

Agricultural production**Coronavirus crisis fuels interest in vertical farming**

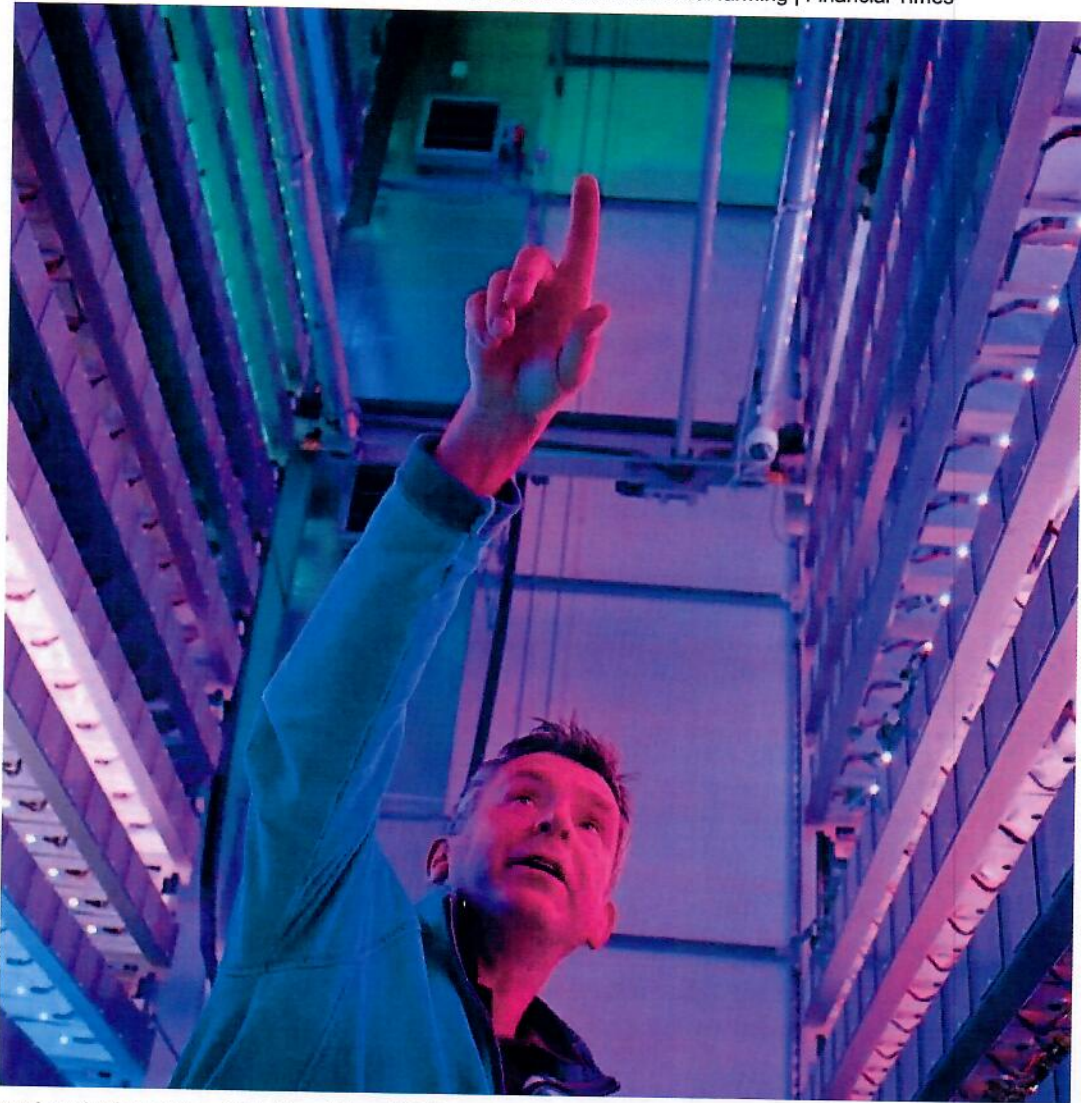
Crops grown in 9m tall towers could point the way to the future of food production

Mure Dickie in Invergowrie and **Emiko Terazono** in London YESTERDAY

The coronavirus pandemic has been a major worry for many British farmers, threatening access to agricultural labour and complicating international supply chains. But for proponents of indoor farming, the crisis has offered an opportunity.

