

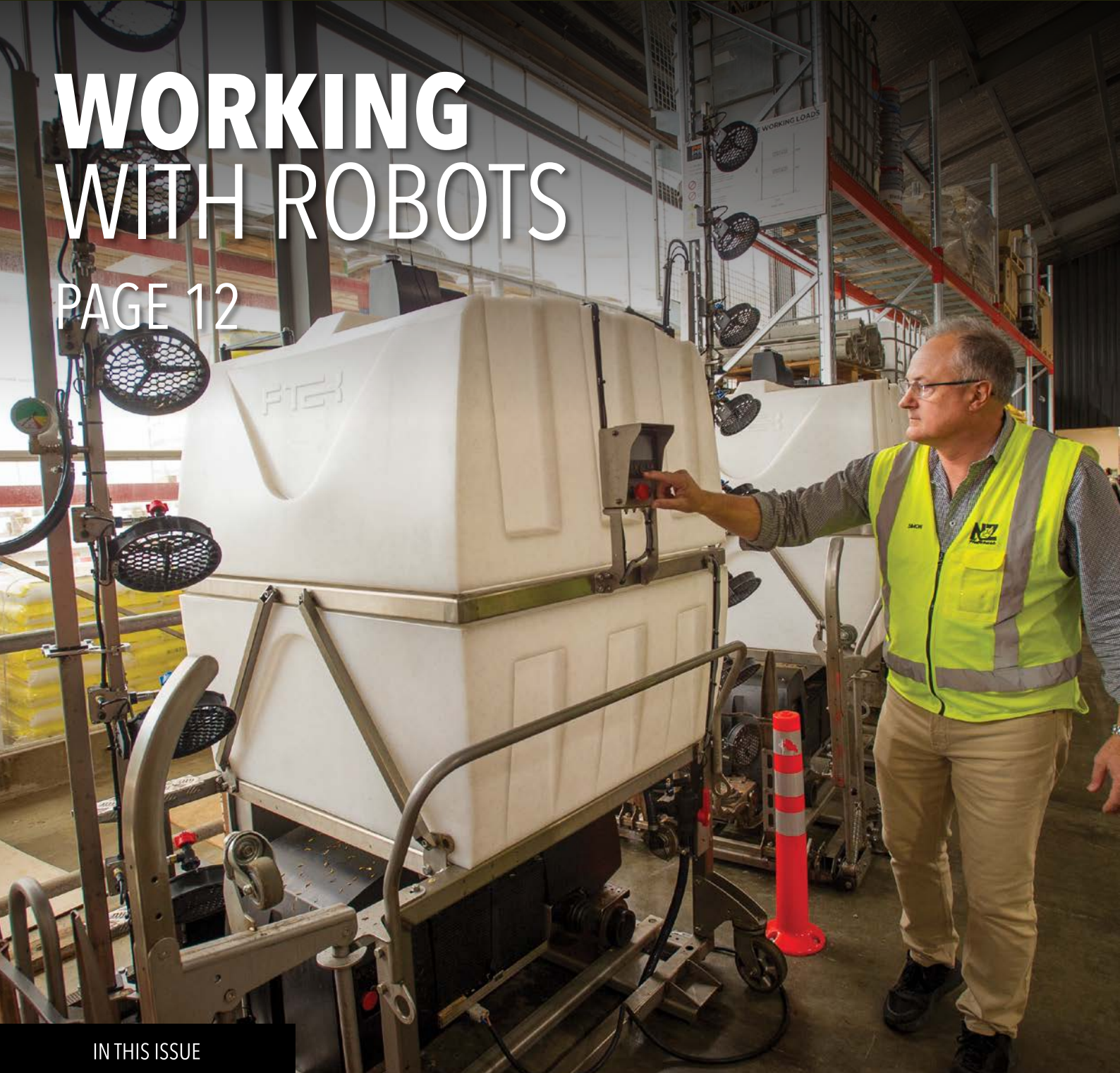
# NZGROWER<sup>®</sup>

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HORTICULTURE NEW ZEALAND

## WORKING WITH ROBOTS

PAGE 12



IN THIS ISSUE

**16** TIME FOR ROBOTIC WEEDING?

**26** SPRING OPTIMISM IN PUKEKOHE

**28** SWITCHING TO CLEAN ENERGY

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# CONTENTS

## UP FRONT

- 2 President's Word: 2023 is a year we will remember!
- 4 The Chief Executive: Adversity yields learnings for a better future

## YOUR INDUSTRY

- 7 Carbon Positive: Regen project update
- 10 Velvetleaf biosecurity risk
- 12 Greenhouse invests in labour-saving technologies
- 16 Is it time for robotic weeding on New Zealand soil?
- 22 Fresh Facts 2023 - the year in vegetables
- 26 Spring optimism in Pukekohe
- 28 Flower grower switches to clean energy
- 32 Pūhā venture revives traditional Māori vegetable
- 36 APHANZ new chief executive
- 37 Obituary Grant Hagerty (1958-2023)

## TECHNICAL

- 39 Vegetables NZ pest monitoring activities - a focus on diseases affecting cucurbits and corn
- 42 Waiting to see what El Niño brings
- 44 Planning crucial to surviving El Niño drought
- 46 Navigating New Zealand's new dam safety regulations

## PRODUCT GROUPS

- 49 New Zealand Asparagus Council
- 49 Vegetables NZ Inc.
- 50 Regen project well underway
- 52 Keep on alert for fall armyworm
- 54 TomatoesNZ



## ON THE COVER:

Simon Watson from NZ Hothouse Ltd with a robot sprayer, see page 12  
Photo by Trefor Ward

## WHAT'S NEW

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

- 56 Tuatara Structures - Cherry on top
- 57 Site Safe - Safety app crucial team tool on farms
- 58 Enza Zaden - Rural people helping rural people

## FINAL PICK

- 60 Horticulture's 2035 action plan gets into gear



# 2023 IS A YEAR WE WILL REMEMBER!



Barry O'Neil : HortNZ president

**It started off with the worst weather imaginable, had plenty of drama and intrigue in between, and ended up with us getting a new trifecta government that collectively has promised everything!**

A change in PM with Chippy taking the reins early in the year, multiple ministers resigning after they lost their way, a 'new' 74-year-old king for New Zealand, and the last of the Covid-19 restrictions finally being removed, were to me some of the notable events that happened. Up the Wahs is now part of our lexicon, and we even nearly won the Rugby World Cup - unfortunately we came second, but well done to the boys in black who did New Zealand proud!

“

**We are calling for this government to have a greater focus on horticulture**

It's also been a huge year for Horticulture New Zealand, with too much significant policy change being pushed by the outgoing government, trying to finish off what they had started before the election. The most contentious being labour reforms with totally unnecessary costs being imposed on employers, environmental freshwater reforms that significantly restricted what could be grown and where, and pricing for emissions

**SEEING APPLES IN FLOWER IN LOVELY WARM WEATHER IS A WONDERFUL SIGHT!**



*Photo by Florence Charvin*

being imposed before technology is available to mitigate.

And then there was Cyclone Gabrielle, the impacts of which will be with us for years to come, especially in Hawke's Bay and Tairāwhiti. It's heartbreaking still to see the destruction that Gabrielle caused, but also wonderful what a difference spring can make, and seeing apples in flower in lovely warm Hawke's Bay weather is a wonderful sight! I am very proud of the work that the industry and HortNZ did in supporting growers in the immediate aftermath, as well as the ongoing work in securing government support to assist growers in getting back on their feet.

A really positive highlight for the year but one that isn't often front of mind or in the news so much, is with the programme of work called A Lighter Touch, which is changing our approaches to crop production with a transition from agrichemical pest management to agroecological crop protection. Some really exciting work happening across multiple product groups in finding ways of growing

that require fewer agrichemicals, and I congratulate all involved, and we want to be doing everything we can to ensure this work continues.

The Aotearoa Horticulture Action Plan being finalised and transitioning to implementation is for me a wonderful achievement and another highlight. Especially with all the challenges during the year it's really easy to focus on the problems, rather than investing time and resource in the opportunities.

HortNZ is committed to doing its part to finalise the action plan and has fully aligned its own strategy with it, and we look forward to working with industry and the new government on enabling its implementation.

As we wrap up the year and think about what just was, it's good to also be thinking what will 2024 deliver for us? First on my list would be better growing conditions than what we have just endured and suffered, which for growers hopefully the El Niño system will bring, but we also know there are some really big challenges ahead for us all and for our country.

In any country there is only so much taxpayer funding that can go around, and always there will be tensions with what is the highest priority. Health care, law and order, education and welfare support are all very important but they also are big users of the taxpayer dollar, and borrowing excessively to fund these only leaves a difficult legacy for our grandchildren. Getting our economy working for New Zealand has to be the number one priority for the new government, so we can continue to afford and deliver what our country needs.

“  
**A really positive highlight for the year but one that isn't often front of mind or in the news so much, is with the programme of work called A Lighter Touch**

Horticulture has become a significant part of our economy and will be even more so in the years ahead, as well as being so important for enabling us to have healthy lives. We are calling for this government to have a greater focus on horticulture, and not for it to be a subset of a future pastoral focused agriculture minister's portfolio. The Ministry for Primary Industries also needs to have a specific focus on horticulture, as they do for fisheries and forestry, so that we can get greater understanding of our sector, and greater ability to work together on future opportunities and issues.

Finally, while it may sound appealing for a new government to repeal legislation, like the Natural and Built Environment Act, such actions won't come without challenges - including what replaces it, and do we go back to the old Resource Management Act which we all know wasn't working that well at all, that is assuming it is never going to be a free-for-all?

And for me whatever the legislative changes that will be happening, they don't take away our need and responsibility to grow better, whether that is because of the changing climate, whether that is because of a catchment's poor water quality, or whether that is because we absolutely must maintain our social licence to operate with our communities. We actually don't need to wait for government direction, and it's great to see so many horticultural companies and growing businesses having decided to get on with doing what they believe is needed irrespective of government direction, and as such positioning themselves for future success.

Thanks to our members for your support over 2023, and thanks to our chief executive and staff for the tremendous work over the year. My best wishes to all for this Christmas period, and while it's a busy growing time of the year I hope you find time away from your work to spend with family and friends.

Meri Kirihimete me te Hape Nū la! ●



**HORTICULTURE HAS BECOME A SIGNIFICANT PART OF OUR ECONOMY AND WILL BE EVEN MORE SO IN THE YEARS AHEAD, AS WELL AS BEING SO IMPORTANT FOR ENABLING US TO HAVE HEALTHY LIVES**

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# ADVERSITY YIELDS LEARNINGS FOR A BETTER FUTURE



Nadine Tunley : HortNZ chief executive

**The year 2023, which brought so much pain to so many, especially our growers, is drawing to a close, and many of us won't be sorry to say goodbye to the past 12 months.**

The year began with the Auckland anniversary weekend storm and got worse by Valentine's Day when Cyclone Gabrielle caused havoc across the Hawke's Bay, Tairāwhiti Gisborne, Northland, Bay of Plenty and northern Manawātū regions. I know many growers, their families and staff are still trying to recover emotionally and financially; it has been a very long and arduous road, our thoughts are with you all.

“

**I know the horticulture industry stands ready and willing**

On reflection, 2023 did deliver some positives for horticulture, and as is the nature of our industry and our growers, learnings for a better future have been found from adversity.

The heartening thing that I witnessed during all of these horrendous times was the camaraderie and collaboration amongst communities and wider New Zealand. People often ask me why I do my job and at the very core of it, it is because the horticulture sector is by in large made up of people who come to work every day because they care. You care about producing food that nourishes everyone, you care about the land that you produce that food from, and you care and take pride in how you achieve these things. It is this pride and care that creates an environment and magnetism where I and others in our sector want to support this cause.

On top of the challenges Mother Nature threw at us in 2023, there were the added and often unrelenting regulatory and compliance changes that the previous government wanted to push through before the election, again with such a cyclone-like style in delivering much of this change that we all had to brace for the worst and hope for the best. In some cases, however, we had some positive outcomes, and after six years of hard work by the Horticulture New Zealand environment policy team led by Michelle Sands and supported with robust grower advocacy, we were rewarded in August with news that the Natural and Built Environment Act (NBA) would support commercial fruit and vegetable growing in New Zealand. This is an explicit recognition of the importance of food security for generations to come.

At times when I write about how resilient you all are as growers I cringe because you are having to be resilient in the face of adversity. With the passage of time however, there are always learnings and hence usually improvements, and we saw this play out in Pukekohe in January when the benefits of planning ahead were clearly demonstrated. While rain washed away some crops in just a few hours, the extent and degree of damage was significantly less than Pukekohe growers have previously experienced. That's because in the last 25-plus years, growers, councils and the wider horticulture industry have worked to form the Franklin Sustainability Project and an Integrated Stormwater Management System for parts of Pukekohe Hill.

Then in February immediately after and during Cyclone Gabrielle, growers, industry groups, district associations and Horticulture New Zealand sprang into action to help those suffering its impacts. I know of growers who used resources like helicopters and tractors to rescue people. Some of those same growers had also lost everything – their crops, machinery, homes and all their possessions. We are all grateful for your selfless actions.



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Following this, primary sector leaders got together to develop a plan to address immediate needs, as well as the long-term recovery of the affected regions. As the frequency and severity of adverse weather events increase, steps to mitigate or reduce damage become even more crucial.

“  
**The heartening thing that I witnessed during all of these horrendous times was the camaraderie and collaboration amongst communities and wider New Zealand**

In early February there was a positive for horticulture with the launch of the Aotearoa Horticulture Action Plan. This document was over two years in development, with extensive consultation across the partners of industry, science, Māori and government. It is a plan ultimately working on initiatives to double farmgate values by 2035 in a way that improves prosperity for our people and protects our environment along the way.



On any road to recovery, it is important to network, socialise, plan and envision a brighter future - which is exactly what our inaugural Horticulture Conference Week (31 July to 4 August) gave our industry participants the chance to do. It was a rich smorgasbord of content and while no one was denying the challenges, the tone of the week was forward looking and positive and celebrated our theme *sharing successes to strengthen our future*.

I know the horticulture industry stands ready and willing to continue to make a significant contribution to growing a prosperous and sustainable economy while ensuring food security for New Zealanders.

But to do so we must first take care of ourselves and our loved ones. Please take some time to relax and celebrate the festive season together and look forward to a brighter 2024. ●



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# YOUR INDUSTRY



ACROSS THE SECTOR - ACROSS THE COUNTRY



**16** ROBOTIC WEEDING  
IN NEW ZEALAND



*Photo courtesy of SeedSpider*





# CARBON POSITIVE: TOMATOES PLANTED AT THE LANDWISE MICROFARM



Dan Bloomer : LandWISE



*The cover crop of oats, vetch and lupin held about 12 tonnes per hectare of dry matter*

**Planting tomatoes for Heinz-Wattie's marks the start of the second year of Carbon Positive, a long-term study of regenerative practices applied to intensive process crop production, focused on increasing soil carbon, soil health and profitability. After two wet years, the soil is finally starting to dry out and seedlings were transplanted in ideal conditions. We are grateful to our contractors and the Heinz-Wattie's agriculture team for their commitment to the project and making sure everything went as smoothly as possible.**

The operations programme for the 2023-2024 season was developed over the last five months in conjunction with Heinz-Wattie's, McCain Foods, regenerative consultants, advisors, interested local growers, organic vegetable producers, international process tomato growers, technical field representatives and contractors. That is a lot of people and a lot of conversations, well facilitated by Alex Dickson, the LandWISE project manager for Sustainable Systems.



*Heinz-Wattie's team planting tomato seedlings at the MicroFarm*

We have three parallel growing systems: conventional practice, regenerative practice, and a hybrid system taking elements from each of the other two systems. So, multiply headache by three.

Planning and consultation for this process tomato crop was much more extensive than for the previous year's sweetcorn, reflecting the considerably higher need for inputs. Tomatoes are an expensive crop to grow, so there are safeguards applied to minimise risk of failure and maximise production. There is the added complication of needing to produce the required volume to feed a factory. There were several iterations of the project's operational plan, and the 'final' version is still subject to change depending on what the season brings. It has already been significantly altered.

Despite predictions of an El Niño summer, soil conditions remained wet over winter and early spring, and cultivation activities were delayed. With a factory-schedule planting date, additional passes with aerators and rotary hoes were required to achieve the mechanical tilth required to transplant tomatoes.

