

**Soil Treatment Market Report by Type (Organic Amendments, pH Adjusters, Soil Protection), Technology (Biological Treatment, Thermal Treatment, Physiochemical Treatment), End User (Agricultural, Construction, and Others), and Region 2024-2032**

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**Report description:**

The global soil treatment market size reached US\$ 43.1 Billion in 2023. Looking forward, IMARC Group expects the market to reach US\$ 68.1 Billion by 2032, exhibiting a growth rate (CAGR) of 5.1% during 2024-2032. Increasing adoption of sustainable and organic soil treatment methods and the integration of digital technologies for real-time monitoring and data-driven decision-making in soil treatment processes are some of the key factors driving the market growth.

**Global Soil Treatment Market Analysis:**

- **Major Market Drivers:** Elevating levels of urbanization, along with the growing population globally, is resulting in decreasing arable land and increasing food shortages, which are driving the market for soil treatment. Additionally, the escalating demand for high-quality food grains is also contributing to the market growth.
- **Key Market Trends:** The rising awareness about environmental sustainability and the importance of soil health management is creating lucrative growth opportunities for the overall market. Moreover, various leading market players are investing in research and development (R&D) activities to innovate existing solutions and introduce sustainable techniques for increasing market penetration, which is also contributing to market growth.
- **Competitive Landscape:** Some of the leading soil treatment market companies include AMVAC Chemical Corporation (American Vanguard Corporation), Arkema S.A., BASF SE, Bayer AG, Compagnie de Saint-Gobain S.A., Corteva Inc., Novozymes A/S, Solvay S.A., Swaroop Agrochemical Industries, Syngenta Group (China National Chemical Corporation), Tata Chemicals Ltd., and UPL Limited, among others.
- **Geographical Trends:** According to the report, North America currently dominates the global market. Agriculture in North America is highly diverse, with a wide range of crops cultivated across different countries. Furthermore, the significantly rising population across the region is augmenting the demand for high-quality food, thereby bolstering the market growth in the region.

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-□Challenges and Opportunities: Challenges in the global soil treatment market include addressing complex soil contaminants, navigating varying regulatory landscapes across regions, and managing high costs associated with remediation technologies. Opportunities lie in advancing soil treatment technologies and leveraging sustainable practices for soil restoration.

Global Soil Treatment Market Trends:

#### Escalating Need for Effective Pest Management

The increasing prevalence of soilborne pests, such as nematodes, fungi, and bacteria, is significantly impacting crop yields and soil health, which is primarily driving the need for soil treatment techniques that enhance soil microbiome balance or suppress pest populations. For instance, the white grub infestation reduces the root system by approximately 25% in soybeans and 64% in maize. It was observed that *Phyllophaga capillata* and *Aegopsis bolboceridus* damaged all evaluated variables, reducing overall soybean productivity by 58.62% and maize productivity by 59.76% in South American countries like Brazil. Similarly, Nematodes such as *Meloidogyne incognita* and *Pratylenchus brachyurus* cause big losses in fruits and vegetables. For example, carrots can lose up to 20.0% of their crop because of them. These nematodes live in the soil, so it's important to use nematicides to kill them and protect the crops. Consequently, there is an escalating need for soil treatment solutions, which is anticipated to significantly propel the soil treatment market share in the coming years.

#### Growing Demand for Quality Food

The increasing demand for organic and quality food is further creating a positive outlook for the overall market. Quality food production relies heavily on fertile soil that provides essential nutrients to crops, which in turn influences crop yield, nutrition content, and overall food quality. The growing population, inflating disposable incomes, and elevating standards of living are resulting in an increased demand for food and agricultural products. According to a data report, the total food grain demand will grow to the level of 311 million tons, which includes 122, 115, 47, and 27 million tons of rice, wheat, coarse cereals, and pulses, respectively, by the year 2030. Besides this, the government authorities of various nations are taking initiatives to promote organic farming practices, which is further stimulating the market for soil treatment solutions. For example, the introduction of favorable initiatives, such as the National Program on Organic Farming and the Paramparagat Krishi Vikas Yojana, by the Government of India (GoI) to promote bio-agriculture in the country through financial assistance to farmers is facilitating the market growth.

