NZGROWER®

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HORTICULTURE NEW ZEALAND

USING COVER CROPS TO INCREASE YIELD

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Vegetables NEW ZEALAND Inc

Future director internship for 12 months

August 2023 to August 2024

Vegetables New Zealand Inc is seeking a Future Director to serve and gain experience on its board.

The year-long appointment commencing in August 2023 would allow the successful appointee to gain experience in governance, leadership and strategy. This position will suit an applicant who has active involvement in a horticultural enterprise giving an understanding of the issues and challenges that horticulture and growers face.

This is a great development opportunity for a future leader with a genuine interest in governance. The Future Director will have the opportunity to be mentored by an industry leader and receive governance training. In making the selection, VNZI diversity policy will be taken into account.

The job description can be found at:
freshvegetables.co.nz

If you are interested in this role, please send your CV and cover letter to:
Lynda.banks@hortnz.co.nz

Applications OPEN on Monday 22 May 2023 and CLOSE at 5pm, Friday 23 June 2023. The successful candidate announcement will be made at the VNZI AGM on 2 August, followed by an induction during August/September. Their first VNZI Board meeting will be in late September 2023 (meeting date subject to VNZI Board schedule).

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Photo by Anne Hardie.

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A regular advertorial section of new products and services. This publication does not endorse the products or services featured here.

WE SEEM TO HAVE LOST OUR MOJO

Barry O'Neil : HortNZ president

Prior to Covid-19 parts of horticulture had seen unprecedented growth in the last decade with exports doubling in value. There seemed to be an insatiable appetite for further growth. The horticulture sector grew by over 60 percent during this period due to significant investments in new orchards, new breeding varieties, in alternative growing techniques, and in harvest and post-harvest practices.

In my industry, kiwifruit licence and property values went through the roof – we couldn't seem to go wrong. But then along came Covid-19 and the horticulture wheels started to wobble. Then with this season's awful weather causing such huge stress and pressure, in some cases the wheels have nearly fallen off.

Alarmingly, the current appetite for investment in horticulture is low. Investors both large and small are holding back, and who could blame them. In Hawke's Bay and other areas affected by Cyclone Gabrielle, some growers don't even have an orchard left to invest in even if they could get funding.

We seem to have lost our mojo in this current climate of labour shortages and related issues of productivity and affordability, input costs in many situations doubling, fruit and veggie yields low and crops not storing well due to seasonal weather events, increased transport and shipping disruption and costs, and unfortunately the list just seems to go on and on!

As growers we know weather is something that changes. We are looking for ways to be more resilient to changing weather and an increasing number of extreme events. So let's park weather for once, and look at what else needs to happen for us to get our mojo back.

Unfortunately, quite a bit. The good news is that we know the reasons why, but we do need to align our efforts and energy on addressing these so they work for us, rather than against.

> "I really struggle to understand why the government is not showing greater leadership in working with us

There was recently a launch of a plan to get us back to growth. Horticulture New Zealand was actively involved in the development of the Aotearoa Horticulture Action Plan – a positive initiative to get us back on the path to prosperity and growth. For me this plan ticks all the boxes regarding what we need to do in order to prosper again, and my thanks to the wise heads from across all horticulture and government that have brought this plan together.

The plan of course requires industry to invest, which it will do if there is confidence that government is with them and not against them. Unfortunately, recent government policies have made it really challenging for horticulture businesses to succeed. Whether that be migrant labour settings being too restrictive for seasonal workers, wage settings or worker protection programmes dictated by government being difficult for growers to meet, or whether that be additional Resource Management Act requirements being constantly introduced.

There has been a lack of leadership from government to support recovery from the devastation caused by Cyclone Gabrielle. All the expert analysis, including from the heavyweight Boston Consulting Group, says the minimum required just for Hawke's Bay horticulture alone is over $700 million if we are going to save $3.5 billion of future horticulture industry value over the next six years. If government is committed to spending $15 billion for light rail in Auckland, or $1.24 billion on contractors and consultants in the public service to tell them what officials should already know, why aren't they equally passionate about supporting the economic powerhouse of New Zealand, our primary sector businesses that keep Aotearoa ticking? I really struggle to understand why the government is not showing greater leadership in working with us, and supporting us to get back on our feet?

Investors need certainty of favourable government policy settings for the lifetime of their investment.

Who would invest $20 million in horticulture without certainty of for example access to affordable migrant seasonal labour, or if resource consents for water takes are restricted to only ten years?

> **We should be celebrating business success, not strangling it from succeeding**

As an investor I am prepared to take some risk, but I don't expect government policy to be working against me. Yes I want to grow using less nitrogen and sprays, yes I want to look after the land and rivers better, yes I want a neutral carbon footprint, yes I want to support the people in my community and to be a good neighbour, but to do all these my business needs to be successful economically.

Making money in being a successful horticulture business seems to be frowned upon by some in government these days, which I find absolutely ridiculous, even pathetic. Surely no one wants us to see us become a developing country, not able to afford modern health, welfare, education, and law and order.

We should be celebrating business success, not strangling it from succeeding. As a country we need to restore a focus on economic prosperity, not just social equity and environmental stewardship. Some would say I am the wrong generation to be making this statement, being one of those "fortunate" boomers, but my goodness when I fill in a census that seems to be more worried about what gender I was born as, rather than why my business is losing money, I worry a lot about where this country is going and what my grandchildren are going to have to fix.

Despite all these headwinds I am very confident in the future of horticulture and regaining our mojo and confidence to invest, as we produce great tasting and healthy products that consumers are wanting and needing.

And to help future governments support us to grow successfully and profitably, HortNZ has led the development of a manifesto document to focus discussion leading up to the election on some of the critical actions and changes that are needed. Check it out on our website, and I welcome any feedback and suggestions.

Kia kaha

Visit www.hortnz.co.nz/about-us/ to view the document

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Your Levy AT WORK

MPA Associate Member (NZ)

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YES, WE DO HAVE A FUTURE

Nadine Tunley : HortNZ chief executive

The government's 2023 Budget – *Support for today, building for tomorrow* – was announced late last month. Prior to Budget Day, Finance Minister Grant Robertson and other government Ministers visited the Hawke's Bay, where they announced more than $1 billion more in government funding for the recovery from Cyclone Gabrielle, on a nationwide basis.

Following this announcement, the Minister made some clear statements on Radio New Zealand's *Morning Report* on 15 May:

- "The government cannot be expected to pay every dollar of the recovery and rebuild."
- "Clearly the government cannot be expected to run and fund every industry in New Zealand."
- "We want to work out a way where we can support them [the horticulture industry] that is fiscally sustainable."
- "We acknowledge the timing issue. We will again be sitting down with the [horticulture] industry and running through the options to give them the certainty they need as they head into winter."

The horticulture industry has advocated tirelessly since 14 February when the cyclone struck. There have been multiple reports written, groups formed, and meetings held. In all this, the government has been quite clear that while the recovery is being nationally funded, it will be community led, in contrast to how the recovery from the Canterbury earthquakes in 2011 was run. However, the government has not engaged with our industry on the full range of funding options to support the recovery.

Many growers are demoralised and are facing going out of business or substantially downsizing their business. That's not a situation that Horticulture New Zealand can support or would wish on any grower.

However, faced with a stark reality, affected growers, other businesses and some communities will need to start to find ways to move on, working closely with those in their communities tasked by the government to lead the local recovery.

> "We have a bright future, but it is going to look different to the trajectory that growers were on

Uncertainty remains as to what 'community led, government funded' looks like. The Finance Minister indicated in his Radio New Zealand interview on 15 May that he expected the situation to become clearer in early June. If you are not already well connected to what's happening on the ground, it would be a good idea to make a strong connection. We will continue to update growers based on the meetings we are having with the Ministry for Primary Industries and other government departments, as well as the meetings we are having with the various groups formed to lead the regional recoveries, particularly in the Hawke's Bay and Tairāwhiti.

As a mayor in the Hawke's Bay has said, "it's hard to be positive about the future when you are surrounded by silt". However, I would like to encourage as many growers as possible to be positive about the future. Yes, this is an extremely challenging time, but the industry has successfully come through many challenges – for example, Psa – before.

> "The government has not engaged with our industry on the full range of funding options

We do have a bright future, but for several years it is going to look different to the trajectory that growers were on in the Hawke's Bay and Tairāwhiti, in particular. ●

Expanding knowledge supports grower practices

Fruitfed Supplies' Technical Horticultural Representatives (THRs) work alongside growers in formulating and implementing crop protection programmes. The know-how possessed by THRs comes in part from the learnings passed on by the Fruitfed Supplies Technical Team which encompasses research and development (R&D).

Last year, 59 R&D trials were conducted by the team on a range of products including plant growth regulators, biostimulants, biopesticides and agrichemicals across all crop sectors. Taking place over several seasons, the trials allow a large breadth of research to be collected, providing growers with practical, in-field data. The trial data is often used to form a part of the technical information required when applying to the New Zealand EPA and ACVM for new product registrations or label extensions.

In her role within the Technical Extension Team, Elaine Gould, Technical Specialist – Subtropicals, shares information about newly registered products with the wider Fruitfed Supplies team and growers as she explains.

"Education forms an important part of my role. I impart knowledge from the wider industry, new product releases and R&D trials to the Fruitfed Supplies team through a variety of channels, ensuring all THRs and store teams are kept up to date. Extending the learnings from R&D trials allows us to provide our teams with clear messaging they can pass onto customers."

Elaine believes the findings from R&D trials provides the Fruitfed Supplies team with valuable information. "When a product comes to market, we already have an in-depth understanding of how it works in local conditions, the most appropriate application timings, and the finer points that can only be known from testing the product in the field."

Elaine Gould, Fruitfed Supplies Technical Specialist – Subtropicals.

"Armed with this knowledge, our THRs understand how the product fits within a spray programme and can therefore provide growers with the most up-to-date information on the best products available."

Involved in horticulture at an industry level, Elaine formed a kiwifruit extension group. "Myself, and others from post-harvest facilities, Zespri, and Kiwifruit Vine Health, meet regularly to ensure the technical advice we are delivering to growers is consistent." She also attends industry meetings, keeping abreast of any developments. From there Elaine passes relevant information onto THRs so they can update crop protection programmes as required, including adjustments to application rates or pre-harvest spray intervals.

With the Fruitfed Supplies Technical Extension Team covering the major horticultural crops, each specialist is aware of the current issues within their crop sector and the available products. This allows them to provide THRs with training on how best to manage pests and diseases along with the most effective way of delivering nutrients to crops.

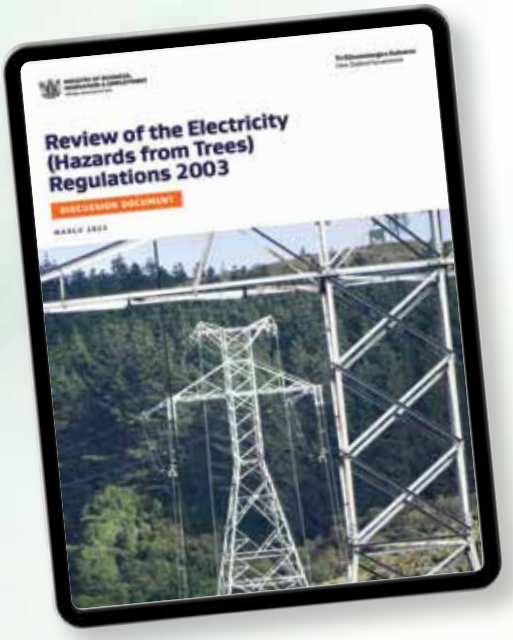
YOUR LEVY AT WORK

INDUSTRY WIDE ISSUES FOR INDUSTRY GOOD

RECOGNISE THE IMPORTANCE OF HORTICULTURE

Michelle Sands : HortNZ strategy and policy manager

Horticulture New Zealand continues to highlight to the government how New Zealand's productive land should be protected for the sake of the country's food supply. Recently HortNZ submitted on the Ministerial Inquiry into Land Use as well as the Review of Electricity (Hazards from Trees) Regulations. Regarding the New Zealand Emissions Trading Scheme, government policy should make it practical and affordable for growers.



https://www.mbie.govt.nz/dmsdocument/26235-discussion-document-review-of-the-electricity-hazards-from-trees-regulation-2003

Improving Market Governance of the New Zealand Emissions Trading Scheme

Horticulture New Zealand has submitted to the New Zealand government regarding the regulation of the New Zealand Units (NZU) market. HortNZ has expressed concerns that extra regulations would create an administrative burden. The submission focuses on four topics: growers' ability to continue the current practice of surrendering units to offset carbon costs directly to energy suppliers, the need for small minimum NZU bundles that are practical and affordable for growers, allowing growers to trade NZUs without the need for financial advisors, and the assertion that no additional Anti-Money Laundering and Countering Financing of Terrorism (AML/CFT) Act obligations should apply beyond the current legislation. HortNZ believes that businesses that receive free allocations and participate in the scheme have dedicated in-house knowledge, and requiring trades of units to occur via a financial advisor would create additional costs and processes. HortNZ supports the current AML/CFT legislation, which already captures activities of interest in the NZU market to deter money laundering and financing of terrorism.

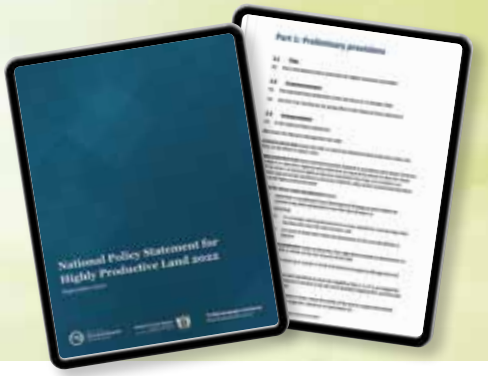
Review of Electricity Hazards from Trees Regulations (2003)

There is an ongoing tension between the needs of electricity lines companies and horticultural growers. Horticultural operations do not see the need to increase the Growth Limit Zone beyond the current range of 4m when there is electricity network infrastructure within or adjacent to the operation. Increasing the Growth Limit Zone would reduce the productive capacity of the land available to horticultural operations and have an adverse economic impact. An increase in the Growth Limit Zone would create tension between the proposed regulations and the National Policy Statement for Highly Productive

Land, which seeks to prioritise primary production on highly productive land. Horticultural operations are often located on highly productive land. If changes are made, costs and compensation for the loss of productive land must be considered. Horticultural trees do not reach the heights of radiata pines, and thus the regulations must make a clear distinction between plantation forestry trees and horticultural operations.

Ministerial Inquiry into Land Use

Cyclone Gabrielle had a devastating impact on horticulture, destroying crops and causing damage to homes, facilities, equipment and infrastructure. The cyclone also highlighted the vulnerability of horticultural land on floodplains to the large climatic events predicted to become more frequent with climate change. Financial support is needed for immediate relief, while clear national policy direction across resource management, freshwater, and climate change is required to enable and provide for low-emissions food production on highly productive land in the long-term. The submission recommends making an explicit policy provision that recognises the importance of food production and supply, protecting highly productive land for primary production, and supporting those who are willing to reshape the landscape to avoid erosion and sediment-related problems. Regional councils must take responsibility for catchment modelling and maintaining flood infrastructure in line with changing climatic conditions. Gisborne requires improved connectivity to other regions in the face of disaster through significant investment in road infrastructure.



https://environment.govt.nz/publications/national-policy-statement-for-highly-productive-land/

RECALL SIMULATION ENHANCES FOOD SAFETY READINESS

Elaine Fisher

New regulations requiring food businesses to carry out simulated recalls at least every 12 months are good news for both consumers and industry, says New Zealand Food Safety deputy director-general Vincent Arbuckle.

"Consumers can be confident in the knowledge that, should the need arise, food businesses will be able to act quickly and effectively to remove any unsafe or contaminated products from stores and the food chain.

"For businesses, these exercises will test the effectiveness of their traceability and recall procedures in a controlled way and – with the support and guidance of New Zealand Food Safety – provide valuable learnings and improvements," he says.

From 1 July 2023, businesses with a plan or programme under the Food Act, Wine Act, or Animal Products Act, as well as importers and exporters, will need to carry out a simulated recall. Regulations will require this at least every 12 months after a simulated recall, or a genuine recall if that recall demonstrated the traceability and recall procedures to be effective.

From 1 July, your business may need to carry out an annual simulated recall

> **"When things go wrong, they usually happen at an inopportune time**

Melanie Dingle, technical advisor New Zealand Good Agricultural Practice (NZGAP) says a grower testing their ability to effectively carry out a recall, prepares them to prevent financial and reputational loss and can only enhance their food safety readiness to reduce risk to human health, if the need arose.

