IN-STORE FARMING 3.0



IN-STORE FARMING:

a response to Europe's food system vulnerabilities

SweGreen

RETHINKING HOW EUROPE GROWS ITS GREENS

Europe's food system is facing several challenges at once. The assumption that fresh food will always be available at stable prices, in reliable quantities and at consistent quality, is being tested from multiple directions. Geopolitical instability is affecting fertilizer supply chains. Drought across Europe is putting pressure on key growing regions. New binding EU legislation on food waste requires structural change at the retail level. And questions are being raised about the cumulative effects of pesticide residues in the food we eat every day.

For leafy greens and lettuce, these vulnerabilities are clear. Production is concentrated in a handful of regions, supply chains are long and complex, and fruit and lettuce frequently contain multiple pesticide residues.

Swegreen offers a service built around in-store farming: our customers are everyone from supermarkets to restaurants and kitchens who want to grow fresh greens directly on their own premises, without pesticides. Our technology can make considerably more fresh greens available, closer to the end consumer.



FIVE ADVANTAGES OF IN-STORE FARMING



1. ZERO PESTICIDES

Soil-free cultivation in a controlled environment removes the need for chemical crop protection entirely.

2. 99% LESS WATER

Water is recirculated in closed systems.

3. SUPPLY CHAIN RESILIENCE

Production moves close to the consumer and continues uninterrupted even when global supply chains break down.

4. FRESHER FOOD, LESS WASTE

Crops are harvested at peak ripeness and sold immediately - shelf life up to three weeks, directly supporting EU food waste compliance.

5. PREDICTABLE COSTS

No exposure to freight rates, fuel prices, currency swings or fertilizer price shocks.

In-store farming does not replace conventional agriculture. It is an important complement to building a more robust, sustainable and resilient food system.

FOUR STRUCTURAL PRESSURES ON FOOD SUPPLY

1. Supply chain fragility

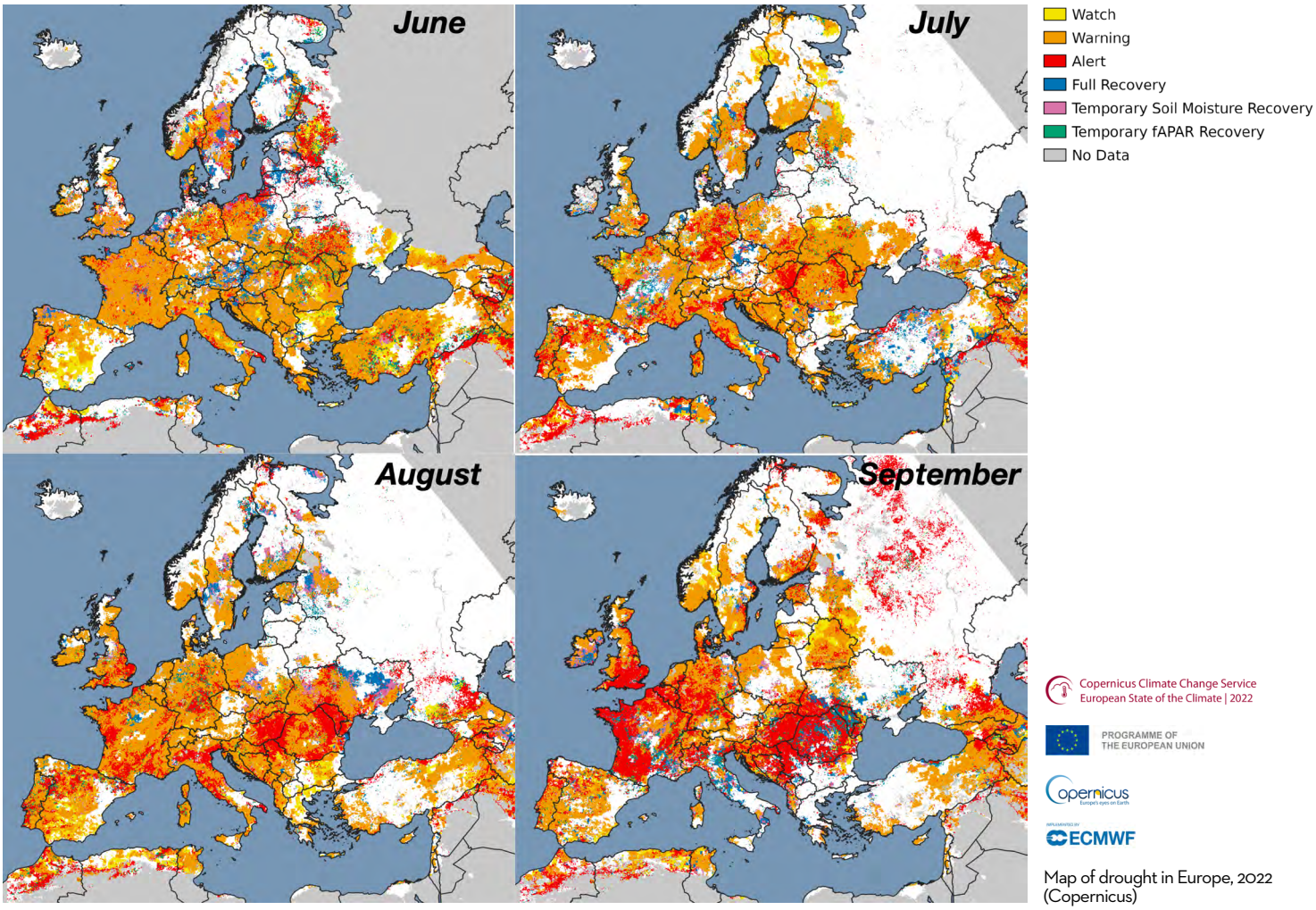
Modern food supply chains have proven highly vulnerable to disruption. The COVID-19 pandemic and Russia's invasion of Ukraine each showed fragility. The closure of the Strait of Hormuz since February 2026 is the latest example and the United Nations Food and Agriculture Organization (FAO) has warned that the disruption could trigger a global food price crisis, with costs already rising for food manufacturers, growers and importers as energy, fertilizer and logistics prices climb. About a third of the world's fertilizer trade passes through the strait, showing how a single chokepoint can quickly ripple from energy markets into food production.

