

TECH FARMING BEARS FRUIT

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Technology has made farming a viable idea in Singapore, but owners of farms hope more can be done to help grow the industry as well as the country's food supplies



Tan Hsueh Yun
Food Editor

Just a decade ago, the idea that farming might be a viable career or business in land-scarce Singapore would have seemed laughable.

But technology, which enables people to grow crops indoors and to literally reach for the sky and grow more on less land, has made farming less of a joke.

Many farms in Singapore do not call themselves farms. They are start-ups, with all that the name implies – innovative, technology-driven, canny disruptors.

The Covid-19 pandemic has also thrown food resilience into sharp relief. People have seen how imported food can be delayed because of logistics, dwindling supplies or protectionism. They have seen here – albeit temporarily – supermarket shelves.

They are coming round to the benefits of eating locally grown produce, which travel far less so remain fresh for longer.

Singapore farms have also upped their game in the last few years, growing the sorts of things that appeal to their customers.

For those who want Asian greens for stir-fries and such, there are many options. For those who want lettuces, kale, edible flowers and herbs, there are farms which grow these crops too.

According to the Singapore Food Agency, less than 1 per cent of the land here is used for farming.

Its latest figures are from 2019, and there are 220 farms here which produce 14 per cent of leafy vegetables Singapore consumes, 26 per cent of eggs and 10 per cent of fish.

The agency has a lofty aim, for farms here to produce 30 per cent of Singapore's food by 2030, in a sustainable way. That is the "30 by 30" target farmers talk about.

Getting the produce out to consumers is one way to meet that target and businesses have been working on that.

The FairPrice supermarket chain says it has been offering locally farmed produce for about three decades.

It works with more than 20 farms here to offer vegetables, eggs and fish. More than 55 per cent of the eggs it sells as well as 10 per cent of its fish and vegetable sales are from local farms.

The FairPrice Group's chief procurement officer Ting Ah Yam says, "Compared with two years ago, we have increased our supplies from local producers by 10 to 15 per cent for eggs, vegetables and fish."

He adds that FairPrice holds annual Made In Singapore fairs, and also supports small and medium-sized enterprises (SME) by helping them sustain and grow their businesses.

Its SME Supplier Support and Development Programme came about in 2009 during the global financial crisis, and was brought back in 2012 during the economic slowdown. Now, it is an annual

programme that supports more than 500 SMEs.

"Last year, we doubled the annual budget for the programme from \$1 million to \$2 million, in view of the pandemic's impact on companies," he says. "This year, the commitment is further increased to \$2.5 million."

Food distribution company FoodServices started Backyard Productions last year to sell locally grown produce. Currently, it has six vegetable farms, three fish farms and a prawn farm supplying produce for sale.

It supplies locally grown produce to 10 food and business establishments and is working on getting the word out to more.

For the retail market, it has The Original Singapore Salad mix, put together using leaves from the vegetable farms it works with.

Its chief executive Nichol Ng says next year, for Chinese New Year, it will launch the Singapore Yu Sheng, also using locally grown produce.

She says: "Covid-19 has emphasised the importance for Singapore to be more self-reliant on our food supply so that we are able to have a buffer in the event of disruptions. More than ever, we need to take the 30 by 30 goal seriously."

"It's hard to say if it's achievable, but we will definitely be much closer to our goal than where we are now if we continue to drive every effort in the right direction."

She adds that Singapore can take inspiration from what Australia has done to protect its farming industry.

"By restricting import volumes and increasing local production, we may just be able to find that balance point," she says.

"What is needed is for us as a nation to take pride in and believe that the produce we put out can be on a par or even better than imports. I truly believe Singapore can be the food basin for the world."

"It's not by producing the supplies, but the development of technology and innovation that go into feeding the world in the future. We need to start supporting our farmers to arrive more quickly at the global stage."

This would be music to Singapore farmers' ears.

Tech-driven farming is not without its problems.

The farms which The Sunday Times spoke to bring up the high cost of utilities – electricity to power round-the-clock air conditioning and LED lights for indoor farms. That, in turn, drives up the cost of producing their crops. But they have to compete with foreign imports.

There are also manpower issues, high rentals, the length of leases for farmland and property taxes.

Farmers here say the Government has done a lot to help people like them – with grants for equipment and to reward productivity – but ask for more support.

