

Soil Moisture Intelligence Market Forecasts to 2034 – Global Analysis By Technology (Dielectric Sensors, Tensiometers, Capacitance Sensors, Neutron Sensors, Remote Sensing and Other Technologies), Soil Depth, Data Mode, Intelligence Output, End User, and Geography

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Abstracts

According to Statistics MRC, the Global Soil Moisture Intelligence Market is accounted for \$1.5 billion in 2026 and is expected to reach \$4.9 billion by 2034 growing at a CAGR of 15.9% during the forecast period. Soil moisture intelligence refers to technology-enabled systems that collect, analyze, and interpret soil moisture data to optimize irrigation, crop management, and agricultural resource use. These solutions integrate soil sensors, satellite imagery, remote sensing, weather information, artificial intelligence, and predictive analytics to provide real-time or near-real-time insights into water availability within agricultural fields. Soil moisture intelligence helps farmers determine irrigation requirements, reduce water consumption, prevent crop stress, and improve yields. Increasing water scarcity, precision agriculture adoption, and demand for efficient irrigation management are driving the global adoption of soil moisture intelligence solutions.

Market Dynamics

Driver:

Growing water scarcity and irrigation optimization needs

Growing water scarcity and increasing demand for irrigation optimization are driving adoption of soil moisture intelligence solutions across all agricultural regions facing water constraints. Climate change impacts on precipitation patterns and water

availability are accelerating demand for precision irrigation technologies that maximize water use efficiency. Regulatory requirements for water use efficiency and reporting are supporting market expansion as governments implement water conservation policies. Rising input costs and crop value are increasing economic incentives for water optimization through reduced pumping costs and improved yields. Water scarcity concerns are intensifying across major agricultural regions worldwide.

Restraint:

High sensor costs and infrastructure requirements

High sensor costs and infrastructure requirements for soil moisture monitoring systems present significant adoption barriers for smaller farming operations with limited capital resources. Limited connectivity in rural areas constrains real-time data availability and system performance where cellular or internet access is unreliable. Data interpretation and integration with irrigation systems require specialized technical expertise that is often unavailable on farms. Maintenance and calibration requirements affect long-term system reliability and increase total cost of ownership. Many farmers lack technical support for effective system utilization.

Opportunity:

Integration with automated irrigation systems

Integration of soil moisture intelligence with automated irrigation systems presents significant growth opportunities for precision agriculture solution providers seeking to create complete solutions. Development of low-cost, wireless sensor networks is expanding addressable markets to smaller operations that previously could not afford monitoring systems. AI and machine learning applications are improving forecasting and decision support capabilities through advanced data analysis. Partnerships with irrigation equipment manufacturers are accelerating solution adoption through integrated product offerings. Automated irrigation based on soil moisture data reduces labor requirements and improves water use efficiency.

Threat:

Competition from satellite-based moisture estimation

Competition from satellite-based moisture estimation services may limit demand for in-situ monitoring solutions, particularly in regions with good satellite coverage. Climate variability affecting soil moisture patterns may influence system value perception during periods of extreme weather. Data privacy and ownership concerns may affect farmer participation in data sharing programs where information could be used competitively.

Limited standardization across sensor technologies creates interoperability challenges for multi-vendor systems. Technology obsolescence requires continuous investment in system upgrades to maintain competitiveness.

Covid-19 Impact:

The COVID-19 pandemic highlighted the importance of water efficiency and food security, accelerating interest in soil moisture intelligence solutions across global agriculture. Supply chain disruptions affected sensor availability and installation during lockdown periods when movement restrictions limited on-farm service. The post-pandemic period has witnessed increased investment in precision agriculture technologies as farmers seek efficiency gains. Remote monitoring capabilities have gained importance for farm management as labor availability remains challenging. Water scarcity concerns continue to intensify, driving monitoring adoption.

The dielectric sensors segment is expected to be the largest during the forecast period

The dielectric sensors segment is expected to account for the largest market share during the forecast period as dielectric sensor technology provides accurate, reliable, and cost-effective soil moisture measurement across diverse soil types and environmental conditions. Capacitance and TDR sensors are widely adopted for both research and commercial applications due to their proven performance characteristics. Growing availability of affordable sensor solutions is driving sustained demand across all agricultural segments and geographic regions. Established industry standards and extensive field validation support continued dielectric sensor market dominance. Dielectric sensors offer the best combination of accuracy and affordability for most applications.

The moisture forecasting segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the moisture forecasting segment is predicted to witness the highest growth rate driven by increasing demand for predictive irrigation management capabilities that optimize water application timing and volume based on expected conditions. Moisture forecasting enables proactive irrigation decisions based on expected soil moisture changes rather than reactive responses to observed conditions. Growing integration with weather data and AI analytics is accelerating adoption of forecasting solutions that provide actionable recommendations. Producers increasingly seek predictive capabilities that optimize water use and reduce irrigation costs. Forecasting reduces the risk of both under-irrigation and over-irrigation.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share owing to early adoption of precision irrigation technologies, well-established sensor infrastructure, and advanced agricultural practices across major

production regions. The United States hosts major soil moisture intelligence providers with extensive commercial deployments across the Corn Belt and western irrigated regions. High technology adoption and water scarcity concerns reinforce regional market leadership through continued innovation and investment. Strong research infrastructure supports ongoing technology development and field validation. Significant water resource challenges in western states drive monitoring adoption.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR driven by growing agricultural water challenges, expanding irrigated agriculture, and increasing adoption of precision irrigation technologies across major economies. China, India, and Australia are investing in soil moisture intelligence solutions to address water scarcity and improve agricultural water productivity. Rising agricultural productivity demands and government support for water efficiency are accelerating market expansion through policy incentives. Growing population and food demand increase pressure on water resources, driving technology adoption. Significant agricultural land area under irrigation creates substantial market opportunities.

Key players in the market

Some of the key players in the Soil Moisture Intelligence Market include John Deere, Trimble Inc., Topcon Corporation, Valmont Industries, Inc., Netafim Ltd., Arable Labs, Inc., Irrrometer Company, Inc., METER Group, Inc., Campbell Scientific, Inc., Stevens Water Monitoring Systems, Inc., Acclima, Inc., Sentek Pty Ltd., Verdi Expeditions, Inc., Planet Labs PBC, and Deveron Corp.

Key Developments:

In April 2025, John Deere launched an enhanced soil moisture intelligence platform integrating sensor data, satellite imagery, and AI analytics for comprehensive irrigation management. The platform provides real-time moisture monitoring, forecasting, and automated irrigation recommendations. The development responds to growing demand for integrated precision irrigation solutions.

In February 2025, Trimble Inc. announced significant enhancements to its soil moisture intelligence capabilities with new sensor technologies and analytics for improved irrigation decision support. The enhancements enable more precise water management and crop yield optimization.

Technologies Covered:

Dielectric Sensors

Tensiometers

Capacitance Sensors

Neutron Sensors

Remote Sensing

Other Technologies

Soil Depths Covered:

Surface

Shallow

Root Zone

Deep Soil

Multi-Depth

Other Soil Depths

Data Modes Covered:

Point Data

Field Maps

Time Series

Forecast Data

Real-Time Data

Other Data Modes

Intelligence Outputs Covered:

Moisture Mapping

Moisture Forecasting

Irrigation Alerts

Water Stress Detection

Water Balance

Other Intelligence Outputs

End Users Covered:

Farmers

Irrigation Providers

Agribusinesses

Research Institutions

Government Agencies

Other End Users

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of Africa

What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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