NZGROWER®

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GROWING EFFICIENCIES

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ENZA ZADEN

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Southern Belle creates efficiencies, see page 28.
Photo by Trefor Ward.

2023 – WHAT WOULD WE WANT IT TO BRING?

Barry O'Neil : HortNZ president

Another year has flown by, and a new year begins. To me, 2022 was an absolutely awful year, our industry's "annus horribilis", as the late Queen Elizabeth II once famously said.

Wanting to move on and be positive, what will 2023 bring to horticulture in New Zealand? Unfortunately, it hasn't started well for most of us with unseasonably large amounts of rain, wind and inclement weather, but I am hopeful this is just a glitch with 11 months of better times ahead.

What would we include on our horticulture new year wish list? I've had a go at what I think it is important that we achieve in 2023.

Available and affordable labour, people who want to work, would still be my number one wish! Good to hear from Central Otago and the cherry harvest that they have a good mix of New Zealanders, Recognised Seasonal Employer (RSE) Scheme workers, and backpackers for their harvest. Also, other sectors are reporting much better situations currently – let's hope it continues to improve.

I, like everyone else in horticulture, have become increasingly frustrated by what appears to be union driven aspirations to increase membership through RSE workers, with the ongoing campaign to undermine a valuable seasonal work programme. That is, valuable to the Pacific workers – their families, communities and nations – as well as the New Zealand horticulture sector.

The unions continue to target the programme with sensationalised claims using the sample examples over and over, and the media lap it up without any fact checking. When I look hard at the scheme and engage with those involved, all I can see are businesses and employers going out of their way to do the very best they can for their RSE workers. It would be a travesty if this smear campaign were to result in employers deciding that employing RSE workers is just too hard. In 2023, it must be left up to the RSE workers, the nine Pacific nations involved, New Zealand employers and the New Zealand government to run the scheme. This is instead of having the unions trying to call the shots, which seems to be happening at the moment.

> "Let's focus our collective talents and efforts on success for the future – a future which is going to be different

I've always said that with a scheme this large, there may be a very small number of employers who are trying to take advantage, but this is the exception and not the rule. However, when they are identified, they need to be removed totally from the scheme, as we have absolutely no tolerance for this behaviour.

My next hope is that as industry good bodies, both within horticulture and the wider primary sector, we get over ourselves and start really working together, rather than trying to maintain what I believe is too many small individual and separate entities, all of which are grower funded. There is just too much to be done for us to be thinking we all need to be taking the lead. It is also ridiculous for us to be thinking that each of these entities can do everything themselves.

Collaboration needs to really take off in 2023, or we run the risk of hitting the wall in a big way. We need to be open minded about what this collaboration will look like. We will most likely see changes to how we are organised if we are to deliver real and enduring collaboration, just like some vegetable product groups are starting to do.

As I have said many times before, we must change how we grow if we are to prosper. This means embracing the challenges we have before us, not denying and delaying. This is whether the challenges are climate change, freshwater quality and quantity, protecting our elite soils, chemical availability, or whatever else.

Let's focus our collective talents and efforts on success for the future – a future which is going to be different. In doing this, let's not lose focus on what our customers and consumers want to see happening. They are the ones who ultimately pay our bills.

Governance is my next focus, and is the key to good outcomes for specific sectors and the wider industry. We all see what good governance can achieve, but unfortunately all too often

WHAT WOULD WE INCLUDE ON OUR HORTICULTURE NEW YEAR WISH LIST?

AVAILABLE AND AFFORDABLE LABOUR AND PEOPLE WHO WANT TO WORK

WE GET OVER OURSELVES AND START REALLY WORKING TOGETHER

GOVERNANCE IS THE KEY TO GOOD OUTCOMES FOR SPECIFIC SECTORS AND THE WIDER INDUSTRY

we also see the results of ineffective governance. While I believe our Horticulture New Zealand Board has excellent governors with good diversity, as with every organisation, we need to continue to focus on improvement and lifting our game.