#### Technological Advancements

Adoption of advanced soil treatment technologies such as bioremediation, thermal desorption, and electrokinetic for efficient contaminant removal are offering lucrative growth opportunities to the market. Moreover, various key market players are increasingly investing in soil treatment technologies to develop more advanced techniques and methods. For instance, in March 2024, the CSIR-Indian Institute of Chemical Technology (IICT) successfully demonstrated the conversion of dry leaves into a 'soil conditioner'. This method called Accelerated Anaerobic Composting (ACC), ensures that only bio-manure is generated, not biogas. Similarly, in October 2023, Rice University scientists and collaborators at the United States Army Engineer Research and Development Center (ERDC) developed a rapid high-temperature process that removes heavy metals and organic contaminants from the soil. Moreover, ongoing research and development in soil treatment technologies are expanding the market's potential to address diverse soil contaminants and meet stringent regulatory requirements worldwide.

Global Soil Treatment Industry Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the global soil treatment market report, along with forecasts at the global, regional, and country levels from 2024-2032. Our report has categorized the market based on type, technology, and end user.

Breakup by Type:

- Organic Amendments
- pH Adjusters
- Soil Protection

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pH adjusters exhibit clear dominance in the market

The report has provided a detailed breakup and analysis of the market based on the type. This includes organic amendments, pH adjusters, and soil protection. According to the report, pH adjusters exhibit clear dominance in the market.

pH adjusters in soil treatment are crucial for modifying soil acidity or alkalinity to optimize plant growth and remediate contaminated soils. They include substances like lime (calcium hydroxide) to raise pH for neutralizing acidic soils, and sulfur to lower pH for alkaline soil remediation. These adjusters help regulate nutrient availability, enhance microbial activity, and improve soil structure, crucial for agricultural productivity and environmental restoration. Additionally, pH adjusters play a vital role in ensuring effective uptake of nutrients by plants, promoting sustainable soil management practices, and mitigating adverse effects of soil contaminants through tailored pH correction strategies.

Breakup by Technology:

- Biological Treatment
- Thermal Treatment
- Physiochemical Treatment

Physiochemical treatment represents the largest market share

The report has provided a detailed breakup and analysis of the market based on the technology. This includes biological treatment, thermal treatment, and physiochemical treatment. According to the report, physiochemical treatment represents the largest market share.

Physiochemical treatment in soil treatment involves processes that physically and chemically alter contaminants in soil to reduce their toxicity or mobility. This method typically combines physical techniques like soil washing, screening, or thermal desorption with chemical methods such as oxidation, precipitation, or stabilization. Soil contaminants such as heavy metals, petroleum hydrocarbons, and persistent organic pollutants are targeted through these processes, aiming to degrade or isolate pollutants from soil matrices. Physiochemical treatment offers versatility in addressing diverse contaminants and is often tailored to site-specific conditions to achieve effective remediation and restore soil quality for safe land use purposes.

Breakup by End User:

- Agricultural
- Construction
- Others

Agricultural sector accounts for the majority of the total market share

The report has provided a detailed breakup and analysis of the market based on the end user. This includes agricultural, construction, and others. According to the report, the agricultural sector accounts for the majority of the total market share. Managing pests effectively is essential for ensuring food security and maintaining a stable food supply. Additionally, the escalating demand for quality food is also augmenting the growth of this segment. For instance, the total global food demand is expected to increase by 35% to 56% between 2010 and 2050, while the population at risk of hunger is expected to change by -91% to +8% over the same period. Besides this, increasing infestation of soilborne pests, diseases, and weeds is also bolstering the need for soil treatment. By optimizing soil health through treatments like fertilization, organic amendments, and pH adjustments, agricultural productivity can be maximized while minimizing environmental impact. Ultimately, soil treatment ensures long-term soil sustainability, supporting food security and maintaining ecosystem health in agricultural landscapes.

