

# ROBOTS TO THE RESCUE

In orchards, packhouses and meatworks, pandemic labour shortages are boosting the use of automated technology, writes **Jamie Gray**

**C**ovid-19 has exposed weak points in economies worldwide, with labour shortages being just one of them.

Many businesses have faced the challenge of keeping their operations ticking over during the pandemic, but with fewer customers and limited staff to get the job done. Others, paradoxically, have struggled to keep up, particularly in e-commerce.

New Zealand robotics firms say the pandemic has helped to shine a spotlight on their industry, particularly in the primary sector.

More automation was already a trend before the pandemic, but they say Covid-19 has now given it a fresh push.

Scott Technology, the country's biggest robotics firm, says that pre-pandemic, some industries were already under pressure from a short labour supply.

"You have seen this in a lot of rural New Zealand businesses such as the meat processors for example," says Scott's chief executive John Kippenberger.

Scott, majority-owned by the world's biggest meat processing company – Brazil's JBS – provides automation systems for meat processors.

Established in Dunedin more than a century ago, the company is now also involved in developing systems for appliance manufacturing, materials handling and logistics, and for the mining industry.

Automation – particularly for industries that deal with big volumes of product – has been an ongoing discussion. The sticking point often comes down to money, as automated systems invariably involve a big outlay – typically \$5 million to \$10m. For that reason, Kippenberger and others say solutions are often best dealt with at an industry level, rather than by an individual company.

As an example, he points to last year's A\$18m contract for Scott to develop beef boning technology with the farmers' group Meat & Livestock Australia and Teyes, one of Australia's leading protein producers.

Strong industry bodies and big balance sheets are usually required.

### To automate?

Kippenberger says the decision to automate is not all about cutting labour costs.

"The transformational automation projects come as a result of companies looking for improvements in yield, in overall efficiencies or to be able to drive faster processing," he says.

"What Covid has done, is that it has scared a lot of companies around this issue of labour supply.

"And a lot of companies are saying: it's not a case of cost reduction, it's a case of what happens when we don't have enough labour to be able to supply product to be able to generate revenue, which obviously drives profitability."

Companies that were considering automation had sped up their thinking because of Covid-19's impact.

"We believe that it's going to take a bit of time, post the pandemic, to understand what the labour environment is going to look like, but we do

believe that the drivers for automation for the mid to long term, are certainly strong from the lessons that we have taken pre-Covid, but also during Covid as well."

Meanwhile, the increase in demand for online shopping has created huge pressure on supply chains, with more companies having to meet growing demand amid the pressure of fast turnaround times.

