

Global Precision Agriculture Market 2023

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Abstracts

Precision agriculture, also known as satellite farming, refers to the use of advanced technologies and data analytics to optimize agricultural practices and increase productivity. It involves the application of various tools and technologies such as GPS, GIS, remote sensors, and variable rate technology (VRT) to gather and analyze data related to soil conditions, weather patterns, crop health, and other factors.

According to the latest data, the market size of the global precision agriculture sector is expected to rise by USD 7.7 billion with a CAGR of 11.4% by the end of 2029. The agriculture industry is progressively embracing advanced technologies in order to reduce labor costs and enhance operational efficiency. Automation and control systems, such as GPS receivers, guidance and steering devices, and variable rate technology (VRT) devices, are extensively employed in precision farming practices. These technologies enable farmers to cover larger areas of land in less time while minimizing labor costs. Governments worldwide are actively investing in modern agricultural management practices and implementing supportive policies to promote precision agriculture. These initiatives aim to encourage the adoption of advanced technologies, improve food security, and mitigate the environmental impact of farming.

One of the primary motivations behind the adoption of precision agriculture is the steadily increasing global population, which creates a higher demand for food production. Precision agriculture techniques play a crucial role in optimizing crop yields, minimizing resource wastage, and ensuring sustainable farming practices. The imperative to feed the growing population and guarantee long-term food security serves as a significant driving force behind the widespread adoption of precision agriculture.

The report covers market size and growth, segmentation, regional breakdowns, competitive landscape, trends and strategies for global precision agriculture market. It presents a quantitative analysis of the market to enable stakeholders to capitalize on

the prevailing market opportunities. The report also identifies top segments for opportunities and strategies based on market trends and leading competitors' approaches.

Market Segmentation

Component: hardware, services, software

Technology: data analytics and intelligence, guidance systems, sensing techniques, variable rate application (VRA), others

Function: farm management, field management, fleet management

Application: crop yield forecasting, farm management, fertilizer management, field monitoring, irrigation management, precision planting and seeding, precision spraying, others

Farm produce: field crops, permanent crops, others

Region: Asia-Pacific, Europe, North America, Middle East and Africa (MEA), South America

This industry report offers market estimates and forecasts of the global market, followed by a detailed analysis of the component, technology, function, application, farm produce, and region. The global market for precision agriculture can be segmented by component: hardware, services, software. Among these, the hardware segment was accounted for the highest revenue generator in 2022. These solutions encompass a range of technologies and devices that are essential for implementing precision agriculture practices effectively. The increasing demand for hardware solutions can be attributed to the widespread adoption of various tools and devices, including automation and control solutions, sensing and navigation solutions, as well as other hardware solutions such as probes and analyzers.

Automation and control solutions are integral to precision agriculture, enabling farmers to automate and streamline various agricultural processes. These solutions include technologies such as automated irrigation systems, robotic machinery, and GPS-guided equipment. By automating tasks such as planting, spraying, and harvesting, farmers can enhance operational efficiency, reduce labor requirements, and achieve precise and consistent results.

Sensing and navigation solutions are also key components of hardware solutions in precision agriculture. These solutions involve the use of sensors, GPS, and other navigation technologies to collect and analyze data related to soil conditions, crop health, weather patterns, and more. By leveraging these technologies, farmers can gain valuable insights into their fields, make data-driven decisions, and optimize resource

allocation for improved crop productivity.

In addition to automation and sensing technologies, other hardware solutions such as probes and analyzers play a vital role in precision agriculture. Probes are used to measure soil moisture, nutrient levels, and other important parameters, providing farmers with critical information for irrigation and fertilization management. Analyzers, on the other hand, are utilized to analyze soil and plant samples, helping farmers assess nutrient deficiencies, pH levels, and other factors that impact crop health and productivity.

Precision agriculture market is further segmented by technology: data analytics and intelligence, guidance systems, sensing techniques, variable rate application (VRA), others. Guidance systems play a pivotal role in the global precision agriculture market, offering farmers advanced navigation capabilities for efficient field operations. This technology primarily relies on the utilization of Global Positioning System (GPS) and Global Navigation Satellite System (GNSS) technologies, which have been adapted specifically for the agriculture industry. By leveraging these technologies, farmers can precisely navigate their equipment and vehicles, ensuring accurate and efficient execution of various agricultural tasks.

