Precision Farming
Market Scenario and Competitive Landscape

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Disclaimer

Context

This report provides an overview of the **precision farming market**, with reference to the trends and dynamics in the period 2023 – 2031, to the market segmentations by offering, technology, application and region and to the competitive landscape, especially at the European level.
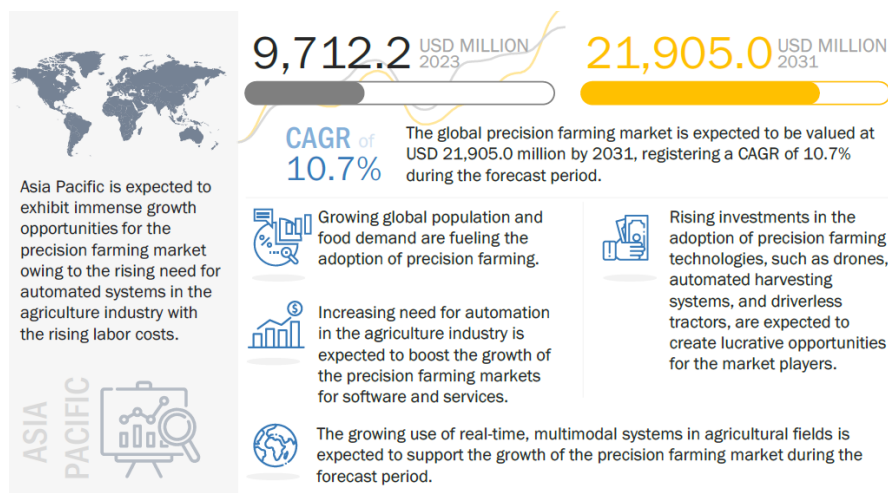
1   Precision Farming Market

Precision farming, also known as **precision agriculture**, is a modern farming management concept involving advanced technologies to monitor and optimize agricultural processes. Data-based technologies, including satellite positioning systems such as Global Positioning System (GPS), remote sensing, and variable rate technology (VRT), are used in precision farming to manage crops and optimize the use of resources such as fertilizers, pesticides, and water.

Precision farming technology reduces the requirement for manual labor by automating crucial processes, including real-time farm monitoring and information sharing. Precision farming is gaining popularity among farmers who want to produce high yields with limited resources. Factors such as global warming, increased labor costs, and rising demand for food have necessitated the use of advanced technologies for increasing productivity and achieving high crop yields.

1.1   Global Market and Market Dynamics

The **global precision farming market** is expected to grow from USD 9,712.2 million in 2023 to USD 21,905.0 million by 2031, at a Compound Annual Growth Rate (CAGR) of 10.7% (Figure 1).

Figure 1. Global Precision Farming Market, in the Period 2023 – 2031

The most significant factor driving the **growth** of the precision farming market is the increasing focus of farmers on enhancing the efficiency of their fields and increasing productivity due to the rising global population and food demand (Figure 2). Precision farming has the potential to transform the agriculture industry by making traditional farming activities more efficient and predictable. The high demand for agricultural products due to population growth, increased adoption of VRT, remote sensing technology, and guidance technologies by farmers worldwide, and strong support from governments for promoting the use of precision farming techniques are the other major factors fueling the growth of the market. However, the high upfront cost of modern agricultural equipment and the limited technical knowledge and skills of farmers are expected to restrain the market growth.

Figure 2. Drivers, Restraints, Opportunities and Challenges for Precision Farming Market

DRIVERS
- Rapid adoption of advanced technologies in precision farming to reduce cost
- Increased adoption of IoT devices in agricultural applications
- High pressure on governments and farmers to meet surging demand for food
- Integration of precision farming technologies with existing farm machinery

RESTRAINTS
- High costs of precision farming equipment
- Small size of landholdings and limited availability of skilled workforce

OPPORTUNITIES
- Adoption of data analytics in agriculture sector
- Emergence of multiple user-friendly smartphone applications for farmers
- Rising use of AI-based solutions in precision farming
- Adoption of digital technologies in sustainable farming

CHALLENGES
- Difficulties in collecting and analyzing data from multiple farms
- Lack of standardized protocols and technologies
- Data privacy issues and security concerns
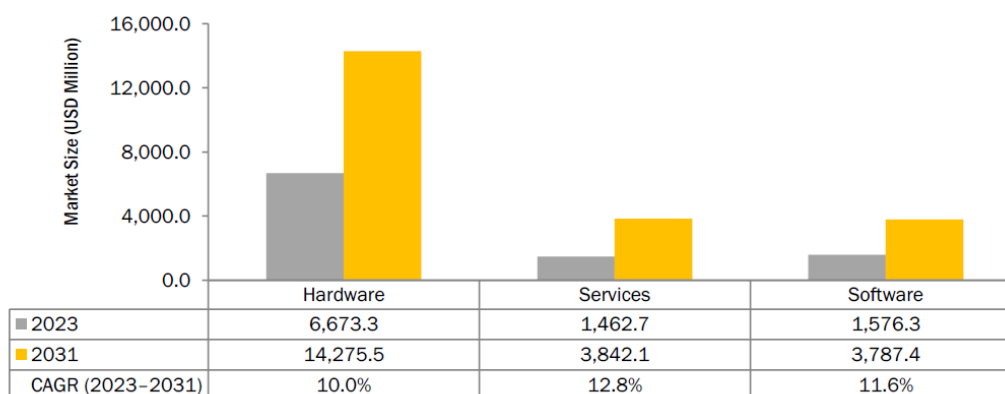- Lesser reliability of internet connectivity and infrastructure for precision farming