"NZGAP has long recognised the importance of traceability and recall systems. Currently NZGAP certified growers are required to have in place a recall system, test the recall system annually, determine its effectiveness and document follow-up actions – meaning there will be little or no change for NZGAP certified growers.

"Traceability from production through to distribution is a key part of the NZGAP Programmes and is a key aspect of any recall system."

Anne-Marie Arts, Technical Advisory Group, United Fresh New Zealand Incorporated, says carrying out a simulated food recall means businesses are well prepared should an issue arise with their products.

"When things go wrong, they usually happen at an inopportune time. By carrying out a simulated recall you have a plan in place to implement if you get a call that a problem has been detected."

This is not a new requirement under the Food Act, and is important in making sure traceability and recall processes are robust.

For most small to medium-sized businesses, the plan doesn't have to be complicated, and in designing a simulated recall, Anne-Marie suggests businesses develop a realistic scenario as the basis for the exercise.

"Base the scenario on things which might have happened in the past, such as discovering a bolt missing from the pack line after packed product has been dispatched.

"Other potential scenarios for fresh produce are non-compliant residue results or unfavourable microbial test results, which come in after product has been dispatched to market."

> **For most small to medium-sized businesses, the plan doesn't have to be complicated**

Anne-Marie cites the case in March this year when tahini imported from Turkey, used as an ingredient in a range of New Zealand hummus and tahini products, caused multiple recalls from shelves due to the possible presence of Salmonella. Fresh produce recalls can also be challenging because the distribution routes to the consumer can be complex, and the products are perishable.

Traceability is vital for any recall system to work, and "growers should be able to trace a product needing recall back to the day's batch at the very least. A 'packed on date' label on pre-packed product is an important tool, so that any product with that date can be pulled from the supply chain."

United Fresh has carried out a three-year project, *The Case for Traceability, Produce Industry Traceability Guidelines*, funded by government through the Sustainable Farming Fund (now the Sustainable Food & Fibre Futures Fund) that investigated traceability within the industry. The report can be found on the United Fresh website.

Anne-Marie says internationally tested and implemented GS1 assessment methods were used to examine the present state of traceability across the fresh produce supply chain and to then generalise the results as far as possible, across the whole sector, with guidance on how to maximise effectiveness. Strawberries and lettuce were the crops used in the pilots.

WHAT YOU NEED TO KNOW ABOUT SIMULATED RECALLS

Detailed information about the legal requirements for regular simulated food recall and step-by-step guides on how to develop and work through scenarios can be found on the New Zealand Food Safety website.

A simulated or mock recall tests the effectiveness of your traceability and recall procedures. It involves developing a scenario, carrying out your scenario in a similar way to a genuine food recall, then reviewing how effective it was to identify any areas for improvement.

A simulated recall is a bit like an emergency evacuation drill, it can help:

- to improve capability (to make a real recall quicker and more effective)
- support everyone involved so they are clear on roles and responsibilities, and know what to expect in a real recall
- identify any gaps or areas for improvement in your procedures
- demonstrate the importance of good traceability record-keeping to staff.

A successful simulated recall scenario should result in either:

- a consumer-level simulated recall, which involves simulating the process for removing affected product from the supply chain and simulating communication to consumers, or
- a trade-level simulated recall, which involves simulating the process for removing affected product from the food supply chain.

For more information visit: **https://www.mpi.govt.nz/food-business/food-recalls/doing-food-recall/**

YOUR INDUSTRY

ACROSS THE SECTOR – ACROSS THE COUNTRY

20 URGENCY REQUIRED

ENERGY EFFICIENCY HELPS WAIMAKARIRI GROWER STAY IN BUSINESS

Aimee Wilson

The hardworking team that are part of the successful indoor cucumber growing operation at Jade Garden

Rachael and Robert Lindsay have taken the first steps on their journey towards reducing energy use in their indoor cucumber operation in Canterbury. They are keen to share this information with other growers.

When the couple, along with Allen and Jo Lim, first bought into the 40-year-old business, Jade Garden Produce back in 2018, they came in with fresh eyes. They knew there would have to be significant changes.

"Having never grown a commercial indoor crop before, we had a lot to learn in a short space of time," Robert says. "Every mistake was costly, and early on my understanding of the relationship between the plant, air temperature energy, and air moisture content was limited."

With major operating costs rising every year – squeezing margins out of their cucumber harvest – the couple looked at what they could do to make changes. "If we were to remain growing, we had to be more efficient. Change is difficult but we had no choice," Robert says.

They had to start somewhere, so employed the 80/20 rule which states that "80 percent of costs come from 20 percent of inputs. In our case, the 20 percent of inputs that had the biggest impact on operating costs were energy and labour. We decided to focus on energy first, starting with boiler efficiency, and then energy losses in the greenhouses after that," Robert explains.

In 2019, with advice from their electrician, they built a do-it-yourself radiation sensor using a temperature sensor and a milk bottle painted black. They then linked the sensor to the boiler controller in order to reduce the boiler heating set-point when the sun was shining.

> "If we were to remain growing, we had to be more efficient

"As the milk bottle heats up it tells the boiler that the sun is providing a lot of heat to the greenhouses, so the energy input into the boiler can be reduced. When the sun is shining, the greenhouses do such a great job of capturing that energy that there is no need to heat them using our boiler – so why heat the water in the boiler to 90°C?"

The next step, reducing energy losses through the greenhouses, Rob tackled alongside Bert van Geffen, his horticulture coach.

Jade Garden grows telegraph cucumbers that only take six weeks until harvest

Energy screens above the cucumber plants are automatically drawn over and above the crop when the outside temperature gets low

"We focused on minimising energy loss, whilst still carefully watching greenhouse humidity levels. We have these wonderful energy screens that are automatically drawn over above the crop when the outside temperature gets low, in order save energy. Previously we had never fully closed our screens, because we needed to allow moist air to exit the crop and escape through the vents. However, we learned that our energy screens are permeable, allowing us to open vents above a fully closed screen – venting moisture but without losing as much warm air."

The greenhouse environment is managed with a Priva climate computer. Basically, this opens hot water valves to heat the crops, and opens vents to cool the crops, and vent moist air. Changes to set-points result in visible changes in crop growth in as little as 24 hours.

Previously they used the basic climate settings, but with Bert's advice and guidance, they are now exploring more advanced settings which has allowed the computer to manage the heating and venting in different scenarios.

"Say we get a nor'wester blowing, this drags too much moist air from the greenhouse, and stresses the plants. Using the advanced settings, Priva recognises the wind direction, and reduces the vent opening on the windward side, resulting in less moisture loss from the crop, and happier plants."

Lastly, they focused on implementing some strategies found in the book *Growing By Plant Empowerment* (GPE) by Dutch authors Peter Geelen, Jan Voogt and Peter van Weel, which gave Robert insight into how much temperature drives the photosynthesis-respiration balance.

Linking the greenhouse temperatures to incoming sunlight meant they could control how much energy the plants were using. On sunny days they run warmer average temperatures than on cloudy days.

Energy is saved during the cloudy days because there is no point putting out a lot of heat when there is no sunlight to increase plant growth.

While it might mean slower growth than otherwise during the winter months, the plants look healthier when grown under this regime, and the cropping is more consistent.

The new technology has been a game changer. While Robert and Rachael did all of this to remain in business, there was obviously an environmental advantage as well.

In the first year after the solar sensor install, they made eight percent savings, in the second year 14 percent and the third year a huge 21 percent.

"I heard a great definition recently – to be a grower nowadays you need to be an agronomist, an engineer, a data scientist and a psychologist – all in one!" Robert says.

Robert and Rachael Lindsay are co-owners of Jade Garden in Canterbury

HOW TO START REDUCING YOUR ENERGY BILL

The cost of energy is consistently a top issue for covered crop growers and is only projected to rise as the Emissions Trading Scheme price increases, says Vegetables New Zealand. Together with the Energy Efficiency & Conservation Authority (EECA), Vegetables New Zealand is funding a dedicated resource to support grower energy transition – energy engineer Ellery Peters.

Ellery says typically high capital solutions are offered to reduce growers' energy usage, but realistically these are unaffordable for many growers despite the guaranteed high savings.

"Robert and the Jade Garden team have shown that through knowledge of your energy systems and by accessing the resources available, high savings can be made at very low cost."

Growers interested in reducing their energy usage can contact Ellery, who will help support both high-cost and these low-cost energy reduction solutions.

ellery.peters@hortnz.co.nz

027 322 2887

POST-CYCLONE SOIL SAMPLES PROVIDE HOPE

Glenys Christian

Photos: Paul Taylor

Months after the cyclone, recovery will take years

Soil testing of sediment deposited by Cyclone Gabrielle hasn't uncovered any 'smoking guns' in the form of any contamination so far, says LandWISE manager Dan Bloomer.

With colleague Alex Dickson and others he's involved in sampling flood affected sites and collecting nutrient and contamination samples in Hawke's Bay, Gisborne and Northland. The aim is to provide information for growers now, so sampling seeks representative sites to help both those landowners and their neighbours. The sampling is supported by the Ministry for Primary Industries (MPI) and Vegetables New Zealand and aims to collect 100 nutrient samples in Hawke's Bay, 50 in Gisborne and 20 in Northland.

After the cyclone, LandWISE wanted to help its members by collating good information on how to manage their existing or 'new' soils. It reached out to the science community including Plant & Food Research, AgResearch, Massey University and independent horticultural consultants. Historical information was gathered from a big Gisborne flood of 1948 and a 2004 storm event that impacted the southern North Island.

"We got a huge response and pulled the information together to give people a way to plan immediate responses," Bloomer says. "The way people nationally responded with generosity was a heart-warming experience at such a bleak time. The Crown Research Institutes (CRIs), universities and consultants responded immediately, and a treasure trove of information was uncovered."

Information was loaded on the LandWISE website and presented at grower meetings organised by the vegetable and apple sectors.

> "It's a case of digging the sediment out or living with it

A soil management decision tree created following the 2004 storm provided the template for guidance that LandWISE gave orchardists and growers. What to do is site-specific and depends on land use, be it for fruit, vegetables or arable crops. "It's a case of digging the sediment out or living with it."

With shallower sediment deposits it is possible to cultivate it into the underlying soil.

"But anything over 20 centimetres is difficult to mix in, and the very deep sediments will have to be developed into a new soil."

In some areas such as Dartmoor and the Esk Valley, there had been a metre of sediment deposited, compounded by woody debris and vehicles dumped. Fruit growers have a high-value crop and a very long time and high cost to re-establish, so many are trying to dig the sediment out and take it away. It may be different for cropping land where the huge cost of sediment removal is harder to justify.

Regardless of the situation, getting something growing as soon as possible is essential to help remove excess water and start rebuilding soil, Bloomer says. Sediment deposited after flooding was unstructured, with varying textures from coarse to fine. It's typically sandier where water moved quicker, and heavier where there was ponding.

"Growers should plan on sowing their drier areas first while there is moisture for the new plants. The medium textures might be sown later once you can get on it. On the finer, really wet, sloppy sediment where water takes a very long time to fully drain away, you can't walk on it or get machinery on it. But you need to get plants established before it dries out because it bakes into bricks or curls up like roofing tiles and you won't get anything growing. So your option is to fly seed and nutrients on from above."

The seed will germinate and as it grows, help draw out the excess moisture, and getting roots into the soil that will encourage worms to start creating new channels for air and drainage.

The raw sediment is low in organic matter, which together with soil-life is necessary to build structure. Compost is expensive to buy and truck in, so LandWISE recommended growers grow as much of their own biomass as possible. "You want to grow as much as you can as fast as you can. Get the biological systems running."

> **"You want to grow as much as you can as fast as you can**

Work from 2004 was based on re-establishing pasture. Studies then showed that the sediment was likely to be low in nitrogen and phosphate, so the default position was to sow a ryegrass-clover mix and use diammonium phosphate (DAP) 'to kick it off'. Now soil test results are coming in, the Hawke's Bay group is finding some of the heavier sediment contains more nutrient that expected, even if lower than desired. It suggests there may be topsoil from upstream properties mixed with the river sediment. The Hawke's Bay advice was to drill whatever grass species or winter cereals were available, ideally including a legume, as soon as possible while there was still soil warmth and daylight. In some cases, growers were able to carry on with planned rotations, especially in mixed systems with longer crop rotation cycles.

Flood waters deposited more than a metre of sediment

As plans developed, the benefit of following measured sites over time was apparent. Where the 2004 flooding affected most pastoral farms, Cyclone Gabrielle hit high value horticulture in three key regions. The Heretaunga Plains and Poverty Bay flats have some of the best growing soils anywhere, and different management responses are possible, Bloomer says.

"We were approached by Massey University and AgResearch asking if they could help survey sites. So together with Alec Mackay and colleagues at AgResearch, Alan Palmer from Massey University's Farmed Landscapes Research Centre (FLRC) group, and Stephen Trolove from Plant & Food Research, LandWISE has been collecting a lot of additional information at each site.

Alex Dickson says they've taken nutrient samples, and in target sites contamination samples too.

"We have also collected a lot of extra information about the sediment depth, texture and moisture content. We've looked at the soil underneath. We've done visual soil assessments and counted earthworms and recorded any actions the farmers have taken or plan."

The aim of this extra unfunded work is to establish baselines, so that if a long-term study is possible, there is solid information to work from.

> **"With shallower sediment deposits it is possible to cultivate it into the underlying soil**

In Gisborne, a team from the Gisborne District Council is spearheading data collection from properties affected with sediment and flooding. And another group is doing the same in Northland, looking at the effect of long-term inundation on kumara paddocks. They're using the same data collection protocols as in Hawke's Bay, so all can be used to generate understanding.

One thing that has surprised everyone is a very thin layer under the sediment that has sealed the underlying soil. Once this layer was dug through, soil life was still quite good underneath and earthworms were found.

"A couple of months in, we are starting to see early responses to the grower's management," says Alex. "Growers who used helicopters to spread grass seed and fertiliser have been pleased by the results, watching plant roots develop, creating holes as well as structure in the soil and helping to boost earthworm numbers. Roots are what's going to get things started, and so the bigger and deeper the better.

"We worked on larger farms at first, but we have been trying to get around the little ones. We know they need help too and they don't have the technical backup."

The individual nutrient sampling along with density and quality assessments takes less than an hour.

"That has in most cases been after we have talked to farmers to find out what's going on for them."

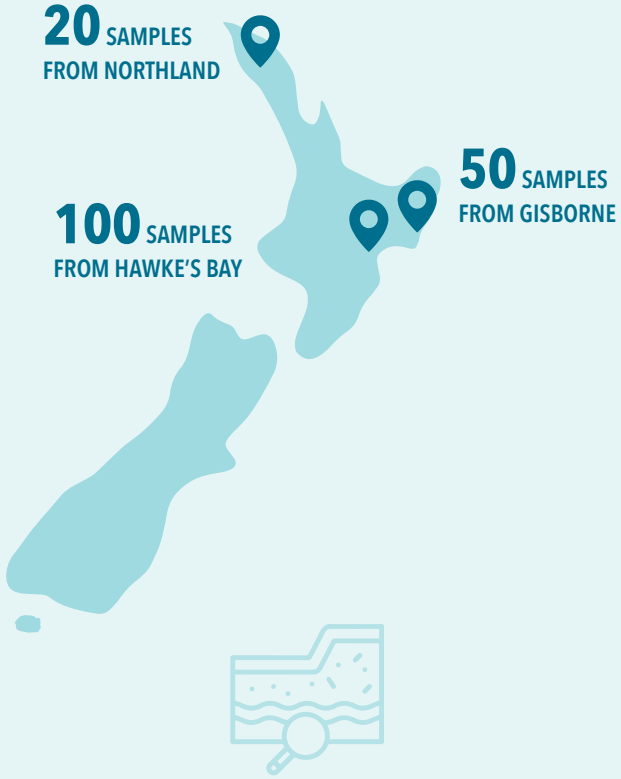
"It starts with a conversation about the flood, the impact it had on the farm and the actions they took in the days following the flood," Dan says.

"Quite often growers have an idea of what they want to do but seem to like running their plans by someone else. They've been through a traumatic situation they've never experienced. They want someone to talk to, kick ideas around with, and resolve in their own head what's next."

The discussions were very helpful in identifying where best to collect samples to provide the growers with useful information going forward.

The hope is that properties being sampled through the study will be followed over the next three to five years with the aim of finding out the best approach to remediating soils. That way the 2004 information can be expanded to cover a wide range of land use types, and we can leave even better guidance for growers adversely impacted by future weather events.