> **My next hope is that as industry good bodies, both within horticulture and the wider primary sector, we get over ourselves and start really working together**

It is understandable that in demanding, high pressure businesses, individuals are reluctant to come forward for these industry good roles. But it seems to me that everyone needs to challenge themselves about contributing to make horticulture even more successful. Most of us will have elections during the year for our respective boards. Let's do everything we can to make sure we have a strong line-up of aspiring and energised candidates. Let's also make sure we engage with the process to elect the right people.

And when I say good governance, I mean individuals with experience, sensibility, diversity and intellect, who are respected with connections and networks to their own and the wider sectors. These are the people who will drive better outcomes, especially in the collaboration area I raised earlier.

Unfortunately, we seem to have become angrier and at times a divided community, and even a divided country, which I didn't enjoy at all in 2022. We all need to reflect on what community and country we want for ourselves, our children, and grandchildren, in Aotearoa New Zealand. Our choice!

I think we can do better, so let's make sure 2023 moves our sector and country in the right direction.

Kia kaha.

NZGROWER

Editors:
Emily Pope
Ph: 027 617 6200
Email: emily.pope@hortnz.co.nz

Andrew Bristol
Ph: 021 021 62 021
Email: andrew.bristol@hortnz.co.nz

Advertising Manager:
Debbie Pascoe
Ph: 027 485 8562
Email: debbie.pascoe@hortnz.co.nz

Design:
Scenario Communications
Ph: 04 385 9766
Email: joy@scenario.co.nz

Subscriptions:
Email: info@hortnz.co.nz

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Your Levy AT WORK

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FOOD SECURITY IN THE LAND OF PLENTY – OR EGG ON OUR FACES

Nadine Tunley : HortNZ chief executive

Just after Christmas, New Zealand – the land of plenty, with plenty enjoying many a festive meal – ran out of eggs. This wasn't caused by Covid-19, supply chains or the weather, which have been behind other recent perishable food shortages and price rises. Remember when McDonald's ran out of lettuce, when restrictions were eased after our country's first national lockdown in late April 2020? And remember all the media stories we endured as an industry last year about the cost of vegetables, due to shortages to do largely with the weather or the fact it was winter?

No, behind New Zealand's egg shortage is egg producers' response to regulation that wasn't fit for purpose, was changed mid-stream, resulting in unrealistic timeframes and the undermining of confidence. The two main supermarkets also played a part, as what they wanted did not align with what the government was hoping to achieve through regulation.

> "This year, we hope the government is more open to listening, and takes more swift and practical action in the right places, particularly in the area of Resource Management Act (RMA) reform

Do not get me wrong. Improving the welfare of chickens and all animals is a good thing, just like reducing environmental impact and improving freshwater quality are good things.

The point I am making here is the very real and immediate effect of poor regulation and the domino effect on food production, and the stark consumer impact, even in a land of plenty like New Zealand.

The Egg Producers' Federation of New Zealand says two years ago, there were around 4.2 million egg-laying chickens. Today, that figure sits at around 3.5 million, with about 3.8 million birds needed to maintain supply. In the year to June 2022, egg production dropped by ten percent – back to 2016 levels – which was the biggest fall in egg production that New Zealand has seen in 20 years.

Why was this? The Egg Producers' Federation says it was because of the number of producers exiting the industry, thanks to a lack of confidence due not only to the changes in regulation and the costs associated with that, but also due to inflation and increases in feed grain prices – feed being 65 to 70 percent of the cost of producing an egg.

Sounds like a perfect storm, and also a situation not too dissimilar to the one that fruit and vegetable growers are facing. That is, poorly thought through and rushed regulation that is not coordinated across government, coupled with ever increasing production costs, the labour

shortage and seemingly never-ending weather that is not ideal for growing.

What impact is this situation having? More and more growers are considering making the heartbreaking decision to leave the industry, because it is just too hard. Some growers have already made this decision and are selling up or just mothballing their operations.

What will the impact of this be on consumers? I think we are already starting to see an impact, with less reliable vegetable supply and associated increased prices. While some in government seem to still believe that New Zealand could import its fresh vegetables, in reality, logistically and economically, that is never going to work plus it would drastically reduce our already fragile food security. Plus, these vegetables would also no longer be 'fresh' and the range of available produce would reduce significantly. Then there's the increase in biosecurity risk through importing more foodstuffs.