1.2   Market by Offering

The precision farming market, based on offerings, has been segmented into: **hardware, software and services** (Figure 3). The **hardware** segment held the largest market share in 2023, owing to the high adoption of automation and control devices such as drones/UAVs, GPS/GNSS, irrigation controllers, guidance and steering systems, yield monitors and sensors in the agriculture industry. In the yield monitoring process, hardware components such as sensors and GPS devices play a vital role in measuring various yield parameters.

The **software** offering is expected to be valued at USD 1,576.3 million in 2023 and is expected to reach USD 3,787.4 million by 2031, with a significant growth rate of ~11.6% during the forecast period.

Figure 3. Precision Farming Market, by Offering, in the Period 2023 – 2031 (USD Million)

	Hardware	Services	Software
2023	6,673.3	1,462.7	1,576.3
2031	14,275.5	3,842.1	3,787.4
CAGR (2023–2031)	10.0%	12.8%	11.6%

1.2.1   Hardware

The precision farming market for the **hardware segment** has been divided into **automation and control systems** and **sensing and monitoring devices** (Table 1). **Automation and control systems**, such as GPS receivers, guidance and steering devices, and variable-rate technology (VRT) devices, are expected to account for a major share of the precision farming market for hardware during the forecast period, owing to their extensive use in precision farming. When control devices are integrated with sensing and monitoring devices, including various types of sensors and yield monitors, a complete precision farming system is formed. Remote sensing plays a significant role in gathering and monitoring farm-related information, facilitating decision-making and optimal usage of resources.

Automation and control systems of hardware offering accounted for ~74% of the hardware segment, with its market size estimated to be USD 4,946.2 million in 2023, and is expected to reach USD 10,762.3 million in 2031, with a CAGR of 10.2% during the forecast period.

Table 1. Precision Farming Market, by Hardware, 2023–2031 (USD Million)

Hardware	2023	2024	2025	2026	2027	2028	2029	2030	2031	CAGR (2023–2031)
Automation and Control Systems	4,946.2	5,589.8	6,372.4	7,296.0	8,135.1	8,908.3	9,577.2	10,200.5	10,762.3	10.2%
Sensing and Monitoring Devices	1,727.0	1,935.6	2,188.3	2,484.6	2,747.2	2,983.1	3,180.1	3,358.4	3,513.2	9.3%
Total	6,673.3	7,525.4	8,560.7	9,780.6	10,882.3	11,891.4	12,757.3	13,558.9	14,275.5	10.0%

Automation and control systems for precision farming involve the integration of advanced technologies to automate various agricultural tasks and optimize control over farming operations (Table 2). These systems play a pivotal role in modern agriculture by reducing manual labor, improving efficiency, and enhancing overall productivity. This approach increases operational accuracy, reduces labor costs, and minimizes resource wastage, contributing to sustainable and responsible farming practices while maximizing yields and profitability. Automation and control systems are the core components of precision farming equipment. At present, the irrigation controllers sub-segment accounts for the largest share of the automation and control systems segment, and the trend is likely to continue during the forecast period. Likewise, the drones/UAVs sub-segment is expected to witness the highest growth rate in the precision farming market, in terms of value, during the forecast period, as agricultural drones are cheaper than surveillance drones and are equipped with advanced sensors. They help farmers in increasing crop yield and reducing crop damage.

Table 2. Automation And Control Systems: Precision Farming Market, by Device Type, 2023–2031 (USD Million)

