GROWING CONCERN

CULTIVATION

WITH AN UNPRECEDENTED SPIKE IN GLOBAL POPULATION, INVESTMENT IN FARMING INNOVATION IS CRITICAL IF WE ARE TO PRESERVE OUR FOOD'S NUTRITIONAL QUALITY

WORDS BY
ANTOANETA ROUSSI

If you happen to find yourself dining at a top restaurant in Amsterdam, the chances are the rocket in your salad or the basil that made your pesto came from the city's first 'vertical' farm.

The practice of obtaining culinary herbs and edible greens from these new farms is becoming increasingly popular in cities, and those in the industry say it all has to do with quality.

'If people are going to live in an urban future, the question every city has to ask is: how do we grow fresh produce?' says John Apesos, GROWx Amsterdam's founder, whose clientele include the city's top restaurants, such as Yerba, the Conservatorium Hotel and La Rive. 'It's about high-quality and high-quantity localised food production.'

In Europe, most of our greens during winter months are shipped in from North Africa and South America. Apesos says this lessens their nutritional value and taste because of the time it takes to get from farm to plate.

'Inside a vertical farm we have everything enclosed – in essence we make climate,' he says. The farm uses an automated system that monitors and controls variables including humidity, CO_2, light intensity, irrigation and air temperature. 'That means by positioning one of our farms in a city centre, they can reach our clients within minutes.'

Vertical farms like GROWx Amsterdam are cropping up across Europe. But the tall, green structures aren't the only farming innovation that's blossoming. Global investment in agritech equalled $1.5 billion in 2018 according to Finistere Ventures and encompasses processes such as aquaponics, hydroponics, GPS-controlled machinery and drones.

Global investment in agritech equalled $1.5 billion in 2018 according to Finistere Ventures and encompassed processes such as aquaponics, hydroponics, GPS-controlled machinery and drones

The need for these innovations is urgent, with the United Nations estimating the world's population will exceed nine billion people by 2050, with 80% living in cities. To ensure food security, and to help mitigate climate change, farmers must get inventive.

The shift towards new farming techniques isn't only being made by up-and-coming entrepreneurs. Lord Jacob Rothschild's five-and-a-half acres at Waddesdon Estate is something akin to a massive horticultural experiment. Working with Hummingbird Technologies, aerial drones hover over the land like bumblebees, collecting data on harvest yields, which the farmers then analyse to determine the quantity of fertiliser needed.

'Sustainability has become a huge factor,' says Fabia Bromovsky, chief executive of the Rothschild Foundation. 'Land price up until now has hugely been driven by where it is in the country and to some extent by yields. In the next 20 years, land price will be dictated by the condition of soil and the sustainability of land.'

With their belief in the future of farming, Waddesdon has launched a project with British architect Norman Foster to create a 'living' building that will demonstrate some of the agricultural techniques that are possible.

The project, located in an area of the garden where 19th-century greenhouses housing exotic plants once stood, will showcase what sustainable farming might look like. Lord Jacob Rothschild – whose grandfather Nathaniel Charles Rothschild established the British Wildlife Trust – believes it all starts with conserving people's soil. »

Previous spread:
New farming techniques are at hand

Opposite page, from top:
GROWx Amsterdam's high-tech vertical farm, located in the city; Some of the greens grown by GROWx Amsterdam

Below:
Waddesdon is committed to working in a sustainable way

'There is an enormously strong heritage on my side of the family in the subject of nature conservation,' Lord Rothschild says. 'Now we're undertaking an initiative which will show to the public the future of farming and what it could be. It's an expensive interest, but we hope one day it might be profitable.'

The idea of precision agriculture was born a decade ago from the idea of GPS-controlled tractors. With the introduction of big data, agronomists realised that they could be much more precise with the application of fertiliser and pesticides, leading to healthier and more sustainable farming.

'Instead of spreading tons of chemicals using these huge machines, you could use a number that are equipped with artificial intelligence to analyse the plants, one by one, and spray only those that have a specific disease,' says Roberto Cingolani, scientific director of the Italian Institute of Technology in Genova. 'This is the counterpart of precision medicine, where instead of giving the same dose of a drug to every person, you give an individual percentage to each patient.'

The Istituto Italiano di Tecnologia (IIT), is in the process of developing a four-legged drone (a 'quadruped'), which will be able to walk around fields without ruining soil – unlike wheels – and traverse all kinds of terrain, whether steep, flat, soft or hard. Using AI and vision apps, the machine will be able to recognise different plants and determine whether they need treating.

Cingolani says that in principle the machine would also be able to pick the fruit, but that would need a great deal of development in dexterity.

'The dream is that you will have machines like that walking in the fields 24/7, checking the individual plants during their development and distributing a specific drug at a specific point, only when needed,' he says. 'I think it will lead to a very healthy agriculture and food system.' **W**

'We're undertaking an initiative which will show to the public the future of farming and what it could be. It's an expensive interest, but we hope one day it might be profitable'

Opposite page:
Indoor farming could help to utilise redundant buildings and warehouses

Below, from top:
The UK played a leading role in the early stages of driverless tractor development; Intelligent Growth Solutions (IGS) opened its first indoor vertical farm in Scotland