Mr Jack Ng, founder of Sky Greens, says: "For most countries, food production is so important. Governments protect their farmers, they try to bring down costs for them. I have been supplying my vegetables to supermarkets for more than 10 years. The price is unchanged, but my overheads have increased."

Ms On Foong-Yoke of GrowUp! By Ubertas AgriTech, a 10-month-old indoor farm, adds: "People here will buy locally grown produce. And farms can set up and start selling."

"The problem is that the operating environment is difficult. Will it survive?"

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Expansion plans for mushroom farm kick off

KIN YAN AGROTECH
INFO: www.kinyan.sg

For more than 10 years, Kin Yan has been supplying its mushrooms just to FairPrice supermarkets.

Then the Covid-19 pandemic hit and other supermarket chains came a-calling. Now, its wares are carried in Cold Storage, Prime and Sheng Siong supermarkets too.

The company, which started in 1997, has also worked up an appetite among customers for growing their own mushrooms at home. It has sold more than 20,000 mushroom-growing kits since June this year.

The company, with a 2.7ha farm in Neo Tiew Crescent, produces – monthly – about 14 tonnes of mushrooms, 6 tonnes of wheatgrass and more than 16 tonnes of pea sprouts.

Over the years, it has found that pink and gold oyster mushrooms, abalone mushrooms and black fun-

gus are suitable for growing in Singapore. Shiitake and king oysters, for example, require lower temperatures and will be more expensive to grow.

Farm manager Ng Zhen Khan, 28, says the focus now is on increasing production to meet the surge in supermarket demand.

Kin Yan is building 10 new greenhouses on its current farm, to be ready by the third quarter of next year, and spending a high six-figure sum on the upgrade.

The challenge will come when the new greenhouses are in operation because they will need more farmers to tend to the crops. The company currently has 15 farmers, six staff who do packing and sorting, and five management staff.

"Fifteen farmers is not enough," Mr Ng says dryly.

It is also working with schools so students know how mushrooms

are grown. In fact, schools have approached the company to buy the kits and to conduct workshops.

Although the company has been selling the kits for four to five years, it had been on a small scale. It decided to push for more sales when the pandemic hit. Mr Ng says: "We want to encourage people to grow their own food."

The kits sell for \$18 each, although there are promotions where they go for \$12.50. Each one contains everything that is needed to grow either pink or gold oyster mushrooms. Growers mist the kit with water three times a day, can expect the first harvest within seven days, and then enjoy two to three more harvests after that.

Over the years, it has also seen the value of turning its crops into higher-value products.

Its wheatgrass, for example, is made into a multigrain cereal mix

Artisan Green founder Ray Poh (right, with a tray of red baby kale) grows spinach (right, below) among his crops.
ST PHOTO: SAMUEL ANG



Creating a salad called Kallang Raw

ARTISAN GREEN
INFO: artisan.green

Coriander, a cooking staple here, is ubiquitous. It is an inexpensive herb, available in every wet market, every supermarket.

Why would high-tech farm Artisan Green choose to grow it? And sell for \$3.90 for a 15g pack?

"Wait till you taste ours," says founder Ray Poh, 36.

Indeed, the proof is in the tasting and Artisan Green's coriander is like a souped-up version of the herb. A little goes a long way. The leaves are bracingly fresh, the flavour puts supermarket coriander to shame.

Instead of growing a variety of crops hydroponically, Mr Poh, who used to be the director of a casino gaming company, has cho-

sen to focus. He started the farm in 2018 with just one crop – baby spinach – and added red baby kale, dill and coriander this year.

His wares make a convincing case for eating locally grown produce. Instead of selling online, he has been able to get some retailers to carry his produce. Stores such as Blyan's Grocery, HAO Megamart, FairPrice Online and Redmart carry the herbs, and the baby spinach – and added red baby kale, dill and Little Farms.

Artisan Green harvests about 100kg of pesticide-free produce a week from its 2,000 sq ft farm in Kallang. The space is not used to its full capacity, and Mr Poh is working that and hopes to harvest more than 200kg of greens and herbs a week by year-end.



He has five full-time staff and 10 part-timers.

He tells The Sunday Times he focused on just one crop and picked high-value, versatile baby spinach. "Everyone else is growing lettuces and kale, and I didn't want to compete," he says. "What we didn't realise was that it's a finicky crop and we are still doing R&D to look at how to grow it better."