Device Type	2023	2024	2025	2026	2027	2028	2029	2030	2031	CAGR (2023–2031)
Drones/UAVs	1,242.6	1,431.4	1,662.7	1,939.0	2,201.5	2,453.9	2,684.6	2,908.7	3,125.4	12.2%
Irrigation Controllers	1,018.5	1,171.4	1,358.5	1,582.0	1,793.5	1,996.3	2,181.0	2,360.0	2,527.0	12.0%
GPS/GNSS Devices	655.9	725.5	809.0	905.7	986.8	1,055.5	1,107.6	1,150.9	1,183.8	7.7%
Flow and Application Control Devices	418.1	467.3	526.7	596.2	657.1	711.1	755.5	795.1	828.7	8.9%
Guidance & Steering Systems	380.1	421.3	470.8	528.3	577.0	618.6	650.9	678.1	699.5	7.9%
Handheld Mobile Devices/Handheld Computers	331.8	379.1	436.9	505.6	569.8	630.5	685.0	737.1	785.6	11.4%
Display	289.5	321.9	361.0	406.5	445.6	479.5	506.5	529.8	555.3	8.5%
Others	609.5	671.9	746.7	832.8	903.9	962.9	1,006.2	1,040.7	1,056.9	7.1%
Total	4,946.2	5,589.8	6,372.4	7,296.0	8,135.1	8,908.3	9,577.2	10,200.5	10,762.3	10.2%

Note: Other device types include standalone cameras, small electronic components in boom sprays, and data loggers.

Sensing and monitoring devices are information gathering and monitoring instruments that provide vital data on crops and fields to further analyze them for decision-making and support farmers' farming operations. Sensing and monitoring devices involve the utilization of advanced technologies to collect real-time data from agricultural fields (Table 3). These hardware components play a pivotal role in modern agriculture by providing insights into various factors that impact crop health and productivity. Utilizing tools such as sensors, cameras, and weather stations, sensing and monitoring devices capture information about soil moisture levels, temperature, humidity, crop growth, and more. This approach enhances precision in resource management, enables timely interventions, and supports data-driven decision-making. Sensing and monitoring devices contribute to optimized farming practices, reduced resource wastage, and improved sustainability, making them essential for achieving efficient and productive precision farming operations.

Table 3. Sensing and Monitoring Devices: Precision Farming Market, by Device Type, 2023–2031 (USD Million)

Device Type	2023	2024	2025	2026	2027	2028	2029	2030	2031	CAGR (2023–2031)
Yield Monitors	971.5	1,078.5	1,207.6	1,357.8	1,486.6	1,598.2	1,686.7	1,763.3	1,825.8	8.2%
Soil Sensors	560.4	637.0	730.2	840.6	942.1	1,036.8	1,119.9	1,198.2	1,269.7	10.8%
Water Sensors	75.7	87.2	101.2	117.9	133.7	148.8	162.5	175.6	188.0	12.0%
Climate Sensors	44.2	50.2	57.5	66.2	74.1	81.6	88.1	94.2	99.8	10.7%
Others	75.3	82.8	91.8	102.1	110.7	117.7	122.9	127.0	130.0	7.1%
Total	1,727.0	1,935.6	2,188.3	2,484.6	2,747.2	2,983.1	3,180.1	3,358.4	3,513.2	9.3%

Note: Other device types include airflow sensors, electrochemical sensors, and acoustic sensors.

1.2.2 Software

Precision farming **software** has become one of the essential elements of precision agriculture and is used to interpret and analyze the gathered data and form a pictorial representation of that information. These systems could be used for different functions, such as data security, crop health monitoring, farm work mapping, and stock management. The use of software allows farmers to monitor and take control of their fields through smartphones, desktops, and laptops, eliminating field trips. Precision farming software is expected to replace traditional paperwork methods as calculations and management can be performed more easily with the help of different agricultural software solutions. Precision farming software contributes to increased productivity, reduced costs, and improved environmental stewardship by allowing farmers to harness data insights for optimal decision-making and management of their agricultural operations. Deere & Company (US), Trimble (US), Agrivi Ltd. (UK), SST Software (US), and Ag Leader Technology (US) are among a few of the major companies providing software solutions for precision farming.

The software segment has been divided into **local or web-based** and **cloud-based** delivery models (Table 4). The local or web-based model is installed locally and considered to be a static approach to using the software. On the other hand, a cloud-based delivery model is dynamic and includes software that can be used according to their requirement. Moreover, the cloud-based delivery model does not require any physical infrastructure, such as servers and cables.

Table 4. Software: Precision Farming Market, by Deployment Type, 2023–2031 (USD Million)

Deployment Type	2023	2024	2025	2026	2027	2028	2029	2030	2031	CAGR (2023–2031)
Local/Web-based	940.6	1,057.1	1,198.0	1,363.1	1,509.9	1,641.8	1,752.1	1,851.6	1,937.6	9.5%
Cloud-based	635.7	746.6	884.0	1,050.4	1,214.8	1,379.0	1,535.9	1,694.0	1,849.8	14.3%
Total	**1,576.3**	**1,803.7**	**2,082.0**	**2,413.5**	**2,724.6**	**3,020.8**	**3,288.1**	**3,545.6**	**3,787.4**	**11.6%**

1.2.3 Services

The precision farming market for **services** has been segmented into five broad categories: **system integration and consulting, managed services, assisted professional services, connectivity services and maintenance and support** (Table 5). The assisted professional services segment is categorized into supply chain management services, climate information services, and others.