A notable feature in planning was to plant the regenerative plots into a mulch cover on untilled soil. A suitable transplanter was located in Palmerston North and with



support from Tobias Euerl and Robert Hall at live2give, their MulchTec machine was made available and tested. We reasoned that having a reasonably thick mulch cover would minimise the need for herbicides and help separate crop protection chemicals from the soil and microbiology below, and no-tilling would cause less disruption and carbon loss. This method is currently being trialled for processing tomatoes in Italy.

Then, just before planting, we found that the drying soil in the regenerative treatment plots was too hard for adequate root development and would impede plant growth throughout the season. Also, in an area we had mulched a week earlier, the oats were regrowing and posing a problem for weed control. A team paddock meeting determined that the cover crop should be incorporated, the ground ripped and cultivated, and the Wattie's conventional planter used to transplant seedlings.

### So where to now?

We could have persisted with our no-till mulch planting in the regenerative plots but would have faced a probable large economic loss. We could have decided to drop a process crop from the regenerative system and instead focus on building the soil for a year, but again with financial implications. In the end, the operations group decided on a pragmatic approach - cultivate and plant an economically viable crop and work out how to fix it afterwards. Sounds familiar?

So, the group is now revising the regenerative crop's management plans. It means putting herbicides back into the programme. We had planned to remove some of the fungal and bacterial crop protection products, including copper, and use the 'softer' options. But we are very conscious that trying to save on early inputs could set us up for a difficult season of catch-up. The plan retains a conservative programme until fruit set, and minimising inputs thereafter where possible.

One way to compare the different crop protection programmes is using the Environmental Impact Quotient (EIQ) model developed by Cornell University. EIQ rates products according to environmental, worker and consumer safety, allowing us to compare the proposed management for each of our growing systems. Tomatoes are a 135-day crop requiring, under current practice, many spray applications each containing several products. The EIQ for tomatoes is high, especially when compared to sweetcorn, but we are endeavouring to find an effective, minimally impactful programme.

Tomatoes are considered a depletive crop, with a high nutrient demand. We are working through how we can reduce inputs of nutrients in the regenerative and hybrid treatments. We are mindful that the regen treatment has 10-12T/ha of dry matter buried the day before planting, which may have a short-term impact on the availability of nitrogen.



*The MulchTec planter from live2give was tested and found suitable for planting tomato seedlings through thick residue mulch*



*Busy little paddocks with several operations underway as the cover crop is mulched, the ground ripped and cultivated ready for transplanting*

We are investigating options to address the impact of our (industry typical) spring field-work practices, which were significant in all the plots regardless of the farming system applied. Hawke's Bay has been through a difficult couple of years, with two very wet spring planting periods, difficult if any harvest, and ongoing rain compounded by Cyclone Hale and Cyclone Gabrielle. It is only now that the soil is dry enough for rippers and aerators to be effective and lift and open it rather than smear slots.

We just smashed the soil, burned off a lot of carbon, and disrupted the microbiology. That is most definitely not what we set out to do. What is the best way to regenerate our base resource? ●

Carbon Positive is a partnership between LandWISE Inc and the Hawke's Bay Future Farming Trust, with processors McCain Foods and Heinz-Wattie's. Funding is from the Ministry for Primary Industries, Hawke's Bay Regional Council, BASF, Heinz-Wattie's and McCain Foods.

Contact Dan Bloomer at: [dan@pagebloomer.co.nz](mailto:dan@pagebloomer.co.nz)

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a Happy New Year**



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HIGH RISK

## VELVETLEAF



With the start of summer, velvetleaf (*Abutilon theophrasti*) is cropping up again. When you're out on your property, look out for this invasive weed.

### Velvetleaf characteristics

- 📍 Annual broad-leaved weed
- 📍 1 - 2.5m tall
- 📍 Heart shaped leaves (velvety to the touch)
- 📍 Buttery yellow flowers
- 📍 Distinctive cup-like seedpods, black when mature

Velvetleaf can affect vegetable crops by competing for water, nutrients and light, and readily overgrows other plants. It can be found in almost any crop, but is of particular concern in maize and many arable crops. The weed can cause significant crop yield loss.

Once fully developed, seed pods can drop more than 30,000 seeds, that remain viable in the soil for up to 50 years and can infest future crops grown in the same fields. While it may be controlled by broadleaf spray, it can go unchecked in headlands and the seeds can easily be spread by machinery to other properties.

It is present on properties throughout New Zealand and can become a major problem if allowed to grow unhindered. If velvetleaf is found early, it can be managed! Velvetleaf is an Unwanted Organism under the Biosecurity Act 1993.

### What can you do?

1. **Keep an eye out for velvetleaf** on your property, especially on headlands and in areas where maize has been grown.
2. Find out the **growing and biosecurity history** of the block if you are growing crops on a new property.
3. Make sure if you are growing maize as a rotation crop that all machinery is thoroughly cleaned before moving onto or between properties. Apply good hygiene and operating practises.
4. If you think you have found velvetleaf, call it in! Contact **Velvetleaf Community Outreach Services!**
5. For velvetleaf or any other weeds or exotic pests, **snap a photo and report it** through the Find-A-Pest app or the Ministry for Primary Industries (MPI) pest and disease hotline 0800 80 99 66.

See Biosecurity New Zealand's overview of velvetleaf: [www.mpi.govt.nz/biosecurity/exotic-pests-and-diseases-in-new-zealand/long-term-biosecurity-management-programmes/velvetleaf](http://www.mpi.govt.nz/biosecurity/exotic-pests-and-diseases-in-new-zealand/long-term-biosecurity-management-programmes/velvetleaf)

For information about resources, contact Velvetleaf Community Outreach Services: [sally.linton.nz@gmail.com](mailto:sally.linton.nz@gmail.com)

HortNZ risk policy advisor Alex Bisson: [alex.bisson@hortnz.co.nz](mailto:alex.bisson@hortnz.co.nz)

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## VELVETLEAF COMMUNITY OUTREACH IN THE NORTH ISLAND

Following the 2015/2016 season when velvetleaf is suspected of reaching New Zealand in contaminated fodder beet seed, the Ministry for Primary Industries set up community engagement under the name Velvetleaf Community Outreach Services, working with both affected landowners/managers and the wider agricultural community.

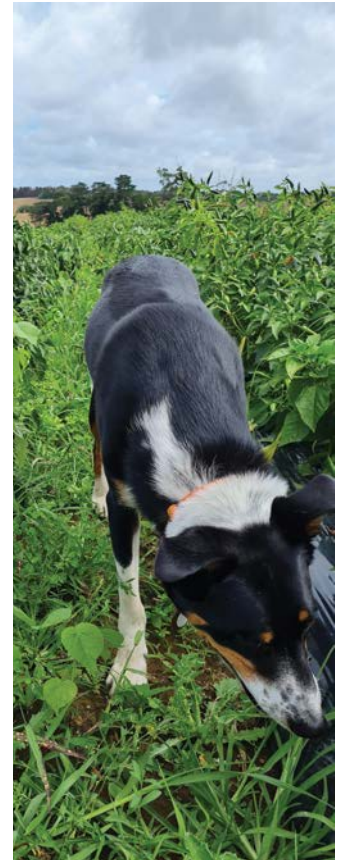
They shared guidelines and helped growers develop management plans, working from three regions: North Island, Southland and Canterbury. South Auckland and Waikato have been the areas most affected by velvetleaf, including several horticulture incursions. To date the South Island has escaped any hort incursions.

This year MPI funding for the services stopped, but secured funding from North Island regional councils and interested parties has enabled the North Island contact Sally Linton to continue. She says that MPI's decision does not reflect a reduced risk of incursions.

"The need for vigilance remains high. It only takes one piece of dirty machinery or movement of an infected crop for a new property incursion to occur."

For horticulture, using land that was previously in maize or using maize as a rotation crop is the highest risk for growers.

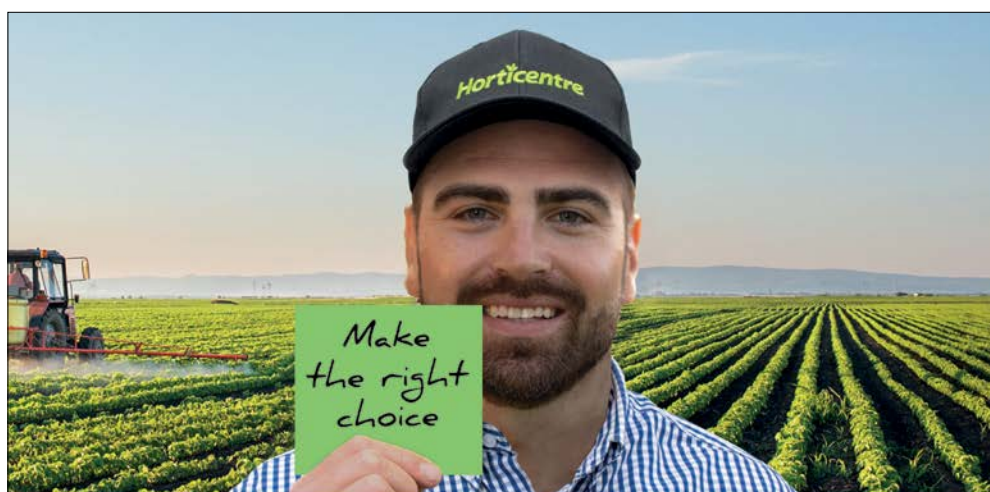
Sally works with a Southland-based detector dog to help locate velvetleaf, with handler John Taylor and his border collie, Wink, regularly taking the flight up to the North Island to undertake scent detection work. ●



### Velvetleaf Community Outreach Services

Sally Linton is happy to meet with any groups to talk about velvetleaf risks and wider biodiversity weed management.

Sally Linton: [sally.linton.nz@gmail.com](mailto:sally.linton.nz@gmail.com), 027 2781 620



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# GREENHOUSE INVESTS IN LABOUR-SAVING TECHNOLOGIES

Geoff Lewis

Photos by Trefor Ward



Navpreet Singh, team supervisor, checking the tomato plants have had leaves correctly removed to allow more light to reach the tomatoes

## NZ Hothouse's Bombay centre is purpose-built for cherry tomatoes and is shaping up as a proving ground for labour-saving automation and robotic technologies developed by local firms.

The plant is a glass spaceship with corridors disappearing almost to the horizon, part of the company's 19ha of greenhousing.

When NZ Hothouse was established by Brett Wharfe in 1983, the Mill Road facility was a kiwifruit packhouse. The building has recently undergone an extensive refit.

Managing director Simon Watson says cherry tomatoes used to be a niche market but have become mainstream, developing a strong presence in the snack food and food service markets. They are retailed through both major supermarket chains throughout New Zealand.

Production is hydroponic in a Rockwool growing medium with CO<sub>2</sub> levels at about 700ppm to boost growth. (By comparison, CO<sub>2</sub> is around 420ppm in the atmosphere.) The miniature variety of tomatoes takes seven weeks before it is ready for harvest, and can grow up to a metre a week in summer with vines reaching 30 metres.

However, the process is labour and cost-intensive as the dinky toms only produce about 30kgs per square metre, as opposed to their big cousins which produce around 70kg per square metre.

"We wait until they ripen naturally. When we pick them they're sorted into small, medium and large. The redder it is from the plant the sweeter it is."

The cherry toms are packed into punnets and bags using PET (polyethylene terephthalate) plastics that are either recycled or recyclable, then loaded into crates for delivery to the supermarkets - black crates for Woolworths and green for Foodstuffs.

“  
We did a trip to  
Australia looking for  
automated machinery



Each pallet carrying the crates is identified by a two-dimensional bar-code document which provides an audit trail including where and when the product was packed - similar to the system used by the kiwifruit industry.

Today bins of the little toms are packed and sorted with the help of recently installed automated machinery designed by Waikato-based BBC Technologies, now Tomra. This has reduced the labour need by half, Simon explains.

Until recently all this work was done by hand. However, as cost and the availability of labour has become an increasing problem, NZ Hothouse has searched for labour-saving technologies.

Simon Watson is the vice-chair of TomatoesNZ and has been on the board of the industry organisation since 2015.

“The move to automation is huge. As a direct result of what happened during Covid-19 we were faced with an unnecessary nightmare with labour. We went through a couple of winters where we could only find 80 percent of the staff we needed. That meant our production was down and relative costs increased.

“We did a trip to Australia looking for automated machinery. They have exactly the same problems. What we found was originally designed for strawberries. We have more coming, many hundreds of thousands of dollars’ worth.”

NZ Hothouse also went to local company FTEK Ltd.

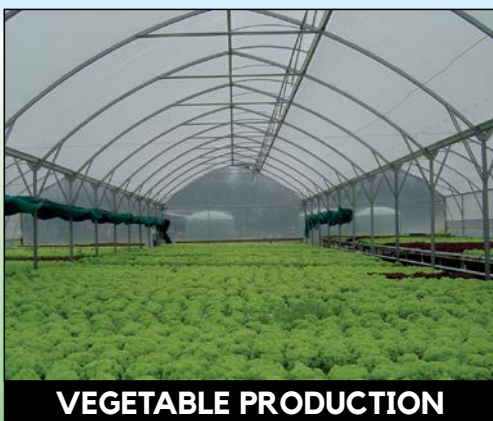


*Pukekohe-based FTEK has delivered four robot sprayers for NZ Hothouse*



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Simon Watson, managing director, NZ Hothouse Ltd



Alfred Loumoli loading tomatoes into the hopper for sorting with the help of recently installed automated machinery



Gloida Dela Cruz sorting cherry tomatoes

Pukekohe-based FTEK is the creation of brothers James and Mark Currie and started out as an engineering and design business in and around their hometown.

Director James Currie says their entry into automation and robotics about 12 years ago, had been somewhat a matter of luck.

“We came across the greenhouse industry and realised 90 percent of the equipment they were using was coming from overseas. Mostly from Holland. We saw an opportunity to bring some Kiwi ingenuity to this space, starting with the TEKlift (an innovative electric crop work trolley).

“Greenhouses are awesome. Everything is technology driven around precision farming with automation in things like irrigation and fertiliser application. For the same area, they get many times the production (compared with outdoors) and up to 90 percent less water usage.

“In the past the greenhouse industry has been seen as really niche. But what is coming through is the importance

of fresh vegetables and food security, which are now a much more valued part of the market.”

Like Simon Watson, James says the biggest problem faced by indoor growers is the cost and availability of labour.

“NZ Hothouse was looking at more efficiency in its spray programme. FTEK had been developing automated spray technology, and this was the perfect opportunity for Hothouse to uptake our solutions. We deployed two robot sprayers to them 18 months ago and subsequently built another two machines, which has been a really exciting milestone.”

James says he and his brother have ‘bootstrapped’ the limited liability business for 15 years, but the time had arrived for a cash injection.

“We were fortunate to have support and uptake from local growers early on. There’s no shortage of opportunities. It’s exciting times, with the aim now to secure capital to push robotics for this industry even further.” ●





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# IS IT TIME FOR ROBOTIC WEEDING ON NEW ZEALAND SOIL?



The team from United States company Carbon Robotics, which builds the LaserWeeder, visited New Zealand recently. Photo courtesy of Callaghan Innovation

**As it becomes harder to find people to hand weed, and global consumer pressure comes on for less herbicides use, New Zealand's onion growers are taking a closer look at robotics. For Onions NZ, KAREN TREBILCOCK found out what growers think of the technology available - which includes home-grown New Zealand technology.**

Bostock New Zealand, in Hawke's Bay, is one of the many onion growers keeping an eye on developments, its innovation and sustainability manager Matt Stafford says.

They met with United States-based Carbon Robotics when representatives visited New Zealand in the winter, but were unsure how the company's LaserWeeder, which zaps weeds with lasers, would perform on their land.

"We're fortunate we're a diverse business so we can utilise labour in different ways to that of other growers. We can move labour from thinning apples to hand weeding onions easily when needed," Matt says.

Canterbury grower Jan Lepoutre of Lepoutre-Kroef Farm, which has about 100ha of onions in production, says the spot sprayer from United States-based Verdant Robotics may have advantages for them.

It precisely fires a highly targeted, very small amount of herbicide at identified weeds.

