

United States Agricultural Micronutrient Market By Crop Type (Cereals and Grains, Oilseeds and Pulses, Fruits and Vegetables, Turf and Ornamentals, Others), By Product (Boron, Copper, Iron, Manganese, Molybdenum, Zinc, Multi-Micronutrient, Others), By Application Mode (Fertigation, Foliar Spray, Soil Application, Seed Treatment), By Form (Chelated, Non-Chelated), By Region, Competition, Forecast and Opportunities, 2019-2029F

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Abstracts

United States Agricultural Micronutrient Market was valued at USD 801.07 Million in 2023 and is expected to reach USD 1207.21 Million by 2029 with a CAGR of 7.04% during the forecast period. The United States Agricultural Micronutrient Market is a dynamic sector that plays a crucial role in enhancing crop productivity and quality through the supply of essential micronutrients. This market includes a range of products designed to address micronutrient deficiencies in soils and crops, which are vital for optimal plant growth and yield. Key micronutrients such as zinc, manganese, copper, boron, and molybdenum are integral to various physiological processes in plants, including enzyme function, photosynthesis, and disease resistance. The market is driven by several factors, including the increasing need for crop diversification, advancements in agricultural technologies, and growing awareness of soil health. According to data from the U.S. Department of Agriculture, agriculture, food, and related industries contributed approximately \$1.530 trillion to U.S. GDP in 2023, representing a 5.6-percent share. Of this amount, \$203.5 billion came from farm output, accounting for about 0.7 percent of U.S. GDP. The total contribution of agriculture to GDP exceeds 0.7 percent, as agriculture-related sectors use agricultural inputs to generate additional

economic value. As U.S. farmers adopt more diverse cropping systems, including specialty crops and cover crops, there is a rising demand for tailored micronutrient solutions to meet the specific needs of different plants. The emphasis on sustainable farming practices and precision agriculture is fueling the development of more targeted and efficient micronutrient products.

Technological innovations, such as slow-release formulations and nano-technology, are also influencing the market by offering more effective and environmentally friendly options for nutrient delivery. The rise of precision agriculture and soil testing technologies has enabled farmers to better understand and address micronutrient deficiencies, leading to more precise and efficient use of micronutrient products. Despite these opportunities, the market faces challenges, including fluctuating raw material prices and regulatory pressures. However, the ongoing investment in research and development, along with increasing awareness of the importance of micronutrients for crop health, is expected to drive growth in the United States Agricultural Micronutrient Market.

Key Market Drivers

Growing Awareness of Soil Nutrient Deficiency

The growing awareness of soil nutrient deficiency is becoming a pivotal factor driving the United States Agricultural Micronutrient Market. Over the years, the intensification of agricultural practices, including over-farming and the continuous cultivation of crops without adequate nutrient replenishment, has resulted in significant soil degradation. This degradation has led to the depletion of essential micronutrients such as zinc, iron, manganese, and boron, which are crucial for plant health and productivity. With the increasing frequency of these deficiencies, farmers and agricultural stakeholders across the United States are becoming more conscious of the adverse effects on crop yields and overall quality. This awareness is leading to a heightened demand for micronutrient-enriched fertilizers and soil amendments to address these deficiencies effectively.

In response to this growing concern, both public and private sectors are actively engaging in initiatives aimed at addressing soil nutrient deficiencies. Government programs are being rolled out to support farmers in adopting sustainable agricultural practices, with a particular focus on balanced nutrient management. These programs often include subsidies, grants, and educational outreach to promote the use of micronutrient fertilizers. The private sector is investing heavily in research and development to innovate advanced micronutrient formulations that are specifically

tailored to different soil types and crop needs. Such innovations are enabling farmers to apply precise amounts of micronutrients, thereby enhancing crop health and productivity while minimizing environmental impacts.

Educational campaigns and extension services play a critical role in disseminating knowledge about the importance of maintaining soil health. These efforts are empowering farmers with the information and tools they need to implement more effective nutrient management strategies. As a result, the demand for agricultural micronutrients in the United States is witnessing substantial growth, as more farmers prioritize soil health to achieve better crop outcomes and long-term agricultural sustainability.

Advancements in Precision Agriculture

Advancements in precision agriculture are significantly driving the growth of the United States Agricultural Micronutrient Market by transforming the way farmers manage crop nutrition. Precision agriculture technologies enable the application of fertilizers and micronutrients with unparalleled accuracy, ensuring that crops receive the exact amount of nutrients they need at the most opportune times. This targeted approach not only enhances crop yield and quality but also reduces the environmental footprint by minimizing the overuse and runoff of fertilizers, which can lead to soil degradation and water contamination. Technologies such as soil mapping, remote sensing, and variable rate application systems are at the forefront of this agricultural revolution. Soil mapping allows farmers to create detailed profiles of their fields, identifying areas that may be deficient in specific micronutrients. Remote sensing technology, using drones or satellite imagery, provides real-time data on crop health and growth patterns, enabling farmers to detect nutrient deficiencies early. Variable rate application systems, integrated with GPS technology, allow for the precise distribution of micronutrients based on the specific needs of different parts of a field, optimizing both the efficiency and effectiveness of nutrient applications.

