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# Global Insect Fertilizers Market Size Study and Forecast by Insect Type (Black Soldier Fly Larvae Frass, Mealworm Frass, Cricket Frass, Others), By Application (Fruits & Vegetables, Turf, Ornamentals & Nursery Crops, Indoor, Urban & Home Gardening, Cereals & Grains, Oilseeds & Pulses, Plantation & Cash Crops), By Form (Dry, Granules, Liquid), and Regional Forecasts 2026–2036

https://marketpublishers.com/r/G468F41ADA1AEN.html
Date: August 2026
Pages: 285
Price: US$ 3,750.00 (Single User License)
ID: G468F41ADA1AEN

## Abstracts

The Global Insect Fertilizers Market, valued at USD 0.20 Billion in 2025, is projected to reach USD 1.29 Billion by 2036, expanding at a CAGR of 15.6% during the forecast period. The market includes bio-based fertilizers mainly from insect frass and insect organic residues that enhance soil fertility, increase microbial activity and enable sustainable agricultural production. Insect-based fertilizers are emerging as circular economy solutions that convert organic waste into nutrient-rich soil amendments and also reduce dependence on synthetic fertilizers. The market consists of Black Soldier Fly Larvae Frass, Mealworm Frass, Cricket Frass and other insect derived fertilizers in Dry, Granules and Liquid forms for application in Fruits & Vegetables, Turf, Ornamentals & Nursery Crops, Indoor, Urban & Home Gardening, Cereals & Grains, Oilseeds & Pulses, Plantation & Cash Crops and other agricultural sectors.

The market is experiencing exponential growth due to the rising demand for sustainable farming practices, the increasing adoption of organic agriculture, growing awareness about soil health, and the expansion of circular bioeconomy initiatives. More and more farmers are turning to insect fertilizers because they can improve soil structure and help make nutrients more available, stimulate beneficial microbial activity and support long-

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term crop productivity with a relatively low environmental impact. Innovations in insect farming, frass processing, nutrient stabilization, and waste valorization are improving product quality, scalability, and commercial viability. Higher investments in organic food production, regenerative agriculture, climate-smart farming and environmentally friendly crop nutrition also support market demand. Furthermore, the global insect fertilizers market is expected to be driven by positive government policies on sustainable agriculture, rising investments in insect bioconversion technologies, as well as strategic joint ventures between agri-tech companies, insect farming companies, and fertilizer manufacturing companies during the forecast period.

Global Insect Fertilizers Market: Key Highlights

The global insect fertilizers market size was worth USD 0.20 billion in 2025. The growing adoption of sustainable agriculture, increasing demand for organic fertilizers, rising awareness regarding soil health and growing use of insect frass as a nutrient-rich biofertilizer are expected to drive the insect fertilizers market growth.

The market size is estimated to hit USD 1.29 Billion by 2036, growing at a CAGR of 15.6% over 2026-2036. The growth is attributed to the rapid expansion of insect farming, increased focus on circular economy practices, increasing production of organic food, and increasing investments on regenerative agriculture.

Europe dominates the global market with an estimated share of 38.6% in 2025. The region benefits from strong regulatory support for sustainable agriculture, broad acceptance of organic farming, cutting-edge insect farming technologies, and increasing investments in bio-based fertilizers and circular bioeconomy projects.

From 2026 to 2036, Asia Pacific is expected to have the highest CAGR of 17.1%, owing to increasing agricultural production, rising government support for sustainable agriculture, growth of organic cultivation, expansion of insect farming capacity, and increasing awareness regarding eco-friendly crop nutrition solutions.

The Black Soldier Fly Larvae Frass is estimated to hold the largest share of the insect type segment, with 56.8% in 2025. This section succeeds due to its high nutrient content, its ability to improve soil conditions, its efficient conversion of

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organic waste and its wide commercial availability.

The mealworm frass segment is projected to witness the highest CAGR of 16.5% during the forecast period, attributed to rising commercial insect farming, growing demand for premium organic fertilizers, and increasing applications in high-value horticultural crops.

Fruits & Vegetables is the largest application segment accounting for an estimated share of 35.9% in 2025, driven by the increasing adoption of organic cultivation practices, higher-value crop production, and rising consumer demand for residue-free fresh produce.

The Indoor, Urban & Home Gardening is expected to grow at the fastest CAGR of 17.4% during 2026-2036, due to the growing urban gardening trends, home horticulture, vertical farming and increasing consumer inclination toward the environmentally friendly plant nutrition products.