"We're trying to minimise inputs, and if we can reduce the amount of spray we have to use that would be great," Jan says. "If it means a healthier and higher yield crop that would be even better."

Besides the price tag, the time it takes to do the job could be a barrier.

"At the moment we can have all the onions sprayed in a couple of hours. The machine we're looking at buying takes a lot longer.

"If it was fully automated, we could just set it going. If it didn't need a tractor, it could work maybe earlier in the morning and later at night.

"It's whether we buy now or wait until the sprayer is developed more. They are always improving."

**CARBON ROBOTICS REPRESENTATIVES CLAIM THAT FOR ONIONS, YIELD IS INCREASED BY 20 PERCENT**





The LaserWeeder zaps weeds and leaves crops untouched. Photo courtesy of Callaghan Innovation

He says most weeds in his onions are controlled by herbicides, as it is hard to get people for hand weeding.

“It’s why we’ve started to look at targeted sprayers. We can manage using herbicides. Residuals are never found in our crops, but if we can use less it would be better.”

Onions NZ chief executive James Kuperus remains supportive of growers and industry partners who are looking into technologies that increase productivity while supporting the sustainability of the sector. There is a strong regulatory and market push to continue to innovate in this space, particularly to reduce agrichemical usage and tackle plant health more holistically.

“Without trialling new technologies and aids to production,” he says, “the New Zealand onion sector does run the risk of being irrelevant to consumers and importers from our biggest markets, so the work and dialogue progressing in

robotics overseas and in New Zealand is promising.”

Dan Bloomer from LandWISE, who has been interested in the role of robotics in horticulture for years, was part of the Callaghan Innovation delegation to FIRA USA 2023 in the Salinas Valley in California in September and thought the Carbon Robotics LaserWeeder could have a place in New Zealand onion fields.

“But it comes with a hefty price tag, and it needs a big generator to run it. The lasers require about ten times as much power as they put out, including for cooling. And the lasers need replacing after a few thousand hours and they’re expensive to replace.”

However, the Carbon Robotics representatives claim that for onions, yield is increased by 20 percent.

“That is not verified independently but if you take it at face value, then that 20 percent increase is good money.



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Verdant Robotics from the United States manufactures a spot sprayer that identifies weeds and avoids blanket spraying. Photo courtesy of Callaghan Innovation

"If you assume the LaserWeeder is getting the weeds early so there is no competition for the crop, and that the herbicide used currently might be affecting the growth of the onion plants, then such an increase is believable."

He says the Verdant Robotics spot sprayer machine is another impressive system.

"We haven't been looking at how blanket spraying of herbicides affects the soil microbiome - the bacteria and the fungi that are needed for soil health and the growth of plants. The concept of using much less spray applied only where it's needed, instead of over the whole field, seems to have great merit."

He says there are no simple answers apparent yet for New Zealand onion growers.

"It's about the capital cost and the operating costs and the yield advantage, but as well as that, growers will have to respond to consumer pressure and if that is less herbicide use then that is what they will have to do somehow."

But the robotic weeder market isn't all about United States companies. New Zealand has its own - SeedSpider from Palmerston North and it has just sold its first WeedSpider in California.

"It's slightly terrifying but really quite exciting," one of the company's robotics engineers Sam Lockwood-Geck says.

He's also back from FIRA where he saw the WeedSpider lined up amongst the big robots from around the world.

"Seeing it with products from companies which are much better funded, holding its own, a little Kiwi company from Palmerston North, it was pretty huge."

SeedSpider, formerly Greentech Robotics, now has an office in Santa Maria near the California coast from Bakersfield and is hoping to capitalise on the interest from FIRA.

"The scale of vegetable growing in California is just unfathomable unless you've been there. There are growers that have 6000ha and the larger ones are three to five times that size," Sam says.

"Most of the crops are hand weeded and labour is hard to get, so robotic weeders supplement that labour force."

And amongst the robots that kill weeds with spot spraying or by burning them with lasers, the WeedSpider is so far on its own with its spidery arms which can be programmed to move whichever way in three dimensions.

This enables it to maintain a uniform cut depth across the whole seed bed when weeding, or move a spray nozzle directly over a plant or weed when spraying.

It's also solar powered and fully electric, so friendly on the planet.

At six-figures it's not cheap but not as expensive as others, especially as the exchange rate from US dollars doesn't have to be factored in.

But its versatility is what is important, Sam says.

"We've got a model that goes behind a tractor as well as a lightweight, fully automated one. The machine's initial development was done in the wet here in New Zealand and although we tried our best, we have never been able to get it stuck."

Already proven at weeding brassicas, he believes it can also be reconfigured for niche crops such as tomatoes. Although several 100,000ha of tomatoes are grown in California, so maybe not so niche there.

Onions NZ has also approached the company, hoping for a little help with weeding onions closer to home.

"We think we can reconfigure it for onions and hope to do some testing soon in a field. We're already talking to growers in Pukekohe.

"We need to capture some data to see if it's viable, but we're confident that our machine can do it.

"We need to test it on newly planted onions, and then every few weeks as they grow, to really understand when is the best time for our machine to get into the field."

He says the price would come down with further sales in the US helping, and hopes it will soon become affordable in New Zealand.

"My family are kiwifruit growers so we know about labour costs continuing upwards, and the pain of that.

“  
**Without trialling new technologies and aids to production... the New Zealand onion sector does run the risk of being irrelevant**

"Ultimately, it's all about return on investment. We want acquiring one of these machines to be a no-brainer for growers, but we know it takes time for growers to build confidence in the machine and its abilities."

One of the Pukekohe onion growers SeedSpider is talking to is Balle Bros.

"They're coming back in the autumn and we'll weed some young onions with it and invite other growers to see how it works," Balle Bros general manager farms Roger Tomlin says.



# PLANT FOR SUCCESS

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New Zealand's own SeedSpider from Palmerston North has just sold its first WeedSpider in California, pictured here in the tractor-drawn version

"It's pretty cool, and from a plant health perspective, totally relevant for us."

Their onions are sprayed with herbicides to stop weed growth, but hand weeding is also required.

"There are some weeds we're seeing that are becoming persistent that the sprays don't seem to be touching."

He says Balle Bros has looked at the Carbon Robotics LaserWeeder but, besides its price tag, he didn't believe it would handle Pukekohe's volcanic soils.

"It's massive, it would just get stuck. But they're onto I think version four, and when they're at version ten, 11 or 12 then it might be what we need.

"We've looked at drones too, but they are not there yet either."

However, the company is keen to use technology and has recently invested in soil probes.

"The data we're getting from them, on my phone, is amazing. Moisture and soil temperatures, so much data.

"So we're really interested, really engaged and there is some really cool technology out there. New Zealand is just really complex, with our contours and our soil types and our short runs, so we have to make sure what works in California's sandy, irrigated flat fields will also work for us.



SeedSpider's chief executive Don Sandbrook and senior robotics engineer Tobin Hall with the fully autonomous WeedSpider in a field in Bulls

"I think with robotic weeding we're going to sit on the sidelines for now, but I'm not sure for how long."

New Zealand's AgResearch is also working on a laser weeder, aptly name Map & Zap.

"While Map & Zap is still in the research and development phase, we are talking to potential partners about investment opportunities," AgResearch senior scientist Kioumars Ghamkhar says.

Its development uses AgResearch's agriculture, plant and weed research including its library of weed images to train the AI (artificial intelligence). A trial in a vineyard is already underway. ●

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# VEGETABLE GROWER NUMBERS AND CULTIVATED HECTARES DECREASING

The industry snapshot highlighted in the latest *Fresh Facts* publication paints a stark picture of vegetable growing in New Zealand. ELAINE FISHER spoke with the publication's new editor Dr Hans Maurer about the importance of the data, which is widely referenced by government, banks, investors, research and international organisations.

Vegetable growing continues to be an important land use throughout New Zealand, but there was a 25% reduction in the area under cultivation between 2012 and 2022.

The 2023 publication *Fresh Facts*, which for 23 years has been documenting the highs and lows of horticulture, reports that in 2020 there was a total of 37,420ha of land growing vegetables, a drop from 49,707ha in 2012.

The potato industry is among those to experience a reduction in plantings, says Dr Hans Maurer, chair of the Technical Advisory Group at United Fresh and *Fresh Facts* editor. "Our potato planting area decreased by 18.6 percent between 2018 and 2023, a loss of 1920ha, with the total annual potato production reducing by 107,990 tonnes between 2018 and 2023, a decrease of 20.5 percent," he says.

“

The potato industry is among those to experience a reduction in plantings



The domestic value of the New Zealand table potato sector accounts for 36% of the total domestic potato sector. Domestically consumed process (chips) and frozen fries made up 62.5% of the total domestic industry value in 2023. Exports accounted for 12.5% of the value in 2023, an increase from 8.3% in 2022.

Pukekohe is one of New Zealand's largest vegetable growing areas, comprising 4359 ha of some of the country's most fertile soils. The area accounts for only 3.8% of New Zealand's total fruit and vegetable production but the \$327 million revenue generated for the horticultural business in Pukekohe in 2012 equated to 26% of New Zealand's total domestic value of vegetable production and to a lesser extent of fruit.

According to the report *New Zealand Food Story: The Pukekohe Hub*, Deloitte 2018, The Pukekohe hub has exceedingly fertile and efficient productive soils, temperate climate, easy and direct access to transport routes and proximity to New Zealand's biggest city.

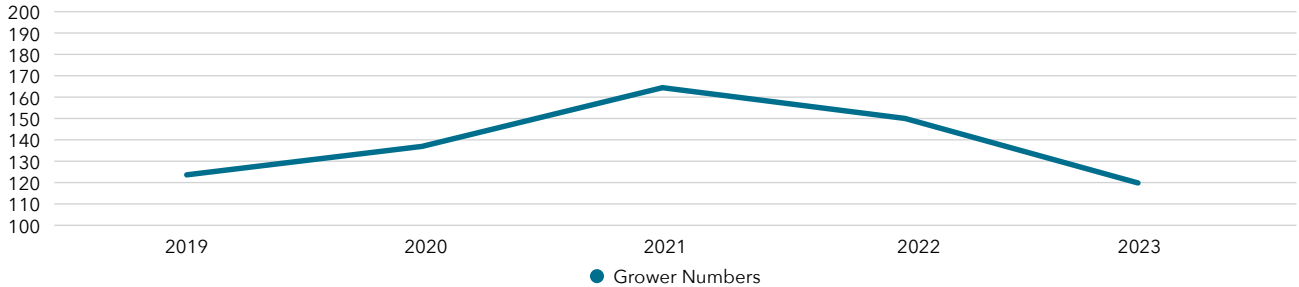




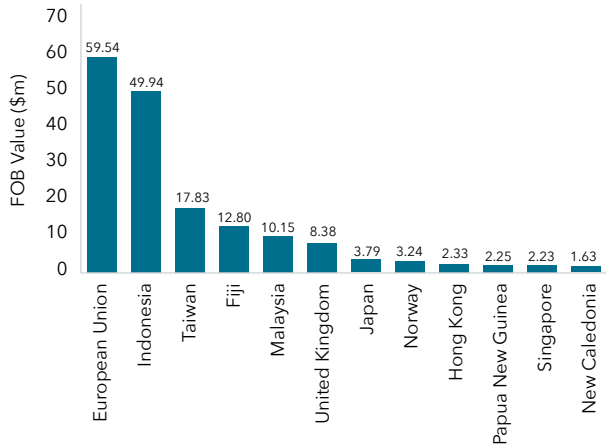
## SOME EXAMPLE FRESH FACTS

### FLUCTUATING TOMATO GROWER NUMBERS REPORTED

Sources: Tomatoes New Zealand Key Concerns of Tomato Growers Document (2023). Tomatoes New Zealand Annual Report 2022/23

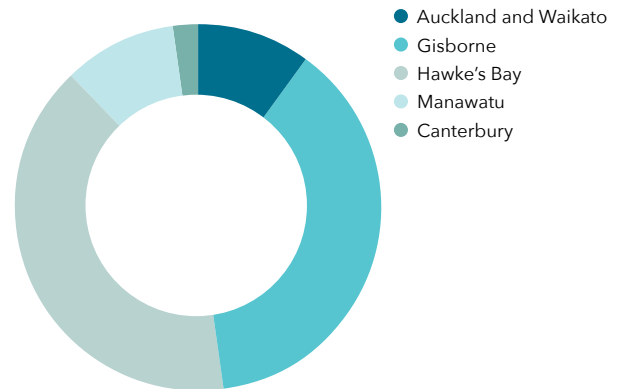


### TOP EXPORT DESTINATIONS 2023 FOR ONIONS



Sources: Statistics New Zealand Infoshare, accessed 10 August 2023

### BUTTERCUP SQUASH PRODUCTION BY REGION 2022/23



Sources: Buttercup Squash NZ product group website. Accessed 15 August 2023

"This means the hub's horticultural production could be a cornerstone in our domestic food security, providing for a hungrier Auckland in the future, and adding significant value to the regional economy - and New Zealand as a whole.

"But only if the current challenges to production, including access to appropriate land, are managed in the most effective and efficient way," the report says.

“

**The latest data shows a 17% drop in the area of crops grown under cover between 2012 and 2020**

Hans says the report is now five years old and the data will be out of date. "The strategic relevance of the Pukekohe Hub report has, however, not diminished. If anything, as climate change and environmental pressures increase, the report's relevance is likely to intensify." *Fresh Facts* includes links to the report.

The latest data reported in *Fresh Facts* also shows a 17% drop in the area of crops grown under cover between 2012 and 2020. The tomato industry is focused on under cover tomato production and there has been a drop in the number of growers from 150 in 2021-22 to 120 in 2023.

The last exports of New Zealand tomatoes to Australia happened in February 2021. In 2020, 587 tonnes of tomatoes were exported to Australia, and in 2021 this was down to 44 tonnes. In 2022 no tomatoes were exported due to a biosecurity incursion.

The number of growers producing onions has dropped from 80 in 2021-22 to 75 in 2022-23. The industry had a combined total of 4571 ha planted in onions in 2022. In the financial year 1 July 2022 to 30 June 2023, 90% of New Zealand's onion crop was exported, accounting for 151,900 metric tonnes.

In the year to March 2023, the New Zealand onion industry exported \$143 million worth of onions to 46 countries and employed 1050 people.



PUKEKOHE IS ONE OF  
NEW ZEALAND'S LARGEST  
VEGETABLE GROWING  
AREAS, COMPRISING  
**4359 HA**  
OF SOME OF THE  
COUNTRY'S MOST  
FERTILE SOILS



There were 19 registered buttercup squash growers in 2022–23, eight registered squash packhouses and ten registered squash exporters. Japan was the most valuable export market, representing 65% by volume, with exports increasing 6% to a value of \$34.6 million.

Vegetables NZ states that the fresh vegetable category consists of more than 55 crops with a farm gate value of more than \$420 million per annum, produced by approximately 760 growers. This data does not include potatoes, onions, tomatoes, asparagus, and buttercup squash.

For processed vegetables, the key growing regions are Gisborne, Hawke's Bay, Marlborough and Canterbury.

Process Vegetables NZ represents 350 commercial process vegetable growers with their members growing mainly carrots, sweetcorn, peas, beans and beetroot. Minor crops include kūmara, cauliflower and broccoli.

### FUTURE OF FRESH FACTS DEPENDS ON CREDIBLE INDUSTRY DATA

The experience of editing the 2023 edition of *Fresh Facts* has reinforced Dr Hans Maurer's view that "horticulture is a wonderful industry to be in and that it is an industry, as a country, we need to cherish".

Hans, chair of the Technical Advisory Group at United Fresh became the editor last year when United Fresh agreed to produce the publication, which was founded in 1999 by Plant & Food Research. In recent years it has been a collaboration between Plant & Food Research and Horticulture New Zealand, but both have decided to discontinue their direct involvement.

Hans acknowledges the previous work of Plant & Food Research and the MARTEC teams, who have worked hard to generate annual Fresh Facts data sets.

"United Fresh is grateful for their commitment over the last 20 plus years and we plan to build on their efforts over the coming years, having started with *Fresh Facts 2023*."

*Fresh Facts*, a pocket-size publication, also available online, has proved to be a valuable reference document for anyone who wants to invest in the horticultural industry. "It provides a picture for an outsider considering investing in the industry about what provides the best returns and where the risks are. In that regard it is quite an important document."