Early this year, he decided to expand his product range. "In order to get into FairPrice or Dairy Farm supermarkets, we needed



Kin Yan
Agrotech's
farm manager
Ng Zhen Khan
with the
company's
pink oyster
mushrooms
(left). It also
grows maple pea
sprouts (below).
ST PHOTOS.
KEVIN LIM



under the Good Lady brand. The cereal is made in Malaysia and there are plans to build a facility here to make it.
Kin Yan also uses its mushroom and wheatgrass to make dried and fresh noodles. These are sold at the store in its farm, and also in stalls at some wet markets.

The company is looking to do more of this, just as soon as it has levelled up to cater to the additional demand for its produce from supermarkets. "It's very challenging to just sell fresh produce," Mr Ng says. "The money we make is not a lot because we have to lower prices to fight the imports."



Veggies that even kids love to eat

GROW UP! BY
UBERTAS AGRITECH
INFO:ubertas-agritech.com

On the eighth floor of a flatted factory in Hillview Avenue, behind anonymous yellow metal doors, is one of Singapore's newest vertical farms.

Grow Up! By Ubertas AgriTech has been running for about 10 months and the owners - Mr Keith Heah, 63, and Ms Oon Foong-Yoke, 53 - grow a startling variety of vegetables in their 2,000 sq ft farm: curly and Tuscan kale, cos lettuce, red radishes, baby turnips, Genovese basil, oregano, tatsoi, chye sim, tang-oh, kailan and mizuna, among other crops.

They have also grown rainbow chard, zucchini flowers, patty pan squash, ice plants and even strawberries, the fruit small, the flavour intense.

Mr Heah, inspired by rooftop farming in the United States, decided to try his hand at farming when he quit his job in IT in 2015.

He had a prototype farm in Lim Chu Kang, where he grew tomatoes, cucumbers and cauliflower successfully. "I seem to have green fingers," he says. "And it all started with food security. I saw the way other countries could just shut down the supply of food and thought it would be a good idea to be able to supply some of our food needs."

They harvest more than 100kg of hydroponic vegetables a month and have regular customers who buy their \$40 Farmer's Pick boxes every week. Customers order

online from the website.

But they are at a crossroads, a situation other small farms like theirs are probably also facing.

How do they grow from here? Ms Oon says: "In an ideal world, I would be able to customise my boxes, so people can order only lettuces and herbs, or only Asian greens. I would like to supply to more restaurants too."

Currently, she supplies kale to Kausmo at Shaw Centre, a restaurant that actively cuts down on food wastage, and oregano and basil to Spanish restaurant Esquina in Jiah Chuan Road.

Mr Heah would like to grow more strawberries. There are small and different sizes, like wild strawberries and not the large and evenly sized ones sold in supermarkets. They hand-pollinate the plants using make-up brushes and usually consume what they harvest.

"People find it amusing that you can grow strawberries in Singapore," he says, adding that he is working out ways to grow them better.

There is space in their farm to grow upwards, but they will need to pump in more money - at least another \$100,000 more than the \$500,000 they and their family have already invested in the farm.

Those strawberries will need different types of trays and a new system tailored to grow them.

The owners are mulling over getting in investors. Moving operations to farming areas such as Neo Tiew Crescent and Lim Chu Kang is out of the question for now. Even though farmland will cost less, the



Grow Up!
By Ubertas
AgriTech's
owners Keith
Heah and Oon
Foong-Yoke
(both above)
also grow
strawberries
on their farm.
ST PHOTOS.
NG SOR LUAN

cost of building greenhouses and putting in electricity, water supply and sewage works will set them back at least \$2 million.

"It's hard to break even," says Ms Oon, citing rentals, utilities for air-conditioning and LED lighting, and manpower costs. The couple are very much hands-on in the farm and have one part-time staff.

"She would like to see more government support for small farms like hers."

On the 30 by 30 goal, she says: "If this is going to be a national agenda, I'd like to see a more consolidated approach to help us start-ups with the high overheads such as commercial rents and operating costs."

While the going might seem tough, she says there are rewards in farming. "I have customers who tell me their children will not eat vegetables at all, but when they stir-fry our vegetables for the kids, they eat them all up."

more than just one product. Red baby kale is eaten in salads and our system is geared towards growing baby greens, so it's economically viable. Also, the kale contains more antioxidants and the colour of the leaves pops in a dish."