SOIL TESTING OF SEDIMENT DEPOSITED BY CYCLONE GABRIELLE



SOIL TESTING OF SEDIMENT DEPOSITED BY CYCLONE GABRIELLE HASN'T UNCOVERED ANY 'SMOKING GUNS' IN THE FORM OF ANY CONTAMINATION SO FAR

COLLABORATION KEY TO INDUSTRY'S FUTURE – PUKEKOHE YOUNG GROWERS

Pukekohe Young Grower winner Taylor Leabourn

Last month the horticulture industry came together to watch eight young horticulturists battle it out for the Pukekohe Young Grower title. HELENA O'NEILL chats with the contestants about what's on the minds of our young growers as they look to the industry's future.

Held on 19 May, the competition tested competitors' vegetable and fruit growing knowledge and the skills needed to be a successful grower. While those competing were keen to take home the top prize, they all agree the competition is an excellent opportunity to meet like-minded young people in the industry and to share experiences and knowledge.

Taylor Leabourn is an agronomist for LeaderBrand and was born and raised in suburban Auckland. The 28-year-old had never entered something like the Young Grower competition before and thought it would be a great opportunity to learn more about the horticulture industry outside of lettuce and broccoli.

"It's good to put yourself out there and try something new – learn as you go. It's been really good to meet everyone, we've come from different backgrounds and parts of the industry."

Taylor won the 2023 Pukekohe Young Grower competition and will compete on his home ground at the national Young Grower of the Year in Pukekohe on 4–5 October.

"It's been a tough two years, off the back of Covid-19 and the summer we've had. The thing that scares me a little bit is food security and how people rank it. People are constantly complaining about the cost of vegetables, but if you look out the window and see it's absolutely teeming with rain: you can't pull broccoli from nowhere."

Coming from an urban background, Taylor has developed a passion for growing and says the industry needs to share that passion with consumers.

"I would love for us as an industry, or as a country, to be better at telling horticulture's story," he says.

That wish for the industry featured in his competition speech, with his chosen topic on social media as a modern tool to better tell horticulture's story, ideally creating a 'Horticultural Influencer'.

Taylor says industry initiatives like the Horticulture New Zealand Leadership Programme – which is designed for potential or current leaders in the fruit and vegetable industry – are really beneficial for horticulture.

The Pukekohe contestants

"It was great, I highly recommend it. We had a great group of people wanting to learn, and Sue [Pickering] runs such a great programme as well."

Fellow competitor Chris Lowe, 26, orchard manager at Punchbowl PackCo Ltd, also took part in last year's leadership programme.

"It was quite interesting having 20-odd people in a similar age bracket, facing the exact same problems across the industry. The same with an event like this, it's great to have a yarn and pick everyone's brains and see if you can come up with some solutions."

Chris says it's important to network and build connections with other growers to strengthen the industry.

Kate Miln, 27, is an assistant grower at Gourmet Waiuku Ltd, growing capsicums for both local and export markets.

"It's a fascinating industry: the growth and the innovation are amazing. There's so much that can happen, so much that we can do going forward. Everyone that works in the industry is so passionate and happy to share their knowledge."

She says some of the long-term challenges for growers include the selling of productive land for housing, changing climate and adverse weather events, and meeting energy needs.

Zachariah Stelts, 23, is a glasshouse technician for T&G and agrees that growing land being swiftly being converted to housing is a major challenge. This feeds into the wider issue of land cost, Rajpreet Singh (25) says. The business development manager for Dhindsa Farm Ltd says land availability and expansion can be tricky for horticulture. On a more positive note, Rajpreet says people in horticulture are welcoming, and willing to share ideas and experiences, which in turn feeds passion within the industry.

Janardin (Jana) Bhana is a 28-year-old machinery operator for Hira Bhana. He says that increased pressure on growers has forced many out of the industry, which makes it harder for those remaining.

Like Jana, Myles Fong also comes from a long-established Pukekohe vegetable-growing family. The 27-year-old is a crop production manager for Desloe Produce Ltd.

"My dad said there was a lot less red tape than there is now … I think that can be more efficient and if the government listens to us, the growers, a bit more and hears our side for everything. We don't want to pollute the environment or things like that."

With a shrinking industry, having a strong growing community is more important than ever, Myles says.

"Networking is pretty important. You come to these things to build relationships, bounce ideas off each other, and create relationships with industry stakeholders too. If I wasn't here today, I wouldn't have the opportunity to be working so closely with Plant & Food Research … it's good to have them here at the competition."

Like his fellow competitors, 27-year-old Zi Jia Teo retains a love for the horticulture industry despite the many challenges it faces. The agronomist for Woodhaven Gardens looks after crops such as spinach, silverbeet and celery. For him, the competition offered a chance to leave his comfort zone and accept new challenges – something that our young horticulturists are ready and willing to do to grow with the industry.

The 2023 Central Otago Young Grower of the Year competition was held on 26 May. Regional competitions will be held in Nelson on 7 July, Bay of Plenty on 12 July, Gisborne on 20 July, and finishing in Hawke's Bay on 10–11 August.

URGENCY NOW REQUIRED IN CYCLONE RECOVERY, GROWERS SAY

Photos: Paul Taylor

Without government support for clean-up, a lot of silt is still sitting on farms and orchards

Several months after Cyclone Gabrielle tore a destructive path through Hawke's Bay, orchardists and vegetable growers are frustrated by the lack of leadership. While the numbers speak volumes, BONNIE FLAWS finds that it's growers' personal stories that paint the big picture.

"If we don't get this right, and fast, the impacts are going to be long-lasting," says Lesley Wilson.

The implication is that the Hawke's Bay's economy and social fabric will come under pressure if timely and well considered decisions aren't made by those at the top, to support growers in the aftermath of flood devastation.

An orchardist in Dartmoor, Lesley and her family have farmed there for decades. But one of the family homes and orchards was directly in the path of one of the first stopbank breaches.

The damage was horrendous, and she and her family are now working to get hundreds of thousands of tonnes of woody debris and silt – mountains that literally dwarf people – off their property before any remedial work can begin.

In total, two homes and three properties were affected. They have now picked what remained of the apple crop – about 30 percent – and have managed to remove debris from trees so that they will be able to grow a crop next year. Trucks sent by the regional council are arriving regularly to remove woody debris, but the process is slow going, she says.

Insurance payouts have been made for flood damaged vehicles and house contents, but like so many things, the claim on her damaged houses won't be accepted until the government makes clear which homes will be allowed to rebuild and which ones won't. And while she has no desire to rebuild the house that took the brunt of the water – the geography is too dangerous – the home she lived in with her husband is repairable.

While the government has announced the criteria it will use to guide these decisions, they have not yet been made. And the more difficult cases such as Lesley's are being left until last.

"There are no timelines on that. So I guess one of the major things is that we really need some urgency around this. We've got people up the valley living in caravans and tents, house buses. These are people wanting to be back on their farms.

"I understand that they are going to make the easy decisions first, but they should have been made already.

"We're going into winter and people with kiddies are living in containers, there are retired people moving a caravan and tent onto their property today. We just need some quick decision making so we know what we are doing."

Winter is coming

Talking to growers, I've heard this refrain a lot. And by the time this story hits print, winter will well and truly have arrived.

Hawke's Bay Fruitgrowers' Association president Brydon Nesbit notes that the bay has had exceptionally lovely weather throughout April and early May, which has helped dry everything out, but a lot of silt is still sitting on farms and orchards. Once the real winter weather hits, the silts could alternate between dust and mud – neither are pleasant prospects.

Central government funding for silt and debris cleanup has only recently been announced – for growers in Hawke's Bay and Tairāwhiti there's $70 million.

"It's a bit difficult – on the one hand we are grateful and we always appreciate funding and it is great they're giving us a hand, but it's still nowhere near enough. It's actually less than ten percent of what we've asked for, but we've only asked for half of the $1.5 billion that Horticulture New Zealand estimates is needed. Growers are asking for $750 million and we've been given $70 million," Brydon says.

The funding is on a cost-share basis and capped at $210,000 per commercial property.

But Brydon says even with this package, there will still be growers who can't afford to pay their half, and for many growers, cleanup costs run into the millions. Others are underinsured. And every grower is in a unique situation because the volume and types of damage vary widely depending on what was upstream.

"It depends how big their blocks are, what the silt is like, what their balance sheet is like. Remembering that we've had two hard years and there are many growers out there that were in debt anyway, and had to borrow to get the crop to where it was.

$3.8 BILLION

DIRECT AND INDIRECT LOSSES IN HAWKE'S BAY BETWEEN NOW AND 2030

$1 MILLION PER DAY

LOSSES OF HAWKE'S BAY HORTICULTURE INDUSTRY

$1.5 BILLION

ESTIMATED COST OF CLEANUP FOR HAWKE'S BAY GROWERS

$70 MILLION

CENTRAL GOVERNMENT FUNDING SO FAR FOR SILT AND DEBRIS CLEANUP IN HAWKE'S BAY AND TAIRĀWHITI

$1.2 BILLION

HAWKE'S BAY HORTICULTURE'S CONTRIBUTION TO THE NEW ZEALAND ECONOMY

6700

PERMANENT HAWKE'S BAY WORKERS EMPLOYED IN HORTICULTURE

Source: Boston Consulting Group report

"They were hoping for the harvest to pay back the debt for the next coming season, and now they will be wiped out. So the banks aren't chomping at the bit to give us more money. They are waiting for the government to move."

Central Hawke's Bay vegetable grower Hugh Ritchie says complaints about how long things are taking to get done are a fair grievance. Things haven't been moving as fast as initially promised, and it is putting mental stress on people far more than is needed.

"I was there when they made promises about getting things done, and it just hasn't happened."

Hugh has just finished shifting over 10,000 tonnes of sand back into holes that the velocity of the flood water carved out, and flooded farm cottages are waiting for assessors to take a look.

"We lost all of our carrots, beans, most of our squash, and all of our sweet corn was wiped out. But we are very lucky to have a mixed business and our beef and lamb went well the year before, and we still have a maize crop. Financially, we are probably in quite a lot stronger position than many people, I suspect."

He reckons he's lost about ten kilometres of fencing, and just shy of $1 million in gross income, and has spent about $300,000 shifting soil.

"We've probably lost more soil than we've gained, including a lot of valuable top soil, but we have grass back in and it's looking okay," he says.

Lambs will come back onto the paddocks of the crops they've lost, and so he thinks he'll be in a position to sow new crops fairly quickly.

He had been particularly lucky – and thankful – that friends and volunteers had come to work on the farm cleanup. He knows of others whose mental health isn't as good because they have a bleaker short term future, with more difficult situations.

"You have to be mindful of that."

Looking ahead

After three months of initial shock and stock-taking, growers are now able to see what needs to be done and are thinking about medium-to-longer term sector recovery.

After the cleanup is finally done, blocks will need to be replanted, posted, wired and irrigated, all of which requires more money, in an environment where banks and insurers are feeling nervous. Everyone is looking to the government to lead the way, growers say.

The region's horticultural sector is at an important crossroads, and decisions made now will make it or break it, according to analysts.

A Boston Consulting Group report commissioned by Rockit says there is potential for Hawke's Bay to suffer about $3.8 billion in direct and indirect losses between now and 2030 unless immediate investment is made. A staged recovery plan has been proposed, with the aim of creating a higher value and more resilient and innovative sector by the end of the decade.

Yummy Fruit grower Paul Paynter, who suffered major damage to his operations, reckons the sector could shrink by a third in a worst-case scenario. He can even see a potential scenario in which Esk Valley still looks the same in ten years – the levels of investment needed to replant it in grapes and orchards could be too high.

"We're all broke. Our bank security was our orchards and they're not worth so much anymore."

He has laid off 21 people to cut costs and get in the good books with the banks, he says. The only other option was to inject capital and there was none.

"My view is that cleanup is a fair taxpayer expense. You could make the argument that investments in producing a crop that is now gone is fair too. This is particularly so in Pakowhai where it was an infrastructure failure that could be put partly down to slash, partly policy and management of riparian strips, and partly to management of waterways.

"There are lots of angles to argue that some responsibility rests with the Regional Council. I'm sure foreign reinsurers will explore potential legal action in these areas as they'll be out of pocket hundreds of millions."

This is a view shared by Hugh Ritchie, who says if council had focussed more on flood protection systems, things might not have been so bad – he believes his own property wouldn't have flooded at all if shingle had been cleared from the Waipawa River.

Paul Paynter's own idea is that a government issued 20-year Gabrielle bond with a 4.5 percent coupon rate could be a solution. In this model, orchards and vineyards would borrow based on a business proposal in the same vein as the Provincial Growth Fund at about five percent. Initially taxpayers would pay the interest to give growers time to get fruit production to reasonable levels and generate cashflow and break even. Then growers would be responsible for the interest and amortisation for the following 16 years.

Brydon says there will be knock-on effects for the wider region if investment isn't made: businesses, employment, social cohesion, shrinking Gross Domestic Product, rising food prices. After all, Hawke's Bay is the country's food producing centre.

"What we are trying to get through to the government is that either way it's going to cost them, so it's better to get the growers up and running now, or they'll pay at the other end."

> **"WE JUST NEED SOME QUICK DECISION MAKING SO WE KNOW WHAT WE ARE DOING.**
>
> LESLEY WILSON

> **"WE ALWAYS APPRECIATE FUNDING, AND IT IS GREAT THEY'RE GIVING US A HAND, BUT IT'S STILL NOWHERE NEAR ENOUGH.**
>
> BRYDON NESBIT

> **"THEY MADE PROMISES ABOUT GETTING THINGS DONE AND IT JUST HASN'T HAPPENED.**
>
> HUGH RITCHIE

> **"THERE ARE LOTS OF ANGLES TO ARGUE THAT SOME RESPONSIBILITY RESTS WITH THE REGIONAL COUNCIL.**
>
> PAUL PAYNTER

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MORE STRAWBERRIES COMING FOR NEW ZEALAND CONSUMERS

By Anne Hardie

The opportunity to expand strawberry consumption in New Zealand has prompted large-scale market gardener JS Ewers near Richmond to develop a 4ha block under cover.

The Waimea Plains market garden, which is a subsidiary of the MG Group, plans to plant the area this winter, with the first berries potentially picked in late September for a season that will run through to May.

General manager Pierre Gargiulo says the development will enable its customers and consumers to have strawberries on the shelf consistently, for a longer period and in doing that, the business will do its part to increase strawberry consumption in New Zealand.

He says the strawberry category in New Zealand does not have the same level of consumption when compared with other countries including Australia, the United States, United Kingdom and large parts of mainland Europe. In those locations, he says berryfruit outperforms bananas and tomatoes.

"There's definitely a huge opportunity for all strawberry growers to contribute to an expanding category, with under-cover cropping helping put good quality fruit in front of Kiwi consumers more consistently and over a longer period.

"We have an opportunity to increase consumption and grow the overall category through providing a longer season and more consistent supply, which is something all strawberry growers can get excited about."

> "We have an opportunity to increase consumption and grow the overall category

Pierre says customers in the South Island recognise the importance of the berryfruit category and have a strong appetite to expand their offering to consumers with berries grown under cover.

The strawberries are primarily destined for South Island customers but will also head to other markets around the country when required. The market will determine the price, based on supply, quality and consistency. The real value for customers and their consumers, he says, will be the ability to have strawberries consistently on the shelf over a longer period.

Strawberries are a new crop for JS Ewers, which has 250ha of outdoor land growing vegetables 365 days of the year and 13ha of glasshouse growing indoor vegetables.

JS Ewers employee Kent Elford works on the construction of the 4ha development

Construction of the strawberry development will be completed in time for planting

The strawberries are going under large steel hoops covered in high-grade plastic material, with plants grown on standing gutters above the ground. Apart from avoiding weather challenges, Pierre says the system enables them to grow the berries in a more environmentally friendly way with less inputs, and also makes them more efficient to pick.

Many of the 145 permanent staff employed by JS Ewers will work between the outdoor operation, hothouses and the new under-cover berry operation, with 40 more employed through the strawberry harvest. Pierre says labour is an ongoing challenge and the company is constantly looking at new ways to attract new people.

LIFTING THE BAR:
NEW SEED VARIETIES 2023

Consumers are very aware of the escalation in fruit and vegetable prices. Statistics New Zealand recorded an increase over the prior year of 22.5 percent for fruit and vegetables (April data) against an overall food price increase of 12.5 percent.

For consumers to continue to add fresh whole foods to their trolleys we need to be able to make a strong case that our produce is worth the price. A key determinant of this perceived value will inevitably be quality. Healthy, generously sized vegetables which are fresh, vibrant and store well, but also taste great, all contribute to the value perception at point of sale.

How we lift the bar as an industry is in the continuous improvement process of new variety introductions. For this we must thank the tireless efforts over many decades of our seed breeders, and our seed companies who take these innovations through to the New Zealand market in partnership with our grower innovators 'in the field'.