The publication is also widely referenced by government departments, banks, Massey University,

international organisations and other horticultural industry participants.

Now the primary goal is to see *Fresh Facts* play an even more central role in the data-based decision-making processes that are integral for the continued growth of the industry.

The annual publication date of *Fresh Facts* has been moved from March to September which facilitates a more comprehensive and diverse reporting season for the major produce groups.

It no longer contains information about the honey, hops or wine industries. "Instead, our focus will increase on those products which are typically sold in supermarket fresh produce departments, greengrocers and through other channels where produce reaches consumers in a 'fresh' state. We have also raised the profile of the domestic produce value chain."

Hans says it has not been possible to source accurate data on all aspects of the industry. "The publication provides not only quality data where it is available but features blank spaces where data ought to have been placed but hasn't been available.

"We would prefer to show the gaps in the hope that those who have access to what we consider missing data will work with us in the lead-up to the 2024 edition to ensure these gaps are plugged over time."

The farm gate value of processed vegetables (excluding potatoes) was \$53.40 million for the year ended 31 March 2023. The export value of processed peas was \$140.16 million, compared to \$115.4 million reported in Fresh Facts 2020, an increase of 21.5%.

The values of processed beetroot declined by 20.6% from \$24.1 million in 2020 to \$19.14 million in 2022. Australia accounted for 97% of processed beetroot exports in 2023.

Wattie's Hastings factory processes more than 30,000 tonnes of locally grown outdoor tomatoes annually, accounting for the content of 90% of canned tomatoes the company sells each year. The remaining 10% comes from tomatoes imported from Italy. ●

“

“DESPITE THE CHALLENGES, WE ARE HOPEFUL THAT THE NEW GOVERNMENT WILL ADOPT A MORE USER-FRIENDLY APPROACH TO SUPPORT OUR GROWERS.”

**PAUL OLSEN, CHAIR POTATOES NZ**



“

“THE REDUCTION IN AREA IS A CONCRETE EXAMPLE OF THE PRESSURE OUR VEGETABLE INDUSTRY IS UNDER.”

**JOHN MURPHY, VEGETABLES NZ CHAIR**



## LESS AREA UNDER CULTIVATION CAUSE FOR CONCERN

The reduction in the area under cultivation for vegetables is a concern to the industry and should be a concern to New Zealanders and the incoming government, says Vegetables NZ chair John Murphy, if food security and access to fresh, healthy vegetables at reasonable prices is a priority.

“The reduction in area is a concrete example of the pressure our vegetable industry is under. For more than a decade, returns to vegetable growers have not increased while input costs have increased considerably. Today's growers also face ever increasing regulation and it is very difficult for them to expand production, to keep up with increasing demand.”

John says Vegetables NZ is talking with the incoming government about what is needed. “They are very supportive, however, there are a lot of aspects to vegetable growing that need addressing, across land, water, agrichemicals and labour, if New Zealand's vegetable industry is to have a bright future and reach its potential.”

An increase in the area of land under cultivation in Canterbury is a welcome trend but Paul Olsen, chair of Potatoes NZ, says this positive development is tempered by a broader decline in vegetable cultivation nationwide.

However, Paul remains optimistic about the industry's future. “Despite the challenges, we are hopeful that the new government will adopt a more user-friendly approach to support our growers. Collaboration between industry stakeholders and the government is key to creating an environment that promotes sustainable growth and ensures the resilience of New Zealand's vegetable production.”

## POTATO OF THE MONTH: **BELLINDA**

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# SPRING OPTIMISM IN PUKEKOHE

Glenys Christian



*Pukekohe Vegetable Growers' Association (PVGA)  
president Kirit Makan*

**Pukekohe vegetable growers are hoping for favourable summer growing weather and some greater acknowledgement from the new government that they are doing a good job.**

"It's been pretty challenging over the last 12 months," says Pukekohe Vegetable Growers' Association (PVGA) president, Kirit Makan. "It's been stressful and it's taken a toll. But growers are resilient and tend to remain positive. It's a new season and we'll see what happens."

The weather once again will be a determining factor. After a winter of short sowing and planting windows, crops were eventually planted, but now after months of regular rainfall, irrigation is a priority to keep crops growing.

"It's fickle at this time of year."

While fertiliser prices have eased a bit they are still high. The price of diesel has gone up again recently, and chemical prices are "a mixed bag", also affecting growers' margins. There are still issues with labour, although the situation is not as bad as over Covid-19. Overseas students able to work under a new visa category are travelling around the country and finding a variety of horticultural work for a few weeks in the different areas they visit.



*Grower Peter Reynolds on his Pukekohe farm*

The present high interest rates are a concern if growers are running seasonal overdrafts. Growers would like to see compliance costs held back, especially in the environmental regulation area.

“

**Growers knuckled down after last February's storms and made sure their on farm systems were future-proofed**

"We'd like to think the new government will be a bit more sympathetic to the rural sector," Kirit says. "It would be good to see the pipeline of legislation slow down. Growers understand the need for legislation, however it needs to be workable."

He attended Environment Court hearings into Waikato Regional Council's Plan Change One (PC1) in early November along with four other Pukekohe Vegetable Growers' Association representatives, Brent Wilcox, Brendan Balle, Stuart Davis and Bharat Jivan, by all accounts receiving a fair hearing. The association has also met and had good conversations recently with Auckland Council representatives as it prepares to release its proposed Freshwater Plan early in December.

Peter Reynolds says growers knuckled down after last February's storms and made sure their on farm systems were future-proofed. His traps have picked up a little bit of silt through the winter, but a minor amount compared with what had to be emptied out immediately after the February storms. And luckily they were halfway through their onion harvest so didn't encounter the storage issues which some other growers did.

His 30ha crop of onions just out of Tuakau was sown two weeks later than normal on 25 May due to the wet weather which has been a feature of the past year.

"Up until the end of August it was wet and from then it's been an average spring," he says.

With 30 millimetres of rain falling early in November he hasn't had to use his irrigator yet, but says many growers have taken the opportunity to make sure they have a good supply of water, as well as upskilling themselves with new irrigation technology.

"They know they can get hit with a drought."

He feels growers need to be better recognised for knowing what they're doing.

"We've got our fertiliser programmes in place as well as soil and silt control," he says. "We're world-leading but we keep getting it poked down our throats that we're doing things the wrong way. If we weren't doing what we're doing, we wouldn't be growing crops like this."

In his case, for the last two years he has used consultant Olivia Prouse to monitor fields of onions every three to four weeks to make sure the plants are receiving the correct nutritional requirements. Finetuning can then make sure that any shortfall is made up by dry or foliar feeding, without having the previous lengthy wait to get leaf samples to the lab to be tested.

"We're getting real-time results," he says. "It's proving that we do need the amount of dry nutrients we're putting on, because we've got proof of their uptake."

And that's meant that despite the present high fertiliser prices he hasn't cut back on these inputs.

"We're employing a lot of people and growing a lot of food," he says.

Problems with wet ground which have persisted right through to early summer have caused crop planting delays for a number of growers, says Bharat Bhana.

"The ground is still very wet when you're working it up," he says. "There are still clods 75-80mm across. Once they're dry they crumble up, but the soil needs to dry out for that to happen."

That's meant extra working up of the soil has been required, resulting in potato planting running around four weeks behind schedule.



"We're having to make two or three extra passes and that's cost a lot of diesel," he says. "Two extra runs to get to the seedbed stage is all extra dollars. And the labour required will run into the thousands."

While there has been some recent rain, he says the soil is acting like a suction device, making carrot harvesting difficult, so watering has been required. They've left some Iceberg lettuce behind in the paddock as prices have dropped. Consumers should take full advantage of the value for money as well as the larger size lettuces now being grown.

**“**  
**Growers would like to see compliance costs held back, especially in the environmental regulation area**



He says the weakness of the New Zealand dollar against the US dollar and Euro are other issues growers have had to deal with, as freight rates, which haven't decreased, as well as fertiliser and chemical prices are all influenced. He believes interest rates could go up again, and while there's been a turnaround in the labour situation with potential workers approaching growers, "often they don't have the right visa".

Whether farm plans are prepared by growers or consultants, new environmental regulations are adding more cost at a time when many growers are planting out some of their gullies in natives anyway.

"It all comes down to time, and that's something no one has got," he says. "The business we're in is tough, but if we're allowed to do it properly we can enjoy it along the way." ●



# THORNY ROAD TO SECURE A FUTURE



Van Lier Nurseries co-owner Theo Van Lier checks on houseplant stock in one of the greenhouses near Kumeū, northwest of Auckland

**It was a case of necessity being the mother of invention for a West Auckland flower grower with an energy source dilemma. Now Van Lier Nurseries is switching from gas to electricity to heat its glasshouses. HELENA O'NEILL visited the family-owned business to take a look at its unique system and learn about its potential for edible indoor crops in New Zealand.**

For more than 60 years the Van Lier family has been growing flowers in West Auckland. Starting out in Massey, the company is now based at Riverhead, northwest of Auckland.

Van Lier Nurseries Ltd started operating in 1968, founded by Walter and Maria Van Lier who had immigrated from the Netherlands. They were fondly known to all as "Oma and Opa", which is Dutch for grandma and grandpa. They initially grew carnations but started growing other flowers including their current primary crop, roses.

Today the business grows six types of cut flowers: roses, alstroemeria, dahlia, gypsophila, helleborus, and limonium. Roses are their signature flower, with more than 30 varieties grown. They are the second-largest producer of cut roses in New Zealand.

In 2016 Van Lier Nurseries began growing and selling a range of houseplants and now has a greenhouse dedicated to propagating and supplying plants to commercial cut flower growers and houseplants to retailers.

The nurseries are now third-generation family-owned. Walter's son Theo, and grandson Harry, partly own the business. Harry is the operations manager and Theo works alongside him. Joanne Hurley rounds out the senior management team as chief operations officer.

“

**They now have a robust and sustainable energy set-up for the next 20 to 30 years to help future-proof the business for the next generation**

Joanne says Walter and Maria first grew potatoes on their home property at Oratia, West Auckland, with the returns helping set the couple up as growers of cyclamens, carnations, and then roses and other flowers.

Prior to the Covid-19 pandemic, Van Lier Nurseries was in the midst of an expansion project, adding more greenhouses to their operation. Then came the news from their energy supplier that their gas contract would be ending.

"We had six months' notice that the gas contract would end, and it was unlikely that we would be able to secure gas from anyone else."

After more than 50 years in business, losing the gas contract was a hard blow and put the operation's future under pressure. Profit margins for cut flowers were already tight without adding in an energy investment project just to keep the business operating.

"We could have sold the business, or grown cold with a mid-September to May growing season rather than a year-round supply. We would have had months without roses for supply, meaning culling up to two-thirds of our staff. So we had no choice but to find another energy option."

And finding that alternate energy option proved to be a long and complex journey.



*The new R744 (CO<sub>2</sub>) heat pump system by Glacim Cooling Technologies*

Van Lier Nurseries applied to the Energy Efficiency and Conservation Authority (EECA) for the Government Investment in Decarbonising Industry (GIDI) Fund and was successful in securing co-funding of \$215,000 towards initial capital costs. However, they still had to invest nearly \$2 million into the project and implement it.

EECA is a Crown Entity that works to accelerate the uptake of clean and clever energy. One of EECA's focus areas is supporting productive and low-emissions business, and EECA's funding can be used for technical consultancy and project management services. EECA has also in the last few years added new, accessible programmes that help businesses map a path to becoming more energy efficient and make the switch to renewable energy.

EECA business group manager Nicki Sutherland says that with their gas contract coming to an end, Van Lier could have chosen to replace their energy contract with another fossil fuel option. Instead they chose a clean energy option - an innovative electric heat pump solution that had not been used in New Zealand before.

"Van Lier has shown what is possible for growers interested in joining the clean energy economy, and the team at EECA are delighted to have played a part in bringing this exemplar project to life.

"We'd like to encourage all growers interested in energy efficiency and renewables to investigate the programmes we have available - like our covered cropping pathway, which has been designed specifically for the sector. Each of the five steps provides evidence based, practical information - and you can pick and choose what to take on board, depending on how far along you are on your journey."



*Airside evaporators at Van Lier Nurseries*

Joanne says that Genesis offered a robust engineering team to assist with preliminary and detailed design and project management. While not a turn-key project, Genesis managed engineering work, suppliers of equipment, piping connections, electrical work, and the automated uptake of grid power depending on price via the installation of a TOU (time of use) meter.

"I couldn't fault the Genesis engineering team, the extra spent on their fee was absolutely worth it."

Joanne's key advice for growers looking into alternate energy sources is to do extensive research on what is the best fit for you, even before selecting a consultant.

"What we're doing here could be applied to any indoor horticulture business. My advice is to start talking to your lines company very early on in the process as they might not have the grid capacity right now for your energy needs."

They now have a robust and sustainable energy set-up for the next 20 to 30 years to help future-proof the business for the next generation. However, there are still problems to resolve, such as investing in a generator to protect their stock when there are power interruptions.

Another drawback with the new heat pump system is that it can no longer be fixed in-house by Van Lier Nurseries' staff like the outgoing gas boiler.

“

**“WHAT WE'RE DOING  
HERE COULD BE APPLIED  
TO ANY INDOOR  
HORTICULTURE BUSINESS.”**

**CHIEF OPERATIONS OFFICER,  
JOANNE HURLEY**





*Pipes bring heat into the greenhouses*

Genesis says its pilot with Van Lier Nurseries replaces the gas-fired boiler with a state-of-the-art 1MW (megawatt) low-emission heat pump to heat its greenhouses.

The heat pump is more efficient than traditional gas boilers; in addition, Van Lier Nurseries expects to save 770 tonnes of carbon emissions per annum over the new heat pump's 25-year life.

On its website, Glaciem Cooling Technologies says it designed Van Lier Nurseries a unique new system capable of simultaneous heating and cooling with extremely high efficiencies.

The CO<sub>2</sub> heat pump is designed to provide cooling or heating to the store via an air-handling unit. The heat pump can also provide simultaneous cooling and heating for dehumidification, with the capacity for full air-sourced heating when no simultaneous cooling is available, and an adiabatic gas cooler when no (or insufficient) heating demand is available. (Adiabatic means that no heat is transferred into or out of the system.)

A CO<sub>2</sub> heat pump absorbs naturally occurring warmth from the air, amplifies it, and transfers it to heat the water. It uses mechanical energy from electrically powered compressors rather than the much less efficient method of heating with an electric element. By using CO<sub>2</sub> as a refrigerant, the heat pump can operate much more efficiently in a high-temperature range and perform more efficiently at low ambient temperatures.

The nursery business has a large 400 m<sup>3</sup> hot water storage tank – also called a thermal battery – connected to the heat pump. The amount of heat storage in this tank is equivalent to running the heat pump at full output for approximately ten hours.

Genesis' chief transformation and technology officer Ed Hyde says this provides a great opportunity for Van Lier to reduce their energy bill by charging the thermal tank (running the heat pump) during off peak energy times when energy prices are low, and conversely turning the heat pump off and draining heat from the tank during peak energy times when electricity is more expensive.

Shifting load from peak to off peak times has the additional benefit of reducing the peak load on the local electricity lines, so lines companies can better utilise the infrastructure they already have, avoiding expensive lines upgrade projects.

Ed says Genesis and New Zealand Green Investment Finance (NZGIF) are providing the heat pump to Van Lier Nurseries on a lease-to-own arrangement, enabling the flower operation to spread the cost of the heat pump while receiving engineering and maintenance support from Genesis.

"Genesis has worked with Van Lier Nurseries on mapping their energy needs and advising on how they could run more efficiently. The heat pump pilot will take that relationship to a new level. We will also use learnings from this pilot to refine offerings to other business customers."

NZGIF chief investment officer Jason Patrick says if successful, the arrangement could be scaled up and offered to companies who want to avoid the upfront cost and risk of transitioning to new technology. ●

## COVERED CROPPING DECARBONISATION PATHWAY

- EECA offers a covered cropping decarbonisation pathway to connect New Zealand growers wanting to become more energy efficient and reduce emissions, with world-class innovation and best practice guidance.
- The programme involves collaboration between EECA, Vegetables NZ, Tomatoes NZ, and NZ Plant Producers, and has input from technical experts.
- Businesses get access to advice on how to reduce reliance on coal or gas and diesel by using existing equipment and processes as efficiently as possible and reducing overall energy use. This has a flow-on to emissions savings. It also makes fuel switching possible and cheaper later.
- The bespoke pathways result in cost savings and can increase productivity – while also reducing the carbon footprint of the grower.