He is developing a salad mix called Kallang Raw, the name a reminder to customers of where the greens are grown and a play on the Kallang Roar soccer cheer, for sale in supermarkets. It will be a mix of the spinach and kale.

Getting his produce to supermarkets has been a challenge. "We have been knocking on doors to get them to taste the greens," he says. "But with people working from home, headquarters locked down, it has been a challenge."

Meanwhile, he is also looking to grow thyme, sage, rosemary and other herbs, with corners of his farm devoted to these experiments.

And he is eyeing a bigger farm space. He put in a bid for land in Sungei Tengah last November, but did not win it. So, he is working with Enterprise Singapore to obtain a plot of land that is about 1.2ha in size. "If we build the farm to suit the growing system, that would be more efficient," he says. "It's expensive to rent."

With a larger farm, he hopes to be able to bring down prices and offer a wider range of produce - lettuces, for example, and also edible flowers and micro greens, both of which are in demand from restaurants.

He has seen how Singaporeans are now more conscious about buying locally grown produce.

During the circuit breaker last year, he had people contacting Artisan Green directly, asking to buy his vegetables even though he does not sell direct to consumers.

There is momentum, he says. "30 by 30 is a goal, not a mandate. If it becomes a mandate, that would force retailers to talk more to local farms. Any effort to get more farms on board in supermarkets will help."



Sky Greens founder Jack Ng (right) is rebuilding 500 old vertical gardens (above left) into new ones (above right) at his 3.65ha farm in Lim Chu Kang.
ST PHOTOS SAMUEL ANG

Roping schools into the plot

SKY GREENS
INFO:www.skygreens.com

If Mr Jack Ng, founder of Singapore's first vertical farm Sky Greens, had his way, schools would set aside space for micro farms - he has a design ready to go - and be able to harvest 100kg of vegetables a day.

He thinks that encouraging farming in Singapore is well and good, but the key to sustaining this effort is to rope in new blood.

The 58-year-old says: "To help the industry, you need to interest the younger generation. Have them learn about agriculture, how to grow vegetables and rear fish."

The engineer by training got interested in farming because he wanted to find better ways for farmers to grow their crops.

His 3.65ha farm in Lim Chu Kang started commercial operations in 2012. Its main crops are baby xiao bai cai and chye sim, full-sized nai bai and Chinese cabbage, and the

farm produces 1 to 2 tonnes of vegetables a day.

The produce is sold in FairPrice and Meidi-ya supermarkets, some wet markets, online on RedMart and supplied to restaurants.

He developed the vertical farming system he uses to grow his crops. It consists of rotating tiers of growing troughs mounted on an A-shaped aluminium frame. These frames can go up to 9m in height, but he has found that 6m is optimum.

The troughs rotate slowly through the day - using the flow of water and gravity - and the vegetables, grown in soil, get sunlight, water and nutrients as they cycle through the structure.

Compared with traditional farms, his system results in 10 times more yield for the same land area.

The system can also be used to grow vegetables hydroponically, and he has sold the design to farms in countries such as Brunei, Canada, China, Denmark, Malaysia,

Portugal, Vietnam and Thailand. He thinks there is potential to do more in Singapore.

Food resilience and security will get a boost if Singapore decides to look at how schools can produce vegetables, he says. He adds: "There are 300 schools in Singapore. Imagine if one school can produce 100kg of vegetables a day in a farm the size of a basketball court."

Mr Ng has even developed what he calls a franchise farm model, which incorporates vegetable and fish farming with a farm stay component, a restaurant to showcase the produce and research spaces for collaboration, among other features.

Even as he helps farmers do things better, he is also working on improving his own farm.

He is rebuilding 500 of his 1,000 growing towers, and is doing research and development on growing lettuce and crystal lettuces. "The taste, using our method, is so good," he says.

He is also trying to farm tilapia and sultan fish in tandem with growing vegetables, reusing waste material and water to create a sustainable ecosystem.

The Government can help, he says, by granting leases longer than the current 20 years because the money needed to start a high-tech farm is not a small amount, and owners will want time to recoup their investment.

He says of the farming area where his business is located: "This area should be Singapore's agriculture Silicon Valley. There should be land set aside for value-add services - a seed bank, cold rooms for storage and nurseries, to help farmers."

Naturally, he has come up with a way to incorporate all of these services under one roof.

"We are going to submit our plans," he says. "Whether they will be approved or not is another issue. But we'll try our best."