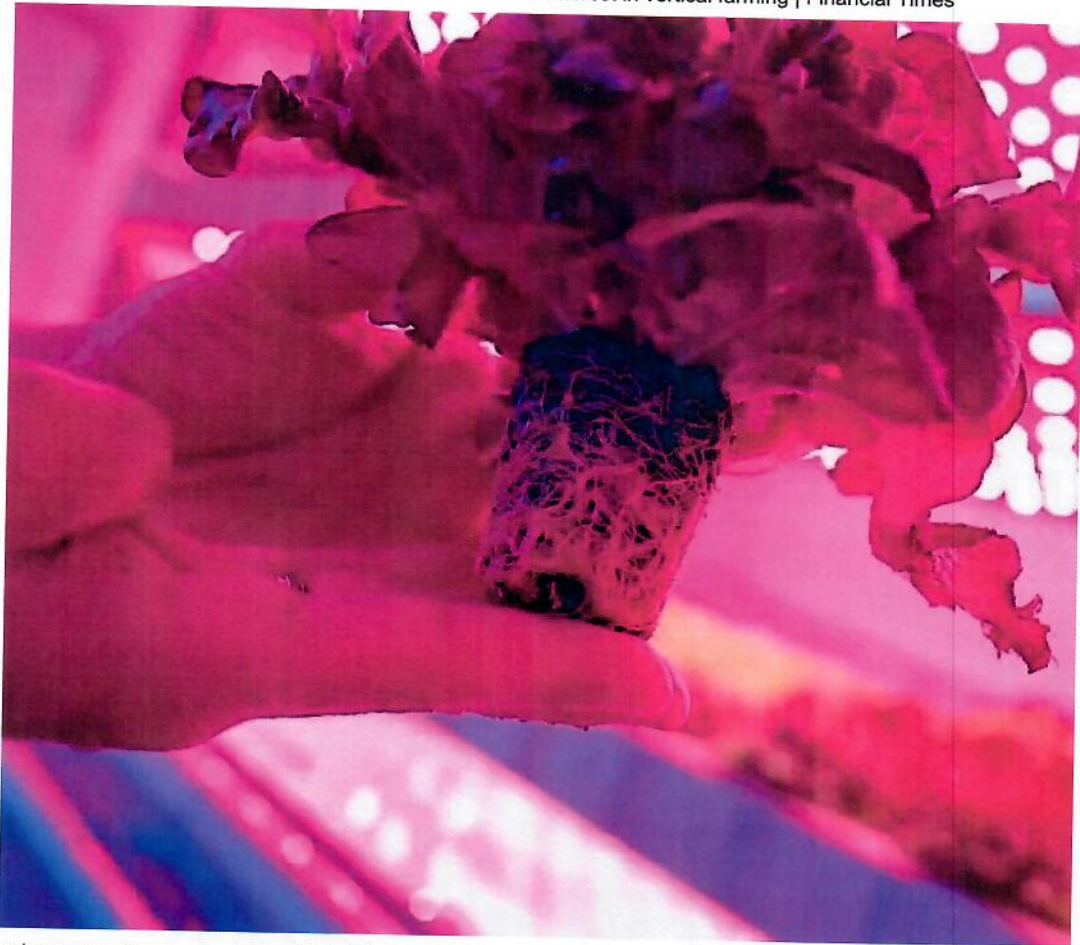
David Farquhar, chief executive of technology developer Intelligent Growth Solutions, says the pandemic has prompted a spike in interest in 'vertical farms', where batches of crops can be individually watered, fed and lit using LED lights, allowing them to be grown year-round with minimal labour near their markets, regardless of local soil or weather conditions.

At the company's demonstration farm in Invergowrie near the Scottish city of Dundee, trays of produce stacked in 9 metre-tall towers are managed remotely from seeding to packaging. Humans only need to enter the towers for occasional maintenance. "You can run it entirely on robotics . . . You probably need to go in once every six months," Mr Farquhar said.



