

Biological Crop Protection Market Forecasts to 2032 – Global Analysis By Product Type (Microbial Pesticides, Plant-Incorporated Protectants (PIP) and Biochemical Pesticides), Type (Bioinsecticides, Biofungicides, Bionematicides and Other Types), Form, Source, Crop Type, Application and By Geography

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Abstracts

According to Statistics MRC, the Global Biological Crop Protection Market is accounted for \$8.54 billion in 2025 and is expected to reach \$23.42 billion by 2032 growing at a CAGR of 15.5% during the forecast period. Biological crop protection describes the use of natural materials and organisms to manage weeds, pests, and diseases in agriculture, resulting in healthier crops with less dependence on chemical pesticides. This strategy uses natural plant extracts, microbial agents like bacteria and fungi, and beneficial insects like parasitic wasps and ladybugs. Moreover, biological crop protection lessens the impact on the environment and promotes sustainable farming methods by boosting biodiversity and collaborating with natural ecosystems. In integrated pest management (IPM) systems, it is essential for farmers to produce safer food while preserving the health of the soil and environment.

According to the FAO (Food and Agriculture Organization of the United Nations), up to 40% of global crop production is lost annually due to pests and diseases, underscoring the urgent need for sustainable pest management approaches—including biological crop protection—to enhance food security and environmental resilience.

Market Dynamics:

Driver:

Growing customer interest in high-quality, residue-free food

Growing environmental and health consciousness among modern consumers has increased demand for food that is sustainably produced, organic, and residue-free. Particularly in metropolitan and export-oriented markets, worries about pesticide residues in fruits, vegetables, and grains have grown. Growers are therefore under pressure to maintain productivity while meeting these expectations. Because biological crop protection products are safe for human health and non-toxic, they are becoming more popular as clean-label food trends gain traction. Additionally, in order to maintain consumer trust and gain access to premium markets, producers are being pushed to invest in biological and abandon synthetic chemicals as a result of this shift in consumer preferences.

Restraint:

Environmental sensitivity and varying efficacy

The variable effectiveness of biological crop protection products in field settings is one of their biggest drawbacks. Biologicals are sensitive to environmental variables like temperature, humidity, soil pH, UV exposure, and application timing, in contrast to synthetic chemicals that frequently produce immediate and broad-spectrum effects. Numerous microorganisms utilized in biopesticides have difficulty surviving and colonizing in unfavorable environments, particularly in arid or harsh climates. Furthermore, biological controls typically work more slowly, taking longer to establish and control pest populations.

Opportunity:

Beneficial government regulations and assistance

Globally, governments are realizing more and more how crucial biological solutions are to maintaining environmental preservation, food security, and farmer income stability. Incentives, subsidies, and policy changes have been implemented by many to encourage sustainable inputs. By 2030, the EU's Green Deal and Farm to Fork Strategy seek to cut the use of chemical pesticides by 50%, which will directly benefit biologicals. Brazil's National Bioinputs Program is expediting bio-input approvals, and India is providing subsidies for organic input kits. Moreover, the favorable conditions created by

these policy changes allow manufacturers to expand their operations, penetrate new markets, and make R&D investments.

Threat:

Strong competition from artificial agrochemicals

Synthetic agrochemicals continue to dominate the global crop protection market because of their broad-spectrum activity, fast-acting performance, and established supply chains, even in the face of mounting environmental and regulatory pressure. Compared to biological products, chemical pesticides are frequently less expensive, simpler to use, and require less technical know-how. Furthermore, many farmers who are under pressure to ensure immediate crop protection continue to turn to synthetic options, which are heavily promoted by big agrochemical companies. Due to convenience and familiarity, synthetic inputs frequently outperform biologicals in markets with lax regulations or inconsistent enforcement.

Covid-19 Impact:

The market for biological crop protection was affected in a variety of ways by the COVID-19 pandemic. Short-term supply chain interruptions and lockdowns made it more difficult to manufacture, distribute, and make biological inputs available, especially in areas that relied on imported microbial strains or formulations. Regulatory slowdowns and restricted workforce mobility also caused delays in R&D, product registrations, and field trials. However, the pandemic raised awareness of food safety, health, and sustainable agriculture around the world, which increased interest in residue-free and environmentally friendly crop protection techniques. Renewing policy support and investment in sustainable inputs, including biologicals, became necessary as a result of the crisis's emphasis on the need for resilient, regional agricultural systems.