Table 5. Services: Precision Farming Market, by Service Type, 2023–2031 (USD Million)

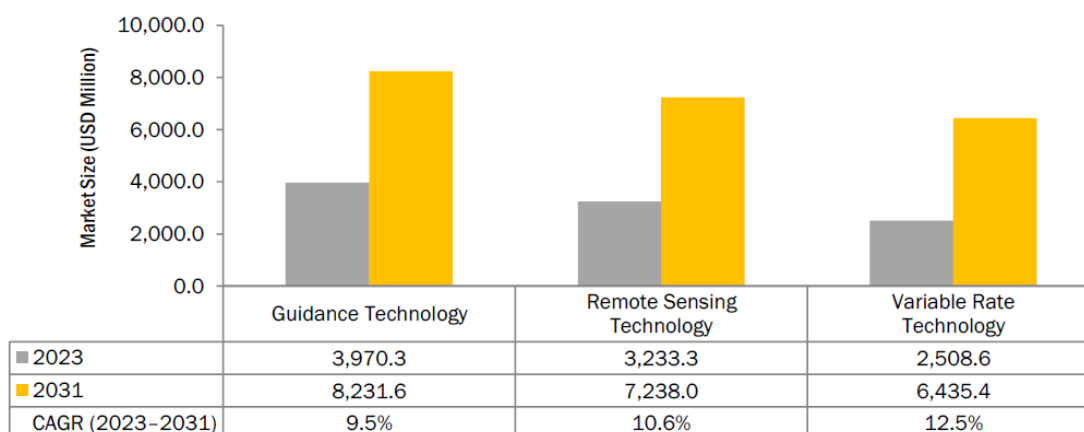| Service Type	2023	2024	2025	2026	2027	2028	2029	2030	2031	CAGR (2023–2031)
System Integration & Consulting	415.2	483.0	566.6	667.4	765.2	861.4	951.7	1,041.4	1,128.4	13.3%
Managed Services	343.1	395.8	460.6	538.1	611.9	683.2	748.7	812.5	873.3	12.4%
Connectivity Services	298.3	347.2	407.6	480.3	551.1	620.7	686.2	751.3	814.5	13.4%
Assisted Professional Services	328.0	380.8	445.7	523.9	599.4	673.4	742.5	810.8	876.8	13.1%
Maintenance and Support	78.2	87.5	98.6	111.3	122.2	131.6	138.8	144.7	149.1	8.4%
Total	**1,462.7**	**1,694.3**	**1,979.1**	**2,321.0**	**2,649.9**	**2,970.3**	**3,267.8**	**3,560.6**	**3,842.1**	**12.8%**

1.3 Market by Technology

In precision farming, several cutting-edge **technologies**, such as **guidance technology, remote sensing technology, and variable rate technology**, are used to manage crops and reduce fertilizers, pesticides, and water usage (Figure 4). **Guidance technology** is implemented through GPS and GIS. The core technology used in precision farming is GPS-based guidance technology. The implementation of GPS has helped farmers use precision agriculture tools and devices effectively to improve crop yield, decrease the use of chemicals for farming applications, and make better farm management decisions. This technology has immensely helped farmers by improving their profit margins. GPS-based auto-guidance technology allows growers to reduce the overlapping of equipment and tractor passes, saving fuel, labor, time, and soil compaction. Guidance technology held the largest market share in 2023, owing to its early adoption by farmers.

Remote sensing uses handheld and satellite devices for precision farming applications, whereas VRT uses map-and-sensor-based methods for equipment applications. The remote sensing technology is estimated to be valued at USD 3,233.3 million in 2023 and is expected to reach USD 7,238 million at a CAGR of 10.6% during the forecast period.

The **variable rate technology** is expected to grow at the highest rate during 2023 and 2031, as it helps apply the right amount of input at the right place on the field, minimizing input waste and increasing land and crop productivity. This technology helps in reducing input usage, thereby decreasing environmental impacts.

Figure 4. Precision Farming Market, by Technology, in the Period 2023 – 2031 (USD Million)

	Guidance Technology	Remote Sensing Technology	Variable Rate Technology
2023	3,970.3	3,233.3	2,508.6
2031	8,231.6	7,238.0	6,435.4
CAGR (2023–2031)	9.5%	10.6%	12.5%

1.4 Market by Application

Precision farming applications include: **yield monitoring, field mapping, crop scouting, variable rate application, weather tracking & forecasting, inventory management, farm labor management, financial management and others** (include demand forecasting, customer management, profit center analysis and tax management) (Figure 5 and Table 6). In these applications, several devices, such as display systems, GPS/GNSS devices, handheld devices, sensors, and farm data management systems, are used.

