+357 96 030922
info@marketpublishers.com

Metal Chelates Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, 2019-2029 Segmented By Type (Primary nutrients, Secondary nutrients, Micronutrients, Others), By Crop type (Cereals & Grains, Oilseeds & Pulses, Fruits & Vegetables, Other crops), By Mode of Application (Soil, Foliar, Fertigation, Others), By Region, and By Competition

https://marketpublishers.com/r/M05349C274ECEN.html
Date: February 2024
Pages: 174
Price: US$ 4,500.00 (Single User License)
ID: M05349C274ECEN

Abstracts

Global Metal Chelates Market was valued at USD 587.49 million in 2023 and will see an impressive growth in the forecast period at a CAGR of 8.12% to 2029. Metal chelates play a crucial role in agriculture by serving as a source of essential micronutrients for plants. In agricultural contexts, metal chelates are primarily used to address micronutrient deficiencies in soils, which can significantly impact crop growth, development, and yield. Micronutrients such as iron (Fe), zinc (Zn), manganese (Mn), copper (Cu), boron (B), and molybdenum (Mo) are essential for various physiological processes in plants, including photosynthesis, enzyme activation, and nutrient uptake. However, these micronutrients are often present in soils in forms that are not readily available for plant uptake. Metal chelates help solubilize and stabilize micronutrients in a form that plants can easily absorb through their roots. Metal chelates are formed by chemically binding a metal ion (such as iron or zinc) to a chelating agent, which is a molecule capable of forming multiple bonds with the metal ion. The chelating agent surrounds the metal ion, forming a ring-like structure called a chelate. This chelates structure protects the metal ion from precipitation, oxidation, or other chemical reactions that could render it unavailable to plants.

+357 96 030922
info@marketpublishers.com

The expansion of agriculture and horticulture sectors, particularly in emerging economies, fuels the demand for metal chelates. As farmers seek to maximize crop productivity and profitability, they increasingly adopt advanced agricultural practices and technologies, including the use of chelated micronutrient fertilizers to address soil nutrient deficiencies and optimize plant growth. Ongoing research and development efforts have led to technological advancements in chelate formulations, enhancing their stability, solubility, and efficacy. Innovative chelating agents and manufacturing processes enable the production of high-quality metal chelates with improved nutrient availability and plant uptake, driving their adoption across diverse agricultural and industrial applications. There is a growing awareness among farmers, agronomists, and policymakers about the importance of soil health and nutrient management in sustainable agriculture. Metal chelates help address micronutrient deficiencies in soils, promote balanced nutrition in plants, and improve soil fertility, contributing to enhanced crop yields, quality, and resilience to environmental stressors.

Key Market Drivers

Expansion of Agriculture and Horticulture Sectors

As the global population grows, there is heightened pressure on agricultural systems to produce more food. This demand drives farmers to intensify their production systems, often on lands that may be deficient in essential micronutrients. Metal chelates provide a precise and efficient way to deliver micronutrients to plants, ensuring optimal growth and yield even in intensive farming systems. Agricultural expansion is not limited to prime agricultural lands. With arable land becoming scarce, farmers are increasingly venturing into marginal lands characterized by poor soil fertility and nutrient deficiencies. Metal chelates play a crucial role in addressing these deficiencies, enabling agriculture to expand into previously untapped areas and improving overall productivity. The horticulture sector is experiencing rapid growth driven by increased consumer demand for fruits, vegetables, ornamental plants, and other high-value crops. Horticultural crops often have specific nutrient requirements to achieve optimal growth, yield, and quality. Metal chelates allow growers to customize nutrient solutions tailored to the needs of different crops, contributing to the success of the horticulture industry.

The adoption of precision agriculture technologies, such as soil mapping, remote sensing, and precision nutrient application, is increasing worldwide. These technologies enable farmers to make informed decisions about nutrient management, including the application of micronutrient fertilizers like metal chelates. By targeting specific areas of the field with deficient nutrients, farmers can optimize resource use and maximize crop

+357 96 030922
info@marketpublishers.com

yields. There is a growing recognition of the importance of sustainable agriculture practices to minimize environmental impact and conserve natural resources. Metal chelates offer an environmentally friendly solution to address nutrient deficiencies in soils, reducing the need for excessive fertilizer applications that can lead to soil and water pollution. As sustainability becomes a priority for farmers and consumers alike, the demand for metal chelates is expected to increase. This factor will help in the development of the Global Metal Chelates Market.