Following guidance systems, sensing technology emerges as another crucial component in the precision agriculture market. Sensing technology solutions are integrated with sophisticated data analysis software, enabling farmers to process and analyze the vast amount of information collected from their farms. These sensing technologies encompass a wide range of sensors, including those for measuring soil moisture, temperature, nutrient levels, crop health, and other relevant parameters.

The integration of sensing technology with data analysis software empowers farmers to gain valuable insights into their farms' conditions and make informed decisions. By collecting and analyzing data in real-time, farmers can monitor the health and growth of their crops, identify areas that require attention, and optimize resource allocation. This data-driven approach helps farmers maximize crop productivity, minimize resource wastage, and reduce the environmental impact of their agricultural practices.

Furthermore, the combination of sensing technology and data analysis software enables farmers to implement precision agriculture techniques such as variable rate application. By precisely applying inputs such as water, fertilizers, and pesticides based on the specific needs of different areas within a field, farmers can optimize resource utilization and minimize costs. This targeted approach ensures that crops receive the right amount

of inputs at the right time, leading to improved yield, quality, and profitability.

Moreover, sensing technology solutions provide farmers with the ability to monitor and manage their farms remotely. With the help of wireless connectivity and cloud-based platforms, farmers can access real-time data and control their sensing devices from anywhere. This remote monitoring capability allows farmers to stay informed about their farms' conditions, make timely decisions, and respond promptly to any issues or changes in the field.

Based on function, the precision agriculture market is segmented into: farm management, field management, fleet management. The field management segment held a significant market share in the precision agriculture industry, primarily driven by the utilization of various hardware components such as sensors, drones, nozzles, cameras, smartphones, and the execution of essential tasks like planting, spraying, fertilizing, and irrigation. These hardware tools and activities play a crucial role in optimizing field operations and maximizing crop productivity.

In addition to hardware, field management software plays a vital role in integrating sensor data and imaging input with other relevant data sources. This integration enables farmers to gain a comprehensive understanding of their fields and make informed decisions regarding treatment and resource allocation. By analyzing the collected data, farmers can identify specific areas within their fields that require attention, such as areas with nutrient deficiencies or pest infestations.

One of the key benefits of field management software is its ability to assist farmers in determining the optimal amount of water, fertilizers, and pesticides to apply to their fields. By considering factors such as soil moisture levels, nutrient content, and crop health indicators, the software helps farmers avoid over-application or under-application of these inputs. This precise application of resources not only maximizes crop yield but also minimizes resource wastage and environmental impact.

Furthermore, field management software supports farmers in avoiding resource runoff, which can have detrimental effects on the environment. By accurately determining the required amount of water, fertilizers, and pesticides, farmers can ensure that these inputs are effectively absorbed by the soil and utilized by the crops, minimizing the risk of runoff and contamination of nearby water sources.

On the basis of application, the precision agriculture market also can be divided into: crop yield forecasting, farm management, fertilizer management, field monitoring,

irrigation management, precision planting and seeding, precision spraying, others. The precision irrigation market is poised for substantial growth in the coming years, as it offers farmers the ability to optimize water usage and minimize the wastage of nutrients, water, and chemicals. This technology plays a crucial role in enabling sustainable agriculture practices by ensuring efficient resource utilization.

Precision agriculture market by farm produce is categorized into: field crops, permanent crops, others. Among these, the field crops segment was accounted for the highest revenue generator in 2022. Field crops are cultivated on a large scale and are primarily grown for widespread consumption. Examples of field crops include grains, cereals, oilseeds, and fiber crops. The adoption of precision agriculture techniques in the cultivation of field crops offers numerous benefits, such as improved yield, resource optimization, and cost reduction.

Precision agriculture technologies enable farmers to precisely monitor and manage various aspects of field crop production. This includes precise planting, accurate application of fertilizers and pesticides, efficient irrigation, and timely harvesting. By utilizing advanced tools such as GPS, sensors, and data analysis software, farmers can optimize the use of resources, minimize waste, and enhance overall crop productivity.

Following field crops, permanent crops also hold a significant position in the precision agriculture market. Permanent crops refer to crops that are cultivated on a long-term basis and have a longer lifespan compared to field crops. These crops include fruits, vegetables, nuts, vineyards, and orchards. Precision agriculture techniques are increasingly being applied to the cultivation of permanent crops to maximize yield, improve quality, and ensure sustainable practices.