The precision farming market for **yield monitoring applications** held the largest market share in 2023. The growth of the precision farming market for yield monitoring applications can be attributed to the benefits of climate service initiatives that enable farmers to effectively deal with climate related disasters and improve food security and decision-making in agriculture.

Weather tracking and forecasting application is expected to record the highest CAGR of 12.4% during the forecast period as it facilitates up-to-date information on prevailing climatic conditions, such as temperature, rain, wind speed and direction, and solar radiation. The changing weather patterns due to increasing global warming have fueled the adoption of advanced farming technologies, such as sensor-based irrigation controllers, to enhance farm productivity and crop yield.

The **field mapping application** is estimated to be valued at USD 1,465.1 million in 2023 and is projected to reach USD 3,503.5 million in 2031, growing at a CAGR of 11.5% during the forecast period.

Figure 5. Precision Farming Market, by Application, in the Period 2023 – 2031 (USD Million)
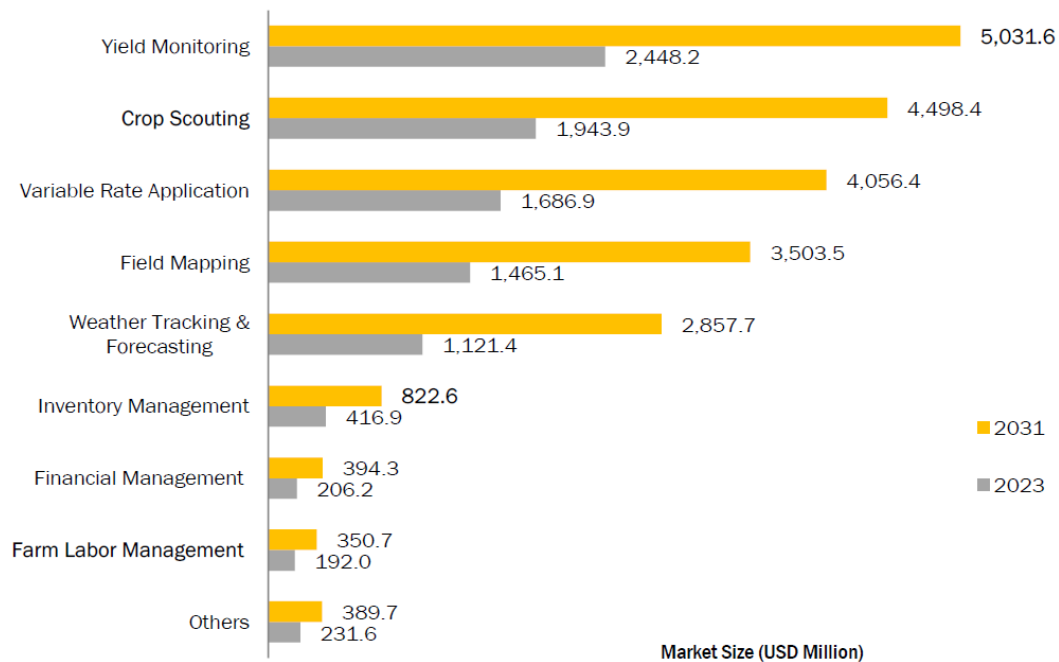
Table 6. Precision Farming Market, by Application, 2023–2031 (USD Million)