Breakup by Region:

- North America
  - o  United States
  - o  Canada
- Asia-Pacific
  - o  China
  - o  Japan

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- o India
- o South Korea
- o Australia
- o Indonesia
- o Others
- Europe
- o Germany
- o France
- o United Kingdom
- o Italy
- o Spain
- o Russia
- o Others
- Latin America
- o Brazil
- o Mexico
- o Others
- Middle East and Africa

North America currently dominates the global market

The report has also provided a comprehensive analysis of all the major regional markets, which include North America (the United States and Canada); Europe (Germany, France, the United Kingdom, Italy, Spain, Russia, and others); Asia Pacific (China, Japan, India, South Korea, Australia, Indonesia, and others); Latin America (Brazil, Mexico, and others); and the Middle East and Africa. According to the report, North America currently dominates the global market.

Agriculture in North America is highly diverse, with a wide range of crops cultivated across different countries. The region's diverse climate and fertile land enable the cultivation of crops such as wheat, corn, soybean, canola, and various fruits and vegetables. Furthermore, as per the soil treatment market forecast by IMARC, the significantly rising population across the region is bolstering the demand for high-quality food. According to the Canadian Agriculture Human Resource Council, Canada's farm labor deficit is anticipated to double by 2029 and lead to a 123,000-worker shortage. This will boost the need for soil treatment solutions to enhance crop yield. Additionally, various key market players are collaborating to introduce new and improved soil treatment solutions, which are further catalyzing the market growth. For instance, in May 2021, Corteva Agriscience and BASF Canada Agricultural Solutions (BASF) partnered toward a joint approach to weed control by recommending the combined use of Liberty 200 SN and Enlist herbicides on Enlist E3TM soybean acres. This partnership is anticipated to increase the use of herbicides, thereby expanding the market growth.

Competitive Landscape:

The competitive landscape of the industry has also been examined along with the profiles of the following key players:

- AMVAC Chemical Corporation (American Vanguard Corporation)
- Arkema S.A.
- BASF SE
- Bayer AG
- Compagnie de Saint-Gobain S.A.
- Corteva Inc.
- Novozymes A/S
- Solvay S.A.
- Swaroop Agrochemical Industries
- Syngenta Group (China National Chemical Corporation)
- Tata Chemicals Ltd.

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(Please note that this is only a partial list of the key players, and the complete list is provided in the report.)

#### Global Soil Treatment Market News:

-□June 2024: Chennai Chief Minister M K Stalin launched the Mannuyir Kaathu Mannuyir Kaappom Scheme to preserve soil fertility by distributing green manure seeds to farmers. The ₹206 crore scheme announced in the state agriculture budget is anticipated to benefit around two lakh farmers.

-□March 2024: CSIR-Indian Institute of Chemical Technology (IICT) successfully demonstrated the conversion of dry leaves into a soil conditioner. This method called Accelerated Anaerobic Composting (ACC), ensures that only bio-manure is generated, not biogas.

-□January 2024: BioConsortia, Inc., a leading agricultural technology company, announced the launch of nitrogen-fixing products to expand the addressable market to new crop opportunities. Their field trial results confirmed that nitrogen-fixing microbial seed treatment products increased yields and reduced fertilizer use in vegetable crops like potatoes.

#### Key Questions Answered in This Report

1. What was the size of the global soil treatment market in 2023?
2. What is the expected growth rate of the global soil treatment market during 2024-2032?
3. What are the key factors driving the global soil treatment market?
4. What has been the impact of COVID-19 on the global soil treatment market?
5. What is the breakup of the global soil treatment market based on the type?
6. What is the breakup of the global soil treatment market based on the technology?
7. What is the breakup of the global soil treatment market based on the end-user?
8. What are the key regions in the global soil treatment market?
9. Who are the key players/companies in the global soil treatment market?

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