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# PŪHĀ VENTURE REVIVES LEGACY OF NAME AND TRADITIONAL VEGETABLE

Elaine Fisher



Sisters Julie Ruawai and Kathleen Puha and Mangisi Kaho are the partners behind Sunny Puha, a new venture to grow pūhā commercially

**For the Puha sisters of Moteuka, their last name was not an easy one to grow up with, but now they are celebrating their father's legacy and name in a new business venture, Sunny Puha, to grow a traditional Māori vegetable pūhā commercially to make a range of products, including pesto.**

"This is the story of the reclamation of our name Puha," says Julie Ruawai (née Puha).

"When we were young there were fewer Māori in Motueka, and we got hassled because of our strange name. But as we got older, we began reclaiming our own identity and have proudly called our business Sunny Puha in honour of our father Sonny Puha."

Julie together with sisters Tracey Andersen and Kathleen Puha began the venture last year, but tragically Tracey, the driving force behind its early development, passed away earlier this year. Kathleen says the whānau miss Tracey terribly but are determined to see her dreams become a reality.



Tracey Andersen the Puha sister who was the driving force behind a project to grow pūhā commercially with a mature pūhā plant complete with flowers and seeds (Photo supplied)

Making pūhā pesto was not the sisters' first business ambition. Both Tracey and Julie gave up secure and relatively well-paid employment with government departments to advance Waka Whenua, a business project to encourage the tikanga (tradition) of placenta planting. However, they needed to find a ready income while in the research and development phase with that project, and decided to harvest the pūhā growing in the family garden to make pesto to sell at the local market," says Kathleen.

Pūhā pesto proved so popular it became obvious it offered an even greater opportunity to create a new business. Pūhā, they realised, had always been a part of their family in more ways than their name.

"We did not have a lot of money and our mother, who was Pakeha, used to forage for pūhā. She would take my boys out foraging with her and while it was necessary to gather food, she turned it into an adventure and the boys loved it," says Julie.

In 2018 Kathleen, who had lived in Auckland for 30 years, moved to Motueka to join her sisters' pūhā venture. She had previously worked for Progressive Enterprises followed by 20 years working as a graphic designer. Julie's partner Mangisi Kaho, is also an integral part of the project.

While pūhā pesto proved popular, producing it on a commercial scale was not easy and once again the family needed another income. In the tradition of their hardworking parents Sonny and Mickey Lilian Puha, the whānau bought a cleaning business, which they still operate to help with cash flow.

In November last year Sunny Puha Limited Partnership gained Sustainable Food and Fibre Futures (SFFF) funding for their project to establish a whānau-run food business.

The aim is to scale-up the production of pūhā and develop food products using cultivated pūhā. The funding is helping Sunny Puha develop a comprehensive system for seed collection, propagation, growing and the harvesting of pūhā.

Kathleen, Julie and Mangisi are grateful for the significant support and encouragement their venture has received including from their local community, Te Āwhina Marae, Kono Wakatū, their kaumatua, SFF Futures, scientists at Plant & Food Research, Motueka, Mark O'Connor of Nelson market gardeners Appleby Fresh, the Ministry for Primary Industries and the Cawthron Institute.

"We have had so much help and encouragement it has been wonderful. There is so much to learn to fully realise the potential of pūhā," says Kathleen.

To harvest seeds for propagation the whānau grew pūhā in a number of different sites, including their home gardens and marae. "We visited Appleby Fresh where Mark O'Connor introduced us to his team who showed us how to propagate the seeds and prick out the seedlings to grow them on," says Kathleen.

“  
**Pūhā is a hardy plant which grows wild in often rugged places**

A shade house has been built on 1.7ha of leased land, and with a blend of seed raising mix created specifically for pūhā, they had in September, thousands of young plants growing in trays.

So far propagation has been successful, and Kathleen is enjoying the exacting work of carefully pricking out tiny plants and transferring them to single cells. In keeping with Māori tradition, she begins each session with a karakia and follows Maramataka, the Māori lunar calendar, to plan transplanting and planting.

Mangisi helps when he's not building raised beds to grow the plants on a sheltered, but flood-prone part of the property. He is also responsible for setting out a trial bed which Plant & Food Research scientists will monitor and advise on the best way to grow pūhā commercially.



Kathleen Puha carefully picks out pūhā seedlings into a single cell tray

Pūhā is a hardy plant which grows wild in often rugged places, but growing it commercially won't be without challenges. "One of our biggest issues is how to control the pūkeko which love to pull the plants out of the ground, and white butterfly caterpillar love them too," says Mangisi.

The optimum time to harvest the plant for the three different products Sunny Puha plans to produce is another area of research. "We want to investigate how to use the whole plant and not waste any part of it. The leaves will be supplied as fresh salad or cooking greens or made into pesto. Other parts of the plant could be used to make a nutritional powder."

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*Mangisi Kaho carefully teases out the roots of a pūhā seedling, ready for transplanting*

Work is underway with Plant & Food Research scientists to produce a growers' manual. "Eventually we want other people to grow pūhā for us, and the growers' manual will be an important part of our intellectual property," says Mangisi.

Kathleen says while the recipe to make pūhā pesto has been perfected, scaling it up to a commercial level is another challenge. Tracey formed a relationship with The Food Factory in Nelson, founded by Pic Picot from Pic's Peanut Butter as a facility that new startups can use to develop their products.

"Eventually we want our own kitchen, but we have so much to learn about the techniques and equipment we need first."

By the end of 2024 Sunny Puha aims to have completed its research and development and be ready to launch their commercial venture. "Then we want to offer employment for our local people and opportunities for landowners to grow pūhā on contract," says Kathleen.

The commercial growing of pūhā will be very different from the land use Sonny Puha, of Ngāti Porou on the North Island's East Coast, found when he moved to Motueka in the 1950s to work on tobacco farms.

Julie and Kathleen believe their parents would be pleased with their ambitious venture which is not only reviving the status of a traditional food, but also of their proud family name. ●

## PŪHĀ COULD BECOME NZ'S NEWEST COMMERCIAL VEGETABLE

Scientist Dr Bruce Smallfield of Plant & Food Research is working with Sunny Puha on a Sustainable Food and Fibre Futures (SFFF) funded project aimed to establish if pūhā can be grown commercially.

"All credit to the Puha sisters, Tracey, Julie and Kathleen and Mangisi Kaho for starting this venture to take a traditional Māori food and grow it on a large scale. If successful, pūhā will be a new leafy green," he says.

While valued by Māori as a nutritional food, pūhā is widely considered by farmers and gardeners as a weed. "In the wild, pūhā seems to only need a crack in the concrete to establish and grows over broad soil and varied climatic conditions, but cultivating it commercially may not be easy," says Bruce.

"We know how to grow broccoli, but with pūhā there is no information we can use as a starting point other than systems used in production of conventional leafy greens."

The aim of the SFF Futures funded project includes carrying out experiments to establish what is required to develop a production method and to produce a growers' guide. Plant & Food Research technologist Irene Ho is also assisting Sunny Puha with the development of pūhā products, including pesto.

Bruce says as pūhā seeds are not available from seed suppliers, they have been harvested from wild plants. "Pūhā seeds have parachute-like pappus hairs which allow the seed to be blown by the wind. The hairs make it difficult to plant the seeds uniformly or for precision planting, so we are looking at how hairs might be removed. We have had some success but there's still work to do. However, we know removing hairs doesn't negatively impact seed germination."

Earlier trials planting glasshouse raised seedlings into the field were not entirely successful. "The plants almost all went straight to seed, which could be from two lots of transplanting shock, so trials to sow seed directly into transplant cells then into the field will be carried out."

Cultivated pūhā is likely to require the same high-class soils as that for other vegetable crops. "It will need well-draining soils so it is possible to come onto the land to harvest or plant at any time during the year. For commercial development the key will be high class free draining silty soils.

"I certainly hope the Sunny Puha team can make this work. It requires a lot of drive and faith to take on something for which there's no production system.

"It is important to stress that we are working through the development phase and there is no certainty at this point that it will be successful," says Bruce.

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# INNOVATIVE SOLUTIONS CRUCIAL FOR HORTICULTURE

NZGrower staff

**Animal and Plant Health New Zealand, the peak industry association representing companies in crop protection science and technology among others, recently appointed Dr Liz Shackleton as its new chief executive.**

She brings a wealth of leadership experience in agriculture and biosecurity. A veterinarian by training, Liz has a passion for crop protection and the success of the primary sector. She is a chartered member of the NZ Institute of Directors and a board member of the NZ Veterinary Council.

## ? What is your message to growers in New Zealand?

Our growers need access to innovation to update our toolkit to manage pests and weeds, not just today but into the future. We are facing new pests, such as fall armyworm, the challenges of weather changes and new or longer life cycles of pests. We must support growers by bringing these innovations to New Zealand to tackle these issues before we hit crisis mode. New Zealand's biosecurity system is a crucial part of this as biosecurity threats can, and do, get past the border.

## ? What excites you about your new role at Animal and Plant Health NZ?

I'm thrilled about supporting our diverse member organisations, representing nearly 90 entities ranging from small family businesses to global multinationals. Their science and innovation play a crucial role in New Zealand's primary sector and economy, addressing biosecurity challenges, ensuring food security, and contributing to global competitiveness.

## ? What are your goals for the future?

Our vision revolves around healthy crops and healthy animals safeguarding New Zealand's sustainability. I aim to engage with the government and partners to advocate for science, innovation, supportive regulation, and effective storytelling. Urgent priorities include unblocking access to innovation, fostering strategic partnerships, and adapting to future challenges.



*Dr Liz Shackleton is the new chief executive of Animal and Plant Health New Zealand*

## ? What should the new government prioritise?

Unblocking access to innovation. This has been a long-standing issue and if we can't embrace new technology, New Zealand risks an increasingly limited toolkit to manage pests, diseases, climate challenges, and sustain productivity. This poses a threat to the agriculture sector, exports, and overall food security, with global investors expressing concerns and withdrawing from the market. Urgent collaboration is needed to address this risk to New Zealand's brand and economy.

## ? What misconceptions about the industry would you most like to address?

There is no rest stop on the misconception highway, with plenty about our industry and the primary industry in general. What we hear less of is the collaboration and constructive action being taken in sustainability and stewardship, such as responsible use and resistance management. We need to continue to lean on the important tools that have long-term and preventative benefits - biosecurity, disease surveillance, diagnostics, management practices, and other health technologies. This means accessing innovation as technology and our product life cycles age.

## ? What do you like to do outside of work?

Parenthood is my primary focus outside of work. I also enjoy trail runs in nature, and time with friends. ●

# FAREWELL TO A CONNOISSEUR OF MUSIC, FOOD, AND CROP PROTECTION SOLUTIONS

## Grant Hagerty (1958-2023)

Grant Hagerty will be remembered for his infectious laughter, generous spirit, love of food and music, and incredible catalogue of technical information on crop protection products.

Known as the go-to person for technical information on managing pests and weeds, BASF's technical manager, Grant Hagerty, sadly passed away in August 2023, leaving a legacy that will be remembered by the next generation of growers.

With his extensive knowledge, Grant was phenomenal at answering technical questions - typically from memory or by consulting his vast collection of electronic or paper files. He made outstanding contributions to agriculture in New Zealand and was instrumental in maximising agricultural productivity and enabling horticultural exports to the world.

Throughout his career, Grant introduced cutting-edge products into the market and collaborated on agrichemical resistance management strategies. He was instrumental in developing and registering herbicides, fungicides, and plant growth regulators in New Zealand, with a knowledge and passion that were second to none - spanning from the early years of crop protection to the latest cutting-edge innovations.

Grant was a passionate advocate of food and music, a great friend, an amazing colleague with an outstanding sense of humour, and a straight shooter. Grant's tenure with BASF, which endured for more than 40 years, leaves a lasting impression on his colleagues as they share their thoughts on working with Grant.

"Grant's infectious laughter, passion for his work, willingness to lend a helping hand, and his unwavering commitment to his job made a lasting impact on all who had the privilege of knowing him. I learnt a lot from Grant and will miss him as both a friend and colleague," says Gavin Jackson, head of agricultural solutions - Australia & New Zealand.

"Grant had a huge stature in the New Zealand agriculture and horticulture industry. His memory of trials done over the decades was phenomenal. In the over 37 years I knew



*Grant Hagerty (centre) shares Revystar® demonstration plots with New Zealand farmers and agronomists at the Foundation for Arable Research Arable Field Day*

Grant, I never stopped learning from him." - Tim Herman, senior technical services specialist.

"Farewell, Grant. We already miss your comments, your laughs, your knowledge. You have left a giant hole in the industry that few can fill. We can only try and maintain your legacy. The challenge is ours to try" says Tim Geuze, territory manager - New Zealand.

Mamoun Al-Farra, regulatory affairs manager, comments: "I am grateful for the memories shared with Grant and the positive influence he had on our team. Grant's vibrant spirit will live on in our hearts and minds forever."

Grant was awarded the Animal and Plant Health NZ Outstanding Contribution Award at the association's July conference. The Award recognised Grant's contributions, including championing the needs of fellow members on industry issues, promoting the industry to the wider community, developing innovative ideas and solutions for the industry, and lending a hand on technical issues.

Grant had the utmost commitment to agriculture, was a valued friend of the industry and, above all, was a great man. ●

# TECHNICAL



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# VEGETABLES NZ PEST MONITORING ACTIVITIES – A FOCUS ON DISEASES AFFECTING CUCURBITS AND CORN

Lisa Wong : Market Access Solutionz Ltd research & technical specialist

**Vegetables NZ recognises that exotic pests and diseases are biosecurity risks that could have significant impacts on the vegetable sector if they were to arrive in New Zealand. For this reason, Vegetables NZ has long been supporting the 'Monitoring biosecurity risks for the vegetable sector' project overseen by the Vegetable Research and Innovation (VR&I) Board. Vegetables NZ also maintains an awareness of the risks posed by new and emerging pests and diseases that could cause damaging impacts on vegetable crops produced in New Zealand.**

Priority pests are exotic pests and diseases that have major impacts on vegetable production overseas. Keeping an eye on priority pests and new and emerging pests and diseases acts as an early warning system, and helps growers prepare for and manage these biosecurity risks in the event they arrive.

Risks from pests and diseases can arise from a changing distribution because of trade or the movement of plants, people or consignments. They can also arise because their host association is expanding, or they may have a greater impact in their new environment compared with their country or region of origin.

Recent monitoring of the scientific literature and other information sources has seen a rise in publications on pathogens (bacteria, fungi, viruses) causing diseases particularly in cucurbits but also in corn. This article highlights and briefly describes some of the new and emerging pathogens currently affecting cucurbits and corn overseas, and why they are a concern for New Zealand growers. Figures 1 and 2 show the disease symptoms of these pathogens.

## **Pathogens affecting cucurbits**

### **Tomato leaf curl New Delhi virus (ToLCNDV)**

ToLCNDV was initially identified affecting solanaceous crops, and is now associated with significant economic losses from lower yields and cracked non-marketable fruit. ToLCNDV has been impacting melon production in Europe for over a decade. Common symptoms are leaf distortion, yellow mosaic, vein clearing and leaf curl (Figure 1A). It is transmitted by the whitefly *Bemisia tabaci*, and is present mainly in Asia and the Mediterranean Basin.

### **Bacterial fruit blotch, *Acidovorax citrulli***

*Acidovorax citrulli* causes bacterial fruit blotch, particularly affecting watermelon but also melon, pumpkin and zucchini. It is a seedborne disease and survives in seeds for long periods. Symptoms on fruit are water-soaked lesions which appear as dark green blotches and then slowly turn necrotic (Figure 1B). *Acidovorax citrulli* is present in many watermelon producing areas of the world.