Our vegetables are not only great value for money when it comes to food choices, but new and exciting varieties deliver even more to the plates of New Zealand families. We must proudly tell our story of excellence, quality and the extraordinary health benefits of vegetables, but also grow our best performing seed selections for the future to ensure the public continue to choose to follow a diet rich in fruit and vegetables.

> "Top picks of the most exciting new varieties in the coming season

The following pages provide an insight into some of our seed companies' 'top picks' of the most exciting new varieties available to growers in the coming season.

NEW VARIETIES BY: CLAUSE PACIFIC

BOLOGNIA – LETTUCE

Bolognia is a reliable and adaptable lettuce for the shoulder season in the North Island. It has a sturdy and robust frame that stands tall and supports efficient harvesting. Its large and dark green head produces crisp and fresh leaves.
Bl:16-37 / LMV:1 / Fol:4

PRIMECUT – LETTUCE

Primecut is a new high-yielder green multi-leaf lettuce with a highly vigorous and upright growth habit that provides a clean base for efficient harvest. Its dark green thick leaf with fine leaf petiole offers consistent leaf curvature, making it ideal for a pillow pack. It has a classical 3D leaf type and narrow cut point that is sought after by processors.
Bl:16-37 / Nr:0 / Fol:1 & 4

GLADIADOR – BROCCOLI

Gladiador is an ideal choice for the shoulder season harvest due to its adaptability and vigorous growth. The plant is erect and produces firm heads with fine beads, ensuring consistent quality and high yield. It has strong field tolerance to white blister (Ac).

MAROON SPOON – TATSOI

Maroon Spoon is an attractive, glossy yet dark and deep maroon tatsoi. It has oval-shaped leaves with a slight savoy texture for yield and superb leaf contrast with a dark, glossy, maroon topside and electric green underside. It is a gourmet addition to any salad mix.

ROSA – ZUCCHINI

Suitable for intermediate and warm season production, Rosa is an excellent choice for hand harvesting, with early production and high yield potential. Its medium-sized plant is open and easy to pick. The fruit is clean, smooth, and has a good dark colour, with good powdery mildew and virus tolerance.
IR: Px / ZYMV / WMV / PRSV

OBIWAN – CAULIFLOWER

Obiwan is an excellent option for a high-quality summer harvest, with even maturity and seasonal flexibility. The plant has an upright habit and is strong against leaf disease, with thick leaves that provide exceptional curd cover. The curds are high-quality, white, smooth, firm and heavy, making them a great choice for growers.

NEW VARIETIES BY: ENZA ZADEN

TWISTIQUE (722) – CAULIFLOWER

Twistique is a white cauliflower for the winter period, with very strong curd protection. The plants have good vigour, better uniformity and better shape compared to other late autumn and winter varieties. It has a flexible harvest window similar to Altair.

NOLAF – ICEBERG LETTUCE

Nolaf iceberg lettuce has a very flexible maturity timeslot over autumn (late March to May) and late winter into spring (September to November) harvest. Sure heading under variable conditions, it has a larger and easy to harvest frame, dark green colour heads, well filled internals for fresh and processing use. Use in an extended traditional Pedrola slot.
Resistance Bl-EU:16-36/ Bl-US:1-9/ Nr:0

LEVENTE (0480) – SWEET PEPPER

A highly productive lemon yellow coloured blocky capsicum. It has large 200–230g >90mm fruit that is fast into production and maintains its size at the end of the season. A strong open plant with a thick fruit wall and very low internal fruit rot. Strong against oidium.
Resistance HR TMV:0-2; IR TSWV:0

MALEVI (0501) – SWEET PEPPER

A high production very glossy red blocky capsicum. Medium fruit size 190–210g >85mm fruit of very high quality. A thick-walled fruit with fast ripening, and low internal fruit rot. A compact and open plant habit, with easy fruit setting. It retains fruit size at the end of the crop.
Resistance HR Tm:0-3; IR TSWV:0

NEW VARIETIES BY: FAIRBANKS SEEDS

MCLAREN F1 – BROCCOLI

The world's first **clubroot resistant** broccoli variety from Syngenta. A versatile variety with a large harvest window, suited to both warm and cool conditions. Has uniform maturity with high percentage cut-out on first harvest. Very firm holding, smooth heads with uniform bead size. A nice green colour, with tolerance to purpling versus other known standards.
HR: Pb0,1,3

EL FURIO F1 – SPINACH

A slow growing babyleaf spinach variety from Syngenta, for summer to autumn harvest. Exceptionally dark green, glossy leaf colour, raising the bar for leaf quality. A thick durable leaf with 3D shape, semi-savoy leaf texture and upright habit. Huge yield potential with added field holding ability. It has a significantly increased post-harvest shelf life. Has a strong resistance package to downy mildew and *Stemphylium*.
HR: Pe1-7,9-19, Sb

CLASSIO – LETTUCE

A new double red multileaf frill lettuce with spiky leaf margin from Syngenta. Has extremely high yield and vigour with fast growth speed. Attractive, uniform, durable leaf, with 3D shape and fine stem attachment. Good bolting and tip burn tolerance, suited to year-round harvest. Strong general disease tolerance due to upright habit, with strong resistance package.
Bl: 16-37 EU / Nr:0

ELSIE F1 – CUCUMBER

A new telegraph cucumber variety from Syngenta, with heat tolerance for late-spring, summer and autumn harvest. Has strong plant vigour with an open habit and very high yield potential. High quality fruit, dark green and shiny, with attractive ribbing. Excellent uniformity with fruit length of 31–35cm. Strong powdery mildew resistance.
HR: Ccu, Px IR: Cca, Gc, CVYV

YUMEROMAN F1 – SQUASH

A new Ebisu type kabocha squash variety suited to both export and local markets. A strong and healthy plant canopy, producing reliable high yields of uniform fruit approximately 1.6–2kg in size. Attractive, dark green shiny fruit with good tolerance to sunburn, making for improved presentation to the consumer. Thick flesh, with a sweet nutty flavour. Has long storage potential, giving extended shelf life compared with existing standards.

EL BANGARRA F1 – SPINACH

A new spinach variety from Syngenta with good vigour for cool-shoulder season harvest. A dark green, extremely thick leaf with a smooth or very light savoy texture. Excellent leaf uniformity with a rounded shape, giving high yield potential. An upright habit for ease of harvest and reliable production in challenging weather conditions. Strong general disease tolerance, including high resistance to downy mildew and *Stemphylium*.
HR: Pe: 1-7, 9-19 / Sb

NEW VARIETIES BY: LEFROY

NIRVANA – SWEET CORN

An early maturating bicolour sweet corn. It has a 20cm cob with excellent tip fill. Excellent eating quality with creamy yet still sweet kernels. Strong emergence, with a sturdy average sized plant. It has a wide harvest window. An easy snap for hand harvesting, and suitable flag leaf.
IR: Et, Ps, MDMV

DUKE – PUMPKIN

A pumpkin with excellent bright orange flesh and a small cavity. A smooth medium grey skin with a smooth rib. Excellent yields with fruit weighing 3–4kg. Matures between Pacific King and Invincible. Use for storage or fresh market.

TIBURTYNO – CHERRY TOMATO

A 15–20 gram cherry tomato presented on a beautiful fishbone truss. Round fruits are bright red, and tasty. Has a great post-harvest shelf life. Excellent continuity of production and earliness. Tiburtyno is highly productive. Loose or truss pick.
HR: ToMV:0-2, Fol:0-1, IR: Ma,Mi,Mj, TYLCV

INCA – ROCK MELON

A mid-maturity extended shelf life (ESL) sutured rock melon. Has a mildly netted skin with excellent internal colour and a small cavity. The fruit weigh 1.6–1.9kg with a brix of 12–14. Productive easy setting for second early and main season harvest.
HR: Gc 1,2 & Fom (Gc = powdery mildew and Fom = *Fusarium*)

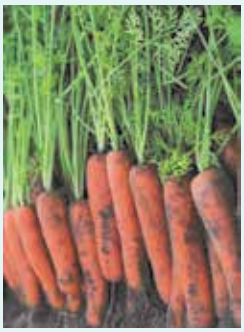
OLMEC

Mid maturity long shelf life (LSL) sutured rock melon. Mildly netted with excellent internal colour and a small cavity. Fruit weigh 1.6-1.9kg with a brix of 12-14. Productive easy setting for second main and late season harvest.
HR: Gc 1,2 & Fom

LYDIARD – SUMMER CAULIFLOWER

An excellent white and well tucked curd delivering a good size and weight. The plant is strong, and the jacket and wrap are excellent. Harvest from early December until mid-late April dependent on location. Very adaptable and very reliable.

NEW VARIETIES BY: PREMIER SEEDS



NATUNA F1 – CARROT

A high-quality variety for late summer, autumn through winter production. Natuna stumps early in its cycle, then fills, producing smooth, cylindrical roots. Production is enhanced through supply of primed seed, achieving uniform emergence and high populations that maintain marketable root lengths of 16–18cm. Natuna notably is well coloured, exceptionally strong against breakage and field holds well into early spring.

PINNAROO – ONION

A vigorous Early Long Keeper variety for sowing from mid to late June through to late July. Pinnaroo's quality is enhanced through supply of large, precision graded 2.00–2.75mm seed size, providing a solid foundation for seedling establishment in cool winter conditions. Earlier and more uniform establishment is achieved through use of primed seeds. Pinnaroo displays hardiness throughout its growth, finishing with excellent skin quality.

AMELIE – CHERRY TOMATO

A new high yielding red cherry tomato with an average fruit weight of 15–19g. A very uniform truss with firm fruit. The fruit have a round shape, shiny red colour, good taste, and long shelf-life. Increased truss branching for increased yields. A vigorous plant with a strong root system, suitable for truss and loose harvest. Intermediate resistance to powdery mildew and tomato spotted wilt virus are a welcome bonus.

LIRIA – CAULIFLOWER

Liria is a summer cauliflower that has proven itself to be a consistent performer, continuing to gain favour in the New Zealand market. It has a strong upright frame and produces heavy white curds that are well covered by wrapper leaves. Liria matures in 12 weeks providing good yields with a high percentage cut out rate. This maturity dovetails with other summer standards, making it easier to plan continuous harvesting in a cauliflower programme.

EUNICE – LETTUCE

A new lettuce suitable for spring through to autumn harvest. Produces a nice dark weighted green head. Very uniform, clean cut with a high harvest percentage cut-out rate. It has a medium frame size with good internal colour and acceptable flavour.
HR Nr0, TBSV; IR FS4, Bl 16-37

CLAREMONT – BROCCOLI

A new summer to autumn Batavia type broccoli with clubroot resistance (Races 0,1,3). It produces a nice fine bead from a tight, well domed and weighted head that sits low in the plant.

NEW VARIETIES BY: SOUTH PACIFIC SEEDS

MONROE – LOLLO BIONDA LETTUCE

Monroe is a vigorous Lollo Bionda lettuce for use in hydroponic systems year-round. The extra vigour of Monroe is especially advantageous during the cool season or during periods of low light, although it can be used throughout the season. Monroe forms large heads and is up to ten days faster to mature in winter than the market standards.

TITUS – ICEBERG LETTUCE

Titus is an exceptionally versatile warm season iceberg suitable for harvest from early summer through until late autumn. Titus forms a medium to large head and nicely complements many of the slower growing, more compact true summer types that may struggle for size in mild or adverse conditions.

CONQUEROR – GREEN CABBAGE

Conqueror is a high quality, drumhead cabbage for warm season production. It has high resistance to clubroot. Conqueror produces a green, medium-sized head with exceptional internal qualities. A key feature of this variety is the soft, sweet flavour ideal for salads. It produces an upright, mid-sized frame offering protection from the sun. This variety offers exceptional uniformity and holding ability, allowing for high cut-out rates. CRR Clubroot Resistance

HEIDI – CELERY

Heidi is a vigorous, main-season celery with dark green foliage and long, broad stalks. Heidi produces tall, upright bunches which are easy to harvest. A uniform variety, Heidi is strong against cracking at the knuckles and shows strong tolerance to *Septoria* spotting. Heidi performs well under cool and challenging conditions. It is suitable for both sleeving and naked presentation. Also available as primed pills.

TANTO – BUNCHING ONION

Tanto is a high quality, hybrid bunching onion for warm season production. A highly uniform variety, Tanto produces long white stems with attractive dark green leaves. Firm, upright stems make this variety an attractive bunching onion for both sleeve and banded display. Tanto is easy to pull and clean and has shown good tolerance to brown tips and bulbing.

DYNAMO – WATERMELON

Dynamo is a seeded watermelon for early and main season production. A vigorous plant with a good canopy, Dynamo has exceptional fruit set, producing high numbers of quality fruit with excellent internal qualities. Dynamo produces fruit with a thicker rind, important for preserving fruit quality during handling and transportation. With sweet and dense red flesh, it provides a superior eating experience.

NEW VARIETIES BY: TERRANOVA

JUBILEE – PUMPKIN

Jubilee is our new hybrid, grey pumpkin with high yield potential and exceptional storage. A medium sized fruit between 3.5 and 4.5 kgs, with a thick shoulder, small seed cavity and good internal colour. It has an attractive appearance, exhibiting a small blossom end scar and maintaining the grey skin colour during storage.

STOAT RZ – SPINACH

One of two new hybrid spinach varieties from Rijk Zwaan, **Stoat RZ** is a slower growing variety, best suited to summer harvest. It has a dark green, medium savoy, oval leaf, holding the leaf size for a wider harvest window. Very uniform, with an upright growth habit. It has strong resistance to *Fusarium*, with a resistance package covering downy mildew and *Stemphylium vesicarium*. The robust leaves have a high dry matter content which handle the washing and drying process very well.
HR Pe:1-18/SV IR:19.

TARSIER RZ – SPINACH

Another new hybrid spinach variety from Rijk Zwaan, Tarsier is very vigorous, exhibiting excellent establishment. Best suited to warm shoulder seasons and summer in most areas. Very similar in habit and appearance to Sunangel RZ; slower growing in the warmer season, and the leaves will be slightly less savoyed and slightly darker green. Tarzier RZ will compliment Sunangel RZ to spread maturity for harvesting. Strong against *pythium*, *fusarium* and anthracnose, with a resistance package:
HR Pe:1-7,9,11-19/Sv IR Pe:8,10.

AZZEDINE RZ – LETTUCE

One of two new lettuce varieties from Rijk Zwaan, Azzedine RZ is a glossy red, oak-leaf lettuce. It is a 'one-cut-ready' Salanova® variety with Knox™ for delayed oxidation. Suitable for year-round production in most areas. Resistances are HR: Bl:16-37EU/Nr:0/Pb IR: Fol:1.

EXFRAME RZ – LETTUCE

Another new lettuce variety from Rijk Zwaan. Also a Salanova® variety with the benefits of Knox™. This is a crisp, green, incised leaf lettuce, with a softer leaf shape than other varieties of this type. It is capable of impressively high yields.
Resistances are HR Bl:16-37EU/Nr:0 IR LMV:1/Fol:1.

CARMINE – RED ONION

Our new early red onion is Carmine. It produces vigorous plants with thin necks for a uniform top fall. Carmine is strong against bolting. Globe shaped bulbs with good size and a dark shiny red colour. It is best suited to May sowing in Pukekohe, resulting in top fall in early December.

United Fresh
New Zealand Incorporated

United Fresh has been working towards a sustainable fresh fruit & vegetable industry in New Zealand since 1991

United Fresh, New Zealand's only pan-produce industry organisation representing the entire value chain turned 31 last year. This is a great achievement for the non-profit industry organisation that relies on a voluntary membership from the New Zealand fresh produce industry to carry out the industry good work that has become award winning over the years.

To follow are some of the projects United Fresh will be working on during 2023:

REPRESENTING NEW ZEALAND INTERNATIONALLY

United Fresh represents New Zealand on the board of the International Federation for Produce Standards which is focused on improving supply chain efficiency of the fresh produce industry through developing, implementing and managing harmonised international standards.

More recently United Fresh has joined the board of the Global Coalition of Fresh Produce addressing increasing cost pressures for the fresh produce industry nationally and globally and the impact it is having across the whole value chain.

WOMEN IN HORTICULTURE (WiH)

United Fresh has taken over the leadership of Women in Horticulture (WiH) as of April 2023.

This is an exciting opportunity to champion women and diversity in our industry for the best possible productivity through inclusivity.

A strategy meeting is planned to coincide with this year's Horticulture New Zealand Conference in August. In the meantime, a database of interested people within our industry is being developed to enable WiH to connect to the regions and the activities planned around New Zealand.

FRUIT AND VEGETABLES IN SCHOOLS

United Fresh has managed the government-funded Fruit and Vegetables in Schools (FIS) initiative for over 20 years. This is now considered a gold standard programme.