The integration of these advanced technologies into modern farming practices has created a growing demand for specialized micronutrient products that can be accurately and effectively delivered to crops. Farmers are increasingly seeking micronutrient formulations that are compatible with precision application methods, ensuring that their crops receive the right nutrients in the right amounts. As precision agriculture continues to evolve, its impact on the United States Agricultural Micronutrient Market is expected to grow. The ongoing development of more sophisticated tools and techniques will drive further adoption of precision agriculture, as farmers look for more efficient and

sustainable ways to manage crop nutrition. This trend is likely to result in an increased focus on micronutrient products that support the precise and environmentally responsible practices that are central to modern agriculture.

Increasing Demand for High-Value Crops

The increasing demand for high-value crops, such as fruits, vegetables, and nuts, is significantly impacting the United States Agricultural Micronutrient Market. As consumers become more health-conscious, they are shifting their preferences towards nutrient-rich foods, which has led to a surge in demand for high-value crops. According to data from the U.S. Department of Agriculture, soybean production in 2023 reached 4.16 billion bushels, representing a 2 percent decrease from 2022. The average yield per acre was estimated at 50.6 bushels, an increase of 1.0 bushel compared to the previous year. The harvested area totaled 82.4 million acres, down 4 percent from the previous year. These crops require precise amounts of specific micronutrients for optimal growth and productivity. Any deficiency in micronutrients can negatively affect crop yield, quality, and marketability. Consequently, farmers are focusing on micronutrient applications to ensure that these high-value crops meet the desired standards and market expectations.

The growing emphasis on the nutritional content of food has also increased the reliance on agricultural micronutrients in the cultivation of high-value crops. According to data from the U.S. Department of Agriculture, the U.S. agriculture sector encompasses not just farming but also various related industries. Together, agriculture, food, and related sectors account for 5.6 percent of the U.S. GDP and support 10.4 percent of the workforce. On average, Americans spend 12.8 percent of their household budgets on food. Consumers are not only seeking fresh and flavorful produce but are also paying attention to the nutrient density of the foods they consume. This has prompted farmers to invest in micronutrient-enhanced fertilizers to enhance the quality and nutritional value of their crops. By addressing micronutrient deficiencies in the soil, farmers can produce crops that meet the rising consumer demand for health-focused products, leading to higher returns on their investments.

In addition to conventional farming practices, the rise of organic farming and sustainable agriculture has further fueled the demand for agricultural micronutrients. Organic farming practices, in particular, emphasize the use of natural and organic inputs, including micronutrient sources, to promote soil health and sustainability. As organic farming continues to gain traction in the United States, the need for natural and organic micronutrient solutions is expected to grow. The trend towards high-value crops,

coupled with the increasing focus on quality and sustainability, is driving the United States Agricultural Micronutrient Market. This trend is anticipated to continue, with farmers increasingly relying on micronutrients to meet the evolving demands of consumers and the agricultural industry.

Key Market Challenges

High Costs of Micronutrient Enriched Fertilizers

One of the primary challenges facing the United States Agricultural Micronutrient Market is the high cost of micronutrient-enriched fertilizers. These specialized products often require advanced manufacturing processes and high-quality raw materials, leading to elevated production costs. The price of micronutrient fertilizers can be significantly higher than traditional fertilizers, which may deter some farmers, particularly those operating on smaller budgets, from adopting them. The financial burden of purchasing these fertilizers can be exacerbated by fluctuating raw material costs and transportation expenses. For many farmers, especially in regions with lower profit margins, the expense associated with micronutrient-enriched fertilizers may outweigh the perceived benefits, limiting their widespread adoption. This challenge is compounded by economic pressures in the agricultural sector, including volatile commodity prices and increased operational costs. Addressing the cost barrier requires innovative solutions such as subsidies, cost-effective manufacturing technologies, and financial incentives to make micronutrient fertilizers more accessible and appealing to a broader range of agricultural producers.

