption mechanisms and compatibility with organic agriculture. Together, these segments are reshaping sustainable crop protection strategies globally.

#### Biopesticides Market Analysis by Application

Foliar spray dominates the biopesticides market, with a 53.4% share in 2024, due to its direct application to plant surfaces, enabling immediate and effective pest and disease control. This method ensures rapid absorption, targeted delivery, and flexibility across crop types and growth stages, making it highly effective and farmer-friendly. Its compatibility with precision farming and ease of integration into existing spraying systems further drives adoption. Conversely, seed treatment is the fastest-growing application segment, projected to expand at a CAGR of 13.3% from 2024 to 2030. This growth is driven by increasing demand for early-stage crop protection, improved seedling vigor, and enhanced resistance to soilborne pathogens. Seed treatment enables targeted pest control with minimal chemical input, supports sustainable farming practices, and complements integrated pest management strategies.

#### Biopesticides Market Analysis by Crop Type

The fruits and vegetables segment leads the biopesticides market with a 39.3% share in 2024, driven by their high susceptibility

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to pests and strong consumer demand for organic, residue-free produce. Biopesticides provide safe, targeted pest control solutions, making them particularly suitable for crops consumed raw, where minimal chemical residue is essential. Growing adoption of IPM practices, export quality requirements, and stricter regulations on chemical pesticides are further accelerating their use in this segment. On the other hand, the oilseeds and pulses segment is expected to witness the fastest growth at a CAGR of 13.4% from 2024 to 2030, driven by increasing global demand for plant-based proteins, growing pest challenges in high-value crops, and the shift toward sustainable pest management practices. Farmers are turning to biopesticides to enhance yield quality, minimize chemical residues, and support eco-friendly cultivation practices aligned with global export and sustainability benchmarks.

## Biopesticides Market Report Scope

This report on Biopesticides analyzes the global and regional markets based on type, source, application and crop type for the period 2021-2030 with forecasts from 2024 to 2030 in terms of value in US\$. In addition to providing profiles of major companies operating in this space, the latest corporate and industrial developments have been covered to offer a clear panorama of how and where the market is progressing.

### Key Metrics

Historical Period: 2021-2024

Base Year: 2024

Forecast Period: 2024-2030

Units: Value market in US\$

Companies Mentioned: 17+

### Biopesticides Market by Geographic Region

- ☐☐ North America (The United States, Canada, and Mexico)
- ☐☐ Europe (Germany, France, United Kingdom, Italy, Spain, and Rest of Europe)
- ☐☐ Asia-Pacific (Japan, China, India, South Korea, and Rest of Asia-Pacific)
- ☐☐ South America (Brazil, Argentina, and Rest of South America)
- ☐☐ Rest of World

### Biopesticides Market by Type

- ☐☐ Bioinsecticides
- ☐☐ Biofungicides
- ☐☐ Bionematicides
- ☐☐ Bioherbicides
- ☐☐ Other Types (Including Biochemical, Plant Growth Regulators, Semiochemicals, Essential Oils, and Others)

### Biopesticides Market by Source

- ☐☐ Microbials
- ☐☐ Biochemicals
- ☐☐ Beneficial Organisms

### Biopesticides Market by Application

- ☐☐ Foliar Spray
- ☐☐ Soil Treatment
- ☐☐ Seed Treatment
- ☐☐ Other Applications (Including Drip Irrigation, Fertigation, Hydroponic Systems, Controlled Environment Agriculture, and Others)

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## Biopesticides Market by Crop Type

□□Cereals & Grains

□□Oil Seeds & Pulses

□□Fruits & Vegetables

□□Other Crop Types (Including Plantation Crops, Medicinal Plants, Turf, and Ornamental Plants, and Others)

### Table of Contents:

#### PART A: GLOBAL MARKET PERSPECTIVE

##### 1. INTRODUCTION

-□Product Outline

-□Biopesticides Defined

-□Biopesticide Types

o□Bioinsecticides

o□Biofungicides

o□Bionematicides

o□Bioherbicides

o□Other Types (Including Biochemical, Plant Growth Regulators, Semiochemicals, Essential Oils, and Others)

