NZGROWER®

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HORTICULTURE NEW ZEALAND

PLANNING FOR GROWING'S FUTURE

PAGE 13

IN THIS ISSUE

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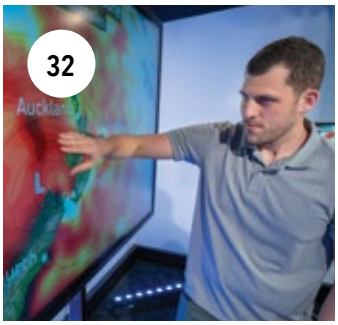

ON THE COVER:

The past 20 years have seen Southern Fresh evolve from a family-run cut-flower operation to a leading supplier and processor of baby vegetables, herbs and salad greens in NZ. Now the company is innovating for its future. See page 13. Cover image; Trefor Ward

YEAR GREETED BY COVID AGAIN!

Barry O'Neil : HortNZ president

As we begin 2022, the world focus, including that of New Zealand, is unfortunately once again on Covid-19, with the pandemic's health realities, and also the impact of significant labour constraints and supply chain challenges.

Omicron is here and measures are being put in place to minimise its effect on the health of our communities, businesses and the economy.

HortNZ is working with product groups to do everything possible to mitigate these impacts. However, the unfortunate reality is that Covid-19 is already disrupting our season yet again. Cherries are currently experiencing this disruption, and no doubt apples and kiwifruit will shortly follow.

With New Zealand's population so highly vaccinated, I think it's time we accept the need to join the world again. Personally, I would sooner catch Omicron in summer when I am healthier, rather than in winter when that season's flus and ills are also circulating.

Potentially with its more infectious but less severe nature, Omicron is going to infect many if not most people in New Zealand. This is the international experience, but hopefully as a result, it will enable New Zealand to reconnect with the world and begin the process of establishing some sense of normality!

But rather than depressingly speculate further about Covid-19, I want to start the year looking at a significant opportunity for New Zealand.

Climate change is starting to have an exponential impact on how we grow, with some breathtaking records being broken. Last year was New Zealand's warmest year on record, and the last decade was the world's warmest in history. And with the incredible hot days being experienced in New Zealand this year, I wouldn't be surprised if 2022 will be another record year.

> "Last year was New Zealand's warmest year on record, and the last decade was the world's warmest in history

The last decade was one degree hotter than pre-industrial times. Experts say with climate change that we can expect temperatures to increase by at least 0.5 degrees every decade. That's why we can only hope that the world will finally get serious about making a real effort to stop the inevitable outcome if little is done to reverse the trend.

One area in which we have an opportunity to be more resilient – while providing for our sector's future growth – is water security.

Water storage is critical for our country. However, over recent years, there has been political push-back on water storage dams due to the perception of too many cows at the end of the irrigation pipes. But thankfully, the debate is starting to get real again due to a scientific review that the Ministry for Primary Industries (MPI) has recently undertaken. Water is something New Zealand has a real competitive advantage in, yet it's something we haven't been leveraging and utilising, and that must change.

New Zealand has just under one million hectares irrigated, but the potential is for this figure to double or triple, if water is available. Our challenge is not having enough suitable land – we have that. Our challenge is water availability, and we can achieve that by capturing and storing water in high rainfall periods, rather than have more than 90 percent wasted and running into the oceans.

NORTHLAND HAD A MASSIVE 17 PERCENT DROP IN AVERAGE RAINFALL OVER THE LAST FIVE YEARS

–17%

THE 2013 DROUGHT – THE WORST DROUGHT IN DECADES – WAS EVALUATED BY NEW ZEALAND TREASURY ECONOMISTS TO HAVE COST

$1.5 BILLION

Only 8.5 percent of land used for food production is currently irrigated. Canterbury is an exception – with 60 percent of its farm area irrigated – but most other regions only have one to three percent of their productive land area irrigated.

MPI's review shows our average rainfall is dropping. For the last five years, New Zealand had three percent less rainfall than the previous five-year average, and 10 percent less than the five-year average starting in 1996. Northland had an even worse record with a massive 17 percent drop in average rainfall over the last five years.

Along with this situation, droughts are becoming more serious for New Zealand and they bring very significant economic impacts. The 2013 drought – the worst drought in decades – was evaluated by New Zealand Treasury economists to have cost $1.5 billion. According to the National Institute of Water and Atmospheric Research (NIWA), drought in some parts of the country in 2020 rivalled that of 2013. For example, the Waikato District saw 61 continuous days of drought in 2020 compared to 63 days in 2013.

With the huge debt New Zealand is generating due to Covid-19, additional macro financial impacts are something we just cannot afford.

We will be doing a great disservice to future generations and the country's prosperity if we don't act now to reverse the growing water deficit situation.

Unlike recent adversarial experience, since the government devolved irrigation schemes to industry in 1988, we now as a sector, community and country need to work constructively together to deliver on the opportunity we have with new storage systems for freshwater. Water storage will also fulfil the aspirations of Te Mana O Te Wai.

This will require New Zealand to embrace the small and medium scale schemes that seem to be in political favour at the moment, as well as large scale water storage schemes, which no doubt will serve many purposes, including urban water supply.

> "New Zealand had three percent less rainfall than the previous five-year average, and 10 percent less than the five-year average starting in 1996

We cannot afford to argue any longer about whether there is a need for new water storage schemes, nor over Māori rights and aspirations related to Treaty issues, or over how these schemes will be funded.

We need to have a mature and sensible conversation on water storage and security and as a country, reach a logical solution. Let's not fiddle here while Rome burns. Rather, let's work together to realise what is needed for our country's future and the future of horticulture.

Kia kaha.

NZGROWER

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THE YEAR'S REALITIES ALREADY BITE

Nadine Tunley : HortNZ chief executive

This year is already shaping up as a tough one for growers, New Zealand and the rest of the world.

Labour is short, inflation is high and supply chain disruption is having an impact. On top of that, January has brought the tsunami in Tonga and the anxiety that creates for Tongan Recognised Seasonal Employer (RSE) scheme workers and their employers; and New Zealand moving to red on 23 January, under the traffic light Covid-19 management regime.

Our industry was already predicting shortages of leafy greens in February, due to heavy rain disrupting planting for several weeks in December in the key areas of Pukekohe and Horowhenua.

Now also, there will be the impact of Omicron on getting fresh produce harvested and transported around the country, as well as Omicron's impact on the export fruit and vegetable harvest.

As growers you are now well-versed in managing with Covid. For those that aren't, this is the time to really come up to speed now that Omicron is in the community. Have you got a plan? Who will manage the orchard or market garden if you have to self-isolate? Have you got enough masks and other Personal Protection Equipment (PPE)? And what about your support network? Who can you reach out to as frustrations and emotions mount?

There is a lot of information about the management of Covid and wellbeing out there – the HortNZ website Covid pages are a good place to start.

Over the coming weeks, HortNZ and your respective product groups will continue to lobby government around labour and supply chain challenges.

The government has stated that its priority is to support critical workers in the food supply and infrastructure sectors. New Zealand's domestic food supply is the priority. HortNZ and product groups are working with the Ministry for Primary Industries to ensure the government understands what it needs to do, to make sure that our sector can continue to operate to provide New Zealanders with fresh, healthy vegetables and fruit, now and over the coming months.

Labour

Labour availability was always going to be a challenge, despite best efforts to attract and retain New Zealanders.

This situation is due mainly to the minuscule number of backpackers that remain in our country. Pre-Covid, there were more than 45,000 backpackers in New Zealand at the peak of summer, whereas this year, that figure is less than 5000.

Competition for available New Zealanders is fierce too with industries across the food and fibre sector, and most parts of the New Zealand economy competing for available workers.

This competition means that employers need to plan ahead and make sure what they offer reflects the market.

Our advocacy and seat at the government's table meant that we were able to have workers from the Pacific return to our orchards and market gardens a lot sooner than other industries have been able to get much needed overseas workers in.

Indeed, the first impact of Omicron on the border and MIQ (Managed Isolation and Quarantine) was felt immediately by our rural contractor colleagues. The government granted them 200 skilled machinery operators in mid-December but they were unable to bring those workers in as MIQ conditions changed once more due to the risk posed by Omicron.

Insight from our Pacific neighbours is that they too are struggling, with their ability to process all of the administration work, and ensure workers' vaccination status. Trying to do this when many workers are coming from outer islands has added to the complexities. Labour unit organisations in the Pacific are working very long hours with limited resources such as adequate numbers of passports for issuing.

At an operational level, everyone is working incredibly hard to assist with the movement and provision of Pacific workers for our horticulture sector.

My focus for 2022

My focus as HortNZ chief executive remains firmly on unity and positivity. This will be another challenging year and our resilience as an industry will be further tested. However, I believe through unity and positivity, we will continue to find ways to provide our markets with the world's best fruit and vegetables.

By working together, we can create pathways to return to prosperity, as our industry adapts to a world that will never be the same again. But that, in itself, offers our industry an incredible number of new opportunities.

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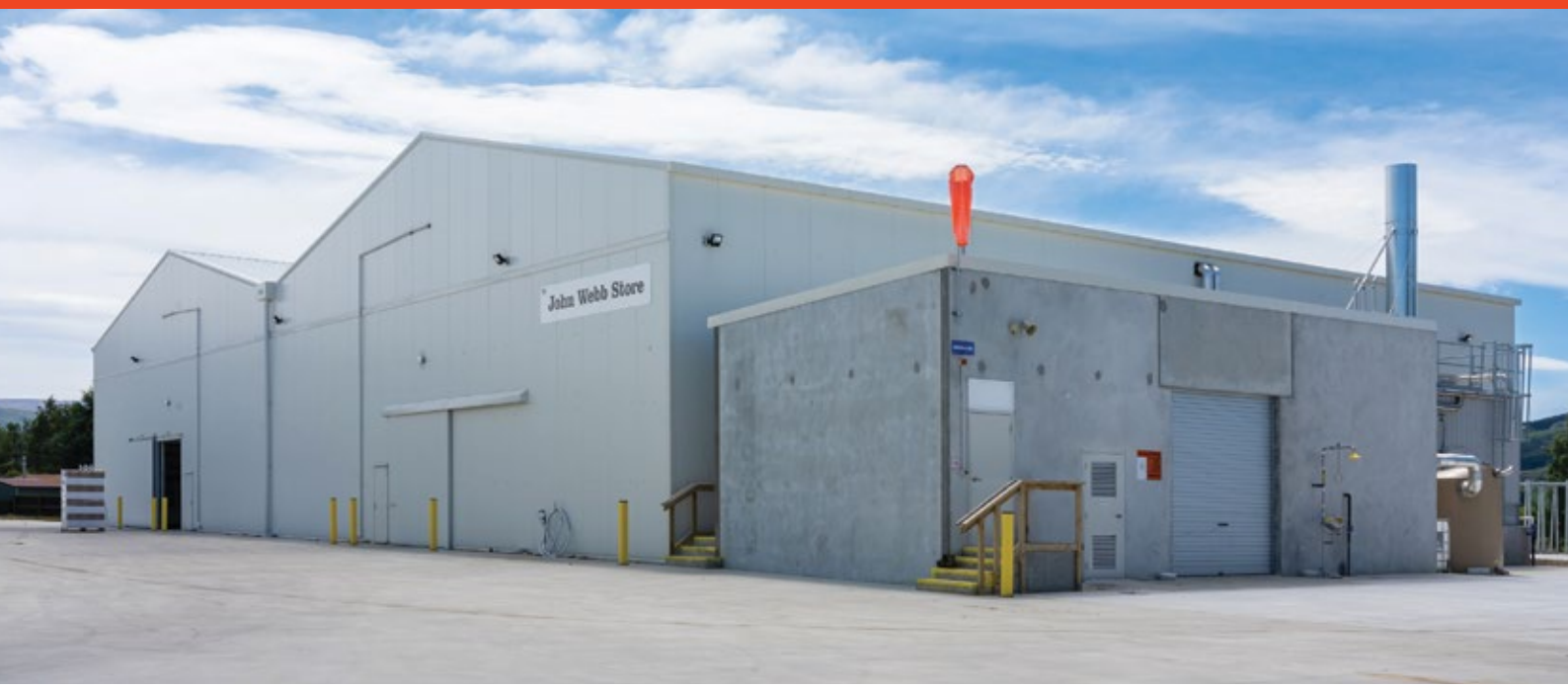

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YOUR LEVY AT WORK

INDUSTRY WIDE ISSUES FOR INDUSTRY GOOD

08 HARVEST & PRODUCTION PRACTICES

NATURAL RESOURCES AND ENVIRONMENT

Ailsa Robertson : HortNZ team lead environment policy

Freshwater Farm Plans at a glance

A Farm Environment Plan (FEP) is a tool that can help growers identify environmental risks and take action where required to demonstrate progress on environmental objectives.

FEPs are property-specific and consider a range of factors including local climate and soils, type of growing system, and current management practices.

A Freshwater Farm Plan (FWFP) is similar in that growers need to assess property-specific risks to freshwater, such as risk of sediment and nutrient losses to groundwater and surface water and evidence of actions to appropriately manage those risks over time. Like an FEP, a FWFP is a living document that needs to be updated as actions are completed, and if your growing footprint changes, for example, with changing leased land arrangements.

> “The requirement for FWFPs is written into legislation – as a new Part 9A of the Resource Management Amendment Act 2020 – requiring all horticultural land that is five or more hectares to have an audited and certified FWFP

A key difference between FEPs and FWFPs is that a FWFP will be tailored to the nature and circumstances of the farming activity, and the context of the catchment i.e., the vulnerability of the freshwater receiving environments. For example, if you grow in a catchment with an aquifer or river with excess levels of nitrates and/or phosphates, your FWFP would need to prioritise best practice for nutrient management. Or, if you grow on sloped or rolling landscape or in a catchment with freshwater impacted by high sediment loads, your FWFP would need to prioritise best practice for erosion and sediment control.

The requirement for FWFPs is written into legislation – as a new Part 9A of the Resource Management Amendment Act 2020 – requiring **all horticultural land that is five or more hectares to have an audited and certified FWFP.** Freshwater farm plan regulations are expected to take effect in 2022. The requirement for certified freshwater farm plans will be phased in from mid-2022.

> “A key difference between FEPs and FWFPs is that a FWFP will be tailored to the nature and circumstances of the farming activity, and the context of the catchment i.e., the vulnerability of the freshwater receiving environments

The government is currently drafting new regulations to give effect to Part 9A. This means there will be national standards for all FWFPs across the country, and regional standards or requirements including catchment values and regional plan rules and limits that need to be reflected in FWFPs.

The regulations will include other details, for example, who can audit and certify FWFPs, and the timing of FWFP implementation across the country. HortNZ is advocating for a recognition pathway for the GAP (Good Agricultural Practice) programmes to deliver FWFPs for horticulture. The GAP programmes provide an integrated farm planning pathway, whereby a grower can meet a range of market access and regulatory standards using one system and with one auditor up the drive.

For growers with an existing FEP using the GAP Environment Management System (EMS) add-on, you are most of the way there. NZGAP is planning a review and update of the EMS to meet the new regulations. HortNZ is currently working with fruit and vegetable growers in the Waimea Plains to develop FWFPs using the existing GAP EMS and test a prototype Part 9A GAP FWFP for horticulture.

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ON-FARM BIOSECURITY SERIES: HARVEST AND PRODUCTION PRACTICES

Anna Rathé : HortNZ biosecurity manager

While we often think of biosecurity risk in terms of what crosses the boundaries of a site, what happens on-site is also important from a biosecurity perspective.

Conducting your everyday production practices in ways that reduce the chance of spreading undetected (or established) pests, pathogens and weeds is worthwhile. This is especially important during busy times such as harvest when increased site activity can cause people to cut corners with biosecurity risk management.

Protocols for production practices should be included in your on-farm biosecurity plan. Contact your industry body to see if they have a crop-specific template that you can use. If not, you can use the HortNZ template available online. Some of the common risk areas associated with production practices are explored below, along with risk reduction actions for you to consider.