The microbial pesticides segment is expected to be the largest during the forecast period

The microbial pesticides segment is expected to account for the largest market share during the forecast period. Microorganisms that occur naturally, including bacteria, fungi, viruses, and protozoa, are the source of microbial pesticides. These substances, such as *Trichoderma* species and *Bacillus thuringiensis* (BT), are used to target particular pests or plant diseases while remaining safe for the environment, people, and non-target organisms. In addition to regulatory support in major agricultural regions,

their growing popularity is fueled by their compatibility with organic farming and Integrated Pest Management (IPM) practices. The most widely used and financially successful sector of the biological crop protection industry is microbial pesticides, whose stability and effectiveness have been enhanced by ongoing innovation in formulation and delivery techniques.

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

Over the forecast period, the biofungicides segment is predicted to witness the highest growth rate. The main component of biofungicides is beneficial microbes like *Trichoderma*, *Bacillus subtilis*, and *Pseudomonas fluorescens*, which target fungal pathogens that cause crop diseases like downy mildew, powdery mildew, and Fusarium wilt. Climate change-related fungal outbreaks, growing resistance to chemical fungicides, and growing consumer demand for organic fruits and vegetables are all contributing factors to their explosive growth. The dual action of biofungicides—disease suppression and soil health enhancement—makes them popular for sustainable farming and Integrated Pest Management (IPM).

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, principally propelled by the US, which is at the forefront of the use of biological solutions, including biopesticides. Established organic farming methods, strict pesticide laws enforced by organizations such as the U.S. EPA, and high consumer demand for sustainable, residue-free produce are the main drivers of the region's dominance. A strong R&D infrastructure, early microbial product commercialization, and active involvement from both startups and large agribusiness players are additional advantages for North America. The market penetration is further enhanced by technological advancements in precision agriculture, rapid growth in Integrated Pest Management (IPM) programs, and supportive government policies.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR. Growing demand for organic food, growing awareness of sustainable farming, and government programs supporting environmentally friendly agriculture are the main drivers of this quick expansion. Through subsidies, organic farming programs, and residue-free export regulations, nations like China, Vietnam, and India are aggressively

promoting the use of bio-inputs. A move toward biological alternatives is also being prompted by the region's severe problems with soil degradation and excessive use of synthetic agrochemicals. Asia-Pacific is the region with the fastest rate of growth in the biologicals industry worldwide due to its large and growing population, increasing agricultural activity, and improving regulatory frameworks.

Key players in the market

Some of the key players in Biological Crop Protection Market include Bayer AG, Syngenta AG, Novozymes A/S, Sumitomo Chemical Co., Ltd., BASF SE, FMC Corporation, Corteva Agriscience, Adama Ltd., BioWorks, Inc, Seipasa S.A., Nufarm Limited, Andermatt Biocontrol AG, Valent BioSciences Corporation, Marrone Bio Innovations Inc. and BioSafe Systems LLC.

Key Developments:

In July 2025, BASF and Equinor have signed a long-term strategic agreement for the annual delivery of up to 23 terawatt hours of natural gas over a ten-year period. The contract secures a substantial share of BASF's natural gas needs in Europe. This agreement further strengthens our partnership with BASF. Natural gas not only provides energy security to Europe but also critical feedstock to European industries. I am very happy that our gas also supports BASF's efforts to reduce their carbon footprint.

In June 2025, FMC Corporation announced a strategic agreement with Corteva Agriscience that will expand FMC's fluindapyr fungicide technology in the U.S. corn and soybean markets. The collaboration between the two agricultural companies will enable more U.S. growers to combat challenging foliar diseases, such as tar spot and southern rust, with this novel fungicide active ingredient.

In March 2025, Bayer and Suzhou Puhe BioPharma Co.,Ltd announced that they have entered into a global license agreement for Puhe BioPharma's oral, small molecule PRMT5 inhibitor that selectively targets MTAP-deleted tumors. Under the agreement, Bayer obtains an exclusive worldwide license to develop, manufacture and commercialize the MTA-cooperative PRMT5 inhibitor.

Product Types Covered:

Microbial Pesticides

Plant-Incorporated Protectants (PIP)

Biochemical Pesticides

Types Covered:

Bioinsecticides

Biofungicides

Bionematicides

Other Types

Forms Covered:

Liquid

Powder

Granules

Sources Covered:

Natural Microbial

Biologically Derived Compounds

Crop Types Covered:

Cereals & Grains

Oilseeds & pulses

Fruits & vegetables

Other Crop Types

Applications Covered:

Foliar Spray

Seed Treatment

Soil Treatment

Other Applications

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

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