The dry form is the most popular in the market with an estimated 52.7% share in 2025. This is due to its ease of storage, long shelf life, convenience of transportation, and widespread use in commercial agricultural operations.

These include growing investments towards insect farming, organic waste valorization, regenerative agriculture, soil microbiome enrichment, circular bioeconomy initiatives, and sustainable crop nutrition. These are likely to offer huge long-term opportunities for insect farming companies, biofertilizer manufacturers, agricultural technology providers, and sustainable agriculture stakeholders.

## Research Scope & Methodology

The report also offers detailed strategic assessment of the Global Insect Fertilizers Market along with the market size and estimates for the period 2026-2036. The report assesses Market Size, Revenue Forecasts, Competitive Landscape, Technology Advancements, Sustainability Trends, and Investment Opportunities Impacting Adoption of Insect-Based Fertilizers Worldwide. The assessment covers the whole value chain from insect farming to the bioconversion of organic waste, frass processing, formulation, packaging, distribution and application in the agricultural and horticultural sectors. The study assesses the market across Insect Type (Black Soldier Fly Larvae Frass,

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Mealworm Frass, Cricket Frass, Others), Application (Fruits & Vegetables, Turf, Ornamentals & Nursery Crops, Indoor, Urban & Home Gardening, Cereals & Grains, Oilseeds & Pulses, Plantation & Cash Crops) & Form (Dry, Granules, Liquid). The report is also divided into regions, namely North America, Europe, Asia Pacific, and LAMEA. These regions are analyzed on factors affecting the growth of the market in these regions such as adoption of organic farming, policies related to sustainable agriculture, capacity of insect farming, demand for fertilizers, environmental regulations, and initiatives for circular bioeconomy. The report also examines developments in insect rearing technologies, frass processing, nutrient stabilization, waste valorization, microbial soil enhancement and biofertilizer formulation that continue to change the competitive landscape of the global insect fertilizers market.

The research methodology is a mix of deep primary and secondary research that provides credible market intelligence and robust long term forecasting. Primary research includes structured interviews with insect farming companies, fertilizer manufacturers, agricultural input suppliers, distributors, agronomists, research institutions, government agencies, and industry experts from key global markets. Secondary research includes sources such as publications of agricultural organizations, organic farming associations, environmental agencies, annual reports of companies, investor presentations, scientific journals, patent databases, sustainability reports and authenticated market intelligence sources. The top-down and bottom-up approaches are applied to estimate the market and to validate the market by data triangulation which is based on the consistency of all the segments of the market and regional analysis. Forecast models combine past fertilizer demand, organic farming expansion, insect farming production, sustainability trends, policy shifts and macroeconomic indicators. Competitive benchmarking offers insight into the product portfolio, production capacity, geographic presence, investment in research and development, strategic collaborations, and innovation pipeline of the key market players to provide a holistic view of the changing competitive landscape of the Global Insect Fertilizers Market.

Key Market Segments

By Insect Type:

- Black Soldier Fly Larvae Frass
- Mealworm Frass
- Cricket Frass

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Others

By Application:

Fruits & Vegetables

Turf, Ornamentals & Nursery Crops

Indoor, Urban & Home Gardening

Cereals & Grains

Oilseeds & Pulses

Plantation & Cash Crops

By Form:

Dry

Granules

Liquid

Key Market Players

Protix

Innovafeed

?nsect

AgriProtein

Hexafly

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Entobel

NextProtein

EnviroFlight

Nutrition Technologies

Beta Hatch

## Industry Trends

The push for sustainable alternatives to synthetic fertilizers, along with a growing focus on regenerative agriculture, circular bioeconomy practices, and environmentally responsible crop nutrition solutions, is driving the momentum of insect-derived fertilizers.

The global growth of Black Soldier Fly (BSF) farming continues with producers increasingly transforming organic waste streams into nutrient rich frass fertilisers, supporting waste valorisation and reducing landfill disposal and greenhouse gas emissions.

The shift to organic farming is driving demand for insect fertilizers as growers look for natural soil amendments that can enhance nutrient availability, increase microbial diversity and meet organic certification requirements.

Contemporary agriculture has a significant interest in soil health, and insect frass is gaining recognition for its ability to enhance soil structure, improve water retention, stimulate beneficial microorganisms and provide long-term soil fertility beyond conventional nutrient supplementation.

Precision agriculture and sustainable crop management practices promote the combination of insect fertilizers with biological crop protection products, bio-stimulants and microbial inoculants for enhanced nutrient efficiency and crop productivity.