Crop surveillance

Keeping a close eye on your crop gives you the best chance of spotting anything unusual that might be a biosecurity threat. Make sure you have a regular monitoring programme in place and keep records, including when you don't find anything. It can be very useful to know that regular monitoring has been undertaken but not picked anything up. Ensure your staff are familiar with what is 'normal' and are aware of the key biosecurity threats for your crop, so they know what is unusual and needs to be reported.

Propagation

Undertaking propagation in designated areas away from crops and practising good hygiene will minimise the likelihood of pests and pathogens spreading via plants that have been grown on-site. Regular use of disinfectant for hands, potting benches and tools is important, particularly before and after handling plant material or soil.

Water sources

Site water sources contaminated with pests or pathogens have the potential to spread the organism across the whole property via irrigation water. Water sources should be inspected for weeds or pests and, if in doubt, test water supplies for pathogens that may be harder to detect visually.

Weeds and volunteer plants

Some weed species and volunteer plants (self-seeded crop plants growing in riparian areas) can provide a refuge for pests or pathogens during or between growing seasons. Control weeds and volunteer plants on your property to reduce the chance of them harbouring unwanted pests or pathogens that might later move into your crop. Pest, disease and weed issues often spill over property boundaries, so it can be helpful to consult with neighbours on any pest issues that you are facing.

> "Undertaking propagation in designated areas away from crops and practising good hygiene will minimise the likelihood of pests and pathogens spreading via plants that have been grown on-site

Use of equipment and tools

Equipment and tools used for production and harvest should be subject to appropriate use, hygiene, and storage practices. If possible, assign tools or equipment exclusively to a property and don't share equipment with other growers. When working in a row or block, wash tools regularly and disinfect with an appropriate product.

When undertaking activities in high-risk areas from a biosecurity perspective, assign dedicated equipment, including tools, clothing and footwear. If working in an orchard or on a farm where any disease is present, always move from the least diseased area to the most diseased area. Tools used in parts of the crop that are known to be infested should not be used elsewhere.

Ensure equipment used during harvest such as bins, crates and pallets, are appropriately cleaned or disinfected before use. They should also be as free as possible of any plant debris or soil acquired in the field before moving to the packhouse.

> **Pest, disease and weed issues often spill over property boundaries, so it can be helpful to consult with neighbours on any pest issues that you are facing**

Agrichemicals

Careful use of agrichemicals is important to avoid the development of pest resistance. Ensure your staff are well trained in proper use of agrichemicals. Apply chemicals following their label instructions for rate, method and expiry date and keep appropriate records of their use.

In conclusion

The above is not an exhaustive list. You should identify any additional production practices that you undertake on your site and think about how to minimise any potential biosecurity risk they may pose.

Remember if you see anything unusual, do the right thing and report any suspect exotic pests or diseases via the Ministry for Primary Industries' pest and disease hotline: **0800 80 99 66.**

Disclaimer: While every effort has been made to ensure the information in this publication is accurate, HortNZ does not accept any responsibility or liability for error of fact, omission, interpretation or opinion that may be present, nor for the consequences of any decisions based on this information.

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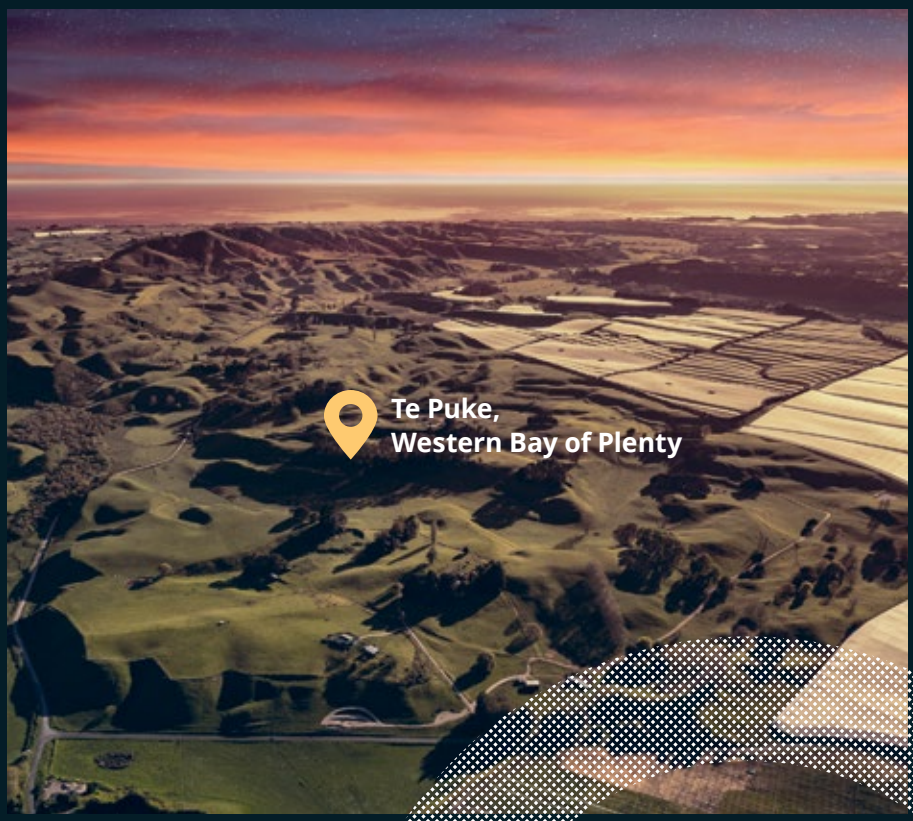

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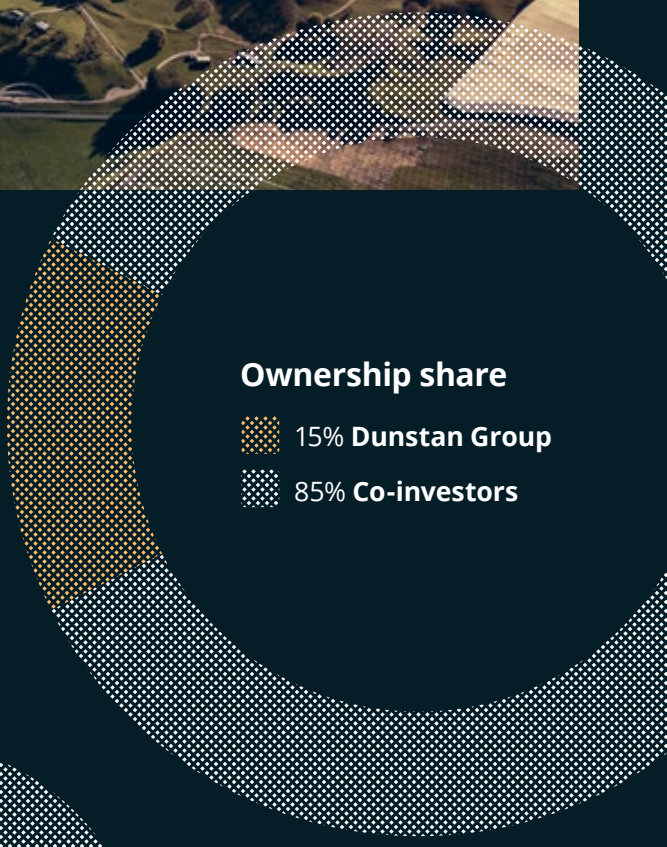

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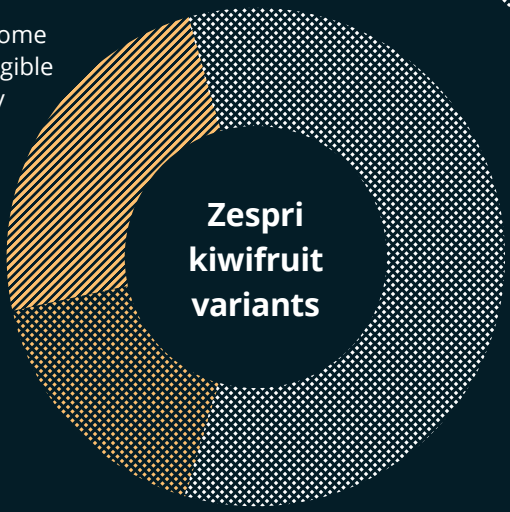

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ACROSS THE SECTOR – ACROSS THE COUNTRY

SOUTHERN FRESH HYDROPONICS PUTS WAIKATO ON THE MAP

Photography; Trefor Ward

Southern Fresh outdoor growing manager, Carl Hodgson, inspecting basil

The past 20 years have been a busy time for the Dunn family. What began as a family cut-flower operation near Cambridge in the Waikato has blossomed into one of New Zealand's leading suppliers and processors of baby vegetables, fresh herbs and gourmet salad greens. GEOFF LEWIS reports.

Owned by Pat Dunn and his son Jeremy, Southern Fresh started as an outdoor growing operation and recently transitioned to indoor growing in one of the largest glasshouse operations in the Waikato – with options to expand.

The family's growing operation has always had the advantage of its growing area being based on the highly productive Horotiu sandy loam – some of New Zealand's best horticultural soil. However, several consecutive winters of wet weather led to the decision to go indoors.

"The 2017–18 seasons affected our ability to supply," says Jeremy, general manager of Southern Fresh. "We looked at our options and tried growing in other regions but concluded that we needed to put a roof over a big part of our production. Then we would not be subject to the vagaries of the weather. "That was the only way we could get consistent supply for our customers. We now have seven hectares under cover."

Key crops in the indoor farm include pak choy, herbs and lettuce. Indoor cropping manager, Greg Dunn, oversees production.

Outdoors, the Dunns grow a range of field crops across their six farm blocks (229ha), including baby spinach, mesclun, wild rocket, baby carrots, beetroot, turnips, leeks and fresh basil.

> "Indoor growing was the only way we could get consistent supply for our customers. We now have seven hectares under cover

Brock (left) and Greg Dunn, father and son, checking the growing progress of trio lettuces

Outdoor growing is managed by Carl Hodgson. A Kiwi, also originally from Cambridge, who brings experience in horticulture from Queensland where he had been involved in growing many of the same crops. Brock Dunn, sales and marketing manager, says Carl's unique experience adds to their combined knowledge.

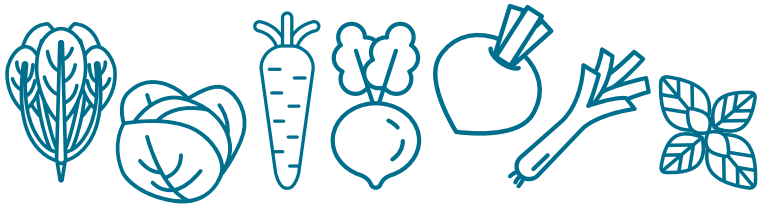
The 2020 lockdowns interrupted initial plans to bring in international experts to support the construction of the new 20,000 sqm glasshouse. Instead, the Dunns turned to local businesses and had the whole project consented and built in 12 months.

"We were committed in early 2019 and started the foundations in November with companies due to come from overseas and install the boiler and piping from Europe and Asia," says Jeremy. "But Covid hit us, so we found the right people locally and got stuck in and did it ourselves."

The Ministry for Primary Industries' (MPI) Sustainable Food and Fibre Futures Fund (SFFF) has allowed Southern Fresh to trial new technologies and alternative ways to make the farm more sustainable, including the installation of LED (light-emitting diode) lighting and the use of CO_2 from its natural gas heating system to boost plant growth. Water comes from bores and rainwater collected and stored from the facility's two-hectare roof.

Southern Fresh now has one of the few automated hydroponic operations in New Zealand.

"We have innovated and embraced modern technology which has enhanced our service promise to our customers," Jeremy says. "We have built New Zealand's first automated hydroponic system and grow the only Trio lettuce in our country."



THE DUNNS GROW A RANGE OF FIELD CROPS INCLUDING BABY SPINACH, MESCLUN, WILD ROCKET, BABY CARROTS, BEETROOT, TURNIPS, LEEKS AND FRESH BASIL.

> **"We have innovated and embraced modern technology which has enhanced our service promise to our customers**

Zhidao Zhang unloading freshly picked parsley for transfer to the cool store

"The difference between indoor and outdoor is that inside we can produce crops for 52 weeks of the year with very little change to the length of growth period," Greg says. "Outdoors, it's 15-week cycles with potential losses due to the environment, versus three to four weeks indoors. Annual production from one-hectare of hydroponics equates to the yield from 40-ha outdoors, which is a significant increase in crop yield."

Brock says fresh vegetables have become the 'cuisine heroes' and central focus on the plate where in previous times they had simply been relegated to the edges. Baby spinach, at one time generally disregarded, has become a top-selling line.

> **"The difference between indoor and outdoor is that inside we can produce crops for 52 weeks of the year with very little change to the length of growth period**

"Our approach to growing is front to back – we believe that what we grow on our farms should be determined by what you want on your fork."

The increasing sophistication of the Kiwi culinary market has been a driver behind product development. Hundreds of tonnes of fresh basil, grown indoors and outdoors, is processed and used in the manufacturing of food products by other enterprises.

Southern Fresh employees, Kiran Balar (back) and Joginder Paul, harvesting green butter lettuce plants

Southern Fresh regards convenience of use and food-safety of its fresh products as high priorities. In their state-of-the-art packing facility the fresh baby vegetables and gourmet salad greens are washed and prepared to a standard where they can be used and consumed directly from the packaging.

Spotting a gap in the market, Southern Fresh began airfreighting twice weekly to top-end food service companies in the United Kingdom and now export to Taiwan and Singapore too. In the domestic space, produce from Southern Fresh indoor and field crops in Cambridge are harvested, washed, chilled, packed and air freighted around New Zealand – from Mangere to as far south as Queenstown – and all within 24 hours. While Southern Fresh does not deal directly with restaurants, it supplies food service companies and specialist retail markets such as Moore Wilson's, Farro and more recently, Progressive Enterprises and Foodstuffs.

Taking a family approach to its staffing, Southern Fresh employs 120 full-time staff, increasing to 160 employees at peak season including workers from more than a dozen nationalities. An ownership mindset and pursuit of excellence is engrained in their culture and is evident in their daily operations.

Jenny Chen trimming green butter lettuce for packing as loose leaf salad greens

> **"Our approach to growing is front to back – we believe that what we grow on our farms should be determined by what you want on your fork**

"We have good relationships with other growers around New Zealand and in the UK and Europe. We are regularly in contact with them to discuss global trends as well as anything from harvesting to seed suppliers, packaging and labour.

"Meanwhile, the Dunns have their eyes on the future and have recently gained resource consent to construct a further four hectares of covered growing area.

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COMMERCIALISATION OF SCIENCE MAKES WORLD A BETTER PLACE

Elaine Fisher

Plant & Food Research chief executive, David Hughes, was named the winner of the inaugural KiwiNet Commercialisation Icon Award

The government's current review of science and its funding is a useful time to think about where commercialisation fits within the science model, says chief executive of Plant & Food Research Ltd (PFR), David Hughes.

"Science can only make a difference when it is taken outside of the lab and used by others," David says. "It is my view that if the *'Future Pathways'* review process has a strong focus on just one thing it should be on how to maximise the flow of scientific knowledge to the people to make New Zealand and the world a better place to live."

David was named inaugural KiwiNet Commercialisation Icon late last year – an award which commended him for his visionary leadership in advancing the cause of research commercialisation, fostering a social licence to commercialise research and his role in nurturing entrepreneurial spirit and skills in others.

"I believe it's important that a share of any financial benefits of research are reinvested to allow scientists to keep innovating," he says. "I've been very privileged to work with some great, forward-thinking scientists as well as those on the business side who can take that science into the world."

David, who was group general manager commercial, prior to being appointed to chief executive in 2018, was recognised for his dedication to finding new ways to commercialise science. In that role, he inspired the culture change required to increase commercialisation of research and championed new business models that provided security and growth for the organisation.