New Zealand is a land of plenty; we used to be proud of that. Now however, the food and fibre sector is fast drowning in uncoordinated, complex and unrealistic regulation. We know and accept we must do better, just like the egg producers knew and accepted that. However, the way the current government is going about change is not the way to do it, just after a pandemic when the world is still in social and economic turmoil.

> **"More and more growers are considering making the heartbreaking decision to leave the industry, because it is just too hard. Some growers have already made this decision and are selling up or just mothballing their operations**

This year, we hope the government is more open to listening, and takes more swift and practical action in the right places, particularly in the area of Resource Management Act (RMA) reform. There is too much riding on this reform to get it wrong – again. I say again as since the RMA was enacted in 1991, it has been amended more than 20 times creating uncertainty, inaction and unnecessary cost.

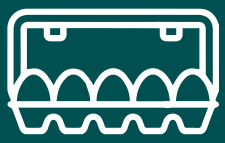
That is just not the way to run a country, let alone a successful business. The only outcome of this approach is having egg on our faces.

Reform of the RMA is the biggest policy change in 20 years and will affect the life of every New Zealander for at least 20 to 30 years – it is paramount it's got right. ●

THE EGG PRODUCERS' FEDERATION OF NEW ZEALAND SAYS

TWO YEARS AGO, THERE WERE AROUND
4.2 MILLION
EGG-LAYING CHICKENS

TODAY, THAT FIGURE SITS AT AROUND
3.5 MILLION



WITH ABOUT
3.8 MILLION
BIRDS NEEDED TO MAINTAIN SUPPLY

YOUR LEVY AT WORK

INDUSTRY WIDE ISSUES FOR INDUSTRY GOOD

NATURAL RESOURCES AND ENVIRONMENT

Sarah Cameron : HortNZ senior environment policy advisor

2022 in review

Last year saw the Horticulture New Zealand environmental policy team increase in capability and capacity as a result of HortNZ's transformation and increased investment in this important area. At a national level, the government's policy agenda was massive and the policy team was kept busy responding to a range of consultations, including:

- Grocery Code of Conduct
- National Policy Statement for Indigenous Biodiversity
- Emissions reduction plan
- Managed coastal retreat
- Climate Change Adaptation Plan
- Freight and Supply Chain Strategy
- Drinking Water Standards, Rules and Aesthetic Values
- Fair Pay Agreements
- Freshwater Farm Plans
- He Waka Eke Noa
- Natural and Built Environment Bill (Resource Management Act replacement)
- National Food Waste Definition.

Regional councils began their freshwater engagement, which is a requirement of the National Policy Statement for Freshwater Management 2020. They need to work with communities to understand the value of freshwater in their regions and develop a vision for freshwater catchments. The team was active in responding to these consultations and advocating for values that support the production of fresh fruit and vegetables.

District plan activity across the country was extensive. In the North Island there were district plan reviews in the Far North, Kaipara, Hawke's Bay, Taupō and Waitomo. And the Wairarapa review was combined across South Wairarapa, Carterton and Masterton District Councils. In the South Island there were district plan reviews in Timaru, Selwyn and Central Otago. The West Coast review was combined across Grey, Buller and Westland District Councils and West Coast Regional Council.

> **"The policy team will continue to keep growers and industry updated on policies and rules and how they may have an impact on growers' operating environments**

District plans are important as they provide the rules for primary production activity. HortNZ has consistently advocated for the protection of highly productive land, to avoid inappropriate subdivision in rural zones and reverse sensitivity; and rules that allow seasonal accommodation to be built, and bird scaring devices, frost fans and artificial crop protection structures to be used.

This year will see gazetting of agricultural emissions (He Waka Eke Noa), national Freshwater Farm Plan regulations, and national Indigenous Biodiversity regulations. We also expect more engagement by regional councils on draft freshwater rules and the replacement of the Resource Management Act with new government acts.

The policy team will continue to keep growers and industry updated on policies and rules and how they may have an impact on growers' operating environments.