The demand for compact, organic and environmentally friendly fertilizer

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solutions that are suitable for controlled growing environments is growing, making urban agriculture, greenhouse cultivation, vertical farming and home gardening important application areas.

Technological innovations in insect farming, automated rearing systems, frass processing, drying technologies, and nutrient stabilization are enhancing production efficiency, product consistency, and commercial scalability across the insect fertilizer industry.

Governments and agricultural organizations worldwide are now actively supporting the development of circular agriculture policies which encourage the recycling of organic waste, development of sustainable fertilizers, decreased reliance on chemical fertilizers and lower agricultural carbon emissions.

Strategic collaborations between insect farming companies, fertilizer manufacturers, agricultural technology companies, research institutions and food processing companies are helping to accelerate innovation in insect bioconversion technologies, nutrient optimization and commercial product development.

Investment in industrial insect farming, organic waste valorization, regenerative agriculture, biological soil health management, circular nutrient recovery, and sustainable fertilizer innovation is expected to support long-term growth of the global insect fertilizers market through 2036.

## Market Determinants

Growing Adoption of Sustainable and Organic Farming Practices: Increasing global demand for environmentally friendly agricultural inputs is driving the adoption of insect fertilizers. Farmers are increasingly shifting toward organic and regenerative farming practices that improve soil fertility, reduce dependence on synthetic fertilizers, and support long-term agricultural sustainability.

Expansion of the Circular Bioeconomy and Organic Waste Valorization: Rising focus on converting food waste and agricultural by-products into valuable resources is accelerating the production of insect-derived fertilizers. Insect farming enables efficient bioconversion of organic waste into nutrient-rich frass, supporting circular economy initiatives while reducing environmental impact.

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Rising Awareness of Soil Health and Microbial Activity: Farmers are increasingly recognizing the importance of healthy soil ecosystems for sustainable crop production. Insect fertilizers improve soil structure, stimulate beneficial microbial populations, enhance nutrient availability, and increase water retention, making them an attractive solution for long-term soil management.

Advancements in Commercial Insect Farming Technologies: Continuous improvements in automated insect rearing, frass processing, nutrient stabilization, and quality control are enhancing production efficiency, product consistency, and commercial scalability. These technological advancements are supporting broader adoption of insect fertilizers across agricultural markets.

Limited Production Capacity and Higher Costs Compared with Conventional Fertilizers: Commercial insect fertilizer production remains relatively limited compared with traditional fertilizer manufacturing. Higher production costs, limited economies of scale, and evolving supply chains can restrict widespread adoption, particularly in price-sensitive agricultural markets.

Regulatory and Market Awareness Challenges: The insect fertilizers industry faces varying regulatory frameworks, certification requirements, and product approval processes across different countries. In addition, limited farmer awareness, insufficient agronomic knowledge, and conservative purchasing behavior can slow market penetration in developing agricultural regions.

## Opportunity Mapping Based on Market Trends

Expansion of Regenerative Agriculture and Organic Food Production: Increasing global adoption of regenerative farming and certified organic agriculture is creating significant opportunities for insect fertilizers as growers seek sustainable nutrient sources that improve soil health, enhance microbial activity, and reduce dependence on synthetic fertilizers while meeting organic certification requirements.

Growth of Circular Bioeconomy and Waste Valorization Initiatives: Rising investments in organic waste recycling and circular agriculture are creating substantial opportunities for insect farming companies to convert food waste, agricultural residues, and organic by-products into high-value insect frass

fertilizers. Expanding waste valorization programs are expected to strengthen commercial production and supply of insect-derived fertilizers.

Rising Demand from Controlled Environment Agriculture and Urban Farming: Expanding greenhouse cultivation, vertical farming, hydroponics, urban agriculture, and home gardening are creating opportunities for premium insect fertilizer formulations that provide efficient nutrient delivery, improve soil quality, and support sustainable crop production in controlled growing environments.

Expansion into Emerging Agricultural Markets and Sustainable Input Solutions: Increasing government support for sustainable agriculture, growing awareness of soil restoration, and rising investments in biological crop inputs across Asia Pacific, Latin America, the Middle East, and Africa are creating substantial long-term opportunities. Companies investing in advanced insect farming technologies, large-scale frass production, product innovation, strategic partnerships, and farmer education programs will be well positioned to capitalize on the accelerating global demand for insect fertilizers through 2036.

