WORDS **JAKE MILLAR**

IF YOU'VE EATEN A TOMATO RECENTLY, THERE'S A PRETTY GOOD CHANCE IT CAME FROM HERE

WE EXPLORE THE BRILLIANT, SLIGHTLY CRAZY, PLAN TO GROW FOOD IN THE MIDDLE OF THE AUSTRALIAN DESERT. AND JUST WHAT IT MEANS FOR THE FUTURE OF FARMING.

INNOVATION & THE FUTURE • INNOVATION & THE FUTURE •

THREE HOURS NORTH OF ADELAIDE, THERE USED TO BE A WHOLE LOT OF NOT VERY MUCH.

This small slice of Australia, sandwiched between the Princess Highway and the Spencer Gulf, was remarkable only in that it was on the way to somewhere else. Keep driving and you'll hit Port Augusta – what locals call the crossroads of Australia – and beyond that, the Flinders Ranges to the north or the Nullarbor out west. But one day, someone looked at this empty stretch of red dirt and blue sky and imagined it as the perfect place to start growing tomatoes. Crazier still, they were right.

Sundrop Farms opened a pilot facility here in 2010. Once it proved the viability of its hydroponic farming concept, with harvests of tomatoes and eggplants, construction began on the nearby, full-scale facility in 2014. After 18 months and a spend of $200m, it officially opened last October.

The facility now produces 15,000 tonnes of truss tomatoes a year – some $105m worth – and employs around 220 people. But by far the most striking thing about Sundrop Farms is that it looks nothing like a conventional farm. Consisting of a 20-hectare greenhouse, a vast field of 23,000 mirrors, a 127m-tall solar tower and a desalination plant, it appears more like a space station parked in the Australian outback than anything resembling an agricultural operation.

Steve Marafiote is the managing director of Sundrop Farms Australia, and comes from three generations of agriculture workers. He was approached to lead the company in early 2015, while working as the CEO of the South Australian Potato Company. "When I understood what Sundrop was about, I knew I wanted to be part of the business," he recalls.

While removed from the obvious hallmarks of a traditional farming set-up – you'll find no soil or fertilisers here – nor is it like a conventional greenhouse, either.

Typically, groundwater's relied upon for irrigation, gas or diesel for heating and electricity for cooling. Sundrop Farms, meanwhile, does none of these things. Instead, it essentially requires two key ingredients – sun and seawater.

The first of those is fairly straightforward – Port Augusta happens to be one of the sunniest places on earth. But this also ties into the second element, as the mirrors direct the sun's rays towards the receiver tower, producing up to 39 megawatts of energy a day. This is used to pump 2.8 million litres of seawater from the Spencer Gulf along a 5.5km pipeline to the facility. There, a solar-powered desalination plant turns it into enough fresh water to irrigate 180,000 tomato plants and heat the greenhouses. Additional saltwater is also used to cool them, and also happens to act as a natural pesticide. "Sundrop technology doesn't exploit nature," declares the company's website, "it works in harmony with it."

"This large-scale sustainable operation is world leading," offers Marafiote. "If you look at the agricultural land where the farm is now, it was 120 hectare site that would traditionally sustain six to 10 cows a year. That's it. Instead, that desert land has been converted to produce 15,000 tonnes of tomatoes a year – it's a stark difference."

Sustainable practices are often seen as feel-good, if inefficient – Sundrop is anything but. The company hires locally and sees itself as a pioneer for sustainable farming practices – creating regional jobs and helping to produce food without harming the environment. That's the feel-good stuff. But the most crucial element in the Sundrop equation is that it's a viable business.

SUNDROP FARMS OPENED ITS FIRST PILOT FACILITY IN 2010, AND NOW HAS 15 PER CENT OF THE AUSTRALIAN MARKET FOR TOMATOES.

Private equity firm KKR invested $100m in the project and Coles has come on board as an official partner. In fact, Sundrop Farms has won a contract to supply the supermarket chain with truss tomatoes for the next 10 years – the reason the facility is focusing on tomato production. And it currently has a 15 per cent share of the Australian market.

Not only does the climate-controlled hydroponic system mean it has a single season, all year round, it also allows the plant to closely monitor and respond to issues in a way that traditional farming cannot.

"This is the least contingent on the environment, compared to what you would see in traditional agriculture," says Marafiote. "We have access to a lot of data points that we can grab information from and alter our settings, in a way not traditionally available."

This data also allows the monitoring and control of things like water, fuel or electricity use – and to predict them well into the future. "We know what those operating costs will look like for the next 20 years, and I don't think there are too many sectors who have the luxury of that position."

Marafiote says the Sundrop Farms method is not only more efficient, but the produce is better. "We have the luxury of light at Port Augusta – and light is where the flavour and maturity of the fruit comes from," he says. "It means we're able to achieve a really high standard of quality by ripening the fruit on the vine, which maximises shelf life."

Professor Robert Park is the chair of sustainable agriculture at the University of Sydney. He sees Sundrop Farms as a promising development for farming's future.

"I consider it to be exciting technology and in time, it will play a significant role in food production," he says. "It's sustainable, but it's also scalable to increase production. And unlike a lot of agricultural production, it can be located anywhere along the coastline.

"But the real advantages are that it's energy neutral and can produce food all year round, in an environment that's not subject to extremes like heat or water shortages."

Another factor that sets Sundrop Farms apart from conventional agricultural productions is it doesn't rely on nitrogen-based fertilisers, usually produced through an energy-intensive artificial process.

Professor Park says these methods help create employment opportunities in rural areas – though he does point out that the likelihood is many of these jobs will eventually become automated in the future. Robotic carts currently transport produce through to the packing facility at Sundrop, but all crops are harvested by hand.

Still, the South Australian company is not without its critics. Some argue that for all its fancy technology, the farm is solving a problem that doesn't exist – that Australia has no issue growing tomatoes. Professor Park says this is rather short-sighted.

"People saying that are not really looking at the big picture. You could say we can grow tomatoes in the field, so what do you need greenhouses for? That's fine, but what's going to happen in the future? With a growing population we need to increase food production substantially. That's where these systems hold great potential."

Australia's long been a world leader in sustainable farming. Our harsh conditions have given farms little choice but to develop technological answers to things like limited rainfall and low soil fertility. Professor Park points to developments from natural genetic engineering of crops to make them more hardy and pest-resistant, through to precise, GPS-guided tractors, and says it's important for companies like Sundrop to lead the way.

"Our farmers have been very quick adopters of new technologies," he says. "But if nobody is building these things and solving problems along the way, we're never going to advance. We're never going to get better. I commend the people who take these projects on because they're innovators and they're driving change. But if no one does anything, it's never going to happen."

Sundrop Farms has since expanded, and now has facilities in Odemira, Portugal and Tennessee in the US. There are also plans to build between three and five additional Australian sites over the next five years.

"We're not worried about market share as much as we are about satisfied customers and having a sustainable business that's profitable," says Marafiote. "But one of our ambitions is to be seen as an example of what can be achieved for the industry. If the industry is achieving good things and we're achieving our objectives, we're happy." ■