> "Science can and does change the world for the better

Royalties have subsequently grown from $13 million in 2009 to $58 million per annum, and now make up 30 percent of PFR's annual revenue. The organisation has also established new commercialisation models, such as the Pacific Berries joint venture with Northwest Plant Company in the United States and recently established spin out companies Scentian Bio and 2Before. Commercialisation was a key part of David's vision and a technology development business unit was subsequently formed to identify and invest in research with commercialisation potential.

"Science can and does change the world for the better," David says. "We are all enjoying significantly better lifestyles than previous generations thanks to scientific advances. However, to do so, science needs to be in the hands of orchardists, marketers, the supply chain and commercial companies, not in research labs or academic publications."

> "We are all enjoying significantly better lifestyles than previous generations thanks to scientific advances

The royalties PFR earns enables investment in ongoing and new research, some of which may take decades to reach the commercialisation stage.

David says PFR receives around one-third of its income from royalties. "That's a rare thing in the biological industry and puts PFR among the top one percent of global research organisations funded this way.

"This is enormously valuable because it gives financial flexibility to plan, to maintain capability and to keep areas going on the basis that we are sure they have a long-term future.

"Under the financial grant model, if you don't win and the grant money does not come in, hard decisions have to be made around staff and research projects.

"Commercialisation has allowed PFR to grow, particularly in the past ten years and hold on to key areas of research."

KiwiNet chief executive, Dr James Hutchinson, says research commercialisation has a critical, game-changing role for New Zealand's prosperity.

"New Zealand's universities, Crown Research Institutes and independent research institutes are havens for great scientists with extraordinary ideas, and the capability to create world-changing technologies," James says. "KiwiNet is thrilled to be part of this knowledge-to-market system. We're excited to celebrate the people harnessing these brilliant research discoveries and propelling some of these most promising projects into the world."

THE 2021 KIWINET RESEARCH COMMERCIALISATION AWARDS WINNERS ARE:

Momentum Student Entrepreneur

Luke Campbell, University of Canterbury: *Millions of calls made smarter with Vxt*

Breakthrough Innovator Award

Dr Shalini Divya, Tasmanlon/Wellington UniVentures: *A new aluminium-ion battery technology, offering a safer, sustainable, cost-effective alternative for grid storage and portable applications*

Researcher Entrepreneur Award

Prof Johan Potgieter, Massey University: I*nspiring entrepreneurial insurgency by creating a technology pipeline*

Commercialisation Professional Award

Darja Pavlovic-Nelson, Plant & Food Research: *Sensing opportunities – capturing value from Plant & Food Research IP*

Commercial Impact Award

Aureo®Gold – Plant & Food Research, Zespri and UPL: *Aureo®Gold a new biocontrol product combating plant disease*

Commercial Icon Award

David Hughes, chief executive, Plant & Food Research

WET, WARM WEATHER A SHOCKER FOR STRAWBERRIES

Kristine Walsh

Gisborne strawberry grower, Kristine Peck, says the weather has made the latest strawberry season their most challenging to date

Having planted strawberries in early June, Gisborne grower Kristine Peck was selling fruit by mid-October and anticipating a busy period leading up to Christmas and beyond.

Then the rains came. And they came and they came until, by early December, she had announced her season was pretty much over.

"The strawberries were just waterlogged and though we tried to keep the crop clean by plucking damaged fruit, we just couldn't keep in front of it," Kristine says.

"They do keep flowering so can produce right through to the end of February, but at some point you just have to decide whether it is worth going on with."

With just 10,000 strawberry plants on a portion of her 12-hectare property, Kristine is a small grower but has produced consistently good weights since her late husband, Richard, decided they would do well in the silt loam soil at their Manutuke site.

The couple picked their first crop in 2006 and even since Richard died five years ago, Kristine has managed to market her crop through a range of outlets – whole; through her popular pick-your-own days and in the fresh fruit ice creams she whips up at her store, Sundays, in the centre of Gisborne.

This last season though has been her most challenging to date.

"Our problems in previous years have been around getting reliable labour but this season's wet weather and humidity was something else," she says. "It wasn't just that they were waterlogged, it was the bugs that brings with it and though we've always controlled bugs with traps, this year we just couldn't."

Kristine grows the early-fruiting Camarosa variety which is generally in full cry by Christmas, with production decreasing over the next month or two.

> "Everything grows like mad here but the strawberries do particularly well and people love the flavour they get

"Not this season though," Kristine says. "Keeping the plants clean means we may yet get more fruit but honestly, this year I'd be happy just to break even."

Kristine says she does love the fruit and is not giving up on it yet, though she's considering installing some under tunnel houses for protection.

"Everything grows like mad here but the strawberries do particularly well and people love the flavour they get," she says. "That's the really rewarding part… the look on people's faces when they come to get their 'Manutuke strawberries.'

"And as growers, we're always optimistic that next season will be better."

Like Kristine Peck, growers around the country have reported losing crops due to weather events, which led to a shortage at Christmas… pavlova season.

Strawberry Growers New Zealand chairman Anthony Rakich says that as few have their crops under cover, weather events are an ongoing risk.

"The number growing under cover is increasing but it is still small, so when we have a wet spring, as we did, it makes for a tough start to the season," says Anthony.

Anthony lost around 60 percent of his family orchard's pre-Christmas crop on Danube Orchards in Whenuapai, northwest of Auckland.

"In many places those wet, humid conditions continued so that gave them little chance to recover," he says.

In major strawberry regions around Auckland and nearby Waikato, growers endured four weeks of non-stop spring rain, followed by heat and even more rain.

"By the end of November we already had issues with quality, and the warmth and humidity just added to that," says Anthony. "Through all that prices stayed strong – probably because many growers were having the same issues – but that's not really what we want. We want to see good volumes right up to and beyond Christmas so we are able to serve the market."

The best case scenario would be to have both high volumes and strong prices, he says.

"We are like everybody else in that our labour costs are high and getting higher and we have to address that somehow."

A fourth-generation strawberry grower, Anthony was picking into mid-January but said the season was almost over, about a month earlier than usual.

While his fruit has traditionally thrived in the outdoor hydroponic environment created for them, he, like Kristine, is also considering investing in covered houses.

"This year, though, we just have to accept that with continued heat and rain, this is not going to be our best season."

STRAWBERRY FACTS

- In 2020 New Zealand strawberry growers reported harvesting 9183 tonnes from 13.5 million plants, creating an industry value of $32.5 million, of which just over $5 million worth was exported.
- While the crop was larger than that reported in 2018 (8000 tonnes), exports had declined from the $8.7 million reported that year.
- Of the 2020 plantings, around 65 percent were around Auckland, followed by Waikato (about 15 percent), with the reported balance in Hawke's Bay, Manawatu/Horowhenua, Northland, Nelson, Marlborough, Canterbury and Southland.
- The main varieties are Camarosa, Ventana and Monterey with most plants grown outdoors in raised beds, some under cover, and an increasing number grown hydroponically.
- Usually an annual crop, strawberry plants can produce for two or three years, but fruit size and plant health may suffer.
- Strawberries aren't really berries, but nor are they fruit. They are an aggregate (multiple) fruit consisting of many tiny individual fruits embedded in a fleshy receptacle.

HARD WORK BEARS GOOD FRUIT FOR FAMILY-RUN BERRY FARM

Leanne Matsinger checks out the strawberry harvest at the family farm in North Otago. Image; Johanna Matsinger

As the strawberry season ramps up, it's all go at Matsinger's Berry Farm in the small town of Papakaio. HELENA O'NEILL speaks to Leanne Matsinger about the popular North Otago farm.

Leanne runs the strawberry and raspberry farm about 20km northwest of Oamaru. The longstanding berry growing operation is a favourite amongst locals.

The strawberry season runs from November to May, while the raspberry season began three days before Christmas this year, finishing three weeks later.

A good balance of sunshine and rain has led to "big, beautiful fruit" this season, with keen customers lining up at the farm shop for strawberries and raspberries as well as the new attraction – real fruit ice cream.

Matsinger's Berry Farm was established in 1955 by Leanne's father-in-law John and his brother Len, who both emigrated from the Netherlands. John's son, Simon, returned to the family's farm when he was 24, to work alongside his parents.

"It was Simon and his parents' dream," Leanne says. "They started the strawberry business and it wasn't my cup of tea. I'd love to go back to my old job at the fashion shop," she laughs.

It hasn't been an easy road for Leanne and her family. In 2010, Simon died suddenly at the age of 45, leaving Leanne with three children to raise and three farms to run.

The day Simon died they had 50,000 strawberry plants needing to be planted. Thankfully, the wider Papakaio community rallied around the family, taking up the job of planting, cooking meals and helping out around both the house and the farm.

"It was just incredible."

> "Now we're one of the biggest growers in the South Island, it's great

The family had three properties – a 202-hectare dryland farm, a 94ha irrigated block and a 15ha berry farm. The two farms are leased out, leaving the berry operation in Leanne's hands, supported by her family and a loyal group of eight or nine employees.

"If we had sold everything it would have been like another death. Keeping things similar to what they knew was very, very important."

For Leanne, it was a baptism of fire into how to run the farm and berry business.

"I couldn't drive a tractor – I had three kids and worked in a fashion shop," Leanne says. "I had to very quickly learn to spray the strawberries, drive the tractor. And then I couldn't buy the chemicals because I didn't have my chemical certificates."

Leanne didn't give up her love of fashion and the colour pink just because she took up a horticulture role instead of retail – she was keen on a pink tractor but had to settle for a more standard orange.

She worked hard to learn the necessary skills needed to run the berry operation and keep things stable for her young children. Eleven years later and her grown-up children continue to pitch in on the farm – and to eat their fair share of fresh berries.

Leanne's son Hann manages operations, while her daughter Johanna runs the packing shed and social media.

The hard slog has paid off and Leanne is proud of what they've achieved.

"Now we're one of the biggest growers in the South Island, it's great," she says. "We've got 20,000 plants in a hydroponic system, which are really, really good. I still like them in the ground – we've got 30,000 new plants and 20,000 established plants in the ground as well as a hectare in raspberries."

> "I get a kick out of producing absolutely beautiful fruit

The hydroponic tabletop system was added a few years ago, but Leanne is a firm believer in growing strawberries in the ground.

"We like the fruit in the ground. They taste better and seem to last longer. We have the land to shift them around and it's a bit of an insurance policy – you can stuff up so quickly in the hydroponics with your fertiliser and things. Also being this far down the South Island you need to have quite a lot of hot weather which we don't often get. It's a lot warmer in the ground."

Matsinger's Berry Farm sends their produce across the South Island through MG Marketing and sells from their on-site shop on a part-time basis too.

"The beauty of us is that we can pick today and the strawberries can be in the supermarket tomorrow."

While there was some uncertainty around Covid-19, the business remains in a good place, she says.

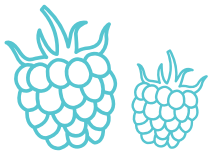
"Last April when we went into lockdown, we could have carried on picking, but my beautiful staff needed to be home with their children. So, we just closed down and lived in our little bubble here, got all the raspberries pruned and everything ready for the next year.

20,000
PLANTS IN A HYDROPONIC SYSTEM

30,000
NEW PLANTS

20,000
ESTABLISHED PLANTS IN THE GROUND

1 HECTARE
IN RASPBERRIES



"We didn't plant so many new ones not knowing how things were going to pan out with Covid. In the first lockdown, people weren't buying strawberries, they were buying essentials."

Last season was just as busy with Kiwis spending their summer holidays travelling the country.

"We did extremely well," says Leanne. "We put in a real ice cream machine and it was full-on."

Other than the family, the bulk of the staff are Filipino women here on work visas with their husbands where they work on local dairy farms.

"They start at 8.30am or 9am after dropping their children off at school and we're finished, all cleaned up by 3pm," Leanne says. "Then we go to the depot, load up all the trucks and get the fruit on. We're a family here, I pick with them and they come back year after year."

The biggest challenge facing the business now is the rising costs, Leanne says.

"It's very hard to be a strawberry grower now. The transport, the punnets, the wages, the price of everything is going up. Stickers, you name it, it's gone up."

Despite the hard road and missing spending more time in the fashion business, Leanne is happy running the berry farm.

"I get a kick out of producing absolutely beautiful fruit."

SEAWEED NAMED IN HONOUR OF 'ACCIDENTAL SCIENTIST'

WOMEN IN HORTICULTURE

Elaine Fisher

Highly regarded seaweed researcher, Dr Ruth Falshaw is also editor of the journal New Zealand Plant Protection

As a young woman, Ruth Falshaw planned to study accountancy but instead became a scientist almost "by accident."

Four decades on she has a PhD in organic chemistry; is so highly regarded as a seaweed researcher Ruth has a seaweed named after her, and is editor of the journal *New Zealand Plant Protection*.

"I could not have in any way envisaged where my career would take me," says Ruth, who now lives in Rotorua and is a member of Women in Horticulture.

Ruth credits a series of fortunate coincidences for her varied and stimulating career, which began when a teacher suggested she study chemistry to give her more career options than the accountancy degree she planned to pursue.

Ruth and her husband married the day after they both graduated as chemists from York University and moved to Birmingham where he had secured PhD funding at the university. "A few days later he came home and asked if I wanted to do a PhD," she says.

"I replied 'not really but what was it in?' The university had secured private funding for some polysaccharide chemistry research but the graduate who was to carry it out had been injured in a motorcycle accident. If they couldn't find a replacement, the funding would be lost." So, Ruth said she would take his place.

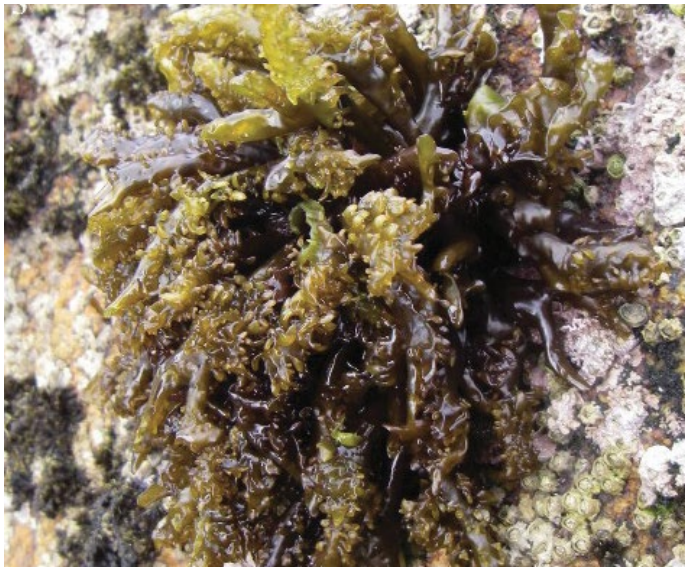
Once Ruth completed her PhD, she was employed by a chemical company in Coventry, researching and developing products from cellulose. Three years later, Ruth came across an employment advertisement which sparked her interest.

"It was for seaweed polysaccharide chemistry research, something you very seldom see advertised. When I read the fine print, I realised it was in New Zealand." Almost on a whim, Ruth posted off her CV figuring it could take six weeks for a reply. "That was in the days before the internet."

When, after six weeks no reply had come, Ruth rang New Zealand to find out if she had the job or not. "It was a big deal to make a phone call half a world away back then." She was told she hadn't got the job because one of her references hadn't arrived. "However, the person they had appointed had turned the position down so if I could supply the reference, they would reconsider me." The reference was faxed and three days later Ruth received a phone call saying the job at the Department of Scientific and Industrial Research (DSIR) in Wellington was hers.

"Once Ruth completed her PhD, she was employed by a chemical company in Coventry, researching and developing products from cellulose

Ruth arrived in 1991 and, during the next two decades, discovered many new seaweed polysaccharide structures, contributed to the discovery of a new species (*Curdiea balthazar*), devised new analytical methods and also led the development of seaweed aquaculture on mussel farms at a pilot scale.



