

# **Biofumigation Market Forecasts to 2032 – Global Analysis By Plant Type (Brassica Juncea, Brassica Napus, Sinapis Alba, Raphanus Sativus, Other Brassicas, and Other Plant Types), Crop Type, Application, End User, and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Biofumigation Market is accounted for \$2.4 billion in 2025 and is expected to reach \$4.3 billion by 2032 growing at a CAGR of 8.5% during the forecast period. Biofumigation is an agricultural technique that incorporates natural substances emitted by specific plants, usually belonging to the Brassica family, into the soil. The decomposition of these chemicals, primarily glucosinolates, produces bioactive compounds that inhibit weeds, diseases, and pests carried by the soil. By lowering the need for chemical fumigants, this environmentally benign technique promotes sustainable and environmentally safe pest management in agricultural systems, improving soil health and crop output.

According to the USDA Economic Research Service, certified organic cropland in the U.S. increased by 79% from 2011 to 2021, reaching 3.6 million acres.

Market Dynamics:

Driver:

Rising demand for organic and residue-free food

The increasing consumer preference for organic and residue-free food is a primary driver for the biofumigation market. As awareness grows regarding the health risks associated with synthetic pesticides, consumers and regulatory bodies are pushing for

safer alternatives in agriculture. Furthermore, stringent regulations on chemical fumigants and the expansion of organic farming practices are compelling farmers to adopt biofumigation methods. This shift not only supports sustainable agriculture but also enhances soil health, thereby contributing significantly to the market's robust growth trajectory.

#### Restraint:

##### Lack of standardized efficacy data

The effectiveness of biofumigation can vary widely depending on soil type, crop species, and environmental conditions. Additionally, insufficient research and limited field trials make it challenging to establish universally accepted protocols. This uncertainty can deter farmers and agricultural stakeholders from fully embracing biofumigation, as inconsistent results may impact crop yield and profitability. Moreover, the absence of harmonized regulations across regions further complicates the adoption of these practices.

#### Opportunity:

##### Development of high-glucosinolate brassica cultivars

The development of high-glucosinolate brassica cultivars presents a significant opportunity for the biofumigation market. These specialized plant varieties release higher concentrations of bioactive compounds, enhancing the efficacy of pest and disease control in soils. Furthermore, ongoing research and advancements in plant breeding are enabling the creation of cultivars tailored for specific climates and pest challenges. This innovation improves the reliability and effectiveness of biofumigation and also opens new avenues for its application in diverse agricultural settings, thereby expanding market potential.

#### Threat:

##### Unpredictable environmental variables

Factors such as fluctuating weather patterns, soil moisture levels, and temperature variations can significantly influence the decomposition of biofumigant crops and the release of active compounds. Additionally, these uncertainties can lead to inconsistent pest and disease control outcomes, making it difficult for farmers to rely solely on

biofumigation. Moreover, climate change and extreme weather events may further exacerbate these challenges, potentially hindering market growth.

#### Covid-19 Impact:

The Covid-19 pandemic had a mixed impact on the biofumigation market. On one hand, it heightened awareness of sustainable agricultural practices and accelerated interest in chemical-free pest management. On the other hand, supply chain disruptions, reduced agricultural activity, and financial constraints hampered market expansion. While the pandemic underscored the importance of resilient and sustainable food systems, it also introduced operational challenges that temporarily slowed the adoption of biofumigation techniques.

The agriculture segment is expected to be the largest during the forecast period

The agriculture segment is expected to account for the largest market share during the forecast period. This dominance is attributed to the widespread adoption of biofumigation practices in crop production, particularly for managing soil-borne pests and diseases. Furthermore, the growing emphasis on sustainable farming, coupled with regulatory restrictions on synthetic pesticides, is driving the integration of biofumigation in conventional and organic agricultural systems.

The oilseeds & pulses segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the oilseeds & pulses segment is predicted to witness the highest growth rate. This rapid expansion is driven by increasing cultivation of oilseed crops such as mustard, which are rich in glucosinolates and serve as effective biofumigants. Additionally, the rising demand for sustainable pest management in these crops, combined with advancements in seed technology, is accelerating adoption. Moreover, the segment's high growth is supported by research initiatives aimed at improving biofumigant efficacy and expanding their application in diverse agro-climatic regions.

#### Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share. This leadership is underpinned by established organic farming practices, strong regulatory frameworks favoring sustainable agriculture, and high consumer

demand for organic produce. Furthermore, North America benefits from advanced agricultural infrastructure, extensive research and development activities, and active participation of major industry players. These factors collectively contribute to the region's significant share in the global biofumigation market, reinforcing its position as a leader in sustainable pest management solutions.

#### Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR. The region's rapid growth is fueled by expanding agricultural sectors in countries like India and China, increased adoption of sustainable farming techniques, and rising awareness of the environmental impacts of synthetic pesticides. Additionally, government initiatives promoting organic agriculture and investments in research and development are accelerating the uptake of biofumigation practices.

#### Key players in the market

Some of the key players in Biofumigation Market include BASF SE, UPL Group (UPL Limited), Isagro USA, Inc. (Isagro S.p.A.), Marrone Bio Innovations, Inc., Eastman Chemical Company, P.H. Petersen, Mighty Mustard, Tozer Seeds, Harley Seeds, Certis USA LLC, Koppert Biological Systems, Biobest Group NV, Valent BioSciences LLC, Syngenta AG, De Sangosse Group, Dow Chemical Company, Monsanto Company (Bayer AG) and Verdesian Life Sciences LLC.

#### Key Developments:

In March 2024, BASF is investing in a new fermentation plant for biological and biotechnology-based crop protection products at its Ludwigshafen site. The plant will manufacture biological fungicides and biological seed treatments, strengthening BASF's portfolio of biological solutions for sustainable agriculture. This includes products relevant to biofumigation and soil health.

In May 2023, UPL partnered with Biome Makers to utilize their BeCrop® Test technology. This collaboration aims to assess the impact of UPL's natural biosolution inputs on soil health across various global trials, enhancing sustainable agricultural practices.

In January 2023, Valent BioSciences acquired FBSciences Holdings, Inc., a leader in naturally derived plant, soil, and climate health solutions. This acquisition enhances

Valent's portfolio in biostimulants and biorational products, supporting sustainable agriculture.

Plant Types Covered:

Brassica Juncea (Brown Mustard)

Brassica Napus (Rapeseed)

Sinapis Alba (White Mustard)

Raphanus Sativus (Radish)

Other Brassicas

Other Plant Types

Crop Types Covered:

Fruits & Vegetables

Cereals & Grains

Oilseeds & Pulses

Turf & Ornamentals

Other Crop Types

Applications Covered:

Soilborne Pathogen Control

Nematode Management

Weed Suppression

Insect Pest Management

Soil Health Improvement

End Users Covered:

Agriculture

Horticulture

Landscaping

Nursery Production

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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