Precision agriculture offers several advantages for permanent crop production. For example, precise monitoring of soil moisture levels, temperature, and nutrient content allows farmers to provide optimal growing conditions for these crops. This helps in maintaining the health and vigor of the plants, leading to improved fruit quality, increased yields, and reduced crop losses.

The precision agriculture market by region can be segmented into: Asia-Pacific, Europe, North America, Middle East and Africa (MEA), South America. North America and Europe were the leading regions contributing to the global precision agriculture market, collectively holding a significant market share of over 70% in 2022. The growth of precision agriculture in these regions is driven by various factors, including the rising costs of agricultural inputs, particularly fertilizers. As farmers face increasing expenses,

they are turning to precision agriculture as a solution to optimize resource utilization and reduce costs.

In addition, there is a growing focus on research and development activities and experimental field studies in Europe and North America. Institutions and government organizations are actively conducting studies to analyze the economic benefits of precision agriculture. These efforts are generating awareness among farmers and stakeholders about the tangible advantages of precision agriculture, leading to a gradual increase in its adoption in regions such as Asia-Pacific and South America.

China, in particular, is witnessing an increase in the adoption of precision agriculture due to the provision of technical training programs for farmers. These training initiatives aim to educate farmers about advanced precision agricultural technologies and their benefits. As a result, more farmers in China are embracing precision agriculture practices to enhance their productivity and efficiency.

Furthermore, the Middle East and Africa region is experiencing a surge in the adoption of precision agriculture due to the emergence of startups and the growing demand for food production with efficient input utilization. Startups in this region are leveraging precision agriculture technologies to optimize resource allocation, reduce production costs, and increase agricultural productivity. The need to meet the rising demand for food while minimizing resource wastage is driving the adoption of precision agriculture in the Middle East and Africa.

Major Companies and Competitive Landscape

The report has also analysed the competitive landscape of the global precision agriculture market with some of the key players being AGCO Corporation, Aerial Technology International LLC, AG Leader Technology, Inc., Agdata s.r.o., AgEagle Aerial Systems Inc., Agerpoint, Inc., Ag-Nav Inc., Agrian, Inc., AgriData, Inc., Agworld Pty. Ltd., BASF SE, Bayer AG (The Climate Corporation), Buhler Industries Inc., CLAAS Group, CNH Industrial NV, CropX Ltd., Deere & Company, DICKEY-john Corporation (TSI Incorporated), DuPont de Nemours, Inc., Environmental Systems Research Institute, Inc. (Esri), Exel Industries SA, Farmer's Edge Precision Consulting Inc., Kubota Corporation, Lindsay Corporation, Nutrien Ltd. (Agrible Inc.), Spraying Systems Co., SZ DJI Technology Co., Ltd., The Toro Company, Topcon Corporation, Trimble Inc., Yanmar Holdings Co., Ltd., Yara International ASA, among others. In this report, key players and their strategies are thoroughly analyzed to understand the competitive outlook of the market.

Scope of the Report

To analyze and forecast the market size of the global precision agriculture market.

To classify and forecast the global precision agriculture market based on component, technology, function, application, farm produce, region.

To identify drivers and challenges for the global precision agriculture market.

To examine competitive developments such as mergers & acquisitions, agreements, collaborations and partnerships, etc., in the global precision agriculture market.

To identify and analyze the profile of leading players operating in the global precision agriculture market.

Why Choose This Report

Gain a reliable outlook of the global precision agriculture market forecasts from 2023 to 2029 across scenarios.

Identify growth segments for investment.

Stay ahead of competitors through company profiles and market data.

The market estimate for ease of analysis across scenarios in Excel format.

Strategy consulting and research support for three months.

Print authentication provided for the single-user license.

Recent Developments

? TELUS announced the launch of TELUS Agriculture, a new business unit dedicated to providing innovative solutions to support the agriculture industry with connected technology. TELUS Agriculture optimizes the food value chain by leveraging data in new ways to increase efficiency, production, and yields, delivering better food outcomes for businesses and the end consumer.

? Nutrien Ltd. announced today that it has entered into a definitive agreement to acquire Agrible, Inc. for total consideration of \$63-million. Agrible is a digital agriculture company with an advanced platform and product offering that includes a broad set of agronomic and on-farm advisory tools, data science capabilities, predictive analytics and a global sustainability business that connects growers with leading agricultural, food and consumer products companies to measure, benchmark and empower sustainable crop production.

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