

Soilless Farming Market Forecasts to 2034 – Global Analysis By Farming System (Hydroponics, Aeroponics, Aquaponics, Vertical Soilless Farming and Other Farming Systems), Growing Medium, Facility Type, Application, End User and Geography

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Abstracts

According to Statistics MRC, the Global Soilless Farming Market is accounted for \$12.2 billion in 2026 and is expected to reach \$39.5 billion by 2034 growing at a CAGR of 15.8% during the forecast period. Soilless farming refers to agricultural cultivation methods that grow plants without traditional soil by using nutrient-rich water solutions or alternative growing media. Common techniques include hydroponics, aeroponics, and aquaponics, which provide controlled environments for efficient plant growth. These systems enable precise nutrient management, reduced water consumption, and year-round crop production with minimal land usage. Soilless farming is widely adopted for urban agriculture, greenhouse cultivation, and high-value crop production. Increasing demand for sustainable food production and controlled-environment agriculture is driving the expansion of soilless farming technologies worldwide.

Market Dynamics:

Driver:

Rising urban agriculture adoption

Increasing pressure on arable land availability has encouraged the use of controlled-environment cultivation systems. Soilless farming enables efficient crop production in urban spaces, rooftops, and indoor facilities. The ability to achieve higher yields with optimized water utilization is strengthening market penetration. Commercial growers are

integrating advanced cultivation systems to ensure year-round food production. Rising consumer preference for locally produced fresh vegetables is further supporting adoption. Urban food security initiatives continue to reinforce market demand.

Restraint:

High hydroponic setup expenses

Establishing hydroponic and controlled-environment cultivation facilities requires advanced infrastructure and monitoring equipment. Costs associated with lighting systems, nutrient delivery units, and climate control technologies increase financial pressure on growers. Smaller agricultural enterprises often face difficulties in managing operational expenditures efficiently. Technical expertise requirements further add to implementation complexity. Inconsistent returns during early operational stages may discourage new entrants. Capital-intensive deployment continues to limit market accessibility in several developing regions.

Opportunity:

Nutrient solution technology innovations

Precision nutrient formulations are improving crop quality, nutrient absorption efficiency, and cultivation consistency across controlled farming environments. This is encouraging development of customized nutrient management systems designed for specific crop varieties and production conditions. Integration of automated nutrient monitoring technologies is also improving operational accuracy. Commercial greenhouse operators are adopting advanced fertigation systems to maximize productivity outcomes. Research activities focused on mineral optimization and sustainable nutrient sourcing are expanding steadily. Technological progress in nutrient delivery solutions is expected to accelerate future market growth.

Threat:

Energy-intensive operational requirements

Controlled-environment agriculture depends heavily on artificial lighting, temperature regulation, and automated irrigation systems. Rising electricity costs can significantly impact operational profitability for indoor farming operators. Dependence on uninterrupted power supply also increases production risks during system failures. High

energy consumption may limit scalability in regions with unstable infrastructure. Environmental concerns associated with energy usage are additionally influencing operational strategies. These factors collectively create long-term market challenges.

Covid-19 Impact:

The COVID-19 pandemic highlighted the importance of localized food production and resilient agricultural systems globally. Supply chain disruptions encouraged investment in indoor farming and controlled cultivation technologies. Consumer demand for fresh and hygienically produced vegetables increased during the pandemic period. Soilless farming facilities benefited from their ability to maintain stable production throughout movement restrictions. Interest in urban agriculture and food self-sufficiency gained stronger momentum across several countries. Agricultural technology investments related to hydroponics and vertical farming expanded considerably after the pandemic.

The rockwool segment is expected to be the largest during the forecast period

The rockwool segment is expected to account for the largest market share during the forecast period as consistent crop support for hydroponic cultivation across commercial greenhouse and vertical farming operations. Its lightweight structure and high nutrient absorption efficiency make it widely suitable for intensive crop production systems. Commercial vegetable growers continue preferring rockwool substrates for tomatoes, cucumbers, and leafy greens cultivation. Compatibility with automated irrigation systems further strengthens segment adoption. Expansion of protected agriculture facilities is also contributing to increasing product utilization. Strong operational reliability continues supporting the segment's dominant market position.

The commercial seedling production segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the commercial seedling production segment is predicted to witness the highest growth rate due to rising demand for uniform plant quality, faster germination cycles, and controlled propagation systems within modern greenhouse and indoor farming operations. Commercial nurseries are increasingly adopting soilless cultivation methods to improve seedling consistency and reduce contamination risks. Advanced propagation trays and precision nutrient delivery systems are enhancing production efficiency significantly. Growing preference for high-yield crop varieties is further accelerating adoption across horticultural applications. Expansion of urban farming initiatives is also strengthening demand for commercial seedling production

facilities.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share owing to advanced greenhouse cultivation practices across countries such as the United States and Canada. Strong investment activity in vertical farming infrastructure continues supporting regional market development. Commercial producers are utilizing soilless farming systems to improve productivity and reduce water consumption. Consumer preference for pesticide-free and locally sourced produce remains particularly strong across urban populations. The presence of established agri-tech companies further accelerates technological innovation within the region.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR driven by expanding adoption of protected agriculture technologies across countries such as China, India, Japan, Singapore, and Australia. Governments throughout the region are promoting sustainable farming practices to strengthen food security capabilities. Rising investments in hydroponic greenhouses and vertical farming facilities are accelerating market expansion. Demand for high-quality fresh vegetables is also increasing steadily among urban consumers. Commercial agriculture enterprises are actively integrating water-efficient cultivation systems within large-scale operations. Rapid modernization of agricultural infrastructure continues supporting strong regional growth momentum.

Key players in the market

Some of the key players in Soilless Farming Market include AeroFarms, Gotham Greens, BrightFarms Inc., Plenty Unlimited Inc., Bowery Farming Inc., Freight Farms, Inc., Crop One Holdings, Inc., Heliospectra AB, Signify N.V., Argus Control Systems Ltd., Netafim Limited, General Hydroponics, LumiGrow Inc., Valoya Oy and Illumitex, Inc.

Key Developments:

In March 2026, AeroFarms entered the final stages of its planned corporate acquisition process, following a period of extensive strategic restructuring to secure long-term

operations funding. This major consolidation transaction stabilizes the company's leading position as an indoor vertical farming powerhouse and ensures the uninterrupted supply of its microgreens to thousands of U.S. retail locations like Whole Foods Market and Walmart.

In May 2025, Plenty Unlimited Inc. successfully emerged from Chapter 11 bankruptcy restructuring just 53 days after filing, securing critical exit financing from One Madison, SoftBank Vision Fund 2, and existing investors. This fast-track financial turnaround downsized operational overhead and realigned the company's capital allocation to focus heavily on its highest-margin indoor cultivation programs.

Farming Systems Covered:

Hydroponics

Aeroponics

Aquaponics

Vertical Soilless Farming

Other Farming Systems

Growing Media Covered:

Coco Coir

Perlite & Vermiculite

Rockwool

Clay Pellets

Other Growing Media

Facility Types Covered:

Indoor Farms

Greenhouses

Container Farms

Research Facilities

Other Facility Types

Applications Covered:

Vegetable Cultivation

Fruit Cultivation

Herb Cultivation

Commercial Seedling Production

Other Applications

End Users Covered:

Commercial Growers

Greenhouse Operators

Urban Farming Companies

Research Institutions

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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