A species of seaweed Gigartina falshawiae *has been named to honour Dr Ruth Falshaw and her extensive and significant seaweed research*

Her research results are contained in more than 40 publications and in 2019, Ruth's contribution to seaweed research was recognised by fellow scientists who named a species of seaweed *Gigartina falshawiae* in her honour.

> **"To prove I could do something other than chemistry I completed a Diploma in Human Resources at Victoria University, partly funded through a scholarship from the New Zealand Federation of Graduate Women**

After 18 years, the seaweed research funding ended, and Ruth turned her mind to her next career move. "To prove I could do something other than chemistry I completed a Diploma in Human Resources at Victoria University, partly funded through a scholarship from the New Zealand Federation of Graduate Women."

In 2008, Ruth saw an advertisement for the editor of the *New Zealand Journal of Forestry Science* (NZJFS) published by Scion in Rotorua and decided to apply. "Despite the fact I didn't like English at school, over the years I had written and reviewed many research papers and been on the editorial boards of two international peer-reviewed journals, *Carbohydrate Research and Botanica Marina*. Getting the job led to major changes in career, location and employer as well as getting divorced."

Having modernised the *NZJFS* and increased its scientific impact, Ruth left Scion in 2017 to establish her own freelance editing business, specialising in scientific documents. She continues to manage the *NZJFS* on behalf of Scion and is currently editor of *New Zealand Plant Protection*.

"One constant factor in my career has been that I have taken opportunities when they arose and my message to others, women in particular, is to back themselves and do the same. I think women are still often more reluctant to take chances with their careers than men." ●

To keep up-to-date with Women in Horticulture, its news and activities, and join the membership database, email **info@women-in-hort.nz** Everyone is welcome.

Horticulture™ New Zealand
Ahumāra Kai Aotearoa

HortNZ Industry Training 2022 Scholarships

$500 for Industry Trainees studying toward a Certificate or Diploma

These 30 scholarships provide assistance and acknowledge the achievements of those who are working and studying in horticulture. The top three awardees will also receive support to attend the 2022 HortNZ Conference in Christchurch, 1-2 August.

The selection team will be looking for:

- Commitment
- Potential contribution to the industry
- Past achievements
- Individual approach, qualities and skills
- Referees' comments.

How to apply

Visit the HortNZ website to access the online application form: **www.hortnz.co.nz/scholarships**

Applications **close at 11pm 5 March 2022.** Applications will be reviewed in April and announced in May.

Any questions regarding the scholarships can be directed to **schols@hortnz.co.nz**

ONLINE EMPLOYMENT TOOL REDUCES PAPERWORK FOR SEASONAL STAFF

Anne Hardie

Jos Bell used to deal with boxes and files of employee information, but no longer

Hoddys Fruit Company near Nelson has saved up to two hours on paperwork for each seasonal worker this year by using the online recruitment tool, PICMI.

Hoddys general manager, Jos Bell, says the company used to write all the details on paper for the 120 seasonal staff they employ each season. Then there were the applicants that didn't turn up which still took time.

Now it takes just minutes to get a signed contract from each seasonal employee and collect all their details for employment.

Employers send an invite to prospective employees through PICMI and a link to a job where the employer can hold online inductions, outline health and safety requirements, post videos and anything they think will help the prospective employee decide whether they want that job or not. If they decide they want the job, they fill in the contract and all their details, including availability dates for work and accommodation requirements if that is applicable.

Jos says PICMI has not only made the sign-up job easier and saved a huge amount of time, but has helped to collect employment data that can be used more effectively.

"It means we can get the data feeds straight from the site, which shows how many people we have employed and for how long. In the past that was a couple of days' work to sort out who those people were and how long they were employed."

"It's already saving us time and those boxes of paper."

In Central Otago, Kris Robb at Clyde Orchards employs about 150 staff to pick his summerfruit crops and has signed up close to 250 contracts via PICMI, saving him up to 500 hours this season. Once prospective employees have gone through the information on the PICMI site, filled in their information and signed a contract, they tend to turn up for work, he says.

"In the past we might have had a list of 150 and maybe 100 would turn up, but now we know where they are at through the process of induction."

"In Central Otago, Kris Robb at Clyde Orchards employs about 150 staff to pick his summerfruit crops and has signed up close to 250 contracts via PICMI, saving him up to 500 hours this season

Rob is also using the data for better planning. Before the season started, he was able to organise seasonal workers into cohorts, drag their information into another spreadsheet to work out who needed accommodation and upload data into their payroll system, ready to go.

"Before we were manually inputting that data and sometimes two to three times. Now we have all that data and are able to manipulate it how we want."

PICMI has been working with different groups within the horticulture industry to develop the application further and now has different templates for summerfruit, kiwifruit, hops and general horticulture.

The next step is mini trials with other industries to link up more work for seasonal workers so they can 'live locally and work regionally.'

PANDEMIC BOOSTS GARLIC SALES

Land is leased around Marlborough, but it is becoming harder to find

Demand for garlic soared last year, as the spread of Covid-19 and recurring lockdowns saw consumers turn to home-cooked meals and healthier ingredients. ANNE HARDIE reports.

Marlborough growers, brothers Robert Harrison-Jones and Alan Jones, experienced "through the roof" demand for their garlic bulbs when the first bout of the pandemic hit in 2020.

"The first year of Covid, garlic roared out the door," Robert says.

The family has been growing garlic since the 1970s, the brothers buying the business from the previous generation in 2003, renaming it Garlico because customers struggled to pronounce the previous name, Piquant Garlic. The operation now encompasses 25-ha of garlic, 14-ha of shallots and 20-ha of onion seed each year. Plus, another 35-ha of mustard seed, rye corn and balage.

Marlborough is ideal garlic country with its cold winters, hot summers and fertile soils. Nothing is guaranteed though and last year's unusually wet winter has had a flow-on effect for this year's crop of garlic. Wet ground delayed planting around the shortest day and then summer was slower turning on the heat, pushing harvest back a few weeks to the end of January.

On the upside, later plantings resulted in a better-formed, albeit smaller bulb.

The business sells its garlic through MG Marketing and Fresh Direct, and it is also included in the home delivery kit, My Food Bag. Robert says sales have settled since the early days of Covid-19, which he attributes to the proliferation of meal ingredient businesses now delivering their kits to homes.

> "The operation now encompasses 25-ha of garlic, 14-ha of shallots and 20-ha of onion seed each year. Plus, another 35-ha of mustard seed, rye corn and balage

The brothers grow their own garlic seed, selecting 50 tonnes of medium to large cloves for the next year's crop. Using their own seed is a necessity rather than a choice as they cannot import new seed from countries such as France due to biosecurity restrictions.

The brothers' garlic has NZGAP (Good Agricultural Practice) certification that records everything from spraying to employment and is regularly audited.

Alan (left) and Robert operate a contracting business alongside their crops

Robert says they can tell customers the day their garlic was harvested and the paddock in which it was grown. Whereas garlic from other countries often has no information on its origin or how it is grown. Robert says some of that garlic can be brought into the country by importers that are NZGAP-approved which enables it to be sold here.

Apart from a pre-emergent spray on the paddocks to get the young garlic growing, the crop is spray-free, and though there are biological options if pests invade, Robert and Alan focus on keeping the plants healthy.

"If you keep the plants healthy, the pests don't attack," Robert says. "It's about keeping the water up and keeping the nutrients up."

Alan says ladybirds do a good job and are a better option than opening pesticides. "We saw a lot of aphids one year and just left it to the ladybirds."

All of their crops are grown on leased land around the region and they are constantly on the look-out for fresh land to plant. It is an increasing challenge to find land to lease as grapes spread further up the valleys. On the plus side, their contracting business benefits by preparing land for grapes and that work fills the gaps between their own crops.

These days their garlic is all harvested by machine. The obvious advantage is less staff, with just eight people employed through harvest to operate machinery, shift bins around and grade the bulbs. A bunch of locals including family and students, plus the occasional backpacker, join the team of three permanent staff.

Hand harvesting meant the garlic originally dried in the paddock, with nothing left behind.

Now the harvester cuts the green tops off the plants, then staff grade the bulbs and place them into bins that are block stacked in large open sheds. Huge fans dry them out for up to ten months of the year. It costs $100,000 a year to run the fans and keep the garlic dry and healthy for their markets.

Robert says the trick is to leave bins of garlic alone because any movement "wakes them up", prompting them to sprout. Another trick is not to cut off the bulb's entire root as it causes it to sprout in preparation for planting.

The brothers have their own beehives for pollinating onions

Garlico sells the bulbs in 10kg cartons and smaller pre-packs, sending them out five days a week so that customers get the piquant bulbs "little and often."

Prices have remained relatively stable over the past eight years, typically selling for around $15/kg – apart from the spike experienced during the first lockdown last year. It means margins are tighter, which are thankfully alleviated by the higher returns the Jones receive from their shallots.

Shallots are a trickier crop and Alan admits there have been a few disasters over the years due to weather, ground conditions or disease. The plants are more susceptible to mildew and pests, needing chemicals to keep them at bay. It is a challenging crop and the knowledge they have built up over the years are secrets they keep close to their chest. Seed is expensive so they have to get it right, but good returns make the extra effort worthwhile. It also diversifies the business, and the growing pattern of the crop fits well with garlic as the shallots are planted in September and then harvested toward the end of February when the garlic has been lifted.

Part of the shallot crop is exported to Australia and the United States where they are more commonly used in restaurants rather than home cooking. Robert says the proliferation of TV cooking shows has contributed to teaching people how to use them, but they are still not widely used in a home-cooked meal.

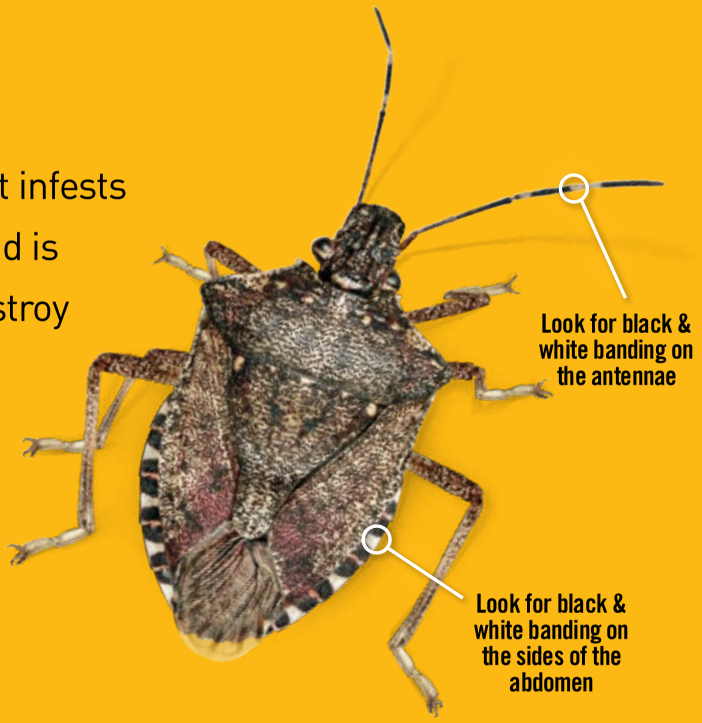
Young shallots fresh from the soil

"People only pick them up from the supermarket if they have a recipe," Alan says.

IT WOULD BE STINK IF THESE GOT INTO NEW ZEALAND

NEW ZEALAND

The **brown marmorated stink bug** is a pest that infests homes, ruins gardens, stinks when crushed, and is almost impossible to get rid of. It could also destroy our fruit and vegetable industries. It's not in New Zealand yet, and we want to keep it that way. So if you see one, don't kill it. Catch it, take a photo, and call us on 0800 80 99 66.



For more information (including how to identify the bug) visit biosecurity.govt.nz/stinkbug

Stink Bugs not shown actual size. (Actual size approx. 1.7cm long)

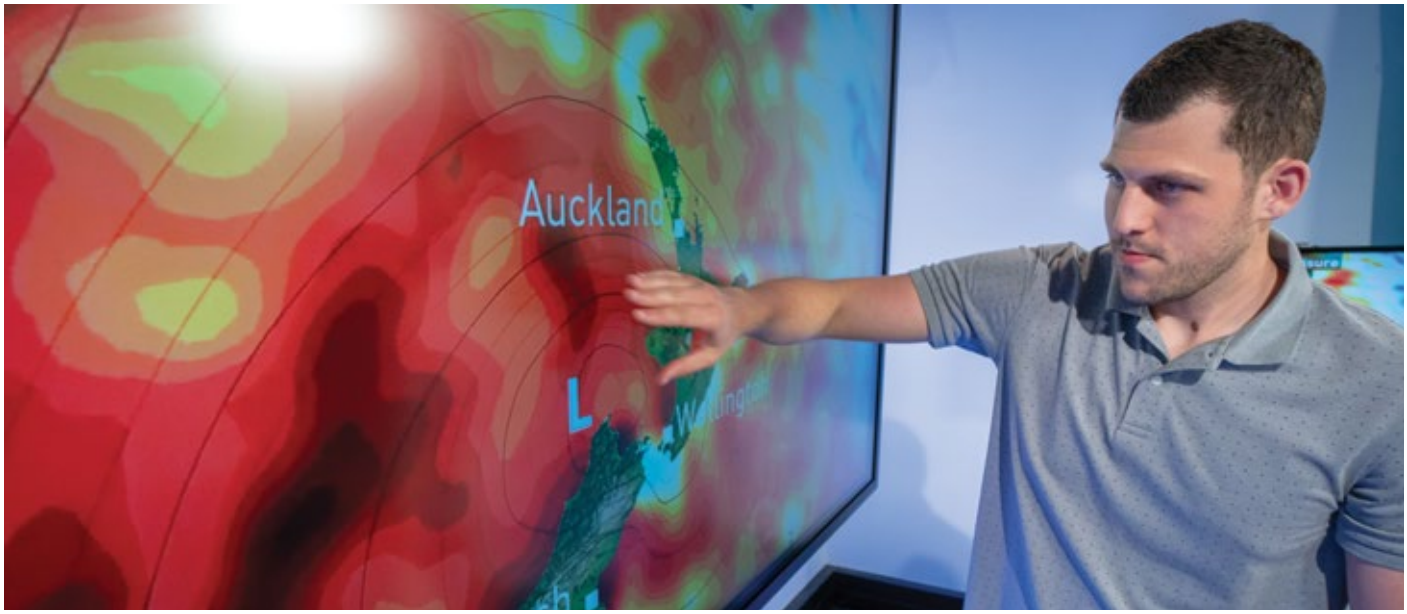
Seed + Grain Readiness & Response · Horticulture New Zealand Ahumāra Kai Aotearoa · Summerfruit New Zealand · KVH · New Zealand Wine Pure Discovery · New Zealand Avocado · New Zealand Apples & Pears · Vegetables New Zealand Inc · TomatoesNZ · NZGIA Biosecurity through Partnership

Biosecurity New Zealand
Ministry for Primary Industries
Manatū Ahu Matua

Ko Tātou This Is Us
BIOSECURITY 2025

NEW WEATHER TOOL COULD BE A GAME-CHANGER FOR DROUGHT-STRUCK GROWERS

Anne Hardie



NIWA metereologist Ben Noll

A new tool being developed by the National Institute of Water and Atmospheric Research (NIWA) to forecast drought and dry conditions could help growers and farmers be better prepared.

NIWA meteorologist, Ben Noll, says scientists will use a weather model released in the United States in 2020 and refine it for New Zealand's complex terrain. It will involve some "data science and deep learning" to understand the New Zealand context.

Initially it will be developed to forecast 35 days ahead and then it will be extended to three and later, six months, as researchers try to push predictions further out.

"We are trying to determine if a drought is likely," Ben says. "Whether or not drought has a higher probability in the next two seasons."

The new forecast tool will sit alongside the New Zealand Drought Index which was developed and launched in 2017. It measures the current status of drought across the country and measures the duration and intensity of recent dryness.

In other words, it is an observation of drought once it has happened.