David Farquhar, chief executive of Intelligent Growth Solutions © Jeremy Sutton-Hibbert/FT





Crops can be grown all year round using LED lights © Jeremy Sutton-Hibbert/FT

This higher productivity will have particular appeal to British farmers, who are facing a steep [increase in costs because coronavirus](#) restrictions have affected the arrival of seasonal workers from eastern Europe. [Brexit](#) may also make it more difficult to access labour from the bloc when the UK's transition period expires at the end of the year.

Colin Campbell, chief executive of the James Hutton Institute, a research organisation that hosts the IGS farm and another vertical farming company, Liberty Produce, said the global food supply system had generally worked well during the pandemic. But he added that the crisis had highlighted worries about food safety and the risks of relying on seedlings or produce grown far away from where it is consumed.

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While agritech investors have been pouring millions of dollars into vertical farm start-ups in the US and Europe, Irving Fain, founder of US vertical farming firm Bowery Farming, said the pandemic had accelerated interest around the world. “The simplicity of the supply chain is extremely important,” Mr Fain said.

IGS sold its first vertical farm in July to an Aberdeenshire venture backed by a founder of craft beer business BrewDog. According to Mr Farquhar the company last year [raised £7m from three venture capital firms and the Scottish Investment Bank](#) and could build a four-tower farm that would produce more than 80 tonnes of produce a year for around £2.5m.

At the IGS facility in Invergowrie, each tray of produce has its own microclimate, with temperature differences of up to 6C between the trays immediately above or below. The growing tower is accessed through an air lock and plastic curtain barrier, removing the need for chemicals to control pests.

Despite the advantages, many vertical farm start-ups have struggled with the high initial investment for building the facilities as well as running costs that include electricity for lighting and ventilation. The sector has been littered with bankruptcies as companies struggling to remain competitive on price have run out of cash.



Derek Stewart (wearing green shirt) and Colin Campbell © Jeremy Sutton-Hibbert/FT





Vertical farming requires less labour but incurs high electricity costs © Jeremy Sutton-Hibbert/FT

Niccolo Manzoni of Five Seasons Ventures, a Paris-based agritech venture capital firm, said locally-grown fruit and vegetables appealed to consumers. He added that producers would also welcome technology that could work in regions such as parts of the Middle East, where conventional farming was impossible, or areas in countries such as China that suffer from serious soil contamination.

Nevertheless, Mr Manzoni said the investment [case for vertical farms](#) suffered by comparison with open field production. “In an open field, you have the sun for free. In a vertical farm, the electricity bill is very high,” he said. “It only makes sense to operate a [vertical] farm where electricity is dirt cheap or a place where energy is being heavily subsidised.”

But Graeme Warren, chief executive of Aberdeenshire-based Vertegrow, said the company expected the four-tower facility that will be built for it by IGS this year to quickly start paying for itself.

“When the facility is fully operational and the four towers are operating at capacity, then it should be profitable at that point,” Mr Warren said. “We wouldn’t be going into this project if we didn’t think we would be cash positive in the not so distant future.”

Because of the relatively high costs of vertical farms, it makes sense to grow high-margin crops rather than commodities like bulk grains or cereals. Martin Dickie, founder of Vertegrow and co-founder of BrewDog, said the new facility would grow leafy greens, baby leaves like pak choi, and herbs such as basil and coriander using only rainwater and without pesticides.

“With Covid, people are really focused on healthy lifestyles, and focused on more sustainable plant based diets, and they want to make sure what they are putting into their bodies are spray-free,” Mr Dickie said.

The green credentials of vertical farming are undermined by the need for artificial lighting, particularly if the electricity is generated from fossil fuels. But Prof Campbell said this was offset by the reduced need for transport and a reduction in food waste, because crops were of more uniform quality and supply could be matched closely to demand.

And, he added, “there is likely to be reduced greenhouse gas emissions, because of reduced fertiliser use”.

“[Vertical farming] appears to be very disruptive in the true sense of the word, because it is making people change their ideas of what the food system should be like.”

This article has been amended to corrected the spelling of Mr Fain’s name

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