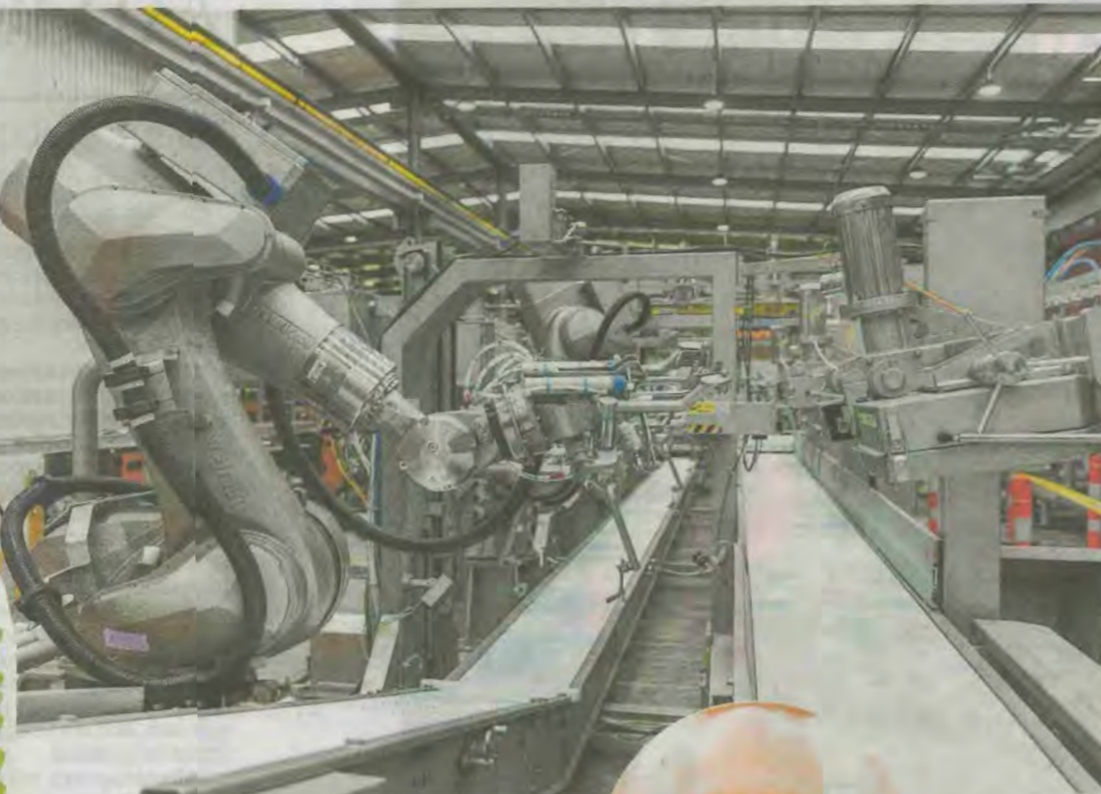
### US meat trade

When Covid struck, the US meat processing industry was already under stress because US immigration policies at the time had effectively shut off labour supply from the south.

Meat plants in

the United States typically employ several thousand workers per site. When Covid hit, some had to shut down. Now, the US market has largely regained its footing after re-tooling its systems.

Scott's systems are widely used in lamb processing, where its technology can process 200 lamb carcasses an hour. The process starts with the carcass running through an x-ray system. Within seconds the system identifies the



Scott Technology chief executive John Kippenberger, and (above) one of the company's robots used in the meat processing industry.



straightforward conveyor and robotics system. That quickly goes up to three-quarters of a million dollars when you start talking about a couple of robots."

Automation lends itself to bigger environments because they have larger volumes to handle, but also longer runs of standard products.

In Europe the big food processors can have seven variants of a french fry, for example. They will be running those seven products 24 hours a day, and setting up automation around those standard products.

"It's a different situation for a smaller food producer in New Zealand that might be producing 220 or 30 different products a day.

"It needs flexibility in order to be able to move between those products."

Seeing the fields full of robots is perhaps a 20- to 40-year reality, but a five-year reality might be more automation around those pain points.

Brendan O'Connell II, Agritech

critical lines where, for example, a shoulder needs to be separated.

The more accurate that cut is, the more meat can be kept on the higher-value cut, Kippenberger says.

Scott has installed \$100m worth of lamb automation systems in New Zealand and Australia over the past 10 years.

Such automation doesn't come cheap, and he says the cost of investing in robotics and automation is still prohibitive for some companies.

"If you look at a food processing or parcel handling company – at the smaller end of town – you are starting to talk \$300,000-400,000 for a

Kippenberger says automation does not always result in job losses.

"We are always in discussion with big companies within the meat, mining and appliance industries on what these companies believe are areas for automation.

"In most areas, the demand drivers for the medium to long term are hugely positive towards automation.

"But the pandemic has shone a spotlight on some of those areas that are more exposed than others, such as materials handling and logistics.

"It has certainly accelerated the need for companies to look at supply chains and at ways to drive increased

capacity and increased

turnarounds.

"Most often that involves discussions around automation."

Homegrown plastics manufacturer Sistema, which was sold to American giant Newell in 2016, is well down the automation track.

Chief executive Drew Muirhead says current labour shortages in New Zealand have made the company refocus, reduce its product portfolio to drive higher volume and to find new ways of working to simplify product movement within its huge facility at Māngere.

### Packing apples

In a very different industry, Global Pac Technologies – a joint venture between New Zealand firm Jenkins Group and US-based Van Doren Sales Inc – this month unveiled a robotic fruit packing machine.

The company says its Aporo II can accommodate twice the throughput of the Aporo I, developed in 2018, with the new machine packing 240 pieces of fruit per minute.

Global Pac says the technology is now being used in France, the UK, Sweden, Belgium, the US, Australia and New Zealand – primarily to pack apples, and now stonefruit such as peaches and nectarines. Work is underway to extend its use to other fruit varieties in the near future.

The Aporo packers were developed by Robotics Plus, based in Tauranga.

Jamie Lunam, general manager at Jenkins Freshpac – part of the Jenkins Group – says Covid-19 has made discussions about automation "pointier".