-□Biopesticide Sources

o□Microbials

o□Biochemicals

o□Beneficial Organisms

-□Biopesticide Applications

o□Foliar Spray

o□Soil Treatment

o□Seed Treatment

o□Other Applications (Including Drip Irrigation, Fertigation, Hydroponic Systems, Controlled Environment Agriculture, and Others)

-□Biopesticide Crop Types

o□Cereals & Grains

o□Oil Seeds & Pulses

o□Fruits & Vegetables

o□Other Crop Types (Including Plantation Crops, Medicinal Plants, Turf, and Ornamental Plants, and Others)

##### 2. Key Market Trends

##### 3. Key Market Players

-□Andermatt Group AG

-□BASF SE

-□Bayer AG

-□BioFirst Group

-□BioWorks Inc.

-□Certis Biologicals

-□Corteva Agriscience

-□FMC Corporation

-□Isagro Group

-□Koppert B.V.

-□Pro Farm Group Inc.

-□Novonosis A/S

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- Nufarm
- Som Phytopharma India Limited
- STK Bio-Ag Technologies
- Syngenta Crop Protection AG
- Valent BioSciences LLC
- 4. Key Business & Product Trends
- 5. Global Market Overview
  - Global Biopesticides Market Overview by Type
    - o□Biopesticides Type Market Overview by Global Region
      - Bioinsecticides
      - Biofungicides
      - Bionematicides
      - Bioherbicides
      - Other Types
    - Global Biopesticides Market Overview by Source
      - o□Biopesticides Source Market Overview by Global Region
        - Microbials
        - Biochemicals
        - Beneficial Organisms
      - Global Biopesticides Market Overview by Application
        - o□Biopesticides Application Market Overview by Global Region
          - Foliar Spray
          - Soil Treatment
          - Seed Treatment
          - Other Applications
        - Global Biopesticides Market Overview by Crop Type
          - o□Biopesticides Crop Type Market Overview by Global Region
            - Cereals & Grains
            - Oil Seeds & Pulses
            - Fruits & Vegetables
            - Other Crop Types

## PART B: REGIONAL MARKET PERSPECTIVE

Global Biopesticides Market Overview by Geographic Region

### REGIONAL MARKET OVERVIEW

#### 6. North America

- North American Biopesticides Market Overview by Geographic Region
- North American Biopesticides Market Overview by Type
- North American Biopesticides Market Overview by Source
- North American Biopesticides Market Overview by Application
- North American Biopesticides Market Overview by Crop Type
- Country-wise Analysis of North American Biopesticides Market
  - o□The United States
    - United States Biopesticides Market Overview by Type
    - United States Biopesticides Market Overview by Source
    - United States Biopesticides Market Overview by Application
    - United States Biopesticides Market Overview by Crop Type
  - o□Canada

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- [ ] Canadian Biopesticides Market Overview by Type
- [ ] Canadian Biopesticides Market Overview by Source
- [ ] Canadian Biopesticides Market Overview by Application
- [ ] Canadian Biopesticides Market Overview by Crop Type

o [ ] Mexico

- [ ] Mexican Biopesticides Market Overview by Type
- [ ] Mexican Biopesticides Market Overview by Source
- [ ] Mexican Biopesticides Market Overview by Application
- [ ] Mexican Biopesticides Market Overview by Crop Type

7. Europe

- [ ] European Biopesticides Market Overview by Geographic Region
- [ ] European Biopesticides Market Overview by Type
- [ ] European Biopesticides Market Overview by Source
- [ ] European Biopesticides Market Overview by Application
- [ ] European Biopesticides Market Overview by Crop Type
- [ ] Country-wise Analysis of European Biopesticides Market

o [ ] Germany

- [ ] German Biopesticides Market Overview by Type
- [ ] German Biopesticides Market Overview by Source
- [ ] German Biopesticides Market Overview by Application
- [ ] German Biopesticides Market Overview by Crop Type

o [ ] France

- [ ] French Biopesticides Market Overview by Type
- [ ] French Biopesticides Market Overview by Source
- [ ] French Biopesticides Market Overview by Application
- [ ] French Biopesticides Market Overview by Crop Type