## Value-Creating Segments and Growth Pockets

### Black Soldier Fly Larvae Frass Dominates the Market While Mealworm Frass Registers the Fastest Growth

The Black Soldier Fly Larvae Frass segment accounted for the largest market share of an estimated 56.8% in 2025, driven by its high nutrient concentration, excellent soil conditioning properties, efficient organic waste conversion capabilities, and large-scale commercial production across established insect farming operations. Rich in essential nutrients, beneficial microorganisms, and organic matter, Black Soldier Fly Larvae Frass enhances soil fertility, improves microbial activity, and supports sustainable agricultural practices. Its widespread availability, cost-effectiveness, and compatibility with organic farming systems continue to strengthen its adoption across commercial agriculture, horticulture, and specialty crop cultivation. Increasing investments in circular economy initiatives and insect farming technologies are further reinforcing the segment's market leadership.

The Mealworm Frass segment is projected to register the highest CAGR of 16.5% during 2026–2036, supported by expanding commercial mealworm farming, growing demand for premium organic fertilizers, and increasing adoption across horticulture,

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greenhouse cultivation, and high-value specialty crops.

Fruits & Vegetables Generate the Highest Demand While Indoor, Urban & Home Gardening Witnesses the Fastest Expansion

The Fruits & Vegetables segment represented the largest market share of approximately 35.9% in 2025, driven by increasing production of organic fruits and vegetables, expanding cultivation of high-value horticultural crops, and rising demand for sustainable fertilizers that improve soil fertility, crop quality, and agricultural productivity. Insect-based fertilizers are increasingly preferred for their ability to enhance nutrient availability, improve soil health, stimulate microbial activity, and support environmentally sustainable farming practices. Growing consumer demand for chemical-free produce continues to strengthen adoption across commercial horticulture.

The Indoor, Urban & Home Gardening segment is projected to register the highest CAGR of 17.4% during 2026–2036, supported by growing interest in home gardening, urban agriculture, vertical farming, greenhouse cultivation, and environmentally friendly plant nutrition products designed for small-scale and controlled-environment agriculture.

Dry Formulations Dominate the Market While Liquid Formulations Record the Fastest Growth

The Dry segment accounted for the largest market share in 2025, driven by its long shelf life, ease of transportation and storage, convenient field application, and broad compatibility with conventional agricultural equipment and farming practices. Dry insect fertilizers are widely adopted across commercial agriculture due to their stable nutrient composition, cost-effective distribution, and suitability for large-scale crop cultivation. Their ability to improve soil structure while supporting gradual nutrient release further strengthens their market leadership across organic and sustainable farming systems.

The Liquid segment is projected to register the highest CAGR of 16.9% during 2026–2036, supported by increasing adoption in precision agriculture, fertigation systems, greenhouse cultivation, hydroponics, and high-value horticultural applications requiring rapid nutrient availability, efficient absorption, and precise nutrient delivery.

Regional Market Assessment

Europe

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Europe is projected to dominate the global insect fertilizers market, accounting for an estimated 38.6% market share in 2025. The region's leadership is supported by the widespread adoption of organic farming, stringent environmental regulations, strong policy support for sustainable agriculture, and continuous investments in the insect farming industry and circular bioeconomy. Countries including the Netherlands, France, Belgium, Germany, and Denmark are at the forefront of commercial insect farming, bio-based fertilizer innovation, and organic waste valorization technologies. Growing emphasis on reducing chemical fertilizer usage, improving soil health, and promoting regenerative agriculture continues to accelerate the adoption of insect-derived fertilizers. In addition, increasing investments in research and development, favorable regulatory frameworks, and strong collaboration between agricultural companies and biotechnology firms are expected to reinforce Europe's leadership throughout the forecast period.

Asia Pacific

The Asia Pacific region is projected to register the highest CAGR of 17.1% during 2026–2036, driven by rising agricultural production, expanding organic farming initiatives, increasing investments in insect farming, growing demand for sustainable crop inputs, and supportive government policies across China, India, Japan, South Korea, and Southeast Asia. Rapid population growth, rising food demand, and increasing awareness regarding environmentally sustainable farming practices are encouraging greater adoption of insect-based fertilizers. Governments and private enterprises are investing in circular agriculture, organic waste recycling, and innovative biofertilizer production technologies to improve agricultural productivity while minimizing environmental impact. Expanding horticulture, greenhouse cultivation, and precision agriculture are also expected to create substantial growth opportunities for insect fertilizer manufacturers across the region.