"We have been working on labour challenges for a long time, but it has been exacerbated by the Covid situation," he says.

Aporo was developed in a "labour-challenged world", he says, to support the very labour-intensive activity of putting apples into trays. "As labour becomes increasingly difficult to find or afford, then this product comes to the fore."

However, this sort of product was a decade in its commercialisation. "You can't just flick a switch and invent something overnight, commercialise it

and fulfil everyone's dreams."

Long before Covid, labour shortages were becoming a problem in the Pacific northwest of North America, where a large

proportion of the world's apples are grown. Similar challenges were being experienced here, and Lunam says that is what drove the product's development.

### Steep spike

"We are certainly seeing a steep spike in demand on the back of Covid and the inability to move labour around the world, and the cost of accessing it," he says.

Both Lunam and Kippenberger say solutions are best developed at an industry level, not by individual companies.

Businesses will naturally look for a return on their investment. "But it is very difficult for the customer to put a value on just not being able to pick their crop, so it's a more complex discussion these days," says Lunam.

"There are lots of decisions that post-harvest operators need to make, but it's clear that operators need to take employees away from the more menial tasks and put them into higher-value roles."

While automation is already a big part of most big packhouses, the task of actually picking fruit is another challenge altogether.

Lunam says that technology is still developing. For root crops, mechanised harvesting is straightforward, but "it does become more complex in an orchard where you have a very three-dimensional environment."

"Pulling carrots out of the ground in a nice row at a known depth in the soil is straightforward compared to an apple tree with apples all over it – some of which will need to be left behind."

"We will see this technology come to the fore but this stuff does not happen overnight so when you are in the poo, you can't get staff – it's too late and you are five or 10 years away from actually solving that."

### Robots vs jobs

But is automation coming at the expense of jobs?



The reality is that we simply can't get people. Nobody is losing their job – we need all the people we can get.

Jamie Lunam, Jenkins Freshpac (left)



Created to pack apples, the Aporo II has been developed to handle other types of fruit. (Below) Robotics Plus has built unmanned vehicles for use in orchards.



"The reality is that we simply can't get people. Nobody is losing their job – we need all the people we can get," says Lunam.

"If you need 300 people but can only get 200, you really need those 200 people to do those really important jobs and work to remove the menial, repetitive tasks that are easier

apple orchards and vineyards.

Saunders says Robotics Plus has had to focus on developing technology that can "scale".

"Although [kiwifruit marketer] Zespri is big in New Zealand, not 200 people to do those really important jobs and work to remove the menial, repetitive tasks that are easier

was maybe a research project to a commercialisation process, so it can take some time."

Then there is the issue of New Zealand being a relatively tiny market.

"We have to look across and find what the opportunities are to actively scale, to actually remain relevant."

"We develop high technology here so it's quite a bit different from just a bespoke engineering company. It was really through that connection with horticulture that I could see the role that technology could play 10 years ago – so see it starting to be problem 10 years ago.

"People don't want to do this work. It's hard, back-breaking work and the idea that these technologies could do these dull, dirty and dangerous jobs lets people pursue more fulfilling jobs within the ecosystem."

Brendan O'Connell, chief executive of Agritech – which promotes technology opportunities in agriculture – says Covid-19 has ushered in change.

Even after Covid's impact fades, the challenge of finding enough labour and feeding the world's population will still be there.

But he expects the changes to be gradual. "It's always going to be around the real pain points, where there is the greatest motivation for change," he says.

"Seeing the fields full of robots is perhaps a 20- to 40-year reality, but a five-year reality might be more automation around those pain points."

solving problems that are solvable globally," he says.

Saunders, who is of Ngāti Rangimū descent, says developing automation systems for agriculture is not easy.

"If the investment has not been there, then it's going to take some time to solve some of these problems," he says.

"We did work 10 years ago on kiwifruit harvesting and it still sits on the shelf because the industry has not supported the investment in it."

"It takes a number of years to develop these technologies – and you only get one harvest season."

"You have to go from being what

to automate."

Robotics Plus chief executive and co-founder Steve Saunders has been in the horticulture industry for 35 years, and says he foresaw labour problems in horticulture 10 years ago, particularly in the specialty crops.

In 2018, Japan's Yamaha Motor Co took a small stake in the company.

Along with the Aporo I and II, Robotics Plus has come up with a log scaling machine that accurately measures the volume of timber on logging trucks.

The company is now working on unmanned ground vehicles for use in