o [ ] The United Kingdom

- [ ] United Kingdom Biopesticides Market Overview by Type
- [ ] United Kingdom Biopesticides Market Overview by Source
- [ ] United Kingdom Biopesticides Market Overview by Application
- [ ] United Kingdom Biopesticides Market Overview by Crop Type

o [ ] Italy

- [ ] Italian Biopesticides Market Overview by Type
- [ ] Italian Biopesticides Market Overview by Source
- [ ] Italian Biopesticides Market Overview by Application
- [ ] Italian Biopesticides Market Overview by Crop Type

o [ ] Spain

- [ ] Spanish Biopesticides Market Overview by Type
- [ ] Spanish Biopesticides Market Overview by Source
- [ ] Spanish Biopesticides Market Overview by Application
- [ ] Spanish Biopesticides Market Overview by Crop Type

o [ ] Rest of Europe

- [ ] Rest of Europe Biopesticides Market Overview by Type
- [ ] Rest of Europe Biopesticides Market Overview by Source
- [ ] Rest of Europe Biopesticides Market Overview by Application
- [ ] Rest of Europe Biopesticides Market Overview by Crop Type

8. Asia-Pacific

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- Asia-Pacific Biopesticides Market Overview by Geographic Region
- Asia-Pacific Biopesticides Market Overview by Type
- Asia-Pacific Biopesticides Market Overview by Source
- Asia-Pacific Biopesticides Market Overview by Application
- Asia-Pacific Biopesticides Market Overview by Crop Type
- Country-wise Analysis of Asia-Pacific Biopesticides Market

o□Japan

- Japanese Biopesticides Market Overview by Type
- Japanese Biopesticides Market Overview by Source
- Japanese Biopesticides Market Overview by Application
- Japanese Biopesticides Market Overview by Crop Type

o□China

- Chinese Biopesticides Market Overview by Type
- Chinese Biopesticides Market Overview by Source
- Chinese Biopesticides Market Overview by Application
- Chinese Biopesticides Market Overview by Crop Type

o□India

- Indian Biopesticides Market Overview by Type
- Indian Biopesticides Market Overview by Source
- Indian Biopesticides Market Overview by Application
- Indian Biopesticides Market Overview by Crop Type

o□South Korea

- South Korean Biopesticides Market Overview by Type
- South Korean Biopesticides Market Overview by Source
- South Korean Biopesticides Market Overview by Application
- South Korean Biopesticides Market Overview by Crop Type

o□Rest of Asia-Pacific

- Rest of Asia-Pacific Biopesticides Market Overview by Type
- Rest of Asia-Pacific Biopesticides Market Overview by Source
- Rest of Asia-Pacific Biopesticides Market Overview by Application
- Rest of Asia-Pacific Biopesticides Market Overview by Crop Type

9. South America

- South American Biopesticides Market Overview by Geographic Region
- South American Biopesticides Market Overview by Type
- South American Biopesticides Market Overview by Source
- South American Biopesticides Market Overview by Application
- South American Biopesticides Market Overview by Crop Type
- Country-wise Analysis of Asia-Pacific Biopesticides Market

o□Brazil

- Brazilian Biopesticides Market Overview by Type
- Brazilian Biopesticides Market Overview by Source
- Brazilian Biopesticides Market Overview by Application
- Brazilian Biopesticides Market Overview by Crop Type

o□Argentina

- Argentine Biopesticides Market Overview by Type
- Argentine Biopesticides Market Overview by Source
- Argentine Biopesticides Market Overview by Application

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- Argentine Biopesticides Market Overview by Crop Type
- o□Rest of South America
- Rest of South American Biopesticides Market Overview by Type
- Rest of South American Biopesticides Market Overview by Source
- Rest of South American Biopesticides Market Overview by Application
- Rest of South American Biopesticides Market Overview by Crop Type

#### 10. Rest of World

- Rest of World Biopesticides Market Overview by Type
- Rest of World Biopesticides Market Overview by Source
- Rest of World Biopesticides Market Overview by Application
- Rest of World Biopesticides Market Overview by Crop Type

#### PART C: GUIDE TO THE INDUSTRY

#### PART D: ANNEXURE

1. RESEARCH METHODOLOGY
2. FEEDBACK

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