### **Cucurbit yellow stunting disorder virus (CYSDV)**

The natural hosts of **CYSDV** are watermelon, melon, cucumber and zucchini. Signs of the disease begin as yellow spotting which covers the entire leaf as the disease develops (Figure 1C). The symptoms can be mistaken for nutrient deficiency. CYSDV is transmitted by whitefly, and is present in the United States, the Mediterranean Basin and China. CYSDV is often reported in mixed infection with Cucurbit chlorotic yellow virus (CCYV) which has similar symptoms. CYSDV is a Vegetables NZ priority pest and is regularly monitored as part of the Vegetables NZ priority pest review. A factsheet on CYSDV is available on the Vegetables NZ website.

### **Cucurbit aphid-borne yellows virus (CABYV)**

CABYV causes yellowing diseases in all major cucurbits, pumpkin, cucumber, squash and watermelon, with the severity of the disease related to the season and cultivar. Symptoms include interveinal yellowing on young leaves and dark green veins on older leaves (Figure 1D). CABYV causes severe yield losses, with affected plants becoming almost unproductive. CABYV is transmitted by aphids and can be introduced through infected plants. CABYV is present in Asia, North Africa and the United States.



**FIGURE 1. DISEASE SYMPTOMS OF NEW AND EMERGING PATHOGENS AFFECTING CUCURBIT**

**A. Tomato leaf curl New Delhi virus (ToLCNDV)**

Symptoms on zucchini (left) and melon leaves (right)

Vegetable hosts: cucurbits, tomato, eggplant, capsicum



**B. *Acidovorax citrulli* (bacterial fruit blotch)**

Symptoms on watermelon (left) and melon leaves (right)

Vegetable hosts: cucurbits, particularly watermelon



**C. Cucurbit Yellowing Stunting Disorder Virus (CYSDV)**

Symptoms are yellowing on melon leaves

Vegetable hosts: melon, watermelon, cucumber, pumpkin



**D. Cucurbit aphid-borne yellows virus (CABV)**

Symptoms on greenhouse cucumber leaves

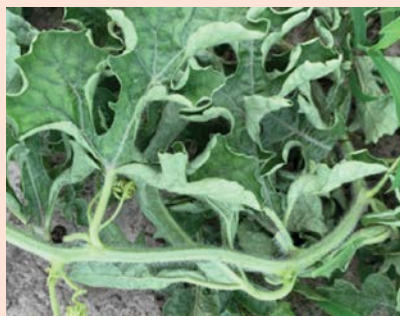
Vegetable hosts: cucumber, pumpkin, squash



**E. Watermelon crinkle leaf-associated virus 1 and 2 (WCLaV1, WCLaV2)**

Symptoms on watermelon leaves

Vegetable hosts: watermelon, squash, zucchini



## FIGURE 2. DISEASE SYMPTOMS OF NEW AND EMERGING PATHOGENS AFFECTING CORN

### A. *Phyllachora maydis* (tar spot)

Symptoms on corn

Corn and maize are the only known hosts.



### B. *Pantoea ananatis* (leaf spot)

Symptoms on corn

Vegetable hosts: corn, onion, tomato



### Watermelon crinkle leaf-associated virus 1 and 2 (WCLaV-1 and WCLaV-2)

WCLaV-1 and WCLaV-2 are new viruses, often detected together in mixed infection. Both viruses are known to infect watermelon, squash and zucchini. Leaf symptoms include mild leaf crinkling, yellow mosaic and mottling, chlorosis, and leaf distortion (Figure 1E). Fruit symptoms include circular lesions and deformations. Little is known about these viruses but current indications are that WCLaV-1 and WCLaV-2 may be associated with seeds. Since being discovered in China in 2017, they have spread to a few states in the United States and Brazil, and to New South Wales, Australia in 2023.

### Pathogens affecting corn

#### Tar Spot, *Phyllachora maydis*

*Phyllachora maydis* is a fungal pathogen which causes tar spot on corn and maize. Corn and maize are the only known hosts. The symptoms of tar spot are small yellow-brown spots on the leaves which may coalesce to form short stripes (Figure 2A). Tar spot is an emerging disease in the United States and Canada, but has caused little damage in Mexico, Central America and the Caribbean where it has been present for over 70 years.

#### Leaf Spot, *Pantoea ananatis*

*Pantoea ananatis* is a bacterial pathogen which causes leaf spot in corn. It is also a major pathogen of onions, causing centre rot. Symptoms on corn are spots and streaks on the leaves (Figure 2B). It is present in many countries across all continents, including Australia.

Maintaining an awareness of these new and emerging pests and diseases is important so that New Zealand growers are prepared for potential incursions. *The Vegetable Growers' On-Farm Biosecurity Manual* for outdoor and covered crops is available on the website and should be used to help growers in planning biosecurity management. Factsheets for Vegetable NZ's priority pests are also available on the Vegetables NZ website to help growers identify pests and recognise disease symptoms. ●

For more information, please visit Vegetables NZ:  
[www.freshvegetables.co.nz](http://www.freshvegetables.co.nz)

Photo credits:

Figure 1A. ToLCNDV, Dr. Agr. Raffaele Giurato (EPPO).

Figure 1B. *Acidovorax citrulli*, A. Obradovic, University of Belgrade (left) (EPPO); Dr Andrea Minuto, Centro di Saggio, CERSAA, Albenga, Italy (right) (EPPO).

Figure 1C. CYSDV, Dirk Janssen (EPPO).

Figure 1D. CABYV, (van der Ven and Smith, 2022).

Figure 1E. WCLaV-1, WCLaV-2, UF-IFAS, University of Florida.

Figure 2A. *Phyllachora maydis*, Kiersten Wise, Bugwood.org (left), Valle-Torres et al. 2020 (right).

Figure 2B. *Pantoea ananatis*, Sauer et al. 2015 (left); Pérez-y-Terrón et al. 2009 (right).

# WAITING TO SEE WHAT EL NIÑO BRINGS

Ben Noll : NIWA Meteorologist

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## Spring 2023: a season of weather surprises

Spring has seen some interesting weather twists and turns. From fluctuating temperatures to powerful wind events and unique rainfall patterns, the season has brought a lot of surprises.

During October, the Tasman Sea and the North Island experienced higher than normal mean sea-level pressure, while lower than normal pressure was seen to the south of Aotearoa New Zealand. This configuration led to more westerly airflows than usual, a pattern often associated with El Niño.

Those in the South Island and lower North Island probably felt the impact of this, with westerly airflows contributing to several strong to damaging wind events throughout the month. In fact, there were 21 locations where record or near-record maximum wind gusts for October were reported. It was a blustery month, to say the least!

But October wasn't all about the winds. Several cold fronts from the Southern Ocean brought occasional cold spells and even low-elevation snow to the South Island. It is unusual to see snow down to the lake level in Queenstown and flurries in Dunedin's central business district, and even more so in late October!

October ended with the remnants of ex-Tropical Cyclone Lola making an appearance, with heavy rainfall and strong winds for the upper North Island. And in November ex-Tropical Cyclone Mal passed to the northeast of New Zealand after tracking through Fiji.

## Looking ahead: the outlook for November 2023 to January 2024

As we look ahead towards the summer months, it is essential to know what Mother Nature has in store for New Zealand. The outlook is shaped by a few key factors, so let's break it down:

**El Niño continues:** El Niño, which was officially declared for New Zealand in late September, is expected to intensify over the coming months. We're almost certain that El Niño will continue during this period, and that it has an 80 percent chance of lingering into autumn, continuing to influence New Zealand's climate.

**Air pressure:** The air pressure forecast indicates above-normal pressure near New Zealand, especially over the

North Island. To the south, we can expect lower than normal pressure. The pressure pattern is expected to deliver more westerly winds.

**Rainfall:** The outlook shows that the north and east of the North Island are likely to experience below-normal rainfall. In contrast, the west of the South Island is expected to see above-normal rainfall. Other regions have about an equal likelihood of near-normal or below-normal rainfall. Prolonged dry spells are likely in several regions.

**Drought:** As of mid-November, no regions across Aotearoa New Zealand were experiencing very dry or drought conditions, but that can change quickly as the days get longer, hotter, and feature strong winds at times. The strongest signal for below normal summer rainfall is from Northland through Hawke's Bay, as illustrated in the image below. These regions, among others, should remain prepared for the dry.

**Temperatures:** Early summer is likely to see above-average temperatures, particularly in the eastern regions of both islands and the north of the North Island, as air masses occasionally migrate over from Australia. Temperatures are about equally likely to be near average or above average in all other regions.

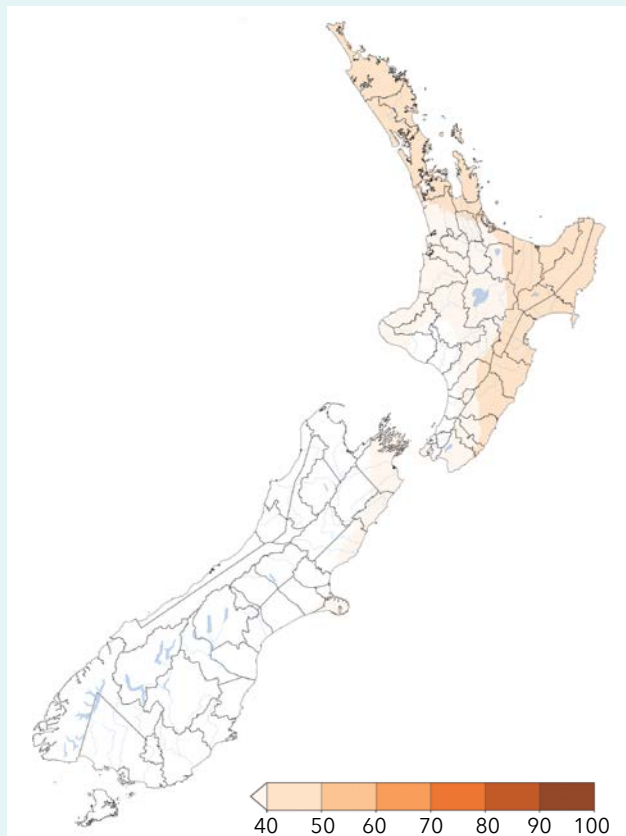
**Wind strength:** Brace yourself for some more windy days! The seasonal wind strength is forecast to be above normal across most of the country, thanks to a stronger than normal pressure gradient (difference in pressure over distance) near New Zealand. This increased wind strength comes with a higher risk for periods of damaging winds.

**Coastal sea surface temperatures:** Coastal sea surface temperatures ranged from 0.35°C to 0.64°C above average during October. We could see localised marine heatwaves in northern and eastern coastal areas in the months ahead.

**Soil moisture and river flows:** The west of the South Island is expected to have near-normal soil moisture and river flows. In all other regions, there's an equal likelihood of near-normal or below-normal values.

**Fire danger:** While late October saw low fire danger across the country, it is essential to remain vigilant. Normal or above-normal wildfire activity is expected through summer, particularly during periods of hot, windy weather in northern and eastern areas of both islands.

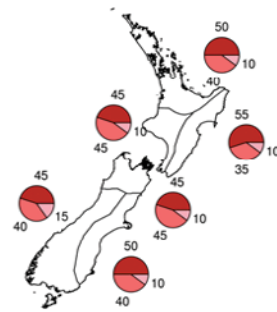
**PROBABILISTIC PRECIPITATION TERCILE FORECAST  
DECEMBER 2023 - FEBRUARY 2024**



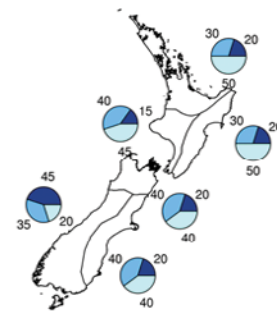
© NIWA Data: Copernicus Climate Change Service, C3S Multi-model ensemble

**OUTLOOK FOR NOVEMBER 2023 - JANUARY 2024**

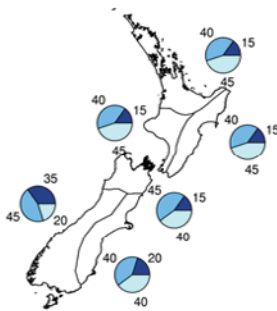
**Air Temperature**



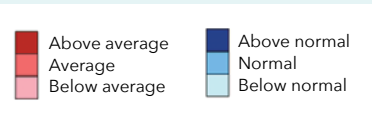
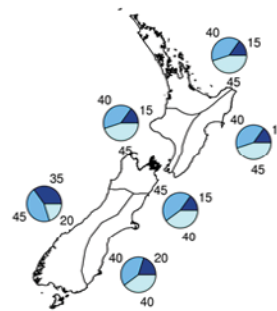
**Rainfall**



**Available Soil Moisture**



**River Flows**



So, whether you're tending to your crops, planning for potential irrigation needs, thinking about summer outdoor adventures or simply enjoying the beauty of our diverse landscapes, it is wise to stay informed and prepared for what the weather may bring in the coming months. From windy days to potential hot, dry spells, New Zealand's weather is full of twists and turns - don't be caught off guard by Mother Nature's surprises. ●

NIWA Seasonal Climate Outlooks: [niwa.co.nz/outlook](https://niwa.co.nz/outlook)

NIWA and Ministry for Primary Industries (MPI) Drought Dashboard: [shiny.niwa.co.nz/drought-forecast/](https://shiny.niwa.co.nz/drought-forecast/)



**NIWA SEASONAL CLIMATE OUTLOOKS**

Predictions of temperature, rainfall, soil moisture and river flows.

[niwa.co.nz/outlook](https://niwa.co.nz/outlook)

**NIWA**  
Tāhoro Nukurangi



# PLANNING CRUCIAL TO SURVIVING EL NIÑO DROUGHT

NZGrower staff



## El Niño has arrived in New Zealand and its impacts, including drought, are likely to become more severe and last into 2024.

Every El Niño is different - and unstoppable - but with advanced warning and well-planned preparations, growers and their crops can get through.

El Niño weather patterns typically occur every three to seven years, usually peaking during late spring or early summer and then weakening the following year. Under a 'normal' El Niño, summer is likely to bring stronger or more frequent westerly winds, drier conditions in the east and more rain in the west. What is different this time is that New Zealand will be affected by two weather patterns, one in the Pacific and one in the Indian Ocean. This combination brought substantial and widespread drought to New Zealand in 2019 and 2020.

The Ministry for Primary Industries (MPI) has prepared a helpful resource that explains El Niño and the predicted weather patterns this summer. This can be found on the MPI website: <https://www.mpi.govt.nz/funding-rural-support/adverse-events/preparing-for-el-nino>.

New Zealand growers and orchardists are facing what may be a tough growing season, and Horticulture New Zealand urges you to be prepared.

It is important to make a plan and act early, and then review and revise your plan along the way. Think about the outcomes you want to achieve and set specific dates for making key decisions depending on financial, weather, soil, moisture and crop conditions at those times.

Active monitoring enables horticultural strategies to be adjusted to manage drought conditions effectively, optimise water use, maintain crop health, and ensure long-term sustainability. Monitor the daily weather forecasts, seasonal forecasts, extreme weather and fire warnings. Using on-farm weather stations will allow you to closely monitor the localised weather conditions and tailor your strategy to them.

Have a robust and realistic budget and check it frequently to manage financial impacts of reduced crop yields or increased costs associated with drought conditions.

HortNZ recommends that you undertake water budgeting to plan for water restrictions, and use irrigation water as efficiently as possible. Make sure you consider your irrigation output as well as all water inputs such as rainfall, surface water and sub-surface water. Regularly check your irrigation systems to ensure they are well maintained, free of leaks and optimised for economical water use. Watering plants during the coolest part of the day will minimise water loss due to evaporation.

Other techniques for adjusting your irrigation programme that you can consider include:

- Using a Regulated Deficit Irrigation (RDI) strategy, which involves fully irrigating during critical periods for crops and limiting irrigation during non-critical periods. This is an effective strategy as the sensitivity of crops to water deficit varies at different growing stages.
- Irrigating your most profitable blocks first. Focusing fixed water resources on smaller areas may increase net yield compared to spreading the same volume of water across larger areas.
- Monitoring soil moisture using sensors and taking plant water stress measurements and using these to schedule irrigation and direct water to the plants that most need it.