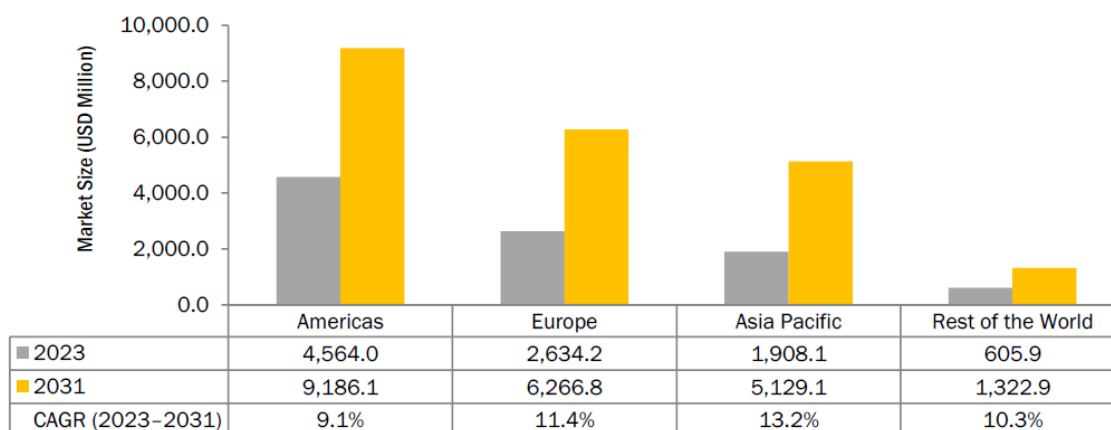| Application	2023	2024	2025	2026	2027	2028	2029	2030	2031	CAGR (2023–2031)
Yield Monitoring	2,448.2	2,747.9	3,111.0	3,537.0	3,916.0	4,257.6	4,544.2	4,804.5	5,031.6	9.4%
Crop Scouting	1,943.9	2,213.6	2,542.7	2,933.6	3,296.2	3,637.5	3,941.0	4,230.4	4,498.4	11.1%
Field Mapping	1,465.1	1,676.1	1,934.4	2,242.0	2,530.6	2,805.2	3,052.8	3,291.2	3,503.5	11.5%
Variable Rate Application	1,686.9	1,930.4	2,228.5	2,583.7	2,917.1	3,234.5	3,521.0	3,797.1	4,056.4	11.6%
Weather Tracking & Forecasting	1,121.4	1,293.5	1,504.8	1,757.8	1,999.2	2,232.6	2,447.4	2,657.4	2,857.7	12.4%
Inventory Management	416.9	465.6	524.6	593.5	653.7	707.1	750.8	789.7	822.6	8.9%
Farm Labor Management	192.0	212.7	237.7	266.5	290.9	311.5	327.4	340.6	350.7	7.8%
Financial Management	206.2	229.6	257.8	290.6	318.9	343.6	363.2	380.3	394.3	8.4%
Others	231.6	253.9	280.3	310.4	334.3	353.0	365.3	373.9	389.7	6.7%
Total	**9,712.2**	**11,023.4**	**12,621.8**	**14,515.0**	**16,256.8**	**17,882.5**	**19,313.1**	**20,665.1**	**21,905.0**	**10.7%**

Note: Other applications include demand forecasting, customer management, profit center analysis, and tax management.

1.5 Market by Region

The precision farming market has been segmented into four major regions: the **Americas, Europe, Asia Pacific, and the Rest of the World** (Figure 6). The **Americas** region is expected to dominate the overall precision farming market during the forecasted period 2023 - 2031. The Americas is estimated to be at USD 4,564.0 million in 2023 and is projected to reach USD9,186.1 million in 2031, with a CAGR of 9.1% between 2023 and 2031.

The **European** region is expected to hold a share of 27%, followed by Asia Pacific with a share of 19%. The growth of the precision farming market in the Americas can be attributed to the higher adoption of advanced technology, increase in R&D activities, and high per-capita disposable income. The **Asia Pacific** region is expected to witness the highest growth during the forecast period, owing to increasing government initiatives to adopt modern technologies and rising awareness regarding the benefits of precision farming among farmers.

Figure 6. Precision Farming Market, by Region, in the Period 2023 – 2031 (USD Million)

	Americas	Europe	Asia Pacific	Rest of the World
■ 2023	4,564.0	2,634.2	1,908.1	605.9
■ 2031	9,186.1	6,266.8	5,129.1	1,322.9
CAGR (2023–2031)	9.1%	11.4%	13.2%	10.3%

The precision farming market in **Europe** exhibits a high degree of professionalism and technological adoption. However, the lack of large farms and slightly higher input costs create a marginal disadvantage compared to the US market. The precision farming market in Europe is projected to witness substantial growth in the near future as this region is currently in the early stage of the adoption of autonomous harvesting systems and driverless tractors (Figure 7). The major factors contributing to the precision farming market's growth in Europe include improved productivity through mechanization, an optimized supply chain, and increasing labor costs owing to the shortage of skilled labor. Uncertainty regarding government support, low farm income, and import restrictions from Russia are the major restraints. The European agricultural machinery industry is one of the most developed in the world and is supported by the presence of global players and subsidiaries, such as John Deere (US), Small Robot Company (UK), Earth Rover (UK), Saga Robotics (Norway), CNH Industrial (The Netherlands), and AGCO Corporation (US).