FIS runs throughout the country in 566 schools reaching around 125,000 tamariki and school staff, equating to over 27 million servings of fresh fruit and vegetables delivered and eaten annually.

New data from an external evaluation of FIS from May 2023 shows:

- 97% of principals rated the management of FIS good/great
- 93% reported that FIS is a great support for feeding hungry children with healthy food
- 92% of principals said FIS supported a healthy food environment

THE 5+ A DAY CHARITABLE TRUST

United Fresh established the 5+ A Day Charitable Trust in 2007 to promote the consumption of fresh fruit and vegetables for all Kiwis.

Our communications strategy for this year is focused on the value of fresh fruit and vegetables with the objective of changing the narrative around cost. In season fresh fruit and vegetables are always the best value and our seasonal promotions build on this by providing recipe and serving inspiration.

Work through our United Fresh Technical Advisory Group includes:

FRESH FACTS

United Fresh is currently working on the next edition of Fresh Facts with input from members and industry. Plant & Food Research and Horticulture New Zealand (formerly responsible for the publication of Fresh Facts) have both indicated that they will remain strong supporters under United Fresh stewardship.

We look forward to publishing this valued resource in September this year.

SUSTAINABILITY GUIDELINES

In November 2022, United Fresh was a key organiser of the inaugural Global Sustainability Symposium held by the International Federation for Produce Standards (IFPS).

Since then, the UF TAG team has made it its business to understand New Zealand's sustainability position a whole lot better. This has resulted in the publication of our Guidelines for the New Zealand Fresh Produce Value Chain, working towards achieving the United Nations Sustainability Development Goals (SDGs).

The document provides guidance on how a fresh produce focused business, operating in Aotearoa New Zealand, can structure its sustainability journey with the help of the SDGs.

Produce value chain participants are encouraged to start their sustainability journey or validate what has already been achieved with the help of this guide available for download on our website **www.unitedfresh.co.nz**

If you would like to know more about United Fresh projects or how to become a member of United Fresh, please make contact with the management office by email **info@unitedfresh.co.nz** or call **0800 507 555**.

Join us on LinkedIn

USING GREEN COVER CROPS TO INCREASE YIELD

Anne Hardie

A New Zealand study has found green cover crops can reduce the need for nitrogen applications for vegetables.

The study, funded by the Rural Professionals Fund, showed a green cover crop grown prior to planting a potato crop captured more nitrogen from the atmosphere and produced a higher-yielding crop that was better quality.

One of the researchers, Dom Ferretti, says though it was a small-scale project, it is one of the first times the advantages of green cover crops have been directly measured in New Zealand and commercial growers can now benefit from the information.

"I'd really like people to at least consider this seriously and if they think it looks quite good, try it out on half a paddock to see if there is a difference."

He says the time is right to consider alternatives to synthetic fertilisers due to rising costs and increasing regulation.

The organic market gardener and former scientist teamed up with consultant Sjef Lamers from Sustainable Nutrition to carry out the trial on his Tasman property at Brightwater. They grew potatoes in the trial because they are a longer-growing crop, are an easy vegetable to use to measure yield, and need reasonable nitrogen for initial growth.

A control plot of potatoes was grown on soil that had been bare, while another plot was grown on an area that had been sown with the legume tic beans, mixed with oats. The third plot was sown in solely tic beans. The green crops were chopped up into the surface of the soil and left for a week before planting the Agria potatoes.

Soil tests were done throughout the nine-month trial as well as biomass tests on roots and tops of plants for dry matter. The figures from the green crops showed an input of 10 tonnes of dry matter per hectare, which Dom says is equivalent to adding about 17 tonnes of compost.

"It's all grown here on-site minimal cost. From the dry matter results and nitrogen content that was measured in the lab, we worked out how much nitrogen the legumes captured."

The legume crop captured 289kg N/ha, while the mixed legume and oat crop captured 198kg N/ha. That reflected the ability for the legumes to fix nitrogen out of the atmosphere, he says.

Dom Ferretti says there has never been a better time to use green cover crops

Oats are a grain and have higher carbon content which takes longer to decompose, and he says that could be useful for growers to use as a slow-release carbon in their crop management.

"For a fast-growing, hungry crop you would use the legumes, and if you had a slower growing crop, then you might choose the slower release mixed-green crop."

The cover crops released nitrogen as they broke down in the soil, and the timing was quite well matched for the potato crop to use it. Using Nitrate Quick Test strips enabled them to easily measure nitrates in the soil throughout the trial, and these showed that the high peak of released nitrogen from the legume crop coincided with rapid potato growth.

When the potatoes were harvested, the legume plot produced 33.5t of potatoes per hectare compared with 30.6t/ha for the mixed cover crop and 30t/ha for the control plot.

"The legume crop captured a lot more nitrogen and we saw it quickly released at a high rate, and we saw a higher yield of potatoes because of it."

Potatoes were graded into size and the mean tuber weight was higher in the legume plot at 71gms versus the control plot at 63gms. The legume plot also had a higher number of larger tubers, while the control plot had the

highest number of smaller tubers. Dom says that meant the legumes produced more potatoes that were marketable. Compared with the control plot, there was an extra 4.3t/ha of marketable potatoes grown in the plots following legume green crops, and an extra 1.7t/ha of potatoes grown in the plots following mixed-green crops.

While green crops add nitrogen into the soil, Dom says they can reduce or stop excess nitrogen from leaching through the soils during their growth.

"If there's a plant there to grab it, it can stick it in the pantry for you to use later."

Green crops decompose over a period of a few weeks or months and Dom says that means they act as a slow-release nitrogen fertiliser, so less leaching is likely. He says more studies need to examine this further though.

"If you were putting on synthetic nitrogen and there was a high-rainfall event, you would lose some or possibly most of that with leaching."

Now that the trial is completed, Dom says they will be running a few numbers to work out the economics of growing a green crop for vegetable production.

"We are interested in the long-term profitability over a typical vegetable rotation of five years. Estimating nitrogen losses is also important and preliminary modelling of this will be done.

"There's a lot of good work going on at the moment with projects like the Sustainable Vegetable Systems nitrogen management tool N-Sight. Soon growers will be able to use the tool for the nitrogen budget of their crops, and account for previous crop residues and get guidance on fertiliser recommendations. If our green crop results can feed into that tool, then there will be greater confidence for growers to use green crops as a nitrogen source rather than synthetic nitrogen.

"Once people try it, I think it will all fall into place because they will quickly see the benefits."

> **"Hopefully there will be people who go wow, that is pretty decent, I might give it a crack**

From his own experience growing green cover crops, Dom says nitrogen is only one of the benefits. Longer term, the soil has more organic matter, better soil structure and fertility, improved aeration and drainage, increased microbial life and more earthworms.

"If you can add green crops into your rotations, the benefits will multiply over the years."

Looking to the future, he says some of the crops that might easily benefit from green crops are corn, pumpkin, squash and zucchini. With those crops, the green crop can just be flattened onto the surface of the soil and the vegetable crop planted into it in a no-till situation. That would reduce or eliminate synthetic nitrogen requirements for pumpkins and add large amounts of organic matter into the soil.

"There's never been a better time to use green crops, and we hope people will see this study and try it for themselves. There's data from overseas, so we wanted to show some numbers from a study in New Zealand and hopefully there will be people who go wow, that is pretty decent, I might give it a crack."

ZOOMING IN ON FARM SOIL
BIODIVERSITY AND DRAINAGE

Supplied by the Hedgehope Makarewa Catchment Group / Thriving Southland

Southern Cross Produce field manager Jesse Malcolm checks out organic potatoes at their Woodlands processing facility

Knowing exactly what's below the ground is proving valuable for Woodlands based Southern Cross Produce – especially with growing demand for organic vegetables.

Southern Cross Produce grows about 20ha of carrots and about 80ha of parsnips, which is more than 50 percent of the all the parsnips sold nationwide. The temperate Southland climate and good soils result in higher crop yields with low disease pressures compared to many other regions.

So when the company was offered the opportunity to participate in a case study as part of the Hedgehope Makarewa *Catchment Group's Understanding Our Land to Drive Change* project it was happy to get on board.

The project, funded by Thriving Southland, uses state of the art technology to map the landscape and its interaction with water quality and greenhouse gas (GHG) emissions.

Invercargill based Land and Water Science has worked alongside the catchment group to create content, using airborne radiometric data to improve and refine existing soil maps, and data from a drone survey to create high-resolution hydrological layers for people to access. The project work also involved "ground-truthing" to validate the accuracy of the radiometric data.

Airborne radiometric methods are used to determine the natural radioactivity (gamma radiation) of near-surface rocks and soils using a gamma ray spectrometer installed in an aircraft. The measurements reveal information on rock and soil properties, particularly their contents of natural radionuclides. The results of the survey are presented in the form of maps indicating total radiation and the concentrations of potassium, uranium and thorium.

Southern Cross Produce managing director Matthew Malcolm says the mapping will be particularly useful for the growing organics market, where traceability is even more important.

As one of the case study properties, it has been really beneficial to add the new information to their toolbox. The data confirmed a lot of what they had learned from running the operation over the years.

Areas of the property with heavier soils could be grazed or planted as appropriate, and it has been useful to know exactly where one soil type turned into another type.

Ultimately, they want to be good custodians of the land, Matthew says.

"It's a good add-on, and we want to be more conscious of what happens in the wider area, and making sure we are doing the right things."

Southern Cross Produce field manager Jesse Malcolm checks out organic potatoes at their Woodlands processing facility

The Makarewa River and its tributaries have been mapped, and divided into seven sub-catchments, because of the level of detail, and four case study properties have been selected to give insights on their landscape susceptibility and resilience as a cross reference of the land use and elevation or location within the whole catchment.

Land and Water Science founder and director Clint Rissmann says the property specific information provided insights into landscape susceptibilities.

The mapping showed the catchment had highly variable landscapes, and this meant a one-size solution for water quality and GHG mitigations would not fit all areas.

Hedgehope Makarewa Catchment Group project lead Tim Campbell, who also works for Land and Water Science, said the catchment contains quite a diverse range of industries.

"It was great to gain an insight into horticultural land use, understanding what their landscape susceptibility challenges are in their industry, and as a community how we can support them with a project like this."

The mapping has given Southern Cross Produce more insight into the biodiversity of their soils, the soil drainage properties on their farm, and will help to inform farm planning, including freshwater farm plans.

"It's about providing tools and resources so they can make these decisions," Tim says.

Thriving Southland catchment coordinator Sarah Thorne says the project has been three years of hard work by the catchment group.

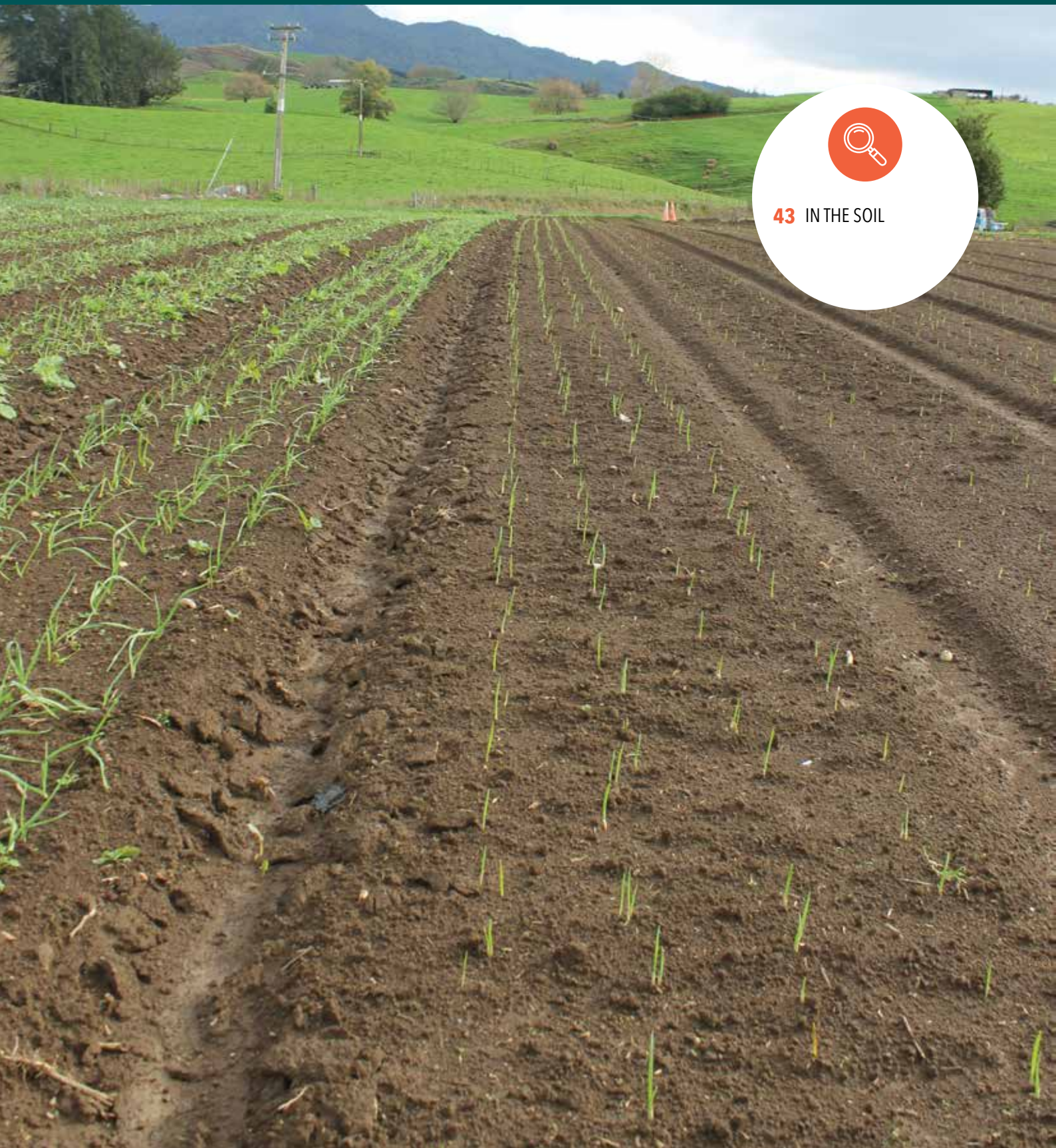
"They have created something really special. They wanted the information to be free, easy to use, and really useful for any property in their catchment. Looking after their catchment and its community is super important to them," she says.

More at:
www.thrivingsouthland.co.nz/hedgehope-makarewa/

Anyone can access the online maps at:
https://bit.ly/HMCGstorymap

TECHNICAL

THE LATEST INNOVATIONS AND IMPROVEMENTS



WHAT IS HAPPENING IN THE SOIL?

Bruce Searle and Trish Fraser : Plant & Food Research

Soil nitrogen (N) is a key factor influencing crop production and the environmental impact of a crop or a rotation. The soil nitrogen content is a summary, at a point in time, of factors affecting crop growth and soil N processes. Having some idea of what is happening to the soil N content could help explain why certain outcomes have been achieved, in terms of yield and N left in the soil after harvest, and inform decisions for subsequent crops to improve N efficiency and sustainability.

There are different ways that mineral N accumulates in soil.

- One of these is fertiliser. Add N fertiliser and it will become nitrate or ammonium and both increase the mineral N content of the soil.
- Another way is via mineralisation of organic matter. A small amount of organic N is mineralised into mineral N every day – the rate at which this happens depends on the time of year, soil temperature and moisture. Over time, this daily mineralisation accumulates if not taken up by plants, or is lost via leaching or gaseous emissions. A PMN (potentially mineralisable nitrogen) test estimates the total amount that could be potentially mineralised over the upcoming four months after the test. Using this test, the amount of N that will become available during the months that the crop is growing can be estimated.
- A similar thing happens with the residues of previous crops – N will become available from the crops at a rate that depends on the type of residue, soil temperature and moisture.

While mineral N can accumulate in the soil because of these factors, it can also simultaneously be reduced by crop uptake, leaching in drainage of excess soil water, or gaseous losses. Soil mineral N content reflects the balance of these different processes.

Based on this, knowing the soil mineral N content, the likely amount becoming available either via organic matter mineralisation or from residue decomposition, and the amount a crop will take up, the optimal amount of N fertiliser to achieve best yield and best environmental outcomes, can be estimated. This is the basis of the tool being developed in the Sustainable Vegetable Systems (SVS) project.