If you need help and advice talk to your regional On Farm Support advisor, rural professional or talk to experts, such as your bank, accountant, professional advisers, and peers who have navigated drought conditions before. If you are unsure where to go for advice or assistance, get in touch with the Rural Support Trust. ●

### Useful resources

For links to sector wide information, including the a drought forecasting tool, daily updates on soil moisture and rainfall, river flow predictions, and managing stress, visit:

[www.hortnz.co.nz](http://www.hortnz.co.nz)



## Drought dashboard

NIWA and the Ministry for Primary Industries (MPI) have developed a new drought forecasting dashboard to help farmers and growers better prepare for periods of dryness and drought.

[shiny.niwa.co.nz/drought-forecast](http://shiny.niwa.co.nz/drought-forecast)



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# NAVIGATING NEW ZEALAND'S NEW DAM SAFETY REGULATIONS

Margaret Stoffel, Lisa Arnold, Evan Giles, and Rex Corlett : WSP New Zealand technical experts

**If you own a dam, you may already know that new dam safety regulations come into effect next May. What you might not know is whether your dam is classifiable, and what your next steps are.**

Across the country, thousands of dams play a pivotal role in sustaining the agricultural and horticultural sectors. From irrigation to livestock water supply, dams are the lifeblood of the industry. While some, like those owned by councils, are large and prominent, many smaller dams used by growers often remain under the radar.

Change for New Zealand dams is on the horizon. With it comes a more rigorous approach to dam management and safety. From 13 May 2024, owners of dams that meet or exceed regulatory height and volume restrictions will need to confirm the potential risk their dam poses, put in place safety plans, and undertake regular dam inspections.

## **Are you affected - yes, or no?**

First, you need to find out where your dam or water retention structure falls under the new regulations. There are special requirements for dams that are either four metres or higher and with a volume greater than 20,000m<sup>3</sup>, or one metre or higher and with a volume greater than 40,000m<sup>3</sup>. The height of the dam is typically the vertical distance from the crest of the dam to the lowest elevation at the outside limit of the dam (i.e. top to toe).

To help make things easy, the Ministry of Business, Innovation and Employment (MBIE) has set out in colour illustrations, what is (and isn't) classified as a dam. We recommend you take a look - they are in Section 7 of MBIE's Dam Safety Guidance.

If you have access to your dam's original design drawings, it may be clear as day that it's classifiable. Or it could be less certain. Either way, it's important you find out. Initially, it may not be more complex than getting out a measuring tape and level, together with measuring up the dam's surface area from a map. But there are some nuances around where the measurements need to be taken from. Again, we recommend looking at Section 7 of MBIE's Dam Safety Guidance.



*Owners should check if dams or water retention structures on their property fall under the new regulations*

## **Is your dam classifiable?**

If you have a classifiable dam, there are some important things to know. From next May, owners of classifiable dams must arrange for a Potential Impact Classification (PIC) to assess the hypothetical consequences of it failing.

Importantly, a PIC is not an evaluation of the dam's structural adequacy. Instead, it focuses on assessing the potential consequences if a dam were to fail - even if the dam is well-designed and properly constructed.

The consequences of dam failure can be catastrophic, affecting communities, property and the environment. A recent example from Waikato, which sent 23,000m<sup>3</sup> of silt-laden water through homes and gardens, underscores the importance and urgency of the new regulations.

You can do the PIC yourself (Section 7 of the Dam Safety Guidance sets out how to do this) or get a professional engineer to help. Either way, your PIC will need to be audited and certified by a Recognised Engineer (Dam Safety) and sent to your local regional authority.

If your dam has a 'medium' or 'high' PIC, you will then have to prepare what is known as a Dam Safety Assurance Programme (DSAP), which must have effective procedures for running the dam and reservoir, and effective surveillance procedures (such as visual inspections) for keeping it safe. The DSAP must also include emergency action steps to notify affected parties of a potential incident. That plan too needs to be certified by a Recognised Engineer.





WSP inspectors assessing flood control

### Why you should act now

With the regulations coming into force soon it is vital you understand the timeline and act proactively. Doing nothing is not an option. Under the new regulations you have responsibilities to meet if you have a classifiable dam. The last thing you want is to fall foul of the regulations, have a dam failure with damaging downstream impacts, and end up in court. That is likely to cost you dearly.

With PICs due no later than three months after the regulations come into force (or no later than three months after a new dam is commissioned) there is not a large window of time.

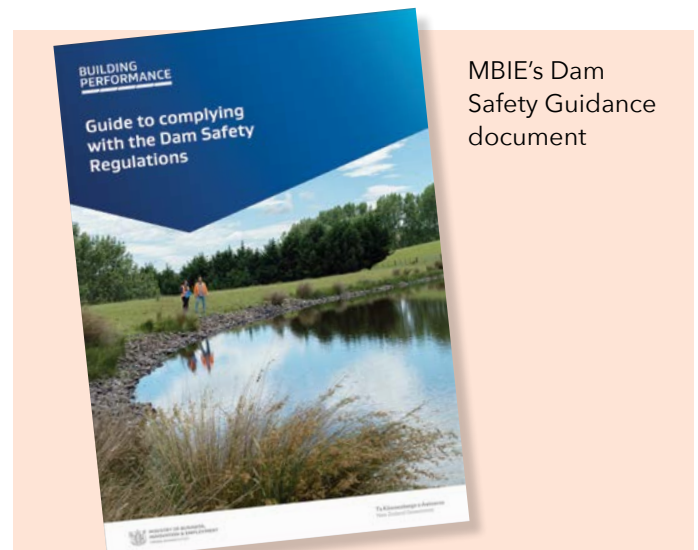
Waiting until the last minute to complete your PIC could lead to unnecessary stress and delays in the approval process. Procrastination can result in a bottleneck - and no-one wants that. Starting well in advance will allow for a more streamlined review by engineering professionals, saving time for both you and the relatively small community of recognised dam safety practitioners.

### Help protect people and property

These new regulations are far from a tick box affair; they are an essential safety measure aimed at protecting people in downstream communities, infrastructure, environmental, cultural and historic features.

While many horticultural and farm dams are in remote areas, the potential impact of a dam failure cannot be underestimated. Failure can result from several factors, including floods, earthquakes, landslides, animal-induced damage, volcanic activity, or even sabotage.

It is important to consider that, while a dam may have existed for many years, changes in population, infrastructure and human activity downstream following its construction could now pose risks that were not present before.



MBIE's Dam Safety Guidance document

### Water management benefits

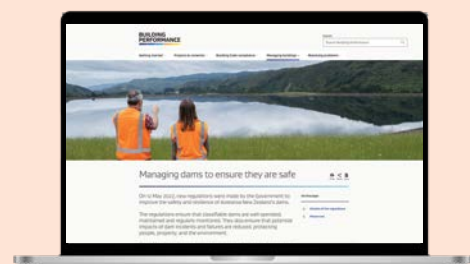
The benefits of these new regulations go beyond safety. Effectively managing a dam and keeping it safe are essential for ensuring water availability and avoiding costly repairs. A well-maintained dam also plays a significant role in water management. It can reduce water wastage due to seepage and piping problems. It can also help with groundwater recharge, offering ecological benefits and reducing the burden on the water supply.

These new regulations are finally ushering in a more comprehensive approach to dam management, emphasising the importance of safety and environmental considerations. In the farmlands and orchards of New Zealand, the safety and sustainability of dams now cannot be overlooked.

While compliance may initially seem like a burdensome process, we urge all dam owners to recognise the significance of the regulations and embrace them as a way of protecting their communities, preserving the environment, and ensuring the continuity of the horticultural industry.

With clear guidelines and proactive measures, we are confident that affected dam-owning growers can navigate these new regulations - contributing to a safer and more sustainable future for all. ●

For more details, visit: [www.building.govt.nz/managing-buildings/dam-safety](http://www.building.govt.nz/managing-buildings/dam-safety)



# PRODUCT GROUPS



ALL THE LATEST NEWS FROM YOUR PRODUCT GROUPS



50 REGEN DEMO  
IN GISBORNE

26/10/23  
Lefroy Valley  
wild rocket  
Trial 22204  
328  
Bed 6 ↑  
40m



# WHY ARE KIWIS BYPASSING ASPARAGUS, THE QUEEN OF VEGGIES?

Matt Thorn : NZ Asparagus Council business manager

After a late and very slow start to the season, New Zealand's asparagus growers reached full production with good growing conditions in November. Unfortunately, despite competitive pricing, consumer demand was down. Produce departments have been ordering less.

One way that the NZ Asparagus Council has helped push consumer demand is a point-of-sale promotion where consumers have the chance to win one of five \$5000 travel vouchers.

In early December we are reaching the final weeks of the promotion for this season. It's simple really, consumers need to purchase two bunches or over 400gm of asparagus and upload a photo of their purchase.

Produce retailers have also been asked to get behind the competition, with prizes up for grabs for the best asparagus promotional display. Every week we are receiving ten to 15 displays to judge for the best display competition. Any retail store can enter, and two of the five \$5000 travel vouchers have been drawn. World Travellers Motueka has helped to sponsor the campaign.

The media has been somewhat interested in the season and the promotion. RNZ Rural Morning News has run a few support pieces. In mid-November NZ Asparagus Council chair Cam Lewis spoke about the season with Hilary Barry and Jeremy Wells on Seven Sharp. He said that he didn't believe that New Zealanders had fallen out of love with asparagus.

"It's a cost of living crisis, I know it was talked about a lot leading up to the election," Cam said. "It's a luxury vegetable, it's more expensive than a lot of the other vegetables. I think it's something that a lot of people are having to make the decision to bypass in their weekly shop."



These PAK'nSAVE asparagus shoppers in Hastings were the winners of the NZ Asparagus Council's promotion first draw

With the season nearly over, asparagus growers will be looking to evaluate how market conditions will improve over the next year. We want fresh asparagus to remain a special seasonal crop that New Zealanders value. ●

Retailers should have been contacted about this competition. If you haven't been and you would like to take part, get in touch with: [matt.thorn@hortnz.co.nz](mailto:matt.thorn@hortnz.co.nz)



To enter the competition to win \$5000 please visit: [www.asparagusqueen.co.nz](http://www.asparagusqueen.co.nz)



# REGEN PROJECT WELL UNDERWAY

Antony Heywood : Vegetables New Zealand Inc. general manager

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LeaderBrand hosted a tour of its regenerative farming project at its site in Gisborne

**A project led by LeaderBrand Produce, Woolworths NZ and Plant & Food Research is an industry-wide collaboration to investigate the impacts of regenerative farming practices in vegetable farming, particularly in relation to productivity, profitability, people and environment.**

“Ultimately, we want this project to deliver a framework for how LeaderBrand and other farmers can produce food more sustainably, now and for future generations,” says Gordon McPhail, LeaderBrand’s general manager of farming. “We’ve already been working hard in this space. This joint project will allow us to build on some of our previous and current projects. Having evidence-based solutions for integrated pest management, nutrient budgeting, soil management and crop rotation is a game changer.

“It’s also an opportunity for us to share and engage with our team, iwi, local communities and customers on sustainable and regenerative practices.”

The project is being run out of LeaderBrand’s vegetable production operation in Gisborne. Two demonstration sites have been established to trial regenerative practices and evaluate the impacts of using compost and cover crops across varied crop rotations.

It started with an assessment of nutrient release characteristics from compost applied at various rates on different soil types, to help understand what adjustments to conventional fertiliser programmes would be needed to account for nutrients released from applied compost.

The teams are constantly reviewing practical experience and published literature on options for cover crops. They’re also evaluating the likely benefits and risks in ecosystem restoration ahead of some significant developments planned for LeaderBrand’s Gisborne farms.



LeaderBrand's electric harvester

The project is also engaging with staff, community and iwi to create practices that work with and for the wider community.

"This is an exciting programme to be working on collaboratively with Woolworths and LeaderBrand. It provides a great opportunity to test regenerative practices based on scientific evidence that could be successfully adopted at a commercial scale to improve production and environmental outcomes linked to vegetable growing," says Dr Paul Johnstone, general manager of science sustainable production at Plant & Food Research.

Regenerative agriculture or 'regen' is a well-used phrase with many different definitions. LeaderBrand is testing the fundamentals of regen in its commercial growing operation. Their focus is on the soil biome and how it holds carbon, while also deriving the right nutrient balance for plant growth.

Michael Hicklin, who heads LeaderBrand's Gisborne farming operation, says what they are trying to achieve is complex.

"Changing the soil biome significantly takes time and a lot of learning. For the couple of things we get right, there are just as many to get wrong. While failure is not our objective, the lessons we learn from the failure mean that we get it mostly right the next time we do the job.

"Compost is a good example of the enormity of the task. Thirty tonnes per hectare is a lot of compost. Getting this right so plants get what they need to grow to optimal size and shape is a complex relationship.

"Dealing with cover crop residue is another issue the team are trying to resolve. Transplanting into sub-optimal soil conditions does not set the plant up for success.

"We need to ensure the ground prep is to a level that the transplant will thrive without competing with residual soil conditions that may inhibit root growth or encourage pathogens."

Mechanical ground preparation goes hand-in-hand with cover crop management. LeaderBrand is reviewing how it prepares ground. The ideal is to use minimal till, however, LeaderBrand has advanced this thinking to optimal till. That's where softer ground prep methods are used over more extreme rotary hoe type activity.

There are many factors to be considered when introducing additional plant biodiversity into an intensive cropping environment. "It's understanding the potential of pest and disease management against a backdrop of agroecological practices and regen practices," Stuart explains, highlighting the complex relationships between crops and invertebrate pests to be considered in the Gisborne farm environment.

To have any chance of success in agroecological or regen approaches, growers need to think in an ecosystem framework, with key data points for management. How to track and interpret the data point information is likely to fall on technology tools and sensors.

"LeaderBrand understands this challenge, but we are not getting ahead of ourselves by jumping head first into tech tools without testing the hypothesis," says Stuart. "Firstly, it takes a system to cope with the data, then the data needs to answer a question that the grower needs to solve, then the tracking of that data point will provide the information the grower can use to make a better decision. The ecosystem is a checking system of continual improvements."

Where to from here? The LeaderBrand team see the progression of this project in terms of a number of key questions:

- In what ways will regen practices become mainstream in our operations?
- Where can we use regen approaches to drive better outputs?
- What regen practices will reduce our carbon footprint?
- If regen practices begin to direct market access, how do we position ourselves to meet this challenge?

Market access is likely to be influenced by climate related disclosures. Regen approaches will allow LeaderBrand to measure and mitigate its carbon.

Overall, the project is a great example of growers working with the supply chain to prove the potential of regenerative approaches in a commercial setting. This bold action may prompt other growers to have the courage to venture into giving regenerative practices a try. We tip our hat to the conviction and pioneering spirit of the LeaderBrand team, led by Gordon McPhail. ●



# KEEP ON ALERT FOR FALL ARMYWORM

Daniel Sutton : Vegetables New Zealand Inc research, development & extension manager  
Photos by Dr Marlin E Rice courtesy of Corteva



FAW IS A PROBLEM BECAUSE AN ADULT FEMALE MOTH CAN LAY **2000 EGGS** IN ITS LIFETIME

**Sweetcorn growers, for both fresh market and processing, are reminded to keep an eye out for any signs or damage in their crop caused by fall armyworm (*Spodoptera frugiperda*). Likewise, if you grow maize as part of your rotation.**

Fall armyworm (FAW) is a global insect pest that does have a large host range (350+ plant species); however, it prefers maize and sweetcorn plants as a host. FAW reached New Zealand in 2022, triggering a biosecurity incursion response. During the 2022-2023 growing season, an extensive monitoring and surveillance programme identified FAW in 140 different sites across New Zealand.

Based on how widespread FAW had become, technical experts concluded that FAW is established and eradicating it from the country is not an option. Therefore, early in 2023

we moved out of a biosecurity response to an industry led, long-term management strategy. Since the last growing season, many areas have experienced higher than normal rainfall, and it is unclear how these conditions will affect the FAW lifecycle and its overwintering capabilities. Because of this, as we progress through the 2023-2024 season, all growers and anyone who spends time in or around sweetcorn or maize crops should be vigilant for this pest.

FAW is a problem because an adult female moth can lay 2000 eggs in its lifetime, so the population has a very high reproductive rate. Adult moths can also travel over 100km per night, meaning the population can spread very far, very quickly. The larvae and caterpillars have multiple feeding behaviors, feeding on the leaves, cobs or seedlings of sweetcorn or maize, meaning they can damage or destroy any above ground portion of the crop. All of this combines to make FAW a potentially highly damaging pest.