Rising Awareness about Soil Health and Nutrient Management

With increasing attention on sustainable agriculture and soil health, farmers and agronomists are becoming more aware of soil nutrient deficiencies. Soil testing and analysis reveal deficiencies in essential micronutrients such as iron, zinc, manganese, and copper, which are crucial for plant growth and development. Metal chelates offer a targeted solution to address these deficiencies by supplying micronutrients in a readily available form for plant uptake. Awareness about soil nutrient dynamics and plant requirements allows farmers to optimize nutrient application practices. Instead of blanket applications of fertilizers, farmers are adopting precision agriculture techniques to apply nutrients where they are needed most. Metal chelates enable precise nutrient delivery, ensuring that plants receive the right balance of micronutrients for optimal growth and yield.

Balanced nutrition is essential for healthy plant growth and resilience to stressors such as pests, diseases, and environmental conditions. Metal chelates help promote balanced nutrition by supplying micronutrients in proportions that complement the nutrient requirements of different crops. This balanced approach to nutrition enhances crop productivity, quality, and sustainability. Sustainable agriculture practices prioritize soil health, water quality, and environmental stewardship. Metal chelates offer several benefits that align with sustainable agriculture goals, including reduced nutrient runoff, improved nutrient efficiency, and minimal environmental impact. By addressing soil nutrient deficiencies effectively, metal chelates contribute to the long-term sustainability of agricultural systems. Agricultural extension services, educational programs, and industry initiatives play a crucial role in raising awareness about soil health and nutrient management practices. These programs provide farmers with information, resources, and technical assistance to implement best practices for soil fertility and nutrient optimization. Metal chelates manufacturers and suppliers often collaborate with extension services and industry organizations to promote the benefits of micronutrient fertilizers and soil amendments. This factor will pace up the demand of the Global Metal Chelates Market.

+357 96 030922
info@marketpublishers.com

Technological Advancements in Chelate Formulations

One of the primary challenges with metal chelates is maintaining stability, especially under varying environmental conditions such as pH, temperature, and soil moisture. Advanced chelate formulations incorporate stabilizing agents and chelating agents with high affinity for metal ions, ensuring that the chelate remains intact and available for plant uptake over a wide range of conditions. Many micronutrients chelates have limited solubility in water, which can affect their effectiveness when applied to crops or soil. New formulations utilize chelating agents with improved solubility characteristics, allowing for better dispersibility and uptake by plants. Enhanced solubility ensures uniform distribution of micronutrients in the soil solution, promoting efficient nutrient uptake by plant roots.

Compatibility with other agricultural inputs such as fertilizers, pesticides, and herbicides is essential for practical application in modern farming systems. Technological advancements have led to the development of chelate formulations that are compatible with a wide range of agricultural inputs, minimizing the risk of adverse interactions and ensuring effective nutrient management practices. Controlled-release formulations offer several advantages in terms of nutrient availability and efficiency. Advanced chelate formulations incorporate coating materials or matrix structures that control the release of micronutrients over time, providing a steady and sustained supply to plants. Controlled release chelates reduce the risk of nutrient leaching and runoff, enhancing nutrient use efficiency and minimizing environmental impact.

Different crops and soils have varying nutrient requirements and conditions, necessitating customized chelate formulations tailored to specific agricultural contexts. Manufacturers leverage advances in formulation science to develop customized chelate products optimized for different crops, soil types, and environmental conditions. Customized formulations ensure that farmers have access to chelates tailored to their specific needs, maximizing the effectiveness of nutrient management strategies. Increasing environmental awareness and regulatory pressures drive the demand for environmentally friendly chelate formulations. Manufacturers are developing chelate formulations that are biodegradable, non-toxic, and environmentally sustainable, aligning with the principles of green chemistry. Environmentally friendly chelates minimize ecological risks and contribute to sustainable agricultural practices. Advances in delivery systems allow for precise and targeted application of chelates to crops and soil. Innovations such as foliar sprays, fertigation systems, and seed coatings enable efficient delivery of micronutrients directly to plant tissues or root zones, enhancing

+357 96 030922
info@marketpublishers.com

nutrient uptake and utilization. Innovative delivery systems maximize the effectiveness of chelate formulations while minimizing wastage and environmental impact. This factor will accelerate the demand of the Global Metal Chelates Market.