For fresh food like lettuce and leafy greens, the consequences are immediate. These products can't be stockpiled, and their short shelf life leaves no buffer in the supply chain.

2. Water scarcity

Global agriculture accounts for 70% of freshwater withdrawals worldwide. In Europe, drought is no longer the exception. The EU's Joint Research Centre European Drought Observatory tracks drought conditions continuously. Persistent drought warnings now regularly cover large parts of Europe, the very regions that supply most of Europe's imported leafy greens.

Climate change is making this worse. Relying on water-intensive open-field farming in drought-prone regions is becoming an increasingly risky long-term strategy.



Map of drought in Europe, 2022 (Copernicus)

3. Pesticides and the potential cocktail effect

The EU's food safety authority EFSA (European Food Safety Authority) reports that 41% of European fruit and vegetables contain pesticide residues, and that lettuce is among the foods with the highest frequency of multiple residues: samples containing two or more different pesticides at once.

This combined exposure, often called the cocktail effect, is not yet regulated, even though scientists continue to warn about the potential health risks. Each individual substance stays within permitted limits, but what they do in combination is still not well understood. The European Commission and EFSA have been working together since 2021 to better understand and regulate these combined effects, with the goal of having a complete framework in place by 2030.

As science develops, stricter regulation and growing consumer demand for pesticide-free food are likely to follow.

4. Food waste

In 2022, the world wasted 1.05 billion tons of food, equal to one fifth of all food available to consumers at retail, food service and household level. Food loss and waste accounts for 8-10% of global greenhouse gas emissions, nearly five times the total emissions from the aviation industry.

For leafy greens and lettuce, the problem is especially clear. Food that has traveled long distances arrives at retail with much of its shelf life already used up. Leafy greens need continuous refrigeration throughout the journey, and any lapse quickly affects quality.

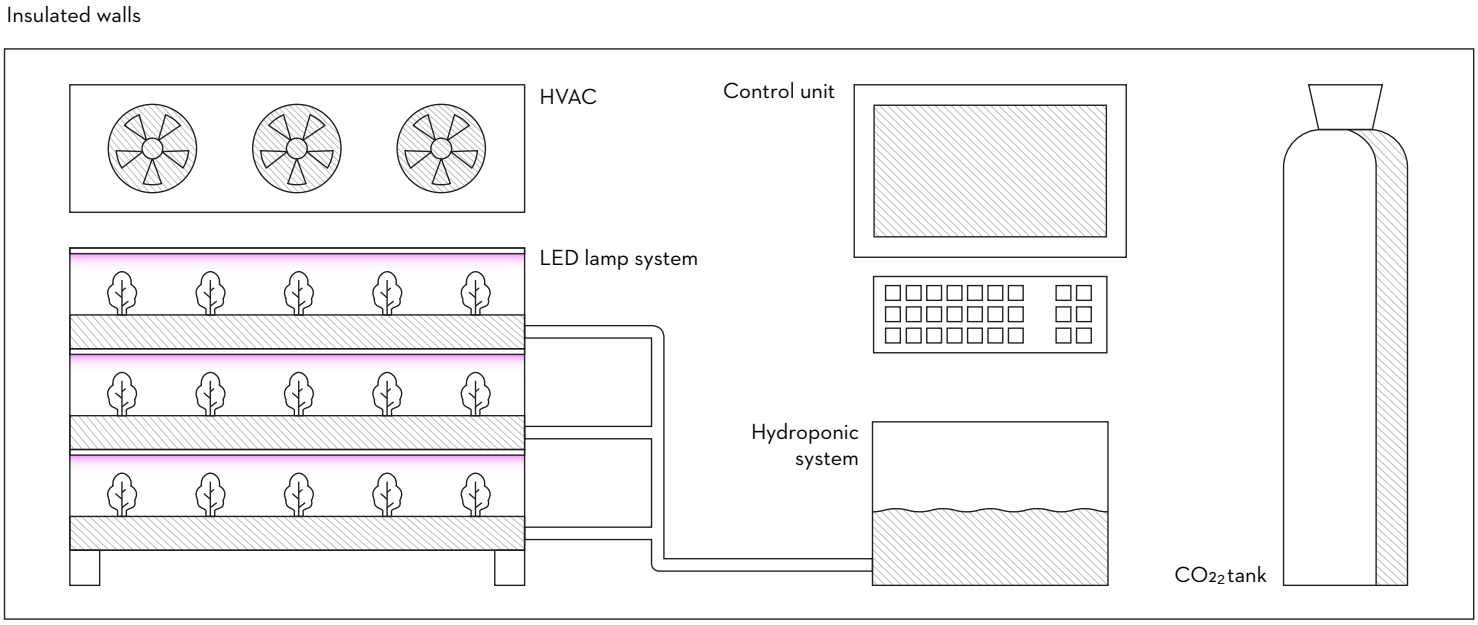
The revised EU Waste Framework Directive entered into force in October 2025, setting binding targets: member states must cut food waste by 10% in processing and manufacturing, and by 30% per capita in retail, restaurants, food services and households - by 2030.