NIWA also provides seasonal climate outlooks each month that look to as many as three months ahead, but they are not drought specific. The new tool will try and foresee the potential for dryness and drought and therefore limit the risk of being caught out by drought.

> "Initially it will be developed to forecast 35 days ahead and then it will be extended to three and later, six months, as researchers try to push predictions further out

Until now, New Zealand meteorology has been using a climate model with a 100km resolution which describes the distance between nodes on a grid.

Image; Alan Blacklock, NIWA

That will move progressively toward a resolution of five kilometres, providing more detail for locations around New Zealand.

> **New Zealand has many regions where mountains closely border productive land – such as Tasman – where current forecasting struggles to predict weather**

Ben says New Zealand has many regions where mountains closely border productive land – such as Tasman – where current forecasting struggles to predict weather. Increasing the resolution will increase the ability to forecast within a region.

Past models looked at weather patterns such as El Niño and La Niña to predict seasons, whereas this new model will take that information plus more data and techniques to better predict what lies ahead.

Ben says there is huge potential to improve the accuracy of the modelling and then push it out to the broader public through the web.

"The goal is to push the science as far as we can with current meteorology."

The new forecasting tool will be available on the NIWA website at the end of 2023 and will supplement other tools used by growers and farmers. Ben hopes it will add more certainty to their planning, such as timing for crop harvests.

> **The goal is to push the science as far as we can with current meteorology**

"There is going to be another summer like the one in 2019–20 and there will be more weather events with increasing frequency," says Ben. "So, to have all our ducks in a row now will set New Zealand up as a nation to cope with those events." ●

Development of the new tool will cost $200,000 and is being jointly funded through the Ministry for Primary Industries and NIWA.

RSE EMPLOYERS GIVE BACK TO THE VANUATU COMMUNITY THROUGH HEPATITIS B CAMPAIGN

Mike Chapman

Employers of Ni-Van workers are helping to raise funds to address the chronic health condition, Hepatitis B, in the Vanuatu community

For over a decade, workers from the Pacific have travelled to New Zealand to assist with harvest and pruning through the horticulture and viticulture industries' world-leading Recognised Seasonal Employer (RSE) scheme.

As more and more Ni-Vanuatu RSE workers arrive in New Zealand to support the horticulture and viticulture industries at such a critical time, we are reminded of the huge contribution they make. These seasonal workers have enabled the growth and increased productivity for many crops and wine grapes here in New Zealand, particularly throughout the Covid-19 pandemic.

The importance of supporting these workers and their Ni-Vanuatu (Ni-Van) communities has been recognised by Ni-Van employers, who are giving back through a campaign aimed at combatting the debilitating disease, Hepatitis B.

HEPATITIS B VIRUS AFFECTS UP TO 15 PERCENT OF THE TOTAL POPULATION OF VANUATU – ONE OF THE HIGHEST RATES IN THE WORLD

Known as the 'silent killer', the Hepatitis B virus hides undetected by the immune system, attacking and damaging the liver until it is too late to treat. It is a chronic health issue in Vanuatu, affecting up to 15 percent of the total population – one of the highest rates in the world.

In little over a year, employers of Ni-Van workers have raised $45,000 through a *Give A Little* campaign – halfway towards the target of $100,000.

The money raised will support training of healthcare workers in Vanuatu so that they can recognise this chronic liver disease. Commencing March 2022, an international team of experts will educate the healthcare workers on the clinical aspects of the disease, laboratory testing and provide immunisation training. Building on this baseline of training, the campaign supports the development of education and training materials in partnership with the Vanuatu Ministry of Health.

> **"In little over a year, employers of Ni-Van workers have raised $45,000 through a Give A Little campaign – halfway towards the target of $100,000**

Rapid antigen testing kits for Hepatitis B will also be supplied as part of the campaign, along with serology testing, training in how to use those kits and mobile testing kits to take out to the outer islands of Vanuatu. With Vanuatu's 80 islands spread out across an area the size of New Zealand, the logistical challenge for expanding testing across the population is massive. Some islands are expensive to reach due to only being accessible by boat and then there is the challenge of transporting the Hepatitis B vaccines at a cool enough temperature to keep the doses viable.

> **"The money raised will support training of healthcare workers in Vanuatu**

The campaign is targeting mother to child transmission, first by screening women early in pregnancy to check how high Hepatitis B infection levels are and then identifying high-risk patients through antenatal screening and treating mothers three months before the birth. It is important that babies are vaccinated as close to delivery as possible. When available, immunoglobulins (Hepatitis B antibodies) will also be given to babies to reduce the risk of further chronic infection. Treatment is safe for the pregnant mother and the baby, including premature babies. Vaccination of the baby provides protection for life and eliminates the virus before it can take hold.

Your donation can make a real difference to the health and wellbeing of the people in Vanuatu. As a country and as employers of RSE workers, this is an opportunity to give back to the Ni-Van community. To make a donation, visit **https://givealittle.co.nz/cause/defeating-hepatitis-b-in-vanuatu.**

CONSTRAINED BY COVID: NORTH ISLAND GROWERS GRAPPLE WITH CRATE SHORTAGES

Glenys Christian

North Island vegetable growers are hoping the worst is over after dealing with crate and pallet supply shortages in the run-up to Christmas.

Growers were well aware that shortage might occur due to a change to collapsible crates, and also having to deal exclusively with crate suppliers, to send produce to North Island Foodstuffs from 1 April last year.

As well as there being fewer crates in circulation some growers had concerns about the crates being returned to them not being hygienically cleaned.

"It's all fine now but the damage has been done," says one grower.

The plan was to make the changeover coming into winter with the lower levels of produce supply, but Covid-19 intervened, causing manufacturing delays and shipping congestion. That meant new crates that had been ordered and were expected to arrive from China in spring were only delivered in December 2021 and January 2022.

To make matter worse, some growers held onto crates out of concern they might not have enough to transport their produce, meaning other growers were left short.

Some were forced to use crates which North Island Foodstuffs said they wouldn't accept, others were able to use cardboard packaging and some ran out of other options altogether.

"We got by but we sailed close to the wind," says NZ Hothouse managing director, Simon Watson.

> "Some were forced to use crates which North Island Foodstuffs said they wouldn't accept, others were able to use cardboard packaging and some ran out of other options altogether

It worked out in NZ Hothouse's favour, after a fashion, that tomato production was reduced due to bad weather, a closing of export markets and a shortage of labour to harvest the crop, meaning the shortage of crates was more manageable.

Head of growing at T&G Global, Ben Smith, says T&G Global worked closely with crate supply company, Viscount FCC to get through.

"We've passed the worst," he says.

Regan Hill, who took over as general manager of Viscount FCC at the end of November, says there have always been crate supply and demand imbalances.

To combat that, the company has made several large investments in its business assets of crates and pallets, as well as in the operation of its three wash plants.

A total of 112,000 new crates arrived in New Zealand between December 2021 and January 2022, resulting in a ten percent increase in the company's total pool. There had been an increase of 32,000 H39-litre crates mainly used by tomato growers, 57,000 H47 crates and 22,000 extra H61 crates.

"It's made a difference," Regan says. "And we'll continue to keep purchasing more crates."

The company is confident its orders of 65,000 new crates split between H39 and H47 sizes will arrive, as expected, in April and May as its Chinese manufacturer has already completed the order. There are enough of the H61-litre crates, used for pumpkins and watermelon, already in circulation he says.

Regan anticipates making further crate purchases through 2022 in order to get a better balance between supply and demand.

112,000 NEW CRATES

ARRIVED IN NEW ZEALAND BETWEEN DECEMBER 2021 AND JANUARY 2022, RESULTING IN A

10% INCREASE

IN THE COMPANY'S TOTAL POOL

Viscount FCC has also made operational efficiencies and investment at its three wash plants in Mount Wellington, Auckland, Palmerston North and Christchurch to increase their capacity by ten percent.

More gains are planned for throughout 2022 by bringing in weekend overtime for workers at its Auckland plant – which usually runs 24 hours a day, five days a week. Part of that plan is to have dirty crates washed within 48 hours for growers to come and pick up.

MANAGING LABOUR DEMANDS KEY TO BOOSTING ASPARAGUS INDUSTRY

Kristine Walsh

Asparagus Hawke's Bay produces some 70 tonnes of mostly green and some purple asparagus at its Trotter Farm at Twyford, just out of Hastings

It was two tales of one season for asparagus growers as bigger operators were hit by export barriers and constricted markets, while more localised ones met or even exceeded previous targets.

Overseeing a crop of nearly 80 hectares at Mangaweka Asparagus near Taihape, New Zealand Asparagus Council chairman, Sam Rainey, has seen a tough few months.

Despite "pretty favourable" growing conditions, he says an imperfect storm of limited labour, constricted demand and a near-halt to export led to the worst returns he has seen in his seven years in the business.

"Auckland being in lockdown had a real impact in the food service industry and with air freight prices being through the roof, everything had to be consumed by the local market and returns plummeted," Sam says.

"Probably the biggest thing though, is the continued rise in labour costs in what is a very labour-heavy industry. But that's been building for a while. For a number of years now our returns have not changed while costs have been going up and that is not sustainable."

To cope with oversupply during the 2021 season, a number of growers mowed some of their crop – putting it out of action for around a week until new spears were produced – while others let the crowns fern out which, while knocking them out for the current season, can lead to better results for the next.

Sam Rainey managed to pick around 90 percent of his crop but says even that reduction, together with skinny margins, made for a rugged season.

However, he believes there is hope for larger growers in the $5 million robotics project. Sam sees it as an exciting development for an industry that relies on manual picking of each spear to harvest a crop.

The Ministry for Primary Industries, Bay of Plenty company Robotics Plus and the Asparagus Council, are working on a four-year programme to develop a mechanical harvester.

According to the Minister of Agriculture, Hon Damien O'Connor, saving on labour would reduce costs and boost production, allowing growers to compete in the export market and to reduce their dependence on domestic buyers.

"Together with rebuilding the export market and further developing our base of domestic customers, we hope there is some light at the end of the tunnel," Sam says.

While the green variety dominates the crop at Asparagus Hawke's Bay, gourmet cooks in particular snap up the smaller quantities of purple

"But it has never been done before, it is completely new and it's a few years away yet. So while we are looking forward to the impact that could have in the future, in the short term we are realistic about the challenges we are facing."

To tackle those challenges, New Zealanders need to be encouraged to eat more asparagus, he says.

"Supermarket data shows that younger people aren't really a big market for us so we need to find out why and work to help them get cooking and enjoying asparagus."

Asparagus plants take three years to start producing so there is a lot of capital investment that growers don't want to walk away from, he adds.

"We are a small industry with limited resources but we really need a big push in the market, and that's the council's goal as an industry body."

The size of the industry means about ten registered growers produce around 90 percent of the recorded annual crop, but Sam says there are a number of smaller operators that can sometimes be more nimble in meeting problems head-on.

That's been the case for Asparagus Hawke's Bay, where third-generation grower Iain Trotter recorded a successful 2021 season.

The fern-out stage of the annual cycle of an asparagus plant allows it to gather energy to produce good spears the next season. Pictures; Asparagus Hawke's Bay

Producing some 70 tonnes of mostly green and some purple asparagus, the grower – at Twyford, just out of Hastings – is still a significant player but small enough to turn on a dime when needed.

The market was kind to Asparagus Hawke's Bay too. In 2021, the company had good returns for both produce sold direct to consumers and the bulk which is moved by local growing, packing and marketing company, Gourmet Blueberries.

Iain's Trotter Farm in Hawke's Bay had one of the best growing seasons he has seen, with demand "pretty much on a par with what it normally is."

> **Producing some 70 tonnes of mostly green and some purple asparagus, the grower – at Twyford, just out of Hastings – is still a significant player but small enough to turn on a dime when needed**

That was despite having to mow off one of his older blocks to deal with a prolonged deluge of heavy rain.

"But asparagus is a really robust crop so even if you do mow, it's only a few days before it is coming up again."

Managing its labour force, too, worked out well in the 2021 season.

"The economy in Hawke's Bay is pretty much based on contract labour so we have a good system of having workers available right on the off times for other local crops like apples," says Iain.

"Even when work like apple thinning picks up around mid-November we can manage it by sharing crews who might, for example, harvest asparagus in the mornings and go out to the orchards in the afternoons. It works for all of us."

To ensure his own smooth work programme, Iain also grows grapes, which are most demanding when the asparagus plantings are not.

"This year we stopped picking asparagus on December 11 so we got a bit of a break before getting back into the grapes in January," he says.

"When the weight picked per day drops we see that as the asparagus telling us it is nearly done, and stopping that little bit earlier helps make for another great crop for the next season."

Asparagus facts

- The New Zealand Asparagus Council has around 39 registered growers operating mainly in Waikato, Canterbury, the south west of the North Island and Hawke's Bay.
- Asparagus plants like free-draining, fertile soil and, as perennials, can produce for 15 to 20 years.
- The asparagus season generally stretches from September until December, with most growers picking for around 100 days, producing eight to 10 tonnes per hectare.
- New Zealand asparagus has a small export market – mainly to Japan and Singapore – but most is sold on the domestic market.

TECHNICAL

THE LATEST INNOVATIONS AND IMPROVEMENTS

SUSTAINABLE VEGETABLE SYSTEMS: PROGRESS AND MINERAL N TRACKING REPORTS

Henry Stenning and Andrew Barber : AgriLINK

Progress report

The Sustainable Vegetable Systems (SVS) programme continues apace, with all four workstreams making significant progress, despite the extra obstacles created by Covid-19 lockdowns.

Workstream 1: As part of the intensive sampling programme at Plant & Food Research Ltd's (PFR) Hawke's Bay and Lincoln research stations broccoli, oats and pak choy have been harvested, with the sampling plots currently resown in lettuces, onions and potatoes.

Workstream 2: Regional monitoring of crop growth, crop nitrogen uptake and movement of nitrogen within soil. See page 43.

Workstream 3: Continues to make progress on the development of a grower nitrogen management tool, with modelling simulations being undertaken using the data gathered from Workstream 1. A group of model developers, model users, agronomists and growers met over two days to identify key issues and essentials for the future grower nitrogen management tool, giving the PFR modelling team further insights on grower input and output requirements.

> "A summary report has been prepared to feed into Workstream 3 to inform grower requirements for the tool under development. A webinar is planned to convey these findings to growers

Workstream 4: Dissemination. Grower interviews are continuing, building upon the earlier online survey in order to better understand the existing institutional grower knowledge, management practices and key issues faced by growers with respect to nitrogen management on farms. A summary report has been prepared to feed into Workstream 3 to inform grower requirements for the tool under development. A webinar is planned to convey these findings to growers. The Workstream 4 leadership team is also planning a series of podcasts and videos for 2022.

> "The primary goal of the SVS programme is to produce a grower focused nitrogen management tool that consequently leads to reduced nitrate leaching

Workstream 2: Why regional monitoring is important

The primary goal of the SVS programme is to produce a grower focused nitrogen management tool that consequently leads to reduced nitrate leaching. The modelling data obtained in Workstream 1 is fed into the model being developed in Workstream 3. Regional monitoring, the focus of Workstream 2, contributes to the model by collecting plant and soil samples across a geographically varied range of soil types and crop rotations. This data will be used to validate the model produced in Workstream 3 against real life grower practices and cropping conditions.

The other way in which Workstream 2 contributes to model development is by forming a core group of growers and regional monitors who will continue to increase their collective knowledge on the scientific principles of nitrogen in soils, soil nitrogen management practices, and the development and use of nitrogen budgets. Once the tool is further along in development this core group of growers, regional monitors of the SVS project, and agronomists will form a Community of Practice becoming the tool's first test group. This group will provide further initial feedback on tool development and gain experience on practical application and use of the tool. This Community of Practice will then be better able to disseminate this collective knowledge throughout the industry more effectively than if the tool was developed and released in isolation (without grower input).