Complexity of Micronutrient Application

Another significant challenge in the U.S. Agricultural Micronutrient Market is the complexity associated with the application of micronutrients. Unlike macronutrients, which are needed in larger quantities and are relatively straightforward to manage, micronutrients must be applied in precise amounts to be effective. This requires a deep understanding of soil science and plant nutrition to avoid over-application or deficiencies. Micronutrient deficiencies or excesses can lead to adverse effects on crop health and yield, making accurate application crucial. The complexity is further heightened by the variability in soil types and crop requirements, necessitating customized solutions for different conditions. Farmers may need to invest in sophisticated diagnostic tools and expertise to effectively manage micronutrient applications, adding to the operational complexity and cost. Integrating micronutrient management into existing agricultural practices can be challenging, requiring careful

planning and continuous monitoring. Simplifying application processes and providing more user-friendly solutions are essential to overcoming this challenge and ensuring the effective use of micronutrient fertilizers.

Limited Awareness and Knowledge Among Farmers

Limited awareness and knowledge about the benefits and use of micronutrients present a substantial challenge in the U.S. Agricultural Micronutrient Market. Despite the proven advantages of micronutrient-enriched fertilizers, many farmers may not fully understand their importance or how to implement them effectively. This lack of awareness can stem from insufficient educational resources, limited access to technical support, or outdated farming practices. In regions where traditional farming methods are predominant, there may be resistance to adopting new technologies or approaches, including the use of micronutrients. The complexity of micronutrient management requires specialized knowledge that may not be readily available to all farmers. Bridging this knowledge gap is crucial for market growth and the effective use of micronutrients. This can be achieved through targeted educational programs, extension services, and collaboration with agricultural advisors to increase awareness and provide practical guidance on the benefits and application of micronutrient-enriched fertilizers.

Key Market Trends

Technological Innovations in Fertilizer Formulations

Technological innovations in fertilizer formulations are playing a pivotal role in driving the growth of the United States Agricultural Micronutrient Market. With continuous advancements in the development of micronutrient-enriched fertilizers, including chelated micronutrients and slow-release formulations, farmers are now equipped with more sophisticated and effective tools for nutrient management. Chelated micronutrients, for instance, enhance the stability and solubility of nutrients, ensuring they remain available for plant absorption over a more extended period. This innovation reduces the likelihood of nutrient loss due to environmental factors such as leaching, volatilization, or fixation in the soil, leading to more efficient use of fertilizers.

In addition to chelated products, slow-release formulations are gaining popularity among farmers. These fertilizers are designed to release nutrients gradually over time, synchronizing with the plant's growth cycle and nutrient demands. This approach not only optimizes nutrient uptake but also mitigates the risk of over-fertilization, which can lead to soil degradation and environmental pollution. Technological advancements have

enabled the production of customized micronutrient blends tailored to the specific requirements of different crops and varying soil conditions. This precision farming approach allows farmers to target nutrient deficiencies more effectively, resulting in improved crop yield, better quality produce, and enhanced resistance to diseases and pests.

These innovations are aligned with the growing emphasis on sustainable agricultural practices. By minimizing nutrient wastage and reducing the environmental impact of fertilizer use, these advanced formulations contribute to more eco-friendly farming. As research and development in agricultural technology continue to evolve, the demand for innovative micronutrient fertilizers is expected to rise, further propelling the growth of the United States Agricultural Micronutrient Market. This ongoing innovation underscores the market's dynamic nature and highlights the importance of technological advancements in shaping the future of agriculture.

Growing Demand for Sustainable Agriculture

The growing emphasis on sustainable agriculture is a pivotal driver for the United States Agricultural Micronutrient Market. As the agricultural sector faces increasing scrutiny regarding its environmental impact, there is a strong push towards adopting practices that minimize the reliance on synthetic chemicals and mitigate ecological damage. At the mid-point of the agenda 2030 for Sustainable Development, it is crucial to assess the global progress in eradicating hunger and food insecurity, as well as advancing sustainable agriculture. The latest report from the Food and Agriculture Organization of the United Nations (FAO), titled-Tracking Progress on Food and Agriculture-Related SDG Indicators, analyzes trends across eight Sustainable Development Goals (SDGs)—specifically SDGs 1, 2, 5, 6, 10, 12, 14, and 15—highlighting both areas of advancement and where additional efforts are required. Sustainable agriculture aims to enhance soil health, conserve resources, and promote biodiversity, which aligns well with the use of micronutrients. Micronutrients are crucial in sustainable agriculture as they contribute to improved soil fertility and plant health. By enhancing soil nutrient profiles, micronutrients help reduce the necessity for chemical fertilizers, which can have adverse environmental effects such as soil degradation and water pollution. Micronutrients bolster crop resilience to environmental stressors, such as drought and disease, thereby contributing to more robust and productive agricultural systems.

The rise of organic farming and regenerative agriculture has further amplified the demand for micronutrients. These farming methods emphasize the use of natural and organic inputs, reflecting a broader consumer preference for products that are produced

with minimal environmental impact. Organic and regenerative agriculture practices focus on soil health, ecosystem balance, and reduced chemical use, driving the need for micronutrient sources that are compatible with these approaches.

