

As arable land disappears, here come the vertical farmers

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Lettuce is grown within an automated internal agricultural system with violet LED lighting at Urban Crops in Waregem

As cities expand, eating up swathes of countryside in the process, agricultural pioneers are finding new ways to grow the fresh produce we need, in containers, empty buildings and any other spare space they can find to create new vertical farms.

"We are just trying to imitate nature. It's not as futuristic as it might sound," insists a smiling Maarten Vandecruys, the youthful founder of Urban Crops, a new Belgian company specialising in indoor growing systems with the help of LED (light emitting diodes) lamps.

Behind him, in a spooky, futuristic purple halo of light, stand rows of shelves dedicated to horticulture. It is a closed environment with no natural light.

The purple glow is the result of red and blue lamps and is believed to provide the optimal growing conditions.

Vandecruys prides himself on the completely automated agro-system he has set up in Waregem, in eastern Belgium.

At the Urban Crops lab, a conveyor belt circulates containers of germinated plants which are placed in a special substrate, using no earth to reduce the risks of disease linked to animal-life and other external factors.

The containers are introduced to a closed room, the walls of which are lined with shelves.

Under the artificial light the plants develop in a controlled environment, fed through a hydroponic system—water laced with the ideal mix of mineral salts and essential nutrients.



The purple glow is the result of red and blue lamps and is believed to provide the optimal growing conditions

No pesticides are required in this much more sterile environment and, as the LED lamps don't heat up, they can be placed close to the plants, allowing for tight layers of vegetables.

Evolution not revolution

According to Vandecruys the future of vertical farming is to expand to an industrial scale.

"It's just an evolution," not an agro-industrial revolution, he says, a natural progression from fields to greenhouses, then from greenhouses to vertical farms.

With his system, a 50 square-metre space (540 square feet) can be transformed into 500 square metres of usable "land". And the plants grow two to three times faster than outdoors, further increasing yields.

In the Urban Crops laboratory, up to 220 mature lettuce plants are produced each day in a 30-square-metre room using just five percent of the water required in traditional agriculture.

However for Samuel Colasse, a teacher and researcher at the Carah agronomic research centre in Hainaut, eastern Belgium, the concept of urban farming is "currently not very convincing" in countries like France and Belgium where the distances between the fields and the towns "aren't enormous".



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But in a highly urban environment like New York "there are projects which work pretty well," he says.

And in hostile climatic conditions, or in some military or refugee camp situations such "somewhat futuristic" ideas could be envisioned, Colasse adds.

His own laboratory has produced everything from bananas to rhododendrons.

Endless uses

For Urban Crops the uses of its vertical farming technology are virtually boundless.

The company can foresee its products being used in pharmaceutical labs to produce plants with medicinal qualities, in supermarkets which could sell their own hyper-fresh produce—and at the same time cut out the transport costs—or in isolated communities in Scandinavia and elsewhere.

For now its clients have more modest ambitions.



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A top restaurant, for example, wants to experiment with the flavour, texture, size and colour of its ingredients through subtle changes to the light, temperature and nutrients during the growing process.

Urban Foods claims to have produced a type of salad rocket the taste of

which "explodes" at the back of the throat.

And for the domestic goddesses, or gods, there are individual shelving and lighting set ups to grow-your-own herbs or cherry tomatoes.

Swedish furniture giant IKEA has already jumped vertically onto the home-farming bandwagon, launching its own range of assemble-yourself vegetable kits.

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