Figure 7. Europe: Precision Farming Market Snapshot
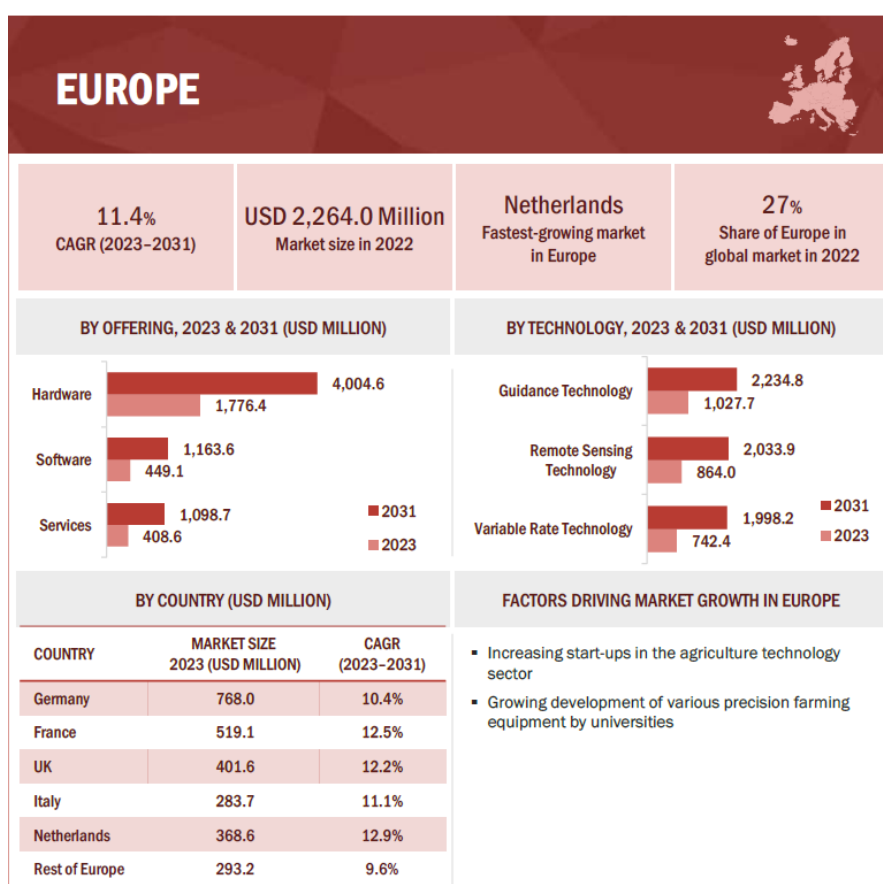
Rest of Europe include Spain, Sweden, Switzerland, Belgium, Poland, Denmark, Norway and Austria

Italy is one of the most important agricultural countries in the EU. The country generates almost one-fifth of the total added value of European agriculture. The latest agricultural innovations will include sensors for local irrigation, agricultural drones, digitalization of wine cellars, and more sustainable chemical products. Precision farming practices are becoming popular and are used for managing irrigation performance, improving yield, reducing fertilizer cost, and optimizing resource management. Lisam S.R.L. (Italy), Kuhn S.A. (Italy), agriCAD (Italy), MaterMacc S.P.A. (Italy) and Titan Italia Spa (Italy) are among the major manufacturers of precision farming equipment in the country.

1.6 Competitive Landscape

The precision farming market is highly diversified and fragmented, with a large number of market players. Major market players are acquiring small players to expand their offerings worldwide.

Major players in the precision farming market are: Deere & Company (US), Trimble Inc. (US), AGCO Corporation (US), AgJunction LLC (US), Raven Industries, Inc. (US), AG Leader Technology (US), Teejet Technologies (US), Topcon (US), Taranis (Israel), AgEagle Aerial Systems (US), ec2ce (Spain), Descartes Labs, Inc. (US), Granular Inc. (US), Hexagon AB (Brazil), Climate LLC (US), and CropX Inc. (Israel).

The market is fragmented, with the top players acquiring approximately 20-25% of the total market share (Figure 8). The chart below provides a detailed ranking of the key market players. Factors such as the market of companies, their client/customer base, total revenue generated by the precision farming segment, and key developments undertaken by them have been considered for ranking the top five players in the precision farming market. The top five players held a 20-25% market share in 2022; hence, the market is said to be fragmented.

Figure 8. Precision Farming Market: Degree of Competition, 2022

DEGREE OF COMPETITION	FRAGMENTED
Total Market Share of Top 5 Players	20–25%
Deere & Company	9–10%
AGCO Corporation	4–5%
Trimble Inc.	4–6%
Raven Industries, Inc.	2–3%
AgJunction LLC	1–2%
Others	75–80%

Note: The degree of competition is fragmented when the top five players have a total market share of <25%, competitive when the top five players have a total market share of 25–50% and consolidated when the top five players have a total market share of >50%. The table has been ranked based on the market presence, client base, revenue generated from precision farming, and recent developments of the companies.

European players active in the market are reported in the following Table.

Table 7. European Players in the Precision Farming Market

Company	Location	Description	Website
ABACO Spa	Italy	ABACO's mission is to drive sustainability and innovation in risk management in agriculture and to build a more digital and sustainable future, starting from agriculture, the sector most affected by climate change. Within the agribusiness sector, it offers business solutions such as sustainability, traceability, efficiency and productivity, agriculture fund management, development projects and real estate management	https://www.abacogroup.com/
agriCAD	Italy	The company develops technology for precision farming	https://www.agricad.com/eng/