Key Market Challenges

Cost and Price Volatility

The production of metal chelates involves the use of raw materials such as chelating agents, metal salts, and other chemical compounds. The prices of these raw materials can fluctuate due to factors such as supply-demand dynamics, currency fluctuations, and geopolitical events. Sudden increases in raw material costs can directly impact the production costs of metal chelates, affecting profit margins for manufacturers. Energy-intensive manufacturing processes contribute to the overall production costs of metal chelates. Fluctuations in energy prices, including electricity, natural gas, and fuel, can significantly impact manufacturing expenses. Rising energy costs may compel manufacturers to increase product prices to offset higher production expenses, potentially affecting market competitiveness and customer demand. Metal chelates are often transported over long distances from manufacturing facilities to distribution centers and end-users. Transportation and logistics costs, including freight charges, shipping fees, and fuel surcharges, are subject to fluctuations influenced by fuel prices, transportation regulations, and global trade dynamics. Variations in transportation costs can impact the final landed cost of metal chelates and influence pricing strategies.

Product Stewardship and Safety

Metal chelates, like many chemical products, pose potential health and safety risks to workers involved in their production, handling, and application. Exposure to certain chelating agents and metal compounds may result in skin irritation, respiratory problems, or other adverse health effects. Ensuring proper handling procedures, personal protective equipment (PPE), and employee training are essential to mitigate health and safety risks in the workplace. Improper disposal, storage, or application of metal chelates can lead to environmental contamination and adverse ecological impacts. Chelating agents and metal ions may persist in the environment, accumulate in soil and water bodies, and pose risks to aquatic organisms, wildlife, and ecosystems. Manufacturers and users of metal chelates must adhere to environmental regulations, implement pollution prevention measures, and adopt sustainable practices to minimize environmental impact. Metal chelates are subject to regulatory requirements and labeling standards governing their production, packaging, storage, and distribution.

+357 96 030922
info@marketpublishers.com

Compliance with regulations such as REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) in the European Union and OSHA (Occupational Safety and Health Administration) standards in the United States is essential to ensure product stewardship and safety. Failure to comply with regulatory requirements can result in legal penalties, fines, and reputational damage for companies.

Key Market Trends

Rising Demand in Healthcare and Pharmaceuticals

Metal chelates are used in various therapeutic applications within the healthcare and pharmaceutical industries. Chelating agents such as EDTA (ethylenediaminetetraacetic acid) and DTPA (diethylenetriaminepentaacetic acid) are employed in chelation therapy to treat heavy metal poisoning and detoxify the body. Additionally, metal chelates are utilized in the development of radiopharmaceuticals for diagnostic imaging and targeted cancer therapy. Metal chelates play a crucial role in drug formulation and delivery systems in pharmaceuticals. Chelating agents are used to stabilize metal ions in pharmaceutical formulations, enhancing drug stability, solubility, and bioavailability. Metal chelates also serve as carrier molecules for targeted drug delivery, enabling the controlled release of therapeutic agents to specific tissues or organs while minimizing systemic side effects. Metal chelates are utilized as contrast agents in diagnostic imaging techniques such as magnetic resonance imaging (MRI) and computed tomography (CT) scanning. Chelating agents complexed with paramagnetic or radiopaque metals enhance the visibility of tissues and organs in medical imaging, enabling more accurate diagnosis and treatment planning for various medical conditions. Metal chelates are employed in the treatment of metal imbalance disorders such as Wilson's disease, hemochromatosis, and thalassemia. Chelating agents bind to excess metal ions in the body, facilitating their excretion through urine or feces and restoring metal balance. Metal chelation therapy is essential for managing these genetic and acquired disorders and preventing associated complications.

Segmental Insights

Type Insights

The Micronutrients segment is projected to experience rapid growth in the Global Metal Chelates Market during the forecast period. There is a growing recognition of the importance of micronutrients in plant nutrition and crop productivity. Micronutrients such as iron, zinc, manganese, copper, and boron play essential roles in various

+357 96 030922
info@marketpublishers.com

physiological processes in plants, including enzyme activation, photosynthesis, and nutrient uptake. As a result, farmers and agricultural stakeholders are increasingly adopting micronutrient fertilizers, including metal chelates, to address nutrient deficiencies and optimize crop yields. With the global population continuing to grow, there is a heightened demand for high-yield and high-quality crops to meet the increasing food requirements. Micronutrient deficiencies in soils can significantly impact crop growth, development, and yield. Metal chelates offer an efficient and effective way to deliver micronutrients to plants, ensuring optimal nutrient uptake and utilization, thereby contributing to improved crop yields and quality. Agriculture is expanding into marginal lands characterized by poor soil fertility and nutrient deficiencies. These lands often require supplementation with micronutrients to overcome nutrient limitations and support crop growth. Metal chelates provide a targeted and efficient solution for delivering micronutrients to plants, even in challenging soil conditions, thereby enabling agriculture expansion and productivity improvement in marginal lands.