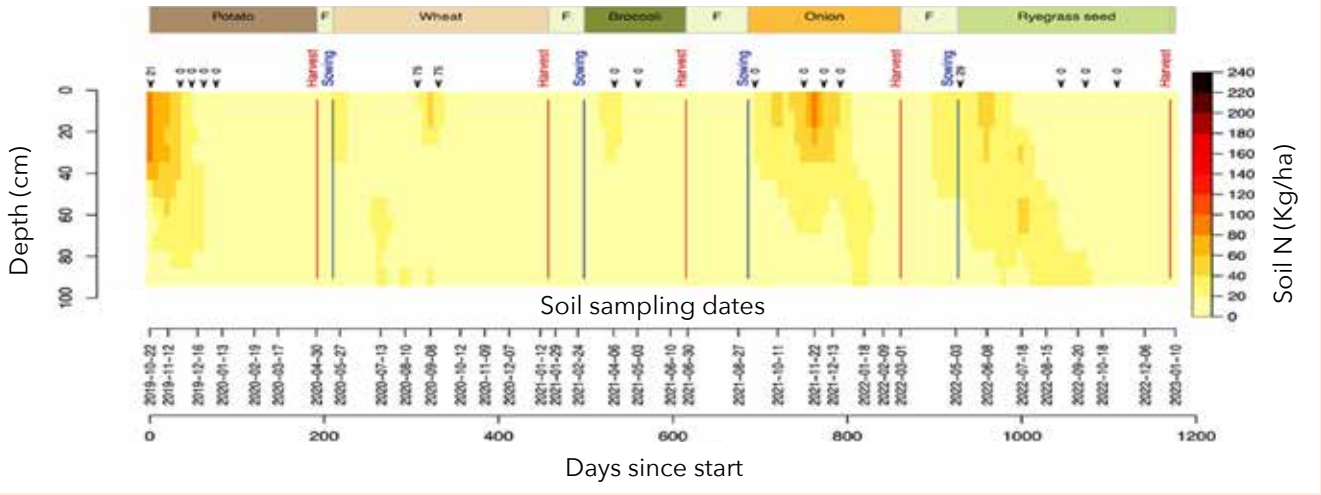
While a one-off soil mineral N test can help identify best fertiliser application rates, ongoing tests (e.g. using a nitrate test-strip) can help adjust fertiliser N supply to the dynamic changes due to plant uptake, soil mineralisation and residue decomposition rates.

In the SVS programme, we have followed changes in soil mineral N content across different rotations at approximately monthly intervals, as well as measuring crop N uptake. In each rotation, we had plots with different N fertiliser rates. We have used geospatial statistical methods to develop a 'map' of soil mineral N in time and soil depth (0–90 cm) for these rotations (see Figures 1 and 2). In Figures 1 and 2, light yellow indicates lower amounts of soil mineral N, and red indicates higher levels of soil mineral N. For each rotation, we show a plot when no fertiliser is added (except for the wheat crop in Rotation 1) and when best management practice rates were applied. The no-fertiliser plot shows what happens when the only supply of mineral N to the system comes from soil mineralisation and residue decomposition.

For most of the rotation, large portions of the soil mineral N are less than 40 kg N/ha. There are periods where soil mineral N increases due to different inputs and is notably higher in the plots receiving best management practice N. Adding fertiliser also subsequently resulted in soil mineral N being higher at depth compared with no fertiliser, where the N was not immediately used by the crop.

Soil mineral N content was seen to increase during the fallow periods. By crop sowing time, the soil mineral N was commonly higher than during the fallow period leading up to when sowing started. This is most clearly seen in the fallow period between the oat and potato crop in Rotation 2 (Figure 2). The residue component of the oat crop was 9 kg N/ha as only a little stubble was left behind in the field. The increase in soil mineral N during the fallow period was close to 60 kg N/ha – so most of this was due to mineralisation of soil organic N, not from the oat residue component. This is something to be aware of as the risk of N loss during a fallow period can be higher because there is no crop present to take up the nitrogen. This risk further increases when the fallow period occurs during warm, moist conditions, which are particularly favourable for soil N mineralisation.

Rotation 1 – no fertiliser



Rotation 1 – best management rates

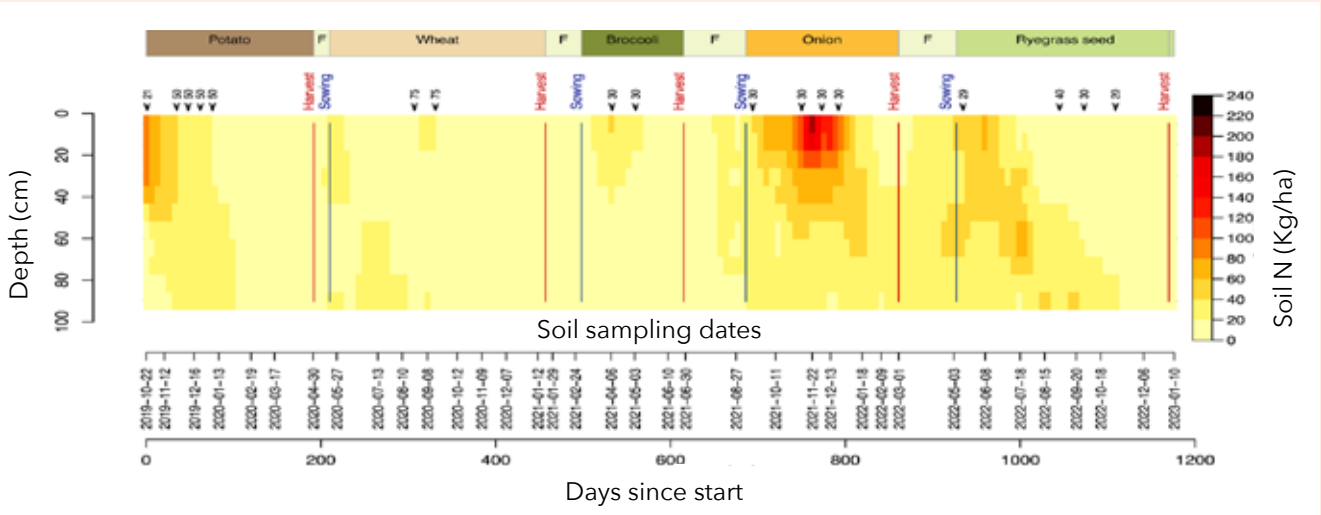


Figure 1. *Rotation 1 soil 'maps' depicting soil mineral nitrogen (N) content by soil depth (0–90 cm) and over time. Rotation 1 of the Sustainable Vegetable Systems programme was grown at the Plant & Food Research farm in Lincoln, Canterbury. The plots show soil mineral N for plots where no fertiliser was added and plots receiving estimates of best management fertiliser rates. Amounts of soil mineral N were measured once every month at the depths of 0–15, 15–30, 30–60 and 60–90 cm. Amounts of fertiliser applied (kg N/ha) and time of their application are marked using small arrows beside corresponding values.*

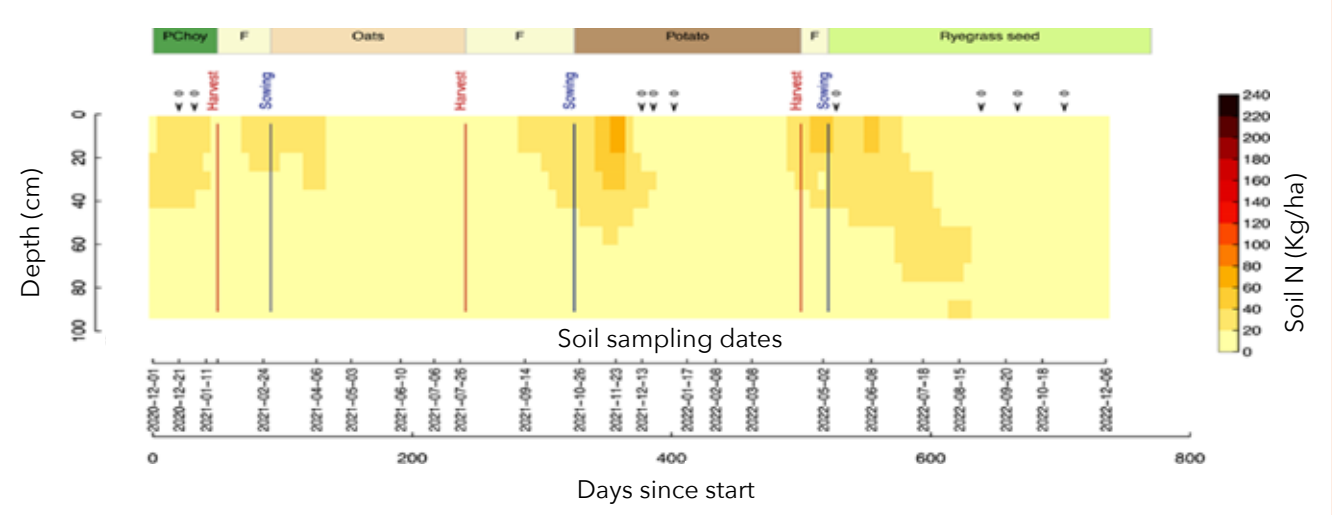
The plots also show occasions when the changes in soil N can be caused by release of N from the residues. For example, this can be clearly seen in the onion crop following broccoli in Rotation 1 (Figure 1). In the middle of the onion growth there is a sharp increase in the amount of mineral N in the top 30 cm of soil, and to a lesser extent to depths of 60 cm in the best management practice treatment soils. The residue measured in the broccoli crop was 68 kg N/ha where no fertiliser was added, and 106 kg N/ha where best practice fertiliser rates where used. This is very similar to the increase in soil N content observed.

In hindsight, the application of N fertiliser to the onion crop was badly timed, as it occurred at the point when N was also released through residue decomposition. This highlights the importance of taking previous crop residues into account, and within SVS the tool is developing an approach to help address this at a basic level. A more comprehensive approach based on evaluating the type of residue (e.g. leaf vs stalk) is an ongoing focus and recognised need.

This map of soil N data also highlights the value of knowing something about your soil through testing. A quick assessment of soil mineral N using a nitrate test strip just prior to a side-dress application would undoubtedly help take account of the dynamic changes that occur in soil N content.

Also worth noting is the different pattern of soil N movement between the potato crops in the two different

Rotation 2 – no fertiliser



Rotation 2 – best management rates

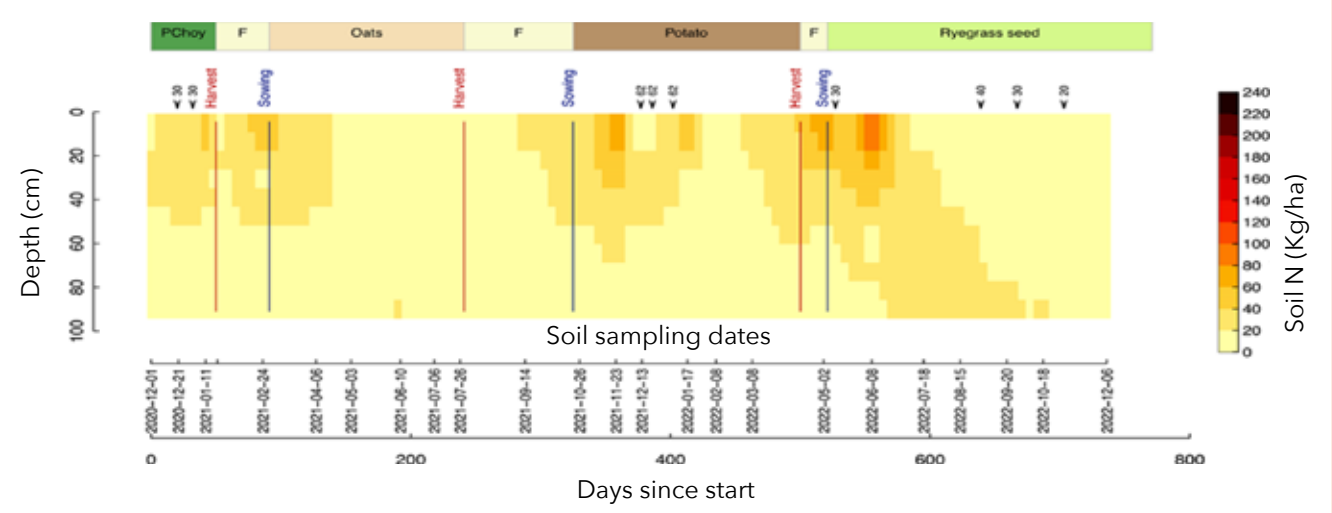


Figure 2. *Rotation 2 soil 'maps' depicting soil mineral nitrogen (N) content by soil depth (0–90 cm) and over time. Rotation 2 of the Sustainable Vegetable Systems programme was grown at the Plant & Food Research farm in Lincoln, Canterbury. The plots show soil mineral N for plots where no fertiliser was added and plots receiving estimates of best management fertiliser rates. Amounts of soil mineral N were measured once every month at the depths of 0–15, 15–30, 30–60 and 60–90 cm. Amounts of fertiliser applied (kg N/ha) and time of their application are marked using small arrows beside corresponding values.*

rotations. In Rotation 1, potato was the first crop of the rotation (following a pasture). At the start there was a relatively high level of soil mineral N (as expected after pasture), and some movement of N below 60 cm. This was more marked in the best management treatment and coincided with the fertiliser N applications. After this, there was a decrease in the soil N content as the crop uptake removed N from the soil. In contrast, the soil N under the potato crop of Rotation 2 was maintained at a more constant amount throughout the life of the crop. This demonstrates the impact of different management.

For Rotation 1, the Potato Calculator was used to determine the rate of N to maximise yield – 221 kg N/ha. Side-dressing dates were selected based on best knowledge.

For Rotation 2, the SVS prototype tool was used to achieve the target yield requiring 186 kg N/ha. The prototype tool also set the timing of side-dressings based on changes in estimated soil mineral N content. During growth of the crop, we used nitrate test strips to check soil N content before every side-dress application date. The soil N was lower than anticipated at the time of the third side-dressing and an additional 20 kg N/ha was applied for a total of 206 kg N/ha. But this seems to have resulted in a more even supply of N to the potato crop in Rotation 2 (compare Figures 1 and 2) and a higher yield (82 t/ha versus 73 t/ha). In the next article, we will look at how different management and soil N movement influenced N balance outcomes.

EL NIÑO LIKELY TO BRING LESS WINTER RAIN FOR AOTEAROA

Chris Brandolino : National Institute of Water & Atmospheric Research (NIWA)

After three years of a rare 'triple-dip' La Niña bringing warm, wet summers to Aotearoa New Zealand, forecasters are now expecting that El Niño conditions may arrive during winter. NIWA's analysis at the time of writing (mid-May) indicates that El Niño has a 70 to 80 percent chance of developing during winter and continuing through spring.

The current atmospheric configuration is very different to the same time last year. June and July are on track to see a reduction in the amount of tropical and subtropical moisture available to passing weather systems, and therefore overall drier conditions are expected.

El Niño Southern Oscillation: what is it?

El Niño and La Niña are opposite phases of a naturally occurring global climate cycle known as the El Niño Southern Oscillation, or ENSO for short. ENSO influences rainfall, temperature and wind patterns around the world, including New Zealand. El Niño and La Niña episodes occur on average every few years and last up to around a year or two.

Although ENSO has an important influence on New Zealand's climate, it accounts for less than 25 percent of the year-to-year variance in seasonal rainfall and temperature at most locations. Nevertheless, its effects can be significant.

What does El Niño mean?

Typically during an El Niño event, ocean water from off the coast of South America (near Ecuador and Peru) to the central tropical Pacific warms more than average. The warming takes place as trade winds (the permanent east-to-west prevailing winds that flow around the equator) weaken or even reverse, allowing for warm water from the western Pacific to move toward the east.

As a result, sea temperatures in the far western Pacific can cool below average. The unusually warm water in the eastern Pacific then influences the Walker Circulation (the circulation of air flow in the tropics caused by differences in heat distribution between the ocean and the land), acting as a focal point for cloud, rainfall and thunderstorms. It is this change in the Walker Circulation that impacts weather patterns around the world.

This year, changes observed to the equatorial Pacific Ocean during April included a sharp warming trend. The 30-day value reached 2.53°C above average, including warming of over a degree during April. This was the highest monthly value since July 2015, which occurred before the onset of the most recent El Niño (2015 to 2016, which saw a moderate-to-strong El Niño).

El Niño's average influence on New Zealand

It is important to remember that while we know the average outcome of El Niño because of historical data, no El Niño is average – each comes with a unique set of climate characteristics and therefore can be expected to influence the weather differently.

That said, during El Niño, New Zealand tends to experience stronger or more frequent winds from the west in summer, which can encourage dryness in eastern areas and more rain in the west. In winter, the winds tend to blow more from the south, causing more frequent cold snaps across the country. In spring and autumn, southwesterly winds are more common.