Consumers and policymakers are increasingly advocating for sustainable food production, prompting the agricultural industry to invest in solutions that meet these demands. As sustainability becomes a core principle of agricultural practices, the adoption of micronutrient solutions is expected to grow. This trend is likely to drive long-term expansion in the United States Agricultural Micronutrient Market, as farmers seek ways to enhance soil health and crop productivity while adhering to environmental stewardship principles.

Segmental Insights

Crop Type Insights

In 2023, the Fruits and Vegetables segment emerged as the dominant crop type in the United States Agricultural Micronutrient Market. This dominance is primarily attributed to the increasing consumer demand for fresh, nutrient-rich produce, which has driven farmers to adopt advanced micronutrient solutions to enhance crop yield and quality. Fruits and vegetables require specific micronutrients such as boron, zinc, and manganese to support robust growth, disease resistance, and optimal fruiting. As consumer preferences shift towards healthier diets, the emphasis on high-quality fruits and vegetables has intensified, leading growers to invest in micronutrient-enriched fertilizers to meet these demands and achieve competitive market prices.

The focus on sustainability and the quest for higher productivity in horticultural crops have reinforced the need for micronutrient management. Modern farming practices in this segment increasingly rely on precision agriculture technologies that optimize nutrient application, further driving the demand for specialized micronutrient products tailored for fruits and vegetables. These products not only improve crop health but also ensure that produce meets stringent quality standards and consumer expectations.

Product Insights

In 2023, the multi-micronutrient segment emerged as the dominant product category in the United States Agricultural Micronutrient Market. This prominence is largely driven by the growing recognition of the benefits of using comprehensive micronutrient solutions that address a broad range of nutrient deficiencies simultaneously. Multi-micronutrient

formulations combine essential elements such as boron, copper, iron, manganese, molybdenum, and zinc into a single product, providing a balanced approach to soil and crop nutrition.

The preference for multi-micronutrient products stems from their ability to simplify nutrient management for farmers, who can efficiently address multiple deficiencies with one application. This holistic approach not only improves crop health and yield but also reduces the need for multiple individual micronutrient products, saving time and labor. Multi-micronutrient fertilizers enhance soil fertility, support plant growth, and boost resistance to diseases, which is particularly valuable for diverse crop types and varying soil conditions. The advancement in precision agriculture technologies has further fueled the demand for multi-micronutrient solutions. These technologies enable more accurate application and monitoring, making it easier to utilize complex nutrient blends effectively.

Regional Insights

In 2023, the Midwest region emerged as the dominated area in the United States Agricultural Micronutrient Market, holding the largest market share. This dominance is primarily due to the Midwest's significant agricultural output and its role as a major hub for crop production in the U.S. The region, known for its extensive farming operations, includes key agricultural states such as Iowa, Illinois, and Nebraska, which are renowned for their large-scale production of cereals, grains, and other essential crops.

The Midwest's dominance is driven by several factors. First, the region's fertile soil and favorable climate conditions make it ideal for diverse crop cultivation, leading to a high demand for micronutrient solutions to enhance soil fertility and crop yields. Farmers in the Midwest are keenly focused on optimizing their productivity and addressing nutrient deficiencies, driving substantial demand for advanced micronutrient products. The Midwest benefits from a well-established agricultural infrastructure, including research institutions and extension services that provide farmers with the knowledge and tools necessary to implement effective micronutrient management practices.

Key Market Players

The Mosaic Company

Koch, Inc.

The Andersons, Inc.

Helena Agri-Enterprises, LLC

Yara North America, Inc.

Nutrien Ag Solutions, Inc

BRANDT, Inc.

SQM S.A.

Nouryon Chemicals Holding B.V

Verdesian Life Sciences

Report Scope:

In this report, the United States Agricultural Micronutrient Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

United States Agricultural Micronutrient Market, By Crop Type:

Cereals and Grains

Oilseeds and Pulses

Fruits and Vegetables

Turf and Ornamentals

Others

United States Agricultural Micronutrient Market, By Product:

Boron

Copper

Iron

Manganese

Molybdenum

Zinc

Multi-Micronutrient

Others

United States Agricultural Micronutrient Market, By Application Mode:

Fertigation

Foliar Spray

Soil Application

Seed Treatment

United States Agricultural Micronutrient Market, By Form:

Chelated

Non-Chelated

United States Agricultural Micronutrient Market, By Region:

Northeast Region

Midwest Region

West Region

South Region

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the United States Agricultural Micronutrient Market.

Available Customizations:

United States Agricultural Micronutrient Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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