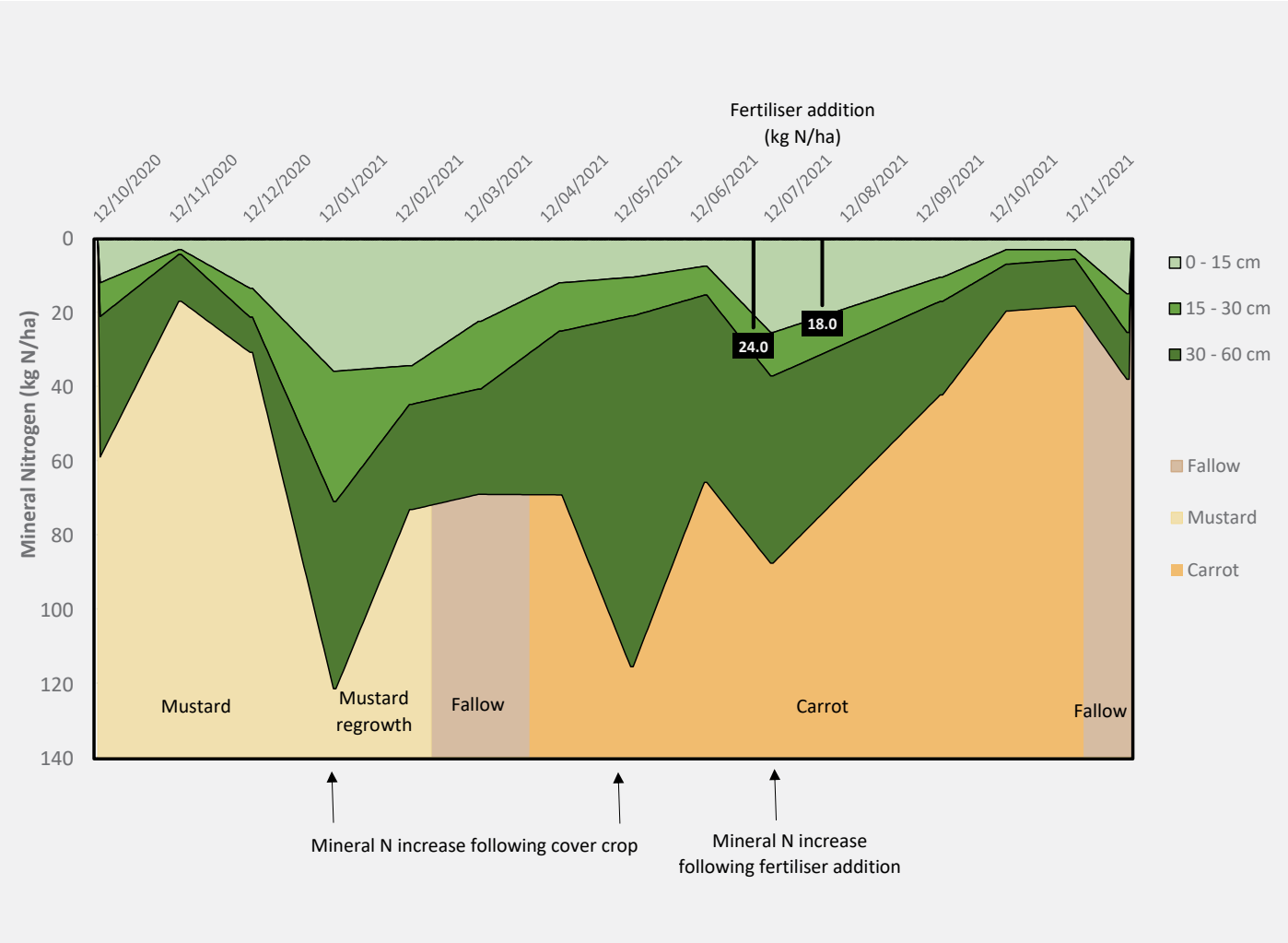


Figure 1. *Changes in mineral nitrogen across a crop rotation*

Workstream 2 – what is being collected from the 9 regional monitoring sites

Sampling has continued on all nine regional monitoring sites, from Pukekohe to Canterbury, sampling a range of crops across a range of soils: from the heavy Pukekohe clay loams to the light sandy loams in Matamata and Hawke's Bay.

Key activities carried out at each monitoring site include soil sampling to 90cm. This is matched at the same time with plant sampling, typically involving three samples of one-metre of bed or 0.5 m2 of field, partitioned into above and below ground fractions. Additional activities conducted at each site include weather station monitoring, the installation and monitoring of soil moisture probes, and bulk density samples taken to convert nitrogen results from the lab (expressed as mg/kg) to a more relatable field basis (kg N/ha). The data collected through these activities will allow for nitrogen budgets to be created for each crop on each site, to improve our understanding of the movement of nitrogen within the system and across rotations, including quantification of the amount of nitrate that may have leached. Nitrogen budgets will be reported on in the next article in this series.

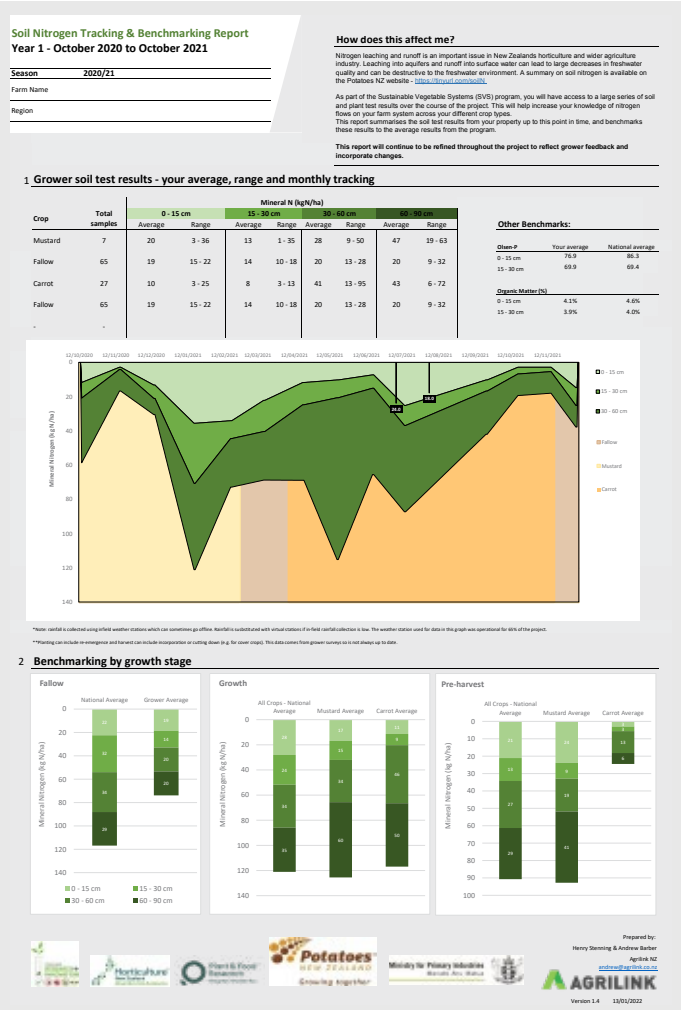
Workstream 2 – individualised soil mineral N tracking reports

Our initial data reporting for the monitoring sites is on the soil mineral N fluctuation across the rotation, in a report shared with growers involved in the monitoring group (Figure 2).

Growers and regional monitors alike have shown a lot of interest in the main graph in these reports (Figure 2), which shows the change in mineral nitrogen levels in the soil, as well as crop planting and harvest dates, nitrogen fertiliser applications and rainfall.

Workstream 2 – learnings and questions raised by the mineral N tracking reports

Taking the graph shown in Figure 1 as our example, we can see large changes in mineral nitrogen in terms of its quantity and location in the soil profile over the course of 14 months. One of the most interesting contributors to changes in mineral nitrogen levels is the likely contribution of nitrogen from previous crop residues alongside the mineralisation of soil nitrogen into the plant available form. The peak of approximately 120 kg N/ha seen around mid-January 2021 happens to follow the incorporation of a mustard cover crop.


Soil Nitrogen Tracking & Benchmarking Report
Year 1 - October 2020 to October 2021

Season 2020/21
Farm Name
Region

How does this affect me?

Nitrogen leaching and runoff is an important issue in New Zealands horticulture and wider agriculture industry. Leaching into aquifers and runoff into surface water can lead to large decreases in freshwater quality and can be destructive to the freshwater environment. A summary on soil nitrogen is available on the Potatoes NZ website - https://tinyurl.com/sc6f4.

As part of the Sustainable Vegetable Systems (SVS) program, you will have access to a large series of soil and plant test results over the course of the project. This will help increase your knowledge of nitrogen flows on your farm system across your different crop types.
This report summarises the soil test results from your property up to this point in time, and benchmarks these results to the average results from the program.

This report will continue to be refined throughout the project to reflect grower feedback and incorporate changes.

1 Grower soil test results - your average, range and monthly tracking

Crop	Total samples	Mineral N (kgN/ha) 0 - 15 cm Average	0 - 15 cm Range	15 - 30 cm Average	15 - 30 cm Range	30 - 60 cm Average	30 - 60 cm Range	60 - 90 cm Average	60 - 90 cm Range
Mustard	7	20	3 - 36	13	1 - 35	28	9 - 50	47	19 - 63
Fallow	65	19	15 - 22	14	10 - 18	20	13 - 28	20	9 - 32
Carrot	27	10	3 - 25	8	3 - 13	41	13 - 95	43	6 - 72
Fallow	65	19	15 - 22	14	10 - 18	20	13 - 28	20	9 - 32

Other Benchmarks:

Olsen-P	Your average	National average
0 - 15 cm	76.9	86.3
15 - 30 cm	69.9	69.4

Organic Matter (%)		
0 - 15 cm	4.1%	4.6%
15 - 30 cm	3.9%	4.0%

2 Benchmarking by growth stage

Fallow
Growth
Pre-harvest

Prepared by:
Henry Stenning & Andrew Barber
Agrilink NZ
andrew@agrilink.co.nz
AGRILINK
Version 1.4 13/01/2022

Figure 2. *An example of a report sent to growers involved in Workstream 2, summarising the data collected from their sites (page 1 of a two-page report)*

> **Our initial data reporting for the monitoring sites is on the soil mineral N fluctuation across the rotation, in a report shared with growers involved in the monitoring group**

Incorporation of crop residues, particularly in summer, can result in a large lift in mineral nitrogen as cultivation stimulates soil microbes to break down organic nitrogen into mineral forms (nitrate and ammonium). In this example, shortly after cultivation the mustard began to regrow and the following rapid regrowth resulted in a significant decrease in mineral nitrogen over the following month.

The regrowth mustard crop was then incorporated, but this time mineral nitrogen levels did not spike again for a couple of months, with an increase evident shortly after the sowing of the carrot crop and after a brief period of fallow.

The second spike (mid-May) in the 30–60cm layer is also interesting. Cultivation can stimulate microbial activity and the formation of the carrot beds may have resulted in a subsequent increase in soil mineralisation (release of mineral N from the organic N pool in the soil). Soil temperature, moisture and aerobic/anaerobic conditions make a significant contribution to microbial activity and will have impacted both the rate of soil N mineralisation and crop residue breakdown.

> **The main practices that affect nitrogen use efficiency are the crops chosen; the crop rotation; cultivation practice and timing; and fertiliser type, rate, application method and timing**

In this particular case, the fertiliser nitrogen applied by the grower had a relatively low impact on mineral nitrogen levels, with a small lift (at most equivalent to the amount of fertiliser applied) in the upper soil profile observed following application around July to August 2021 (orange line and text box denoting the quantity of N applied). Soil mineral nitrogen was of course then taken up by the carrot crop during the main growth phase. An interesting observation is the change in mineral N in the 30–60cm depth of the soil during this main growth phase. It is likely that some N was leached below the sampling depth by the high rainfall in September and October. As the growth phase finished, the quantity of nitrogen in the soil plateaued before increasing again following mixing and disturbance of the soil during carrot harvest and breakdown of some of the remaining crop residues.

Workstream 2: How does this affect me?

Being able to track changes in soil mineral nitrogen allows growers to make informed decisions on future management practices. The main practices that affect nitrogen use efficiency are the crops chosen; the crop rotation; cultivation practice and timing; and fertiliser type, rate, application method and timing.

Crop rotations can be adjusted to some extent, although the crop grown, timing of sowing or planting and harvest are often dictated by market forces.

As shown on page 43, the action of cultivation as well as the return of crop residues can result in large quantities of mineral N. Therefore, timing the incorporation of residues to best match the following crop's N demand and root development – and avoiding having high amounts of N in the soil during periods of high drainage – can all help to reduce the risk of N leaching.

The central role of crop residue breakdown

Theoretically, the nitrogen from crop residue breakdown can be estimated and considered in the following crop's nitrogen budget, though the timing of nitrogen release and the quantity released is currently not well understood. Consequently, these questions form part of a concurrently running project specifically focused on crop residue breakdown. Additionally, it is well known that there is a time lag between residue incorporation, nitrogen release and availability for uptake by the following crop, the length of which depends upon which type of crop was grown and other factors such as how much fertiliser that crop received. The growing database of soil and plant results should assist us to better estimate how long the crop residues will take to break down under a range of variable conditions.

Workstream 3: A grower nitrogen management tool, decision support to lower the N leaching risk

The grower nitrogen management tool and the data sitting behind it are at the heart of SVS. Our aim is to give growers the confidence to make changes in management practice while still being able to sleep at night. As one grower said, "getting it wrong puts many many jobs at risk."

Having the data to present to regulators and the public, optimising nitrogen strategies – by making a few critical decisions – will reduce nitrogen leaching risk on farms, thereby maintaining the social licence to operate and increasing positive public perceptions of the industry's leadership in environmental stewardship.

BIOMASS FOR GREENHOUSE HEATING

Elly Nederhoff : Crophouse Ltd

The biomass burner used by Zealandia Horticulture

Biomass such as waste wood could be used to fuel greenhouses in New Zealand as an alternative to natural gas or coal.

The Bioenergy Association states on their website: "*Wood fuel is a sustainable, carbon-neutral fuel and offers a real opportunity for New Zealand to become greener and less dependent on fossil fuels.*"

Waste wood is used successfully in several greenhouses in New Zealand, for instance, at Zealandia Horticulture in Auckland and Christchurch. However, a shortcoming is that the flue gases from wood combustion are not suitable for CO_2 enrichment unless a very expensive flue gas purification system is added.

This article describes some of the advances in biomass combustion technology in the Netherlands, where decarbonisation started over a decade ago. Some innovative Dutch growers are generating heat and electricity from biomass and others produce heat and CO_2 by biomass combustion.

Biomass rollercoaster

The use of biomass for greenhouse heating in the Netherlands has had its ups and downs. Waste wood was recommended for several years as a promising green alternative for natural gas, both for combustion and for digestion to produce biogas.

Several growers invested in a biomass burner, supported by a particular government subsidy – the Dutch Renewable Energy Support Scheme (SDE) – which aimed to stimulate the use of sustainable energy. However, the sustainability of waste wood is being debated. Some issues include; air pollution, emission of nitrogen, long-term availability of waste wood, long-distance transport, import of fuel from abroad and also the public's opinion on cutting down trees and forests.

> **"Waste wood is used successfully in several greenhouses in New Zealand, for instance, at Zealandia Horticulture in Auckland and Christchurch**

The Dutch government recently concluded that biomass combustion causes more air pollution than previously known – unless an expensive air treatment is applied. In 2021, the government suddenly changed its criteria for the SDE subsidy, so that wood combustion for low temperature applications (100°C) no longer qualified. That subsidy is now shifting towards stimulating the capture of CO_2 from wood combustion. Unfortunately, that meant that growers who were installing a biomass boiler without costly CO_2 capturing are left in limbo.