Horticulture™ New Zealand Ahumāra Kai Aotearoa

CONTACT US
Freephone: 0508 467 869
Web: www.hortnz.co.nz
Phone: 04 472 3795
Email: info@hortnz.co.nz
Horticulture New Zealand
PO Box 10232
Wellington 6140
Level 4, Kiwi Wealth House, 20 Ballance St, Wellington 6011

YOUR INDUSTRY

ACROSS THE SECTOR – ACROSS THE COUNTRY

NEW SEASON OF BERRY BOUNTY FROM DUNEDIN FARMING FAMILY

Eric and Noreen Johnson with their daughter Hannah, son-in-law Vinnie and grandchildren

In a quiet suburban street on the outskirts of Dunedin lies a two-hectare commercial blueberry farm, tucked away in its own microclimate. Eric and Noreen Johnson have owned Blue Willow Blueberries for more than 20 years, but are now looking to the next generation to continue the family business. AIMEE WILSON reports.

Blue Willow Blueberries is currently halfway through an eight-year succession plan, transitioning the operation over to Eric and Noreen's daughter Hannah and son-in-law Vinnie Booiman.

Eric and Noreen bought the property from the late Peter Waters, who once exported 300kg of blueberries a season back in the 1980s.

Because of the short window for picking, the family decided Pick Your Own (PYO) blueberries was best, with offerings eventually expanded by way of selling at the Otago Farmers' Market.

The operation continues to supply the market today, employing one or two pickers to help them get orders ready for the market when the season is in full swing.

The family is now looking at new, alternative markets to try and scale down the PYO side of the business – which has grown at an exponential rate in recent years. The sheer volume of summer crowds that PYO attracts each year has also kept Eric and Noreen involved in the business despite best intentions to fully hand over the reins.

Come opening day in early January, Blue Willow Blueberries welcomes upwards of 1000 people through the orchard for PYO blueberries.

Day one of the season completely blows them away every year.

"There is a constant stream of pickers arriving throughout the day," Hannah says.

Social media has meant the already busy blueberry farm continues to get new people visiting for several weeks of the year as the word spreads. Then there are the loyal customers, with the same families coming back each year to pick a specific crop.

The Blue Willow Blueberries orchard at the start of last season

The Johnson family love their little piece of paradise set amongst duck ponds, gardens and willows, with its serenity – and it is clear that visitors love it too.

"But by the end of the season we are sometimes struggling to know what we love about it," Eric jokes.

The work is labour intensive and requires a full family effort. Hannah was brought up picking the fruit, but with two colour blind brothers, she jokes that they weren't much help.

> **"Social media has meant the already busy blueberry farm continues to get new people visiting for several weeks of the year as the word spreads**

You would think it was obvious to people visiting the orchard how to pick a ripe blueberry, but Eric says sometimes logic goes out the window.

"We do tell people to pick the blue ones. But there is a definite mythology to picking them," Eric says. "They grow in a bunches but not all of them are ripe at once – you have to gently roll your fingers over a bunch, this encourages the riper berries to roll off into your palm [or] waiting container.

"Once they come off the bush, they don't ripen any further," Hannah says.

The couple don't just have the orchard to keep them busy – Hannah is a nurse and also takes care of their two young children, and Vinnie is a full-time agribusiness programme manager. Hannah says being out amongst the blueberry bushes in the orchard and listening to the birds singing is a great way of switching off from their day jobs.

"It's a beautiful atmosphere," she says.

Do they ever get sick of eating blueberries? A resounding "never" comes from all four family members, followed by suggestions of how to consume all their bounty: put them in salads, make a smoothie, add them to breakfast cereal, or just eat them by the handful.

There are many blueberry varieties growing in the orchard with three main ones – Brigitta, Nui and Blueray, planted when they expanded the orchard from its original 800 bushes. These are the most suitable for the climate in the south. Some of the original blueberries from 40 years ago are still going strong.

The older varieties have a distinct taste and although they can be smaller in size, they don't lack for flavour and shouldn't be overlooked when picking, as they are particularly sweet.

There is no advanced technology used on the orchard – Vinnie and Eric spend hours patching up the holes in the nets, keeping on top of weeds and mowing the lawns among other things. During the season, most evenings are spent picking and sorting through the picked berries to find any squished fruit