Crop type Insights

The Cereals & Grains segment is projected to experience rapid growth in the Global Metal Chelates Market during the forecast period. Cereals and grains are staple food crops that play a crucial role in global food security. With the world's population continuing to grow, there is a rising demand for cereals and grains to feed the expanding population. Metal chelates, particularly micronutrient chelates like iron, zinc, manganese, and copper, are essential for enhancing the growth, yield, and quality of cereal and grain crops. Many soils around the world suffer from micronutrient deficiencies, which can adversely affect crop growth and productivity. Metal chelates are used as micronutrient fertilizers to address these deficiencies by supplying essential nutrients in a readily available form to plants. Cereals and grains, being high-demand crops, benefit significantly from the application of metal chelates to improve nutrient uptake and utilization. Modern agricultural practices focus on optimizing nutrient management to maximize crop yields while minimizing environmental impact. Metal chelates offer precise and targeted nutrient delivery to plants, ensuring optimal nutrient uptake and utilization. By providing micronutrients in chelated form, the Cereals & Grains segment can achieve higher yields and better crop quality, contributing to overall agricultural productivity.

Regional Insights

North America emerged as the dominant player in the global Metal Chelates market in 2023. North America, particularly the United States and Canada, boasts a robust

+357 96 030922
info@marketpublishers.com

agricultural sector that relies heavily on metal chelates for enhancing crop productivity and quality. The use of chelated micronutrients such as iron, zinc, and manganese in fertilizers is widespread across North American farms, driving significant demand for metal chelates in the region. The North American region is home to leading manufacturers and suppliers of metal chelates who continuously invest in research and development to innovate new products and improve existing formulations. Technological advancements in chelate synthesis, formulation, and application methods have contributed to the region's dominance in the global metal chelates market. North America has stringent environmental regulations governing the use and disposal of chemical products, including metal chelates. Manufacturers in the region are required to adhere to strict environmental standards, driving the development of environmentally friendly chelating agents and sustainable production practices.

Key Market Players

BASF SE

Akzo Nobel N.V.

Aries Agro Limited

Deretil Agronutritional

Haifa Chemicals Ltd

Nufarm Limited

Protex International SA

Syngenta AG

Valagro SPA

Van Iperen International BV

Report Scope:

In this report, the Global Metal Chelates Market has been segmented into the following

+357 96 030922
info@marketpublishers.com

categories, in addition to the industry trends which have also been detailed below:

Metal Chelates Market, By Type:

Primary nutrients

Secondary nutrients

Micronutrients

Others

Metal Chelates Market, By Crop type:

Cereals & Grains

Oilseeds & Pulses

Fruits & Vegetables

Other crops

Metal Chelates Market, By Mode of Application:

Soil

Foliar

Fertigation

Others

Metal Chelates Market, By Region:

North America

United States

Canada

+357 96 030922
info@marketpublishers.com

Mexico

Europe

Germany

United Kingdom

France

Italy

Spain

Asia-Pacific

China

Japan

India

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

+357 96 030922
info@marketpublishers.com

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Metal Chelates Market.

Available Customizations:

Global Metal Chelates market report with the given market data, Tech Sci 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).

+357 96 030922
info@marketpublishers.com

Contents

+357 96 030922
info@marketpublishers.com

6. NORTH AMERICA METAL CHELATES MARKET OUTLOOK

7. EUROPE METAL CHELATES MARKET OUTLOOK

+357 96 030922
info@marketpublishers.com

+357 96 030922
info@marketpublishers.com

8. ASIA-PACIFIC METAL CHELATES MARKET OUTLOOK

+357 96 030922
info@marketpublishers.com

9. SOUTH AMERICA METAL CHELATES MARKET OUTLOOK

+357 96 030922
info@marketpublishers.com

10. MIDDLE EAST AND AFRICA METAL CHELATES MARKET OUTLOOK

11. MARKET DYNAMICS

+357 96 030922
info@marketpublishers.com

+357 96 030922
info@marketpublishers.com

I would like to order

Product name: Metal Chelates Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, 2019-2029 Segmented By Type (Primary nutrients, Secondary nutrients, Micronutrients, Others), By Crop type (Cereals & Grains, Oilseeds & Pulses, Fruits & Vegetables, Other crops), By Mode of Application (Soil, Foliar, Fertigation, Others), By Region, and By Competition

Product link: https://marketpublishers.com/r/M05349C274ECEN.html

Price: US$ 4,500.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:
info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page https://marketpublishers.com/r/M05349C274ECEN.html