Outlook for winter

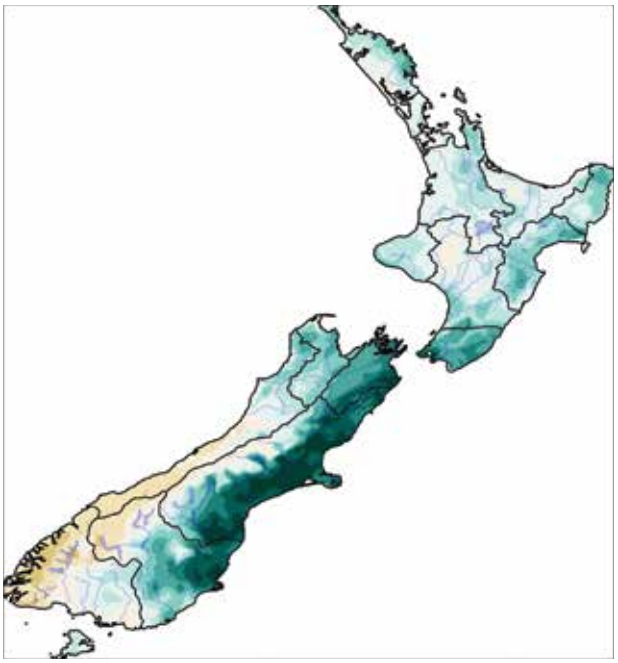
The start of winter is likely to be a pivot point. The persistent wetness and warmth that much of New Zealand has experienced in recent months, due in large part to the triple-dip La Niña, will give way to an eventual reduction of rainfall for many of the places that have experienced excessive rainfall this year.

We are also likely to experience more frequent southerlies, or cold snaps, this winter. However, this doesn't guarantee a cold winter. Other factors will play a role, such as local and regional sea surface temperatures and snowpack quantities.

But even if winter temperatures turn out to be near average, after three consecutive record warm winters, many people may find it relatively cold this winter.

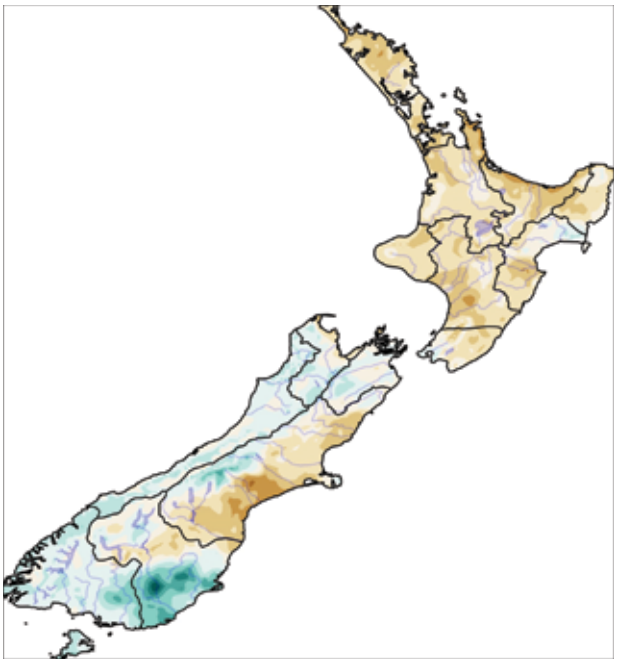
Winter rainfall La Niña & El Niño

La Niña

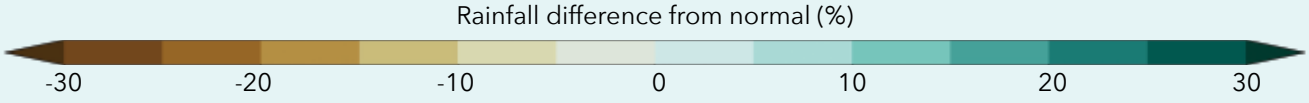


Winter La Niña years: 1973, 1974, 1975, 1978, 1981, 1988, 1996, 1999, 2021, 2011, 2013, 2021, 2022

El Niño



Winter La Niño years: 1972, 1977, 1982, 1987, 1993, 1994, 1997, 2002, 2015



Data: NIWA Climate Station Network (VCSN). Anomalies are calculated with reference to a 1991-2020 climatology. Winter refers to the meteorological season which runs from June-August

For the most up-to-date information, check out our Seasonal Climate Outlook for winter (June to August) at **niwa.co.nz/outlook**.

PRODUCT GROUPS

ALL THE LATEST NEWS FROM YOUR PRODUCT GROUPS

Process Vegetables NZ

New Zealand Asparagus Council

NEW RESOURCE FOR PROCESS VEG AND ASPARAGUS GROWERS

Matt Thorn : business manager (Process Vegetables & Asparagus) Horticulture New Zealand

I am really thrilled to be returning to my roots as Horticulture New Zealand's new business manager (Process Vegetables & Asparagus). I am based in Wellington, but born and bred on the land and still retain my rural ties even when working in professional roles.

I grew up on a tobacco and hop farm in the Ngātīmoti district near Nelson on the banks of the picturesque Motueka River. My brother and I bought the farm from my parents and have spent four years developing the operation further. We have 28 hectares and are a leading producer of premium hops, including Nelson Sauvin™, Riwaka™, Nectaron®, Green Bullet™, NZ Southern Cross™, Pacific Gem™, Wakatu™, Sticklebract, Motueka™ and NZ Pacific JadeTM, for New Zealand and international breweries. The farm is now on a long-term lease so I can focus on work in Wellington.

But hops aren't my only link to the land. I've also distributed cherries around the Wellington region, and promoted kiwifruit in the late 1990s for Zespri across 46 states in the United States.

Since graduating with a B Com Hort from Lincoln University, I've spent most of my time exporting apples. I first started in the supply team at ENZA in Nelson and moved to exporting apples and pears through private companies after deregulation, one of which was Golden Bay Fruit.

I now feel that I have enough experience working on the land and in the marketplace to properly represent the horticulture community in Wellington.

Because of my hands-on background, I know only too well what it's like to be a grower and the challenges that New Zealand presents in terms of growing and trading conditions.

I can help growers not only get to grips with government policies but also to capitalise on opportunities and tackle

Matt Thorn

in-the-field problems that sometimes require a combined approach to solve.

Over the next few months, I will be profiling the processors starting in Hawke's Bay seeing how we can help growers to recover from cyclone Gabrielle. Growing for process might work as a short-term replacement crop, before planting permanently next winter.

The Asparagus Council is looking into the opportunity of exporting for the upcoming 2023 season. The main purpose of this is to diversify the customer base and income to growers. We are looking at running a programme starting in mid-October.

I look forward to meeting many of you as I visit the regions. Please feel free to contact me at:

027 553 7848
matt.thorn@hortnz.co.nz

TomatoesNZ

UPDATES FROM THE TOMATOESNZ BOARD

Dinah Cohen : TomatoesNZ Inc business manager

At the last board meeting in May, TomatoesNZ directors agreed that the focus for the next 12 months should be on the following three areas:

1. Readiness work for priority biosecurity risks.
2. Energy projects that help growers with the daunting task of reducing their energy demands, ultimately working towards decarbonising the covered crop industry by 2050.
3. The use of Integrated Pest Management (IPM) programmes with continued research into beneficial insects.

These are all areas that TNZ has already been active in but with a new focus: I would like to invite all tomato growers to take part in a very short energy survey on your growing site which will help us best direct resources and when available, funding opportunities your way. This survey should only take minutes and should be completed by one representative for each site. You can find it here: **https://forms.office.com/r/gn2W2s9Wcq**

This is a good opportunity to remind you of the do-it-yourself tools available on the Energy Efficiency & Conservation Authority (EECA) website which, as we head towards the cooler months of the year, are a great starting point for you to think about small changes that you could make – for instance the checklist and energy calculator: **www.eeca.govt.nz/co-funding/sector-decarbonisation/covered-cropping-decarbonisation-pathway/tools-and-resources/**

It is also a timely reminder to download Elly Nederhoff's Covered Crops: Greenhouse Energy Efficiency e-book (or email me for a printed copy). This is a user-friendly guide based on current practices in the Netherlands about why and how to instigate changes that will lead to you using energy more efficiently while maximising yield: **https://dl.bookfunnel.com/bb6l8oi4bg**

The board received updates on two projects that TNZ levy money has been helping to fund; the 'A Lighter Touch' project with Bioforce and 'Water sampling to better detect pathogens'.

1. A TNZ project in conjunction with 'A Lighter Touch' is aiming to change the face of crop management of greenhouse tomatoes, moving the industry back to an Integrated Pest Management (IPM) system centred on biological control, rather than chemical control, of insect pests. The research trial showed promising results for using some native beneficial insects to control whitefly and tomato potato psyllid (TPP) in a lab setting. See page 52 for an update on this project. Also come along to the Vegetable Speaker sessions on Wednesday 2 August at the Horticulture Conference in Christchurch to hear how these results are influencing updated IPM schedules.

2. The one-year water sampling project was due to end in June, with current findings suggesting that tests on irrigation water can identify pepino mosaic virus (PepMV) as well as possibly other pathogens. This is important for several reasons: It is thought that water testing might be able to narrow down the row in which an infected plant is located and this, along with early detection of a virus, even before symptoms are visible, would greatly reduce the impact on the grower and the industry as a whole. This project has the aim of helping surveillance, not as a means to mount more responses. There is also potential that the type of testing being used could be extended to cover bacteria as well.

A virologist will be presenting at the Vegetable Speaker day as part of the Horticulture Conference in Christchurch so register today to get a more in-depth update on the results of this testing and the potential future benefits for growers: **https://conferences.co.nz/hort2023/horticulture-conference/**

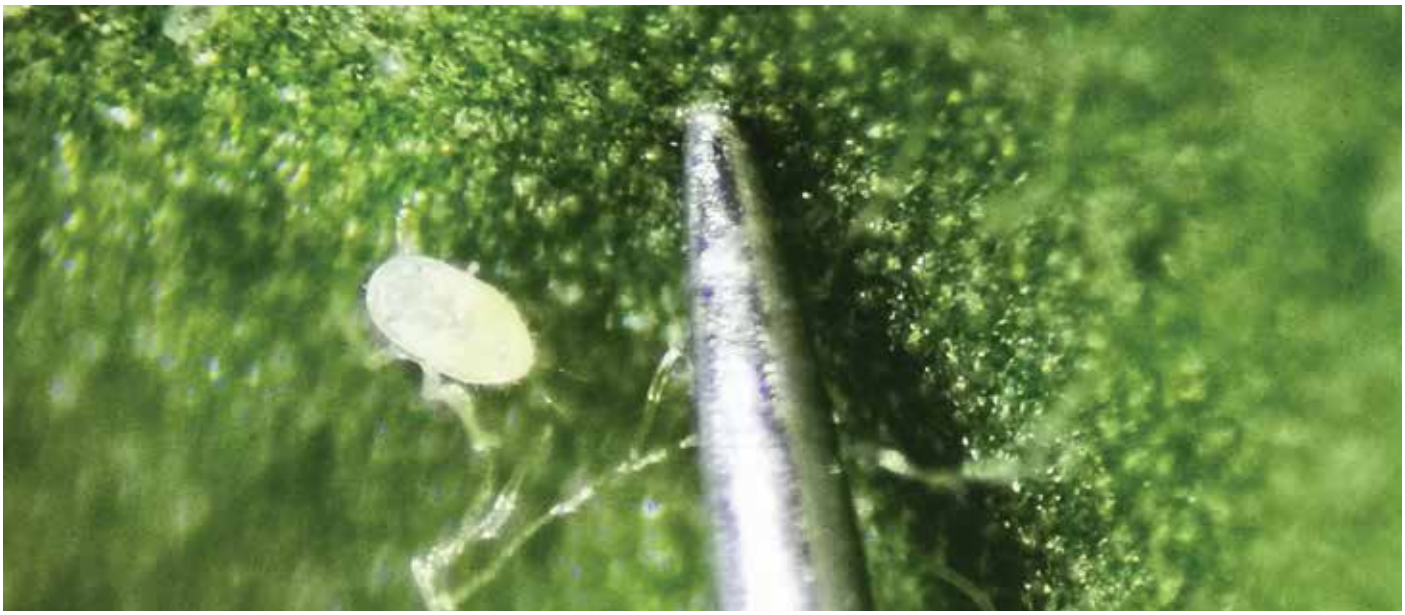
Finally, the TNZ board nominations are now open with two current directors, Simon Watson and Anthony Tringham being up for rotation. Both are standing again. Nomination forms are available from me. Do get in touch if you would like more information on what is involved.

Contact me at:
dinah.cohen@hortnz.co.nz

NATIVE PREDATORS BEING TRIALLED IN GREENHOUSE TOMATOES

Supplied

Photos: Chris Thompson, Bioforce



A whitefly larva next to an acupuncture needle

The potential for native bugs to help control two major greenhouse insect pests is an exciting development in pest control for tomato growers.

A Tomatoes New Zealand project in conjunction with 'A Lighter Touch' is aiming to change the face of crop management of greenhouse tomatoes, moving the industry back to an Integrated Pest Management (IPM) system centred on biological control of insect pests, rather than chemical control.

TomatoesNZ technical lead Lex Dillon says all glasshouse growers, including other greenhouse crops such as capsicum and cucumber producers, have traditionally been big users of biotechnology.

"Tomato growers have been using bumblebees since the early 1990s to pollinate their crops, and they've been using a parasitic wasp *Encarsia formosa* as their main pest control beneficial insect. There's a long history of using biological control systems."

That all changed in the summer of 2005–6 with the arrival of the Tomato potato psyllid (TPP), an overseas pest for which no biological controls were available in New Zealand. The absence of biocontrol tools for this psyllid prompted many tomato growers to move away from biocontrol to more conventional chemical control. Reintroduction of agrichemical sprays in greenhouses in turn disrupted the performance of what had been successful biocontrol of Greenhouse whitefly using the parasitic wasps.

Some growers persevered with biological controls, but these efforts were further compromised by overseas market conditions requiring that crops with a certain amount of psyllids be sprayed.

"From being an industry that was largely using biologicals, many New Zealand growers went back to conventional controls, using agrichemicals."

However, growing pest resistance to agrichemicals had been the driving force behind the growth of biocontrols

in the greenhouse industry internationally, so without effective biocontrols New Zealand growers were also faced with a declining number of new chemical options for pest control, Lex says.

Overseas biocontrol agents were considered for use in New Zealand greenhouses, but proved not to be feasible.

"For the industry to get back on top, the decision was made to investigate what native and/or endemic species were available that could be used as biological controls in greenhouses," he says.

Enter the TomatoesNZ 'A Lighter Touch' project, the primary role of which has been to identify both native beneficials and introduced bugs already present in New Zealand that can be used to control both the Tomato potato psyllid and Greenhouse whitefly, the two major economic insect pests for greenhouse growers.

The project, now in the second year of a four-year programme, involves trials across seven sites, from Auckland to Otago. They range from large commercial operations of ten hectares or more to family businesses which are smaller in scale.

Four beneficial arthropods, or bugs, are being trialled, as a mix of beneficials is required for effective biocontrol.

"With biocontrols, it isn't about one silver bullet. You use a mix of biologicals, with different biologicals controlling different stages of the life cycle of the pests, so we are looking to come up with a package of biological controls that will help growers manage glasshouse pests."

Lex says another point of difference with biocontrol is that unlike chemical control, it's not about wiping out the pest. "To have a population of biologicals, you need a population of pests for them to predate upon, otherwise the biologicals have no food source. It's all about balance, and managing the pest populations so it doesn't impact on fruit quality and profitability for the grower."

There is also a range of 'soft' sprays that can be used in conjunction with biologicals. "The ultimate goal of the project is to add a range of biologicals that can be used in conjunction with soft sprays so that growers can have an integrated range of pest control options. A true IPM programme," he says.

That difference in pest management could be a challenge for growers to come to terms with, but with agrichemical resistance building up, even chemical control is no longer able to eradicate all pests the way they once did, Lex says.

Project technical advisor Chris Thompson, of Bioforce, says earlier research had identified some native arthropods as potential predators of Greenhouse whitefly and Tomato potato psyllid. The field trials now underway were about testing their effectiveness in a commercial greenhouse environment to support observations from the lab plus outdoor trials.

Jackie Bong from NZ Hothouse releasing the predators on to tomato plants

One early observation has seen one of the native bugs released into an established psyllid population in a glasshouse and "rapidly decimate the population of juvenile pests found under the leaves," Chris says.

"This demonstrates that, as was seen in the lab testing, this particular bug can potentially find and predate on juvenile psyllid stages. Of course, the project is still in its early phase, but this observation is a big step in the right direction.