### Identifying FAW

There are a range of resources available to help correctly identify FAW. There are some available on the Vegetables NZ website [www.freshvegetables.co.nz](http://www.freshvegetables.co.nz), however, for the latest information I recommend the Foundation for Arable Research (FAR) [www.far.org.nz](http://www.far.org.nz).

Adult female moths will lay a cluster of 50 to 200 eggs in a mass covered in scales. These will usually be found on the underside of leaves (although under high population pressure, the upper side of leaves).

The key identifying characteristics of FAW caterpillars include:

- Q The inverted 'Y' shape on the head of the caterpillar
- Q Light bands on the sides of the caterpillar with a dark band in between
- Q Four small spots in a trapeze arrangement, in each segment running down the back of the caterpillar
- Q Four large spots in a square arrangement on the second to last segment on the back of the caterpillar.

Young caterpillars can be hard to identify as they can look like other species found in New Zealand. FAW can be difficult to distinguish from tropical armyworm (*Spodoptera litura*), corn earworm (*Helicoverpa armigera*) and cosmopolitan armyworm (*Mythimna separata*). These other species can also cause considerable damage to crops and can be found at the same time as FAW, so correctly identifying which species is present can be difficult.

Adult FAW moths are highly mobile. They do have some characteristic markings on their wings to help identify them from other moth species. Usually these are hard to see, or if they are in a trap, the wings are not in a condition to allow for accurate identification.

Scouting your crop is the best way to determine if FAW is present, and all growers and crop advisors are encouraged to keep an eye on their crops. When scouting, it is important to remember to inspect all parts of the plant for any presence of eggs, larvae, or for signs of feeding. Repeat weekly to track any developments.

Pheromone traps are a good tool to help identify when FAW is active in an area. The information from traps should always be combined with field scouting for informed decision making around crop protection.

### Please share information

As FAW is still a new insect pest to New Zealand, if you do find FAW in your crop, please share the information to help inform other growers. There is also work being done on insect modelling that reports of the insect will help refine as a potential management tool.

If you do find FAW: Take good clear photos of some of the key characteristics of the insect, collect samples if possible, and contact FAR biosecurity officer Ash Mills [Ashley.mills@far.org.nz](mailto:Ashley.mills@far.org.nz)

Management of FAW will depend on several factors such as insect pressure, crop stage, target market, etc. The presence of beneficial insects that may be feeding on or parasitising FAW should also be taken into consideration. If an insecticide application is required, Sparta from Corteva Agriscience has been registered in sweetcorn for FAW. For more information on this please contact Corteva [www.corteva.co.nz](http://www.corteva.co.nz) or your local crop advisory.

While FAW does favour sweetcorn and maize, it has been found on other crops such as brassicas, potatoes, and onion. While this may have been more accidental, all growers should be checking their crops regularly and reporting any FAW they detect. ●



# CONVERSIONS TO DECARBONISE

Dinah Cohen : TomatoesNZ Inc business manager

**Last month a group of 20 people descended on Nelson at the invitation of JS Ewers to see and hear about the process this horticulture business has been following to decarbonise. This is a journey that began in 2017 with a chance conversation with a supplier who had installed a biomass boiler a few years prior. The conversation covered the increasing cost of fuel, and the Emissions Trading Scheme (ETS). This soon led to a heating expert conducting an audit on JS Ewers energy use.**

The audit led to a three-staged approach to decarbonising the business. Step 1 was to try to reduce the energy that they were already using. Several measures were put in place to ensure the existing boilers ran at maximum efficiency.

This led to the installation of:

- 🔥 six hectares of thermal screens
- 🔥 flow meters
- 🔥 three kilometres of underground pipework
- 🔥 a buffer tank which allowed the storage of hot water with minimal heat loss rather than firing up the boiler when the greenhouse temperature dropped.

All of these actions led to a reduction in the amount of energy that JS Ewers required to operate their greenhouses, which in turn meant that they had a really good idea of how many boilers of what size were required on a day-to-day basis.

The next stage was broken down to two separate projects due to the nature of the JS Ewers being spread over more than one site. For the smaller site, the over 30-year-old coal boilers were converted to take wood pellets. The larger site though had two brand new biomass boilers installed, which were brought in from Europe. We were lucky enough to see both of these changes, but particular focus was given to the coal conversions as this is a much more accessible way to decarbonise for smaller growers due to the lower costs involved.

Pierre Gargiulo kindly talked through the measures taken to reduce the risk of burn back, a recognised problem with these types of conversions, however, one that is mitigated with a range of safety features.

There were lots of positives that the growers present were able to hear about, most notably:

- 🔥 The safety measures have worked on the occasions that wood burn could have been a problem.
- 🔥 Wood pellets are much cleaner than coal.
- 🔥 As a result, the boiler runs much cleaner and requires less maintenance and therefore less expense.
- 🔥 They have learnt that coal to wood pellet use is close to 1:1 so huge storage bunkers are not necessary.
- 🔥 And of course, wood pellets are ETS free due to being carbon neutral.

This is still a learning journey though, determining how to avoid the production of creosol, which occurs if the boiler isn't quite tuned correctly.



Some points to consider if you are thinking about a boiler conversion:

- 💧 The conversion from a waste oil boiler to using wood pellets isn't as easy because the auger will have been removed, and this is crucial for wood pellets. You could potentially look to source an old coal boiler with all the parts as a workaround.
- 💧 While wood pellet supply in the South Island is good, you will need to get a representative on your site to talk about the cost of delivering to you - obviously the further your business is from the producer, the greater the cost of the wood pellets.
- 💧 You will need a covered area for storing the wood pellets which is big enough for them to be tip loaded to drop into the feed system.



*The newly installed buffer tank allows the storage of hot water with minimal heat loss*

A representative from Azwood was on hand to answer questions about South Island biomass and wood chip, while North Island growers can contact Nature's Flame to find out about costs and supply.

In terms of the screens that JS Ewers had retrofitted in 2021, the advice given was to research and talk to suppliers about your particular set-up, as greenhouses will require screens for different reasons. For instance, they can be for just saving energy, or offering some shading cover as well. At JS Ewers, the screens have required a learning process to make maximum use of the available controls to manage humidity (and potential fungal issues) and to ensure that opening the screens in the morning does not result in a sudden, large decrease in the atmospheric temperature. One lesson learnt was that arranging for retrofitted screens to be installed when there is no crop in the greenhouse would definitely be advantageous!



*JS Ewers has converted its 30-year-old coal boilers to take wood pellets*

“

**This is still a learning journey though, determining how to avoid the production of creosol, which occurs if the boiler isn't quite tuned correctly**

None of these projects would have been possible without co-funding from the Energy Efficiency & Conservation Authority (EECA) through the Government Investment in Decarbonising Industry (GIDI) fund, which JS Ewers applied for when it started in 2020. ●



*The covered area for storing the wood pellets is big enough for them to be tip loaded to drop into the feed system. Coal to wood pellet use is close to 1:1 so huge storage bunkers are not necessary*

For further information or feedback, email Dinah Cohen: [info@tomatoesnz.co.nz](mailto:info@tomatoesnz.co.nz)



# CHERRY ON TOP

**Working around the clock to meet the season, providing a detailed, market-competitive quote free of charge, weathering material delays and fiscal bottlenecks - it's all just part of the job for the team at Tuatara Structures.**

Thanks to the hard work of Tuatara Structures, Deep Creek fruits is hitting the 2023 season with a brand new, world-class cherry packhouse, coolstore and office facility.

With a footprint of over 4,500 square metres, the new packhouse is outfitted with the world's latest technology, equipment, traceability and export compliance systems to process and pack cherries for national and international markets.

“

**We are delighted with our new facility. Now we can now process all of our own product instead of relying on contract packers**

Deep Creek Fruits co-founder and director, Sharon Kirk, says the new facility has been a game-changer for the business. "We have increasing volumes from our new orchards," says Sharon. "Tuatara's ability to deliver a state-of-the-art facility to budget has been essential in ensuring we have the ability to pack our own fruit, allowing us full control of our fruit from orchard, packing to market."

Tuatara Structures worked from concept to completion to deliver the turn-key project. From the outset, the team used proactive, out of the box thinking to establish a clear design brief that would meet client objectives. By analysing - and at times challenging - industry leading design attributes, the team value engineered a highly cost-competitive solution. This was then put to market to ensure fair pricing for the client.

Sharon says this process was key in ensuring full transparency for the board. "Tuatara was detailed in their design specs and costing, and proved to be competitive against four independent construction companies. This gave the board a great deal of confidence in awarding the contract," she says.



Incorporating the latest technology and supply chain robotics, the new packhouse is the country's most advanced cherry processing and packaging facility. To ensure the facility would meet strict food grade criteria, Tuatara Structures used fit-for-purpose design and construction methodologies to achieve the necessary requirements including clean walls, clean concrete slab, and free from dust and birds.

The packhouse can accommodate up to 70 workers and incorporates an eight-lane Compac cherry processing machine, cold rooms, an office block and a large staff facility area.

"We are delighted with our new facility. Now we can now process all of our own product instead of relying on contract packers," Sharon concludes. "It's a tremendous asset to our business." ●

To learn more visit [tuatarastructures.com](https://tuatarastructures.com), or call **0800 600 750**.





# SAFETY APP CRUCIAL TEAM TOOL ON FARMS

## Te Kuiti farmer Karen Oliver once had a problem.

It was frustrating to occasionally run into people on the three farm blocks she owns with her husband William, and not know who they were and what they were doing.

"We used to have a box at the farm gate where people were supposed to sign in.

"It never happened. Not once."

This mattered a lot to the safety conscious couple. Karen says safety on the farms is forefront of mind on a daily basis because of the diversity and number of hazards.

The Zero Harm app changed all that, and Karen and William now know exactly who is where because the app is an integral part of operations on their sheep, beef, deer and cropping farms run on three blocks. They have more than 23,000 stock units. Everyone – the owners, the five employees and the plethora of contractors who come on site – signs in, because it's easy and just what people do.

All contractors have to download the app before entering the farms, and Karen can see whether they have done this. "Then when they get to my gate, they sign in to the app and they are in my system.

"Our contractors are really happy with the app."

Crucially, like everyone else, they are aware of relevant hazards and dangers on the farms. Karen's 'go to' example is the three-month-long roar when the stags' paddocks are not safe places to be.

The Zero Harm app is designed as a health and safety solution for challenging workplaces like farms and horticultural businesses. Karen first got excited by the app's potential after listening to an orchardist saying how great it was.

Inductions are only a few finger taps away and only unknown risks are displayed to maximise productivity. The app can include up-to-date health and safety policies.

One of Karen's favourite app features – "it's awesome" – is the temporary hazards one which allows her to alert everyone to new dangers, such as the stags' paddock, or tracks to avoid due to slippery conditions.

“



**KAREN SAYS SAFETY ON THE FARMS IS FOREFRONT OF MIND ON A DAILY BASIS BECAUSE OF THE DIVERSITY AND NUMBER OF HAZARDS**

"Because everyone is signing in, and I get a notification, I have a full picture of who is doing what and where."

Before the app, Karen says she had "a thousand pieces of paper flying around, and nothing really nailed what we were required to do". The chat with the orchardist made her realise that she needed to digitise her systems and have all the farms' health and safety information consolidated into the app.

"I'm not very techo, but I find the app so easy to use. I was probably an early adopter."

“

**The Zero Harm app is designed as a health and safety solution for challenging workplaces like farms and horticultural businesses**

Karen says someone getting hurt is her biggest fear. "If something did happen, then thanks to the app you have everything in one place. Everything I need is at my fingertips."

Asked about tangible health and safety results from using the app, she says "well, nothing has happened". ●





# RURAL PEOPLE HELPING RURAL PEOPLE

**Rural Support Trust supports those who are working on the land. You are not alone, Rural Support Trust can help, offering free and confidential support to those who earn their income from primary production. Support is available to the business owners, as well as full-time and part-time workers.**

In Pukekohe, the Rural Support Trust recently organised a dinner with John Kirwan, and three barbeques for growers and farmers, in the last 18 months. Next year a comedy night is planned, and more networking barbeques.

“

**On 7 March 2024, the Rural Support Trust will host a pumpkin and carrot barbeque**

A recent barbeque and potato tasting competition judged by local chef Ryan Fong was won by the Nicholson family, Hinemoa Produce. The 120 people that attended were all winners with a tasty combination of baked potatoes, salad, Chinese style pig by Howe Young, and delicious lamb on the spit by Derek Schofield. Previously participants have been treated to amazing charcoal barbeques with curried lamb prepared by the Bhana and Makan families. These networking events are organised by the Rural Support Trust, Enza Zaden, Horticulture, and supported by the Pukekohe Vegetable Growers Association and a small group of volunteers. Get in touch with Herman 021858939 or Wanda 0211802995 if you would like to help with future Franklin events.

On 7 March 2024, the Rural Support Trust will host a pumpkin and carrot barbeque. Start practising your pumpkin pie and carrot cake recipes. The Rural Support Trust welcomes all growers and farmers, especially straight from work in gumboots, or in high vis fluoro.

Rural Support understands that every situation is different. Rural Support are available to walk alongside someone and put an individualised plan together to



*The Rural Support October BBQ in Pukekohe, kindly sponsored by Enza Zaden, Horticulture and the Pukekohe Vegetable Growers Association*



*Growers enjoying local hospitality*

get the support needed to help with whatever is causing pressure. This may be simply listening, having a cuppa and a chat, or it may involve pulling in extra professional support to assist.

Whether it be an on-farm issue or a personal matter, whatever is causing stress, the important thing to remember is that Rural Support are only a phone call away and if they cannot help, they can offer direction to someone who can help.

Rural Support Trusts run free wellbeing events across the country. Keep up to date with news and events on their website or social media pages.

When someone calls Rural Support, they will get to work with a facilitator. The facilitator can travel to where they are needed, at a time that suits. ●



Get in touch with Rural Support by calling **0800 787 254 (0800 RURAL HELP)**.



Contact can also be made via their social media platforms or the website **[www.rural-support.org.nz](http://www.rural-support.org.nz)**

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# HORTICULTURE'S 2035 ACTION PLAN GETS INTO GEAR



Anna Rathé : Aotearoa Horticulture Action Plan programme manager



The Aotearoa Horticulture Action Plan aims to double the farmgate value of horticultural production from \$6 to \$12 billion by 2035, in a way that improves prosperity for New Zealanders and protects the environment. The plan was created in a collaborative partnership,

with input from industry, Māori, research providers and government – now it is up to all of us in the sector to make it happen. Horticulture New Zealand has appointed Anna Rathé as programme manager on behalf of the plan's partners.

## REMINDE US WHY THIS PLAN IS IMPORTANT?

The Minister of Agriculture launched the plan in Gisborne, just days before Cyclone Gabrielle hit. Obviously the events that followed have put the industry under huge strain, but I think that reflects why the Aotearoa Horticulture Action Plan is so important. As a sector we have to deal with immediate challenges, but we also need to take action on long-term issues like climate adaptation. The Aotearoa Horticulture Action Plan is our chance to be proactive and grasp opportunities now that will enable the future prosperity and growth of our industry, even while we grapple with immediate challenges like cyclone recovery.

## WHERE IS THE PLAN AT NOW?

Launching the plan gave horticulture our 'guiding compass'. In the next phase we are developing the projects that will deliver the plan's outcomes, and organising the people and the investment required. We want to take action on big projects that will deliver results over a ten-year programme.

However, we are also working on smaller projects that we can execute quickly. Most of all, we want to make sure that the whole programme is efficient and well-managed, so all growers and stakeholders can see progress being made towards the goal.

## WHAT INSPIRES YOU ABOUT THE PLAN?

It was really impressive to see how horticulture came together in recognising the importance of the Aotearoa Horticulture Action Plan. It wasn't easy to align priorities, but this plan points us all in the same direction. Now is the time for everyone to get behind it for the good of the country. It's about how the sector reacts to opportunities as well as risks. Despite all the challenges, it's a very exciting time to be in horticulture in New Zealand.

To find out more, visit: [www.hortnz.co.nz/about-us/aotearoa-horticulture-action-plan/](http://www.hortnz.co.nz/about-us/aotearoa-horticulture-action-plan/)  
or email: [anna.rathe@hortnz.co.nz](mailto:anna.rathe@hortnz.co.nz)



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