Company	Location	Description	Website
Agricon	Germany	Agricon is a leading provider of solutions for digital plant cultivation in Central and Eastern Europe. They introduced digital plant cultivation technologies into agriculture and provide support for enterprises in the implementation of modern plant cultivation strategies	https://www.agricon.de/en/
Agrovista	UK	Agrovista is a leading supplier of agronomy advice, seed, crop protection products and precision farming services.	https://www.agrovista.co.uk/
ec2ce	Spain	The company develops decision-making tools based on artificial intelligence for agricultural applications. The company uses powerful software analytics and numerical algorithms to predict crop productivity. The company provides precision farming tools for applications such as pest/disease management and improving productivity	https://www.ec2ce.com/en/
Gamaya	Switzerland	Spin-off from the Swiss Federal Institute of Technology (EPFL), is a Swiss-based startup company engaged in capturing images of farmlands using hyperspectral cameras, which can detect the spectrum of lands that human eyes cannot visualize. The company increases the efficiency and sustainability of large industrial farming and the productivity and scalability of small-holder agriculture by deploying advanced solutions for mapping and diagnosing farmlands	https://gamaya.com/en_us/
Lisam Srl	Italy	Lisam has exported its all-Italian technology across the globe to respond to the increasingly demanding needs of farmers in light of the constant and intense pace of technological evolution of the sector. Today Lisam is the only direct manufacturer of both manual and pneumatic pruning and harvesting systems	https://www.lisam.it/?lang=en
SOYL Precision Farming	UK	OYL produces and interprets variable rate maps covering over 1 million hectares of land and its software technology is in use in over 15 countries worldwide. Innovative technology, robust data, expert advice and technical support are used to improve growers' economic, agronomic and environmental performance	https://www.soyl.com/

Additional European players have been identified consulting the source **Lux Research** and are reported below:

- **AgriCircle** (Switzerland): the company has developed software solutions for agriculture and is involved in the development of agricultural data management, crop performance and crop health prediction platforms.
- **CarbonSpace** (Ireland): The player develops Satellite and CO_2 flux station data-centric agriculture carbon-footprint-monitoring platform.
- **ConstellR** (Germany): start-up dedicated to the monitoring of crop health and water usage using infrared and hyperspectral geospatial imagery.
- **Crop Performance** (UK): The Crop Performance Intelligence Platform™ enables growers to optimize water and nutrients to achieve higher yields of quality crops.
- **eLeaf** (The Netherlands): Provides satellite-based data and services to optimize agricultural production, support sustainable water management, and to assess climate risk and provide crop index insurance solutions.
- **Moolec Science** (Luxembourg): science-based food ingredient company focused on the use of Molecular Farming technology.

2 Conclusions

Precision farming is a practice that involves the use of integrated crop management techniques and devices to increase profitability and sustainability and protect the environment by optimizing the use of soil and water resources. Precision farming technologies, such as guidance technology, remote sensing, smart sensors, drones, and variable rate technology (VRT), have enabled farmers/growers to manage soil and increase crop yield effectively.

The most significant factor driving the **growth** of the global precision farming market is the increasing focus of farmers on enhancing the efficiency of their fields and increasing productivity due to the rising global population and food demand. Precision farming has the potential to transform the agriculture industry by making traditional farming activities more efficient and predictable. The high demand for agricultural products due to population growth, increased adoption of VRT, remote sensing technology, and guidance technologies by farmers worldwide, and strong support from governments for promoting the use of precision farming techniques are the other major factors fueling the growth of the market. However, the high upfront cost of modern agricultural equipment and the limited technical knowledge and skills of farmers are expected to restrain the market growth.

Currently, the global precision farming market is in the introductory phase and is expected to grow further due to the growing adoption of global positioning systems (GPS), guidance, and remote sensing technologies by farmers/growers. The **global precision farming market** is expected to grow from USD 9,712.2 million in 2023 to USD 21,905.0 million by 2031, at a CAGR of 10.7%.

The precision farming market in **Europe** exhibits a high degree of professionalism and technological adoption. However, the lack of large farms and slightly higher input costs create a marginal disadvantage compared to the US market. The precision farming market in Europe is projected to witness substantial growth in the near future as this region is currently in the early stage of the adoption of autonomous harvesting systems and driverless tractors. The major factors contributing to the precision farming market's growth in Europe include improved productivity through mechanization, an optimized supply chain, and increasing labor costs owing to the shortage of skilled labor. Uncertainty regarding government support, low farm income, and import restrictions from Russia are the major restraints.

3 Sources

MarketsandMarkets Knowledge Store - Multisectoral database that collects market research reports in various technological fields and designed to process some information interactively. More than 1,200 market reports are published each year (https://www.mnmks.com/). The information presented are contained in the report "*Precision Farming Market – Global Forecast to 2031*", published in August 2023.

Lux Research - Lux is a research and advisory firm, focused on sustainable innovation that is commercially viable. Lux's diverse team of analysts work cross-functionally across industries as well as technologies, using proprietary research methodologies to unlock unique insights (https://www.luxresearchinc.com/). The information presented are reported in the Company search page.

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