"More research would also be needed to determine how many of the beneficials are required for optimal results, as well as the best time to introduce them in the life cycle of the pest."

If further trials prove these native bugs are an effective predator to whitefly and psyllid, the project also includes plans for growers and bug suppliers to work together on how to establish an economically viable supply of the bugs for growers.

Vermiculite containing the predators on a tomato plant leaf

'A Lighter Touch' agroecological technical lead Jeff Smith says the project is a flagship piece of work for the programme.

"It's the major biological control agent project for the entire programme, and BCAs are going to play a key role in helping move plant food production from reliance on agrichemical control to crop protection with a lighter environmental touch."

Jeff says the idea of using native bugs to control insect pests is novel and generating great interest from growers across the horticulture sector. The concept is one that has the potential to be replicated across other product groups, so results from the project are keenly awaited.

If you are interested in knowing more about these projects and others like them, subscribe to the 'A Lighter Touch' newsletter "In Touch" at **www.a-lighter-touch.co.nz.**

ABOUT 'A LIGHTER TOUCH'

The 'A Lighter Touch' programme is an industry and government partnership supporting New Zealand growers to move to producing plant-based foods with a lighter environmental touch.

Funded by the Ministry for Primary Industries, and a partnership of 15 plant product groups and two crop protection companies, the $27 million seven-year programme started in 2020. Its goal is to help plant food producers move from agrichemical crop protection to an agroecological approach – sustainable farming that works with nature.

A key point of difference about the programme is its collaborative nature, bringing together the horticulture, arable and wine sectors to share knowledge and funding. The long-term goal is to see New Zealand's plant-based food production move to a less chemical dependent future. Learn more about the programme and its projects at **www.a-lighter-touch.co.nz**

Potatoes™ NEW ZEALAND

A TRAILBLAZER IN POTATO PEST MANAGEMENT

Supplied

Integrated Pest Management in action

Potatoes NZ hosted Australia-based Integrated Pest Management expert Dr Paul Horne in March this year. Along with his farm visits and presenting at events, he supplied us with some inspiring case studies.

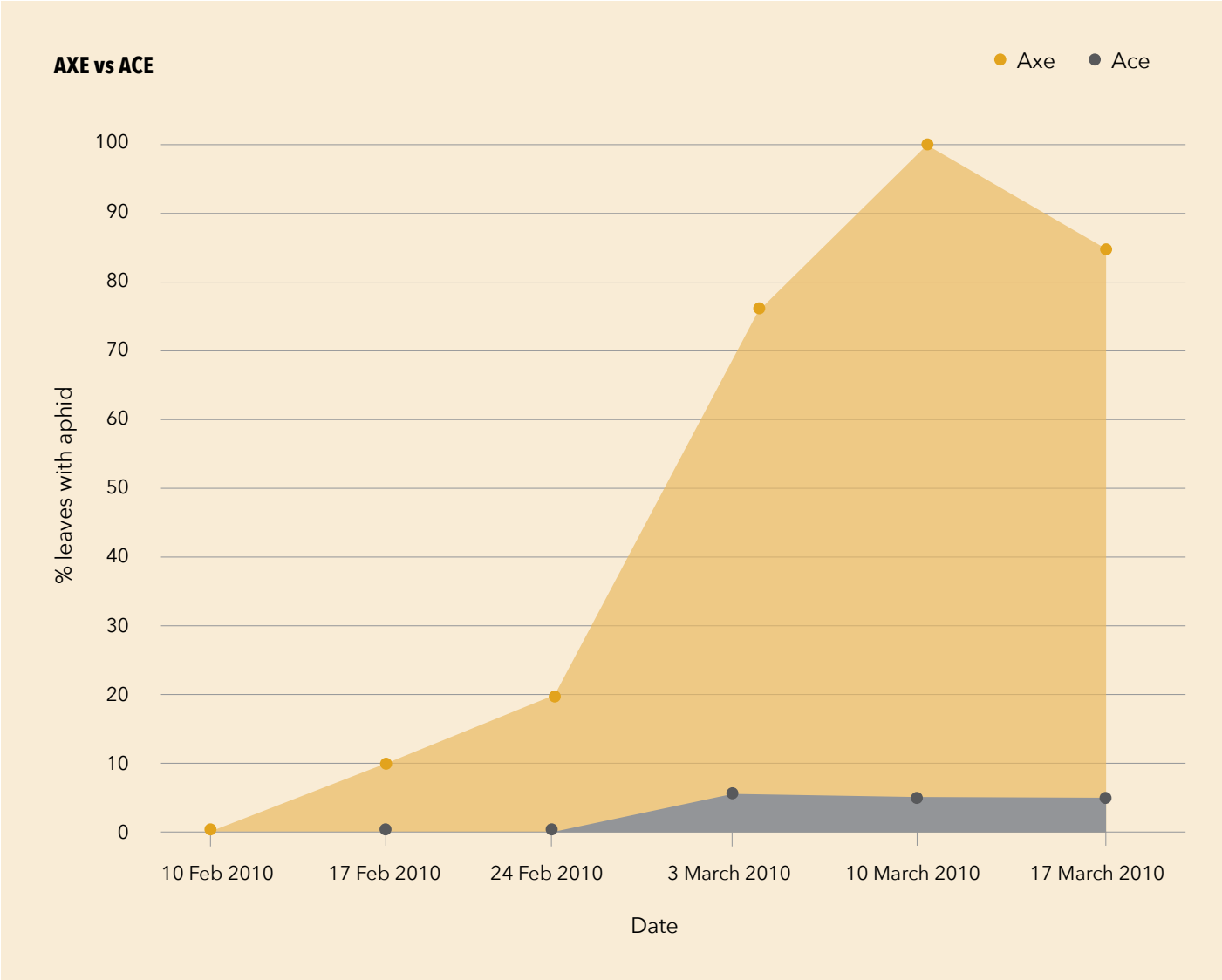
Over two decades ago, Victorian potato grower Wayne Tymensen adopted an Integrated Pest Management (IPM) approach on his farm – and he was one of the first potato growers in Australia to do so. Despite early reservations, Wayne is now reaping the rewards of an integrated approach to pest management.

Wayne Tymensen is a second-generation potato grower based in Gippsland, Victoria. He has grown up around potato production, as his father worked on a potato growing operation before starting his own farm.

While Wayne used to grow about 120 hectares of potatoes each year for the crisping potato industry, this area has reduced to about 23 hectares and he is now involved in a seed-growing operation in the Otway Ranges. He has also diversified, and grows other crops such as maize, wheat and triticale. In addition, Wayne has been on the committee of the Australian Seed Potato Industry Certification Authority AuSPICA (formerly ViCSPA) for well over ten years.

Wayne was one of the very first growers in Australia to change from an insecticide-based strategy to control insect pests to an Integrated Pest Management (IPM) strategy, which he did in 1995. He could also be considered a leader in using IPM worldwide. At present, pesticides are still the basis of pest control in countries such as the United States, the United Kingdom and the Netherlands.

Prior to 1995, Wayne and his father dealt with pests using a regular pesticide-based programme with an insecticide approximately every two weeks – although there were more applications within that period if considered necessary.



Tracking aphid control techniques

Wayne first encountered the possibility of using IPM as a more sustainable approach to pest management over 24 years ago and thought that it was worth a trial. His next-door neighbour agreed. Wayne cautiously began by trialing an integrated approach on two paddocks (each about four hectares) and with more positive results the second year, he started using IPM on the entire farm.

Adopting a new approach required on-farm trials spanning several years. Wayne's IPM advisor Dr Paul Horne also had to learn how to apply his entomology experience to a regular commercial advisory service for potatoes. This collaboration between grower and entomologist allowed IPM to be adopted, and after 20 years this partnership is still going strong.

Wayne has now bought out his neighbour so the farms have effectively become one, and since 1997, IPM has been the basis of pest control. There has not been any thought of moving back to a pesticide-based approach, even though there have been many new products brought to the market over this period.

Instead, Wayne has sought information on what pesticides could be used within his IPM strategy if required and as a result, he has not regularly used chemical insecticides for over ten years, although a couple of times he has applied a bacterial product, DiPel, for loopers. This has not only given Wayne a reduced pesticide bill, but has also resulted in better control of pests.

> **"Wayne used to grow about 120 hectares of potatoes each year... this area has reduced to about 23 hectares**

While previously Wayne would have thought that applying insecticides would always reduce pest numbers and applying less insecticides would increase pest numbers, he has seen the opposite occur, and now would like to encourage his neighbours to stop spraying routine insecticides as that would reduce the pest pressure on his crops.

Control of pests, especially potato moth, has been greatly improved since using IPM. Improved irrigation methods have also helped with the cultural control of potato moth. He has seen just how important a role beneficial species have in crop production and how careful he needs to be in selecting pesticides for a specific need.

In early 2010, Wayne called for a plane to apply a fungicide Ace. However, a mistake was made, and half of the crop was sprayed with an insecticide Axe. Weekly monitoring of aphids showed the difference in aphid counts in the two sections of the paddock. Aphid numbers rose in the section sprayed with Axe because it killed the predators and parasitoids that would have eaten them, which is what occurred in the other half of the crop where there had been no disruption (see graph).

> **"Try a paddock and I would be very surprised if you didn't change over to a full integrated approach**

Seeing this result also emphasised to Wayne just how powerful biological control agents are in his crops. In the early days, not applying an insecticide was difficult when pests were around.

"The only disadvantage is you can feel helpless and a little on edge when the insect pressure is at its greatest," Wayne says. "For example, when you have some very hot weather the potato moth numbers get very high with a crop of potatoes destined for storage. If you apply an insecticide, it feels like you have done something, but you could have actually made things worse."

According to Paul Horne, the IPM Technologies team often recommend a spray of Axe when the crop is dying down or is sprayed off after the beneficial species have done their job, but not during the life of the crop.

Victorian potato grower Wayne Tymensen has adopted an Integrated Pest Management approach on his farm

If he is concerned about insects or insect-vectored diseases, Wayne calls Paul Horne to discuss the potential problems and the options available for control. Given the length of time that Wayne has been using IPM, he is well aware of the advantages but remembers how he felt in the first few years.

"I think if you are unsure about IPM but would like to give it a go, try a paddock and I would be very surprised if you didn't change over to a full integrated approach," Wayne says.

"In the last 20 years I have used fewer insecticide applications on all paddocks than I might have used in a single season per crop before IPM."

For more information about Integrated Pest Management, please contact Dr Paul Horne and his team on **0419 891 575** or email **info@ipmtechnologies.com.au.**

This article is an abridged version of an article from Potatoes Australia magazine, published in NZGrower *with permission.*

STAKEHOLDER ENGAGEMENT AND IN THE PURSUIT OF CHANGE…

Antony Heywood : Vegetables New Zealand Inc. general manager

Sinead and Johanna from EPA speaking with Ben Winkelaar from Exception Ltd about EITE credits

The last 12 months have been hard. If government policy is not hitting us between the eyes, the weather gods have been. In these times it is hard to look out beyond the trees at the boundary fence, let alone think about ways to stay relevant or get ahead with technology. But wait! This may be the perfect time.

How is technology influencing growing food in California?

With recession talk stifling progress, now is the time to set your business on a growth trajectory. Callaghan Innovation has been thinking like that for the last two years. Connecting our smart people with those overseas to create a network of innovation. The latest instalment of this knowledge exchange is the Californian Market Immersion Tour.

The California tour is on the back of the 2035 Oceania Summit in Auckland in October 2022, where Callaghan Innovation hosted a demonstration day with New Zealand growers in Pukekohe. About 50 people attended a covered crop grower tour at NZ Hothouse, followed by a lunch, and finished with a visit to the AS Wilcox processing facility. The grower exchange yielded great discussion and uncovered the reality that growers in the United States and in New Zealand are facing the same challenges – land, water, sustainability and labour.

The grower exchange was so successful that a plan was devised to have regular exchanges between New Zealand, Australia and the United States to share progress on innovation and also provide a path to scale up and embed new innovation onto farms.

Vegetables New Zealand has teamed up with Callaghan Innovation and Plant & Food Research to offer a Californian Market Immersion Tour June 2023. From 11 to 19 June, the delegation will tour the state famous for its wide range of quality produce, visiting large-scale fruit, vegetable and nut-growing operations, cutting-edge research institutions, learning how to seek investment, and about the

Ellery Peters and Talbert and Frans De Jong from Southern Belle Orchards looking at the benefits of dehumidifiers in covered crop operations

Insa Errey from EECA leads a panel discussion at the Covered Crops workshop

government regulations of operating within this market. The programme leads into the 2023 Salinas Biological Summit (20–21 June) organised by Western Growers, and the two-day Central Valley Field Trip (22–23 June) run by New Zealand-based agrifood tech consultancy Wharf42 in conjunction with the 2023 Salinas Biological Summit.

We encourage all growers to support the initiative and register interest on the Callaghan website for this tour or future tours.

https://agritechactivator.co.nz/events/californian-market-immersion

Innovation key to the quickly developing Covered Crops sector

Vegetables New Zealand has been very active in the Covered Crops space since it partnered with the Energy Efficiency & Conservation Authority (EECA) to supply a grower energy transition resource through the appointment of Ellery Peters as energy engineer. Ellery has finalised his report on the six case studies for growers to understand the costs and benefits of energy transition. Ellery then followed up the final energy reports with a grower workshop in Pukekohe in April. The workshop focused on the energy transition options and allowed key suppliers of those options to meet the growers and answer any questions.

The workshop audience also included business owners from the nursery industry. Given the same challenges are being experienced by nurseries as by covered crops, it makes sense to have as many businesses and growers within the food supply chain involved in the process of learning and gaining valuable knowledge from each other.

The Environmental Protection Authority (EPA) Emissions Trading Scheme (ETS) implementation team was also part of the Covered Crops workshop. They presented on how growers can access the Emissions Intensive Trade Exposed (EITE) credits of the ETS. Conversations with smaller growers commonly uncover a perception that gaining EITE credits is difficult, unless you are trading every month. The team from EPA showed how it is relatively easy to connect into EITE credits. Any grower still at a loss on how the scheme works can contact Vegetables New Zealand to see if they can help.

In April, we also joined the Growing the Future Indoors Summit hosted by Callaghan Innovation and Plant & Food Research. This was a showcase of what can be expected from indoor growing. The highlight was a tour of a new tech vertical farm – Greengrower. Global trends in protected and covered cropping show this is a fast-growing sector, and with climatic events significantly influencing outdoor growing in many parts of the world, this trend is likely to continue into the future.

Ellery has spent the last three months understanding how covered crop growers operate, and also what technology is used in New Zealand growing operations. This scan of the industry allows Ellery to better understand what is needed by growers to meet their energy needs, the areas where efficiency can be gained, and then if applicable, fuel switching options to renewable energy sources.

With Vegetables New Zealand in partnership with EECA, Ellery is well placed to be a conduit between Wellington and New Zealand growers. This bridge will pay dividends when the Government Investment in Decarbonising Industry (GIDI) fund is applied to industry technology transfer and pilot studies for innovation application.

ELITE TUNNELS, UK
PROTECTED CROPPING SOLUTIONS FOR GROWERS

Protected cropping solutions have gradually become more prevalent in the horticultural industry as growers search for increased yields, while navigating changing climatic conditions.

Implementation of protected cropping solutions with the latest design of Enviro and High Side polytunnels installed with table-top and trellis systems allow longer harvesting seasons, reduce disease pressure necessitating less chemical input, and facilitate better crop consistency and supply chain management. These benefits have enabled growers to mitigate crop losses and forecast with greater ease as they become non-reliant on weather and working conditions.

Elite Tunnels is a UK based manufacturer and specialist in polytunnels and associated products, and has recently been acquired by the Australian owned Tapex Group, adding to their existing portfolio of horticulture companies, including the New Zealand based operation Empak with facilities in Christchurch and Hamilton. The Elite tunnel design has continually increased its market presence in Australia for the last decade and is now extending its reach in New Zealand, with four major projects in the market to date via Empak.

Advantages of Elite Tunnels:

1. Highest quality European sourced materials.
2. Unparalleled service support and response to customer needs.
3. Highly experienced team with over 15 years in manufacturing and supply across the world
4. Bespoke table-top and trellis design systems

Elite Tunnels global sales manager Ross Watt has been serving and providing solutions in protective cropping to growers in Australasia for over ten years.

Key Contact Details

Ross Watt, Global Sales Manager

Mobile: **+44 (0) 7841 532 652**

Email: **ross@elitetunnels.co.uk**

Shane Burns, Empak Protective Cropping Solutions

Mobile: **027 535 4886**

Email: **sburns@empak.co.nz**

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