FIVE ADVANTAGES OF IN-STORE FARMING

In-store farming means installing vertical hydroponic growing systems directly at the point of sale or service; in supermarkets, restaurants or institutional kitchens. Crops grow in a controlled indoor environment using LED lighting, with water and nutrients recirculated in closed loops. No soil is used. Temperature, humidity, light and CO_2 levels are digitally monitored and adjusted to optimize growth. The result is that lettuce, herbs and leafy greens can be grown, harvested and sold on-site, often the same day.

As part of this closed loop, CO_2 from the indoor environment, exhaled by customers, staff and ventilation systems, is fed directly back into the growing process rather than being supplied externally. Waste heat from the growing system can also help heat the premises.





FIVE ADVANTAGES OF IN-STORE FARMING

1. ZERO PESTICIDES

Soil-free cultivation in a controlled environment removes the need for chemical crop protection. Without soil, the risk of soil-borne diseases, insects and other pests disappears, eliminating the need for pesticides, herbicides or synthetic additives. This is good for biodiversity, the environment and the consumer.

2. 99% LESS WATER

Water use drops by up to 99% compared with open-field or greenhouse cultivation, through circular water systems that recover even moisture from the air. Although vertical farming uses more electricity than conventional agriculture, this is offset by the elimination of shipping and cold chains. In markets with near-carbon-free electricity, the net climate impact is very low.

Vertical farming is also highly space-efficient. Open-field cultivation requires between 180 and 270 square meters of farmland per ton of lettuce per year, while a vertical growing system can produce the same amount in just a few square meters by growing upward.

99 %

water saved via circular use

Resource use per kg of lettuce:	Open-field	Greenhouse	Vertical farming	In-store farming
Liters of water	50–330	16–200	0,5–16	1,3–1,5
kWh	0,3–1,0	5–33	2,4–38	2,6–3,5

3.

SUPPLY CHAIN RESILIENCE

Production moves close to the consumer and can continue year-round. Fresh crops can be grown and harvested directly in-store, regardless of weather, season or supply chain disruptions. The controlled environment also allows for more harvests per year compared to open-field farming, ensuring a steady supply of fresh food. This creates a more reliable and predictable supply structure, especially valuable in urban areas where farmland is scarce.

Traditional agriculture industry



Vertical farming



Swegreen's growing solution



SweGreen

4.

FRESHER FOOD, LESS WASTE

Long shipping and multiple handling steps degrade both quality and nutritional content. Studies show, for example, that spinach can lose half its folate content after eight days in refrigeration.

Closed growing environments with controlled light, nutrition and temperature consistently produce high-quality food. A study comparing lettuce grown in open fields, greenhouses and controlled environments found that lettuce from the controlled environment received the highest ratings for taste, color and texture. Crops harvested and sold on-site can last up to three weeks at proper storage - significantly longer than imported alternatives that have already passed through multiple supply chain steps.



3 WEEKS

With proper storage, in-store grown crops can last up to three weeks at home



5.

PREDICTABLE COSTS

Food prices have risen sharply in recent years, driven by currency swings, freight costs, fuel prices and tariffs. This volatility affects both retailers and consumers. In-store farming offers a stable, local production model with predictable costs. By cutting transport, warehousing and distribution, operators get better control over pricing. This leads to more stable food costs for both consumers and institutional food service operators, regardless of what happens on global commodity and freight markets.





ABOUT SWEGREEN

Swegreen is a Swedish agtech company offering in-store farming as a service (Farming as a Service, FaaS). Through hydroponic growing systems, fresh vegetables are produced directly on-site - in supermarkets, restaurants or hotels - with significantly reduced water consumption, no pesticides and minimal transport. A single installation can produce up to 500 crops per day.

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