Biomass installation with CO_2 capturing[1]

In 2017, three large-scale tomato and eggplant growers formed a company (DES) that built a biomass installation for waste wood including a CO_2 capturing facility. In 2019, the installation started supplying heat and CO_2 to the three glasshouse complexes – the first in the Netherlands, and third in the world, to do so. The installation has the capacity to produce 8.5MW of heat and 2.2 tonnes of almost-pure CO_2 each hour.

Wood shred is delivered by road trucks several times per day, to a total of roughly 20,000 tonnes per year. A local company collects wood waste from over 20 nurseries, arborists and contractors in the region, who are keen to put their waste to good use. The fuel contains around 55% water. The flue gases are led through a 'wet scrubber', that extracts the residual heat from the flue gas and purifies it. This produces 99.8% pure CO_2, ready for CO_2 enrichment, that is partly stored in two 16-meter-high balloons. The balloon capacity is too small to cover all the CO_2 that the glasshouses need, so some extra CO_2 is bought in. Expansion of the CO_2 storage capacity is on the growers' wish list.

Results

After a period of testing, learning and optimising, the three growers at DES are now satisfied with the installation's performance.

Each of the three glasshouse complexes still have their own gas-fired heat supply, either a boiler or co-generator, to provide flexibility and as a back-up. Currently, about 65% of the heat demand is covered by the biomass installation; the aim is to increase this to 85–90%. The result is a saving of roughly 6.5 million cubic meters of natural gas – the equivalent of 12 million kg of CO_2 per year.

The growers say the investment of several million euros is paying off: they produce their own heat and CO_2, biomass is cheaper than natural gas and they receive a government subsidy per unit of heat produced. The outcome is a marked reduction of their heating costs.

Wood burner for heat and electricity

Wouter Moerman grows tomatoes, cucumbers, and beans in a four-hectare glasshouse in the south of the Netherlands which has used a wood burner for its heating and electricity generation since 2019.

Dutch company DES's biomass installation for waste wood with a CO_2 capturing facility

[1] *See also www.des-bv.n*
Most information included in this article was sourced from Onder Glas, December 2021

CO_2 capture plant

Heat from the wood burner heats up ethanol in an Organic Rankine Cycle (ORC) – a small turbine – which generates electricity. The remaining heat (water of 90°C) is used for heating the glasshouses. In winter, it takes six truckloads per week of wood chips that come from forest, park and garden maintenance. The wood burner works fine, but the ORC in combination with the wood burner needs attention. The system saves 2.5 million cubic meters of gas and about 200,000 euros per year, says the grower. In Wouter's opinion, this is the only energy technique that is affordable for his size of glasshouse.

> **"Wood fuel is a sustainable, carbon-neutral fuel and offers a real opportunity for New Zealand to become greener and less dependent on fossil fuels**

Heat and CO_2 from waste combustion

Domestic waste in the Netherlands is burned in mega-large combustion ovens. The heat produced is used for heating of homes and glasshouses, hence the name waste-to-energy plants. There are strict requirements for the flue gases to be stripped of soot and harmful gases. Since 2014, some waste-to-energy plants have installed additional technology to extract CO_2 from the flue gases. The flue gas is cooled down and brought in contact with a dissolving fluid that absorbs most CO_2 gas. This fluid is heated to release the CO_2 gas again, which is then cooled to around -20°C.

The CO_2 is then liquid and pure and can be stored and/or transported. Although the CO_2 is excellent (high quality, suitable for CO_2 enrichment and available in massive volumes), it is hardly utilised by the greenhouse industry. Apparently, the current system of subsidies and tariffs stimulates burying CO_2 deep underground rather than supplying CO_2 to glasshouses. The greenhouse industry and the waste processing industry are lobbying to change this situation.

Conclusion

Above are some examples of biomass-based glasshouse heating in the Netherlands. This is not an exhaustive list. There are other techniques such as using a digester to breakdown biomass and produce biogas which is then burnt for heating. Several trials and projects with biomass are underway that may lead to new developments. Other fuels and energy techniques are also being developed that compete with biomass. Government policies and subsidies will affect the direction of the Netherland's decarbonisation journey.

CURRENTLY, ABOUT
65%
OF THE HEAT DEMAND IS COVERED BY THE BIOMASS INSTALLATION; THE AIM IS TO INCREASE THIS TO
85–90%

THE RESULT IS A SAVING OF ROUGHLY

6.5 MILLION

CUBIC METERS OF NATURAL GAS – THE EQUIVALENT OF 12 MILLION KG OF CO_2 PER YEAR

The spheres pictured here are balloons that store CO_2

Experts in the Netherlands consider biomass to be the best option for independent, medium-sized glasshouses, provided the fuel supply is secured. Dennis Medema, a leading energy innovation specialist at *Glastuinbouw Nederland*, says "…wood burners will be needed in the energy transition, certainly until 2030.

That gives us time to build regional heat distribution nets. Initially they will be fed with heat from a mix of energy sources, including biomass. Later the preferred heat source will be determined, which can be for instance reject heat, geothermal or aquathermal energy."

PRODUCT GROUPS

ALL THE LATEST NEWS FROM YOUR PRODUCT GROUPS

SUMMER SPUD REPORT 2021–22

Gemma Carroll : Potatoes NZ Inc. communications and extension officer

Summer 2022 potato crop

It has been a mixed bag of weather this spring and summer, with a couple of rain events challenging growers in Horowhenua and Canterbury.

New Zealand agronomists and growers in our main growing regions had the following to say about the 2021–2022 potato season.

Canterbury

Roger Blyth, Seed and Field agronomist

Plants were 'soft' in the run-up to December, with big canopies establishing due to low winds. It was a dull spring with low ultraviolet levels, says Roger.

A huge deluge before Christmas meant some disruption for late plantings and some crop loss. The big rain affected the normal petiole range and this has meant unrestricted canopy growth. Tuber setting is not too bad but there is variability in size. There has been no stress during tuber setting.

Canterbury is lucky to have irrigation schemes which mean that the otherwise dry weather has been managed with irrigation.

Rhizoctonia, which can be both seed and soil-borne, is present, probably due to cooler conditions so far.

Psyllid nymphs are visible, but psyllid trap numbers are not off the scale. Psyllid pressure is building, however.

Powdery scab is not much of a problem at this point.

"The Agria crops look exceptional. Innovator still has another month to go and Burbank crops need heat and light, being a North American variety, so it will be interesting to see their progress towards mid to late March," says Roger.

Pukekohe

Daniel Sutton, Fruitfed agronomist

Early crops were hit by wind, but pre-spring moisture was good. Then in late November and December the big dry has hit.

There are pockets of potato tuber moth (PTM) and psyllid, numbers are variable but generally psyllid is lower and PTM a bit higher, above the 2021 average.

There is not as much powdery scab but this is very much a paddock-by-paddock characteristic.

Early blight (*Alternaria*) is always a big pressure and with the dewy mornings, it is certainly a problem this season.

Irrigation is generally very challenging, with growers needing to constantly move equipment from paddock to paddock. The blocks here are smaller and the terrain too undulating for pivots. Irrigation guns are a highly inefficient use of water but they're about all the industry use here at present.

It is very dry in the Franklin and Matamata areas.

Current climatic conditions definitely increase the chances of PTM, but good harvests and getting most of the crop out of the ground in a timely manner, could mitigate those risks. The current challenge is getting enough crop out of the extremely hard, dry ground to satisfy markets.

> **"Mike lost 30 percent of his potato crop and said that those crops that were not lost were certainly affected adversely by the rain and surface flooding**

Manawatu

Mike Moleta, grower and PNZ board member

December's heavy rain event in Horowhenua clocked up the wettest December on record in this region. Mike lost 30 percent of his potato crop and said that those crops that were not lost were certainly affected adversely by the rain and surface flooding. The most frustrating aspect of the flooding was that the Horizon council drains were not clear of weeds, so despite having plenty of pumping capacity there was nowhere for it to go.

Now the conditions have swung the other way and are almost too dry. It's certainly been a spring–summer season of all extremes.

"You just have to plan for what you can control, but you can't eliminate all the risks," Mike says.

December's weather also impacted on growers' ability to manage weeds and disease because the ground was too wet to work on. Mike resorted to spraying from the air and is still left with a weed burden and an inability to cultivate the wetter ground.

Plants have also been smaller in wet ground. On higher ground, the combination of wet and hot weather has meant fast growing spuds – but they've not harvested yet to give a clear picture of yields. Mike has seen no extremes in psyllid at this stage.

PNZ welcomes two new members to the NZ Potato Seed Certification Authority

Cyril Hickman and son Tristan have hit the ground running, with 2021–2022 seed potato inspections underway. At a meet in Methven this January, Cyril commented on the very leggy plants he was seeing, almost a third higher than usual. In his 30 plus years as a seed inspector he had not seen any quite so tall and so fast growing.

PNZ's new seed inspector, Cyril Hickman

Thigh-high potato crops

Seed inspectors look for pest, disease, fungal, viral, bacterial infections and subnormal or not-true-to-type plants in the potato seed crops. The most common problems Cyril is seeing this season are liberibacter and herbicide damage.

The wet weather and dull days have made the all-visual inspections difficult this season.

> **December's heavy rain event in Horowhenua clocked up the wettest December on record in this region**

PNZ the year ahead

The team remains focused on its research and development projects and will be building on extension activities this year. This may be slightly hampered by pandemic disruption, but PNZ hopes to visit growers in each of the spud regions regularly. We are also in the early stages of planning for the delayed national PNZ conference which will be held in Canterbury. A separate PNZ Agronomy Forum will be held in the North Island.

Due to the unknown level of disruption, we will experience from the Omicron variant of Covid-19, PNZ will not be running field walks this summer. Instead, we will visit regions for grower insight meetings. We also start work in late summer on some videos and podcasts as extension work from the Sustainable Vegetable Systems project.

We continue to be led by grower feedback and the governance from the board. Please contact us at any time on: **0800 399 674.**

Herbicide damage

Liberibacter symptoms

CHANGES IN MARKET ACCESS AND CHANGES AT ONIONS NZ

James Kuperus : Onions NZ Inc. chief executive

Kazi Talaska – Onions NZ's new market access and development manager

I will not attempt to predict the year ahead because by the time this article comes out, any number of scenarios could have played out. Instead, I will focus on two important events at Onions New Zealand.

Changing market access requirements

Market access requirements change steadily overtime. In recent years, countries have sought to protect the interests of local producers by putting in place trade restricting barriers, including tariffs, subsidies phytosanitary and biosecurity requirements.

However, over the past decade there has been a greater focus on non-tariff barriers, and governments have become interested in areas that were historically managed by private standards. For example, the European Union is looking at Border Carbon Adjustments.

This will put a tax on certain goods from countries that do not have equivalent emissions tax schemes. In Asia, there is greater emphasis on food safety. Indonesia, Thailand, Russia and to a degree, China, have food safety assurances that must be met, separate to private standards.

It would be nice to think that these barriers would diminish with more Free Trade Agreements. However, the reality is that a new era of protectionism is just starting. Over the past decade, changes have been ramping up, with several countries finding slightly different techniques to protect local industries.

To stay globally relevant as a small producer, New Zealand needs to be very clever and strategic about how we manage market access. We cannot expect key export markets to grant us access just because we have some nice scenery and lots of sheep. At a government level, we need market access and trade to be recognised as a long-term relationship rather than a transactional exchange.

The approach the New Zealand government has taken to China over the past 20 to 30 years needs to be emulated in other countries.

As individual growers and exporters, the requirement for private standards will continue to evolve and get tougher. The bar will be lifted again for producers when Version 6 of GlobalG.A.P. comes out later this year, with stronger climate change and sustainability requirements.

> **“To stay globally relevant as a small producer, New Zealand needs to be very clever and strategic about how we manage market access**

At the sector and industry body level, our role is to maintain and improve market access. This is changing as more countries bring in new access requirements that are not met by private standards. The ability to respond quickly and have insight into what is coming is important for our sector.

In the short term, our biggest pinch point is around food safety assurances. Over the past two years, Onions NZ has started implementing an agrichemical residue monitoring programme. We have already used aggregated data from this monitoring to retain access to Indonesia and try and improve access to the Philippines.

Long story short, market access is evolving and is now heavily focused on non-tariff barriers.

Onions NZ's role is evolving to meet these changes and maintain and enhance access. Growers' support in the agrichemical residue programme is very much appreciated but we also need industry's support to continue to deliver improved access.

Staff Changes

I would like to introduce Kazi Talaska to our industry and the Onions NZ team. Kazi is from Java, Indonesia and came to New Zealand to attend Massey University, where she completed a Bachelor of Horticultural Science. Kazi is joining us from a role at HortNZ, where she was working in the team set up to attract young people to the horticulture industry. We are excited to have Kazi join us, and we believe her science capability will add to the team's skill set.

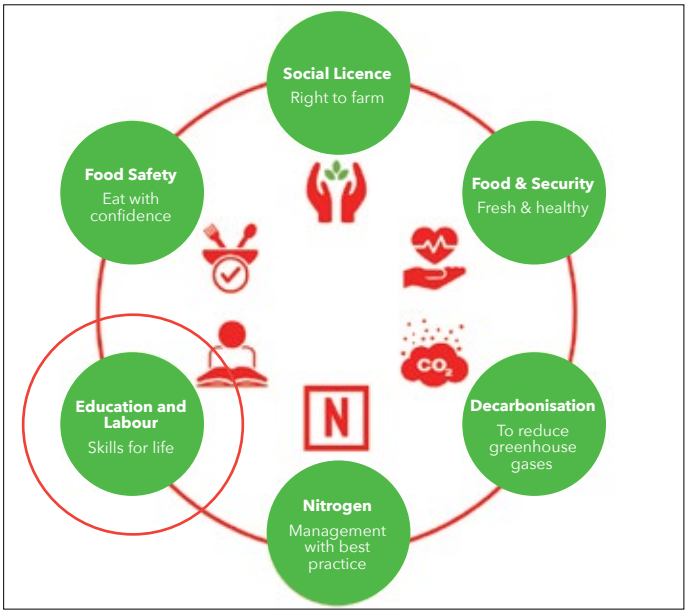
Kazi has replaced Brittany McCloy as market access and development manager. Brittany has been with Onions NZ for three years. She is leaving us in search of new challenges in the Hawke's Bay and hopefully, some international travel.

Brittany has made a significant contribution to Onions NZ. She has brought greater grower credibility and led the application process for our successful Sustainable Food and Fibre Futures (SFFF) Partnership Programme, titled 'From Humble to Hero.'

Kazi will be getting out to meet growers and exporters over the coming weeks. Kazi has a special interest in Indonesia. She will add a lot to Onions NZ's ability to interpret new regulations, as well as undertake projects involving Indonesia.

HOW WILL WE ATTRACT WORKERS WHO UNDERSTAND VEGETABLE GROWING?

Antony Heywood : Vegetables New Zealand Inc. general manager



VNZI manifesto – spotlight on education and labour

Labour is going to be critically short in 2022. It is estimated that 45,000 workers will be required to cover horticulture's labour needs during peak harvest in March and April 2022, but only about 21,000 workers will be available, or less than half of what is needed.

What will this mean for vegetable growers?

Fruit product groups are actively recruiting via co-ordinated programmes. Vegetable growers need to think about similar programmes because without them, workers will pass us by on their way to fruit, arable or dairy employment options. The ball is in our court.

Emma Boase, who was up until recently HortNZ people capability manager, says:

"Employers need a day-to-day focus on building positive workplaces for each and all employees. We can continue competing between ourselves and with other sectors for quantity and quality of people but real, sustained results will only come from collaboratively building our workforce in partnership with the education system. If we do this, and invest a little bit often in our own people, we will find that workers will choose horticulture, they will stay, and they will encourage their community to choose it too.

"Our production capability will always be determined by our people capability."