North America

North America represents a significant market for insect fertilizers, supported by increasing consumer demand for organic food products, growing investments in regenerative agriculture, expanding adoption of biological crop inputs, and the rapid development of commercial insect farming operations. The United States and Canada continue investing in sustainable farming technologies, circular economy initiatives, and innovative waste valorization solutions to reduce dependence on synthetic fertilizers and improve soil health. Rising awareness regarding environmental sustainability, carbon reduction, and regenerative farming practices is encouraging greater use of

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insect-derived fertilizers across commercial agriculture and horticulture. In addition, supportive research initiatives, technological advancements in insect farming, and increasing collaboration between agricultural companies and biotechnology firms are expected to strengthen long-term market growth throughout North America.

LAMEA

The LAMEA region is emerging as an attractive market for insect fertilizers, driven by increasing awareness of sustainable agriculture, expanding horticultural production, growing government initiatives supporting soil restoration, and rising demand for environmentally friendly fertilizers. Countries across Latin America, the Middle East, and Africa are increasingly adopting insect farming and circular agriculture practices to improve agricultural productivity, enhance resource efficiency, and reduce dependence on conventional chemical fertilizers. Growing investments in organic farming, sustainable crop nutrition, and agricultural modernization are creating favorable conditions for market expansion. In addition, increasing focus on waste recycling, soil conservation, climate-resilient agriculture, and bio-based farming solutions is expected to support long-term demand for insect-derived fertilizers across the LAMEA region.

Recent Developments

May 2025: Protix expanded its insect farming operations and increased production capacity for Black Soldier Fly-based products, supporting the growing demand for sustainable animal nutrition and insect-derived fertilizers.

March 2025: Innovafeed strengthened its circular agriculture initiatives by expanding industrial insect production facilities focused on converting agricultural by-products into high-value insect proteins and organic fertilizers.

October 2024: ?nsect enhanced its production technologies for mealworm-based agricultural products, supporting improved efficiency in insect farming and sustainable fertilizer manufacturing.

August 2024: Entobel expanded its insect bioconversion capabilities through investments in automated insect farming systems designed to increase production efficiency and support sustainable agricultural input development.

Critical Business Questions Addressed

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How will the Global Insect Fertilizers Market evolve through 2036?

The report evaluates long-term market growth driven by expanding organic agriculture, regenerative farming, circular bioeconomy initiatives, and increasing adoption of sustainable crop nutrition solutions.

Which insect type, application, and form segments will generate the greatest commercial opportunities?

The study identifies the dominant and fastest-growing market segments, enabling insect farming companies, fertilizer manufacturers, agricultural technology providers, distributors, and investors to prioritize strategic investments.

What are the primary factors driving market expansion?

The report analyzes the influence of sustainable agriculture, soil health improvement, organic waste valorization, insect farming technologies, and regenerative farming practices on future market development.

Which regional markets present the strongest long-term investment potential?

The assessment compares organic farming adoption, insect farming capacity, sustainability policies, agricultural production, and bioeconomy development across major regions to identify the most attractive growth opportunities.

How can insect fertilizer manufacturers strengthen their competitive position in the evolving industry?

The report examines strategic priorities including production capacity expansion, advanced insect farming technologies, product innovation, farmer education, strategic partnerships, and circular economy integration to support long-term competitive advantage.

Beyond the Forecast

> The insect fertilizers market will continue to evolve through advancements in automated insect farming, precision frass processing, nutrient stabilization, microbial soil enhancement, waste bioconversion technologies, and bio-based

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fertilizer formulations, enabling greater production efficiency and wider commercial adoption.

Rising investments in organic farming, regenerative agriculture, circular bioeconomy initiatives, biological crop inputs, sustainable waste management, and environmentally friendly fertilizer production will continue creating substantial opportunities for insect farming companies, fertilizer manufacturers, agri-tech firms, and sustainable agriculture stakeholders worldwide.

As agriculture increasingly prioritizes soil health, reduced chemical fertilizer dependency, carbon footprint reduction, resource efficiency, and circular nutrient management, companies investing in scalable insect farming operations, innovative fertilizer formulations, strategic distribution networks, and research-driven product development will be well positioned to capitalize on long-term growth opportunities in the global insect fertilizers market through 2036.

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## CHAPTER 8. GLOBAL INSECT FERTILIZERS MARKET SIZE & FORECASTS BY FORM 2025-2036

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## CHAPTER 9. GLOBAL INSECT FERTILIZERS MARKET SIZE & FORECASTS BY REGION 2025-2036



## CHAPTER 10. COMPETITIVE INTELLIGENCE

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