> "Employers need a day-to-day focus on building positive workplaces for each and all employees

Vegetables New Zealand (VNZI) is developing a vegetable-centric Workforce Transition Plan, building on what VNZI has already got in play in the people capability area:

1. Vegetables.co.nz – the Food Skills for Life programme, teaching Year 7 and 8 students how to cook with vegetables.
2. Regional Career Progression Managers network – a regionally based labour and education service to guide and support students and employees into the horticulture industry
3. The Food & Fibre Centre of Vocational Excellence (CoVE) –previously known as Primary Industry Training Organisation or ITO – tertiary education experiences and training throughout the country.
4. Other events like Fieldays and the Young Grower of the Year.

These activities deliver a steady flow of New Zealand employees to the vegetable industry, but it is not enough. Immigration, including working holiday schemes, need to continue to be part of the solution, notwithstanding the border restrictions due to Covid-19. Indeed, the Productivity Commission has released a report on immigration which concludes that it has a net positive impact on the New Zealand labour market.

> **“Our production capability will always be determined by our people capability**

Bold plan

VNZI has a bold plan to attract people into the vegetable sector. It highlights the need for co-ordination within the sector and between stakeholders. More importantly, the plan connects to the growers on the ground via District Associations.

> **“Real, sustained results will only come from collaboratively building our workforce in partnership with the education system**

VNZI will be visiting the regions in 2022 to understand grower needs for labour and education, and align our resource allocation with the issues that need addressing.
Dates are as follows:

Pukekohe	March 2022
Northland	April 2022
Canterbury	August 2022
Southland /Otago	September 2022

If growers would like VNZI to visit their region to discuss labour and employment needs, please email me at **antony.heywood@hortnz.co.nz**

SIMON GAULT'S SUMMER SERIES – INSPIRATION FOR EASY COOKING WITH SUMMER VEGETABLES AND TOMATOES

Julie North : Vegetables.co.nz

Simon Gault

If you follow vegetables.co.nz on Instagram or Facebook hopefully you will have spotted our Summer Series with celebrity chef Simon Gault.

Later last year we partnered with TomatoesNZ to launch a series of inspirational cooking videos with Simon Gault showcasing our abundant summer vegetables and tomatoes. Encouraging Kiwis to make the most of all our delicious locally grown produce and prepare easy dishes for friends and family.

The series is made up of eight different recipes; four with tomatoes as the hero and the other four showcasing green beans, cucumbers, courgettes and baby carrots. The dishes also feature sweet corn, capsicums and plenty of shallots and garden herbs.

While Simon was commissioned to develop the recipes and deliver a full length (1.5 minute) video, we have created additional teaser posts, snappy reels and ran a very successful giveaway prior to the launch of the series – all designed to boost engagement on our social media platforms, whilst showcasing our plentiful fresh summer vegetables and encouraging people to support our growers.

As we go to print, the series is mid-way through on social media, with great results so far. The campaign has boosted our 'following' and created lively discussions on people's love for vegetables.

Videos will remain on Simon Gault's YouTube channel so you can see the full series there. If you are not already doing so, get on board with vegetables.co.nz's social media communications and help share the love for vegetables and tomatoes.

NEW YEAR UPDATE FOR TOMATO GROWERS

Helen Barnes : TomatoesNZ Inc. general manager

Staffing news

I am leaving TomatoesNZ and HortNZ on 18 February to take up a new role at GNS Science in Lower Hutt. It has been my privilege to represent fresh tomato growers in Wellington for the past 11 years. I have made many friends in and around the industry and will miss working with you all.

TomatoesNZ business manager, Karen Orr, also left in early December for a 12-month secondment at the Ministry for Primary Industries. We wish her well in this temporary role. Dinah Cohen has joined the team to cover Karen's absence and can be contacted on **dinah.cohen@hortnz.co.nz**

Energy

Elly Nederhoff, the New Zealand based greenhouse energy specialist, has written a review of carbon emissions reduction options in the Netherlands: *Technology scan: Innovative technology for transition to a low-carbon greenhouse industry*.


TECHNOLOGY SCAN

Innovative technology for transition to a low-carbon greenhouse industry

The report can be downloaded from the Energy Efficiency page on our website under "Hot topics": https://www.tomatoesnz.co.nz/dmsdocument/228-technology-scan-innovative-technology-for-transition-to-low-carbon-greenhouse-industry-pdf]

The report was funded by the Energy Efficiency & Conservation Authority (EECA).

> "Growers can access co-funding for up to 40 percent of the costs of an eligible project, up to $250,000 per project

Decarbonisation funding for greenhouses

The Energy Efficiency & Conservation Authority (EECA) is offering an opportunity for small and medium-sized greenhouse growers to apply for decarbonisation funding through their technology demonstration fund: https://www.eeca.govt.nz/co-funding/technology-demonstration/

Growers can access co-funding for up to 40 percent of the costs of an eligible project, up to $250,000 per project.

For example, up to 40 percent of the cost of a low emissions heat pump system to displace a fossil fuel boiler, or the addition of dehumidifying heat pumps to reduce heat loss from the glasshouse. Energy screens and biomass boilers do not qualify for this funding.

We've been working closely with the EECA on a plan to support reducing carbon emissions from the greenhouse vegetable industry. EECA have made this fund available exclusively to greenhouse growers for a short time.

To check if your project meets the funding criteria, get in touch with EECA, or email Dinah.

Update on export markets

Restrictions on New Zealand grown tomatoes being exported to the Cook Islands, Tonga and New Caledonia were lifted late last year. No extra measures have been imposed for these markets. This is in addition to tomato exports to Japan, Hong Kong, Niue, and Samoa which re-opened earlier. There are currently no exports to Australia.

Tomato prices

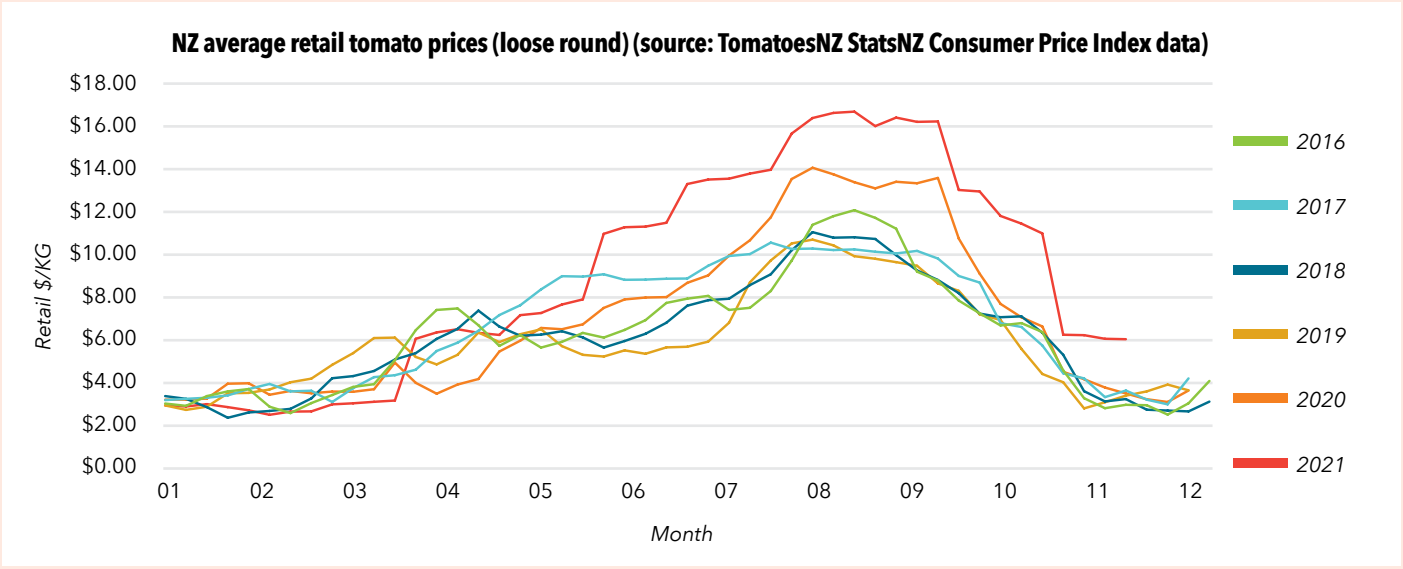
Tomato prices are a frequent topic of media interest. The price graph for the average New Zealand retail (loose round) fresh tomato for the past four calendar years, produced from Statistics New Zealand's *Consumer Price Index* data, shows that in February 2021, prices stayed lower than usual at about $2.50/Kg for longer than in previous years (Graph 1). By June, they had reached much higher than usual at over $11.00/Kg, then climbed and stayed at over $16.00/Kg in August through to the end of September. Prices have stayed several $/Kg higher than usual right through to the end of November are they were still sitting at around $6.00/Kg (the latest data available at time of print) compared to $3.40/Kg in 2020.

A number of factors are contributing to low supply and high prices: Pepino mosaic virus affecting large areas in South Auckland; anticipation of the Australian export market remaining closed in the short-term resulting in reduced plantings; dull spring weather; rising energy costs and Covid-19 related business costs; and severe labour shortages.

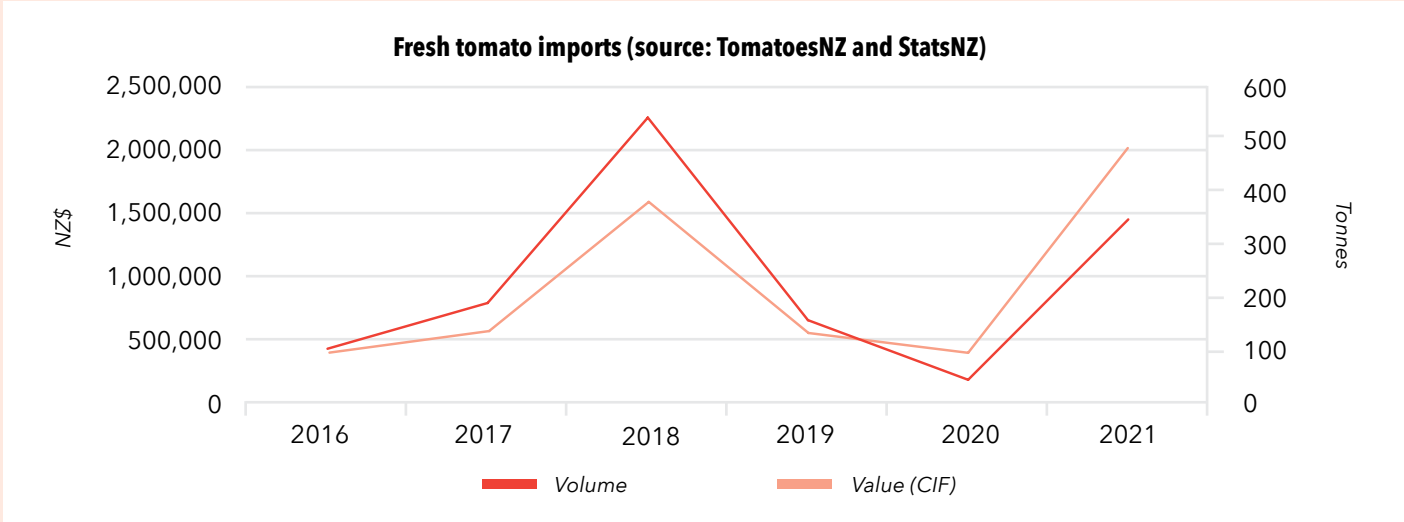
Winter import statistics for fresh/chilled tomatoes

From July to October 2021, 348.5 tonnes of fresh tomatoes were imported from Australia. This was up significantly from winter 2020 (72.2 tonnes) and 2019 (175 tonnes), but as shown in Graph 2, below a 2018 peak of 523 tonnes.

Given the high New Zealand tomato prices during winter and spring 2021, we might have expected an even higher volume of Australian tomatoes. However, Covid-19 freight disruptions and Australian market conditions slowed down the flow.



***Graph 1**. Price graph for the average New Zealand retail (loose round) fresh tomato for the past for calendar years. Source: Statistics New Zealand*



Graph 2

Classified advert rates

	1	3-5	6-10	11
Quarter Page	$435	$420	$395	$355
Eighth Page	$245	$235	$225	$205
Cameo (W40 x H65mm)	$145	$140	$135	$125
Custom $40 per column cm				

To book a classified advertisement in our next issue contact:
Debbie Pascoe (09) 2363633, M: 0274 858562
Email: dpascoe@xtra.co.nz

GREAT CHOICES TO GROW WITH YOU.

ENZA ZADEN

Enza Zaden supports growers to buy direct and to make independent choices for the best varieties in New Zealand and around the world. As a family owned vegetable seed breeding company Enza Zaden looks to the long term future for variety development. Choose the Enza Zaden lettuce range for disease resistance, innovative new types and varieties for all seasons and locations around New Zealand and the world.

Talk directly to us for your seed requirements and trial varieties.

Please call us direct on 09 963 0122 to request seed. Contact Beverley Vahai 021 193 1008 or sales@enzazaden.co.nz for customer support.

For technical advice on open field crops, contact Aneil Hari 021 367 242, or sales manager Herman van der Gulik, 021 858 939

For glasshouse crops: Louise Millar 021 711 709.

www.enzazaden.co.nz

"We love helping lettuce growers to be profitable with the best varieties" says Herman van der Gulik, Sales Manager, Enza Zaden New Zealand.

INTRODUCING ENZA ZADEN LETTUCE:

AUTUMN ICEBERG:

Nolaf NEW! Very uniform in autumn to late autumn, medium size, dark green colour, sure heading and fast maturing, adaptable, very flexible in challenging conditions and has extended maturity window.
Bl:16-36 / Nr:0

Berruguete NEW! Trial in autumn with best results in spring, med-large head and frame, cold tolerant, versatile, uniform and high cut out, strong against big vein.
Bl:16-37 / Nr:0

AUTUMN – WINTER ICEBERG:

Pedrola, autumn standard, reliable, adaptable, produces medium sized heads with high pack out in changeable weather.
Bl:16-27,29,32,34,36 / Nr:0

Diegola, robust, adaptable winter variety, large frame and good wrap for head protection, uniform round heads. Bl:16-27,29,32,34,36

Icemaker, a large iceberg with high leaf count with good big vein tolerance, sure heading with good uniformity. Early winter and spring harvest. Bl:16-36

Botiola (Icebreaker), winter standard, reliable, large size heads, firm heads with good volume, even under adverse conditions.
Bl 16-27,29,32,34,36

Pelayo, a strong performer in the cool early spring conditions, large size, sure heading, suitable for cooler climates in New Zealand. Bl 16-36

SPRING ICEBERG:

Pedrola, spring standard, reliable, adaptable, produces medium sized heads with high pack out in changeable weather.
Bl:16-27,29,32,34,36 / Nr:0

Nolaf NEW! Spring (and autumn), very flexible variety, medium size, dark green colour, uniform size and shape, sure heading and fast maturing, adaptable and more vigour than Pedrola. Bl:16-36 / Nr:0

Berruguete NEW! true spring variety, med-large head and frame, cold tolerant, versatile, uniform and high cut out, strong against big vein.
Bl:16-37 / Nr:0

EAZYLEAF - YEAR ROUND:

Wildebeast, standard very high yielding mid-dark green incised coral, serrated spiky leaves with rounded tip, fine leaf attachment with crisp texture, use for year round production, has an especially high winter production level. Pair with Rhone. Bl:16-36 / Nr: 0 (IR: LMV 1)

Skilton, high yielding dark green incised coral, serrated spiky leaves, small cut surface with fine leaf attachment to keep leaves fresh for longer. Crisp texture with excellent taste. Year round production, Very upright plant habit for reduced disease. Bl:16-36 / Nr:0 (IR:LMV1)

Rhone, high yielding deep red incised coral type, spiky serrated leaves, fresh green highlights, fine attachment, pair with Wildebeast.
Bl:16-33 / Nr: 0

Ezflor, triple red, large high yielding dark red coral with incised leaf, with good 3D shaped leaf with strong green red contrast for maximum freshness, small cut surface for long shelf life, excellent mouth feel and taste. Bl:16-37 / Nr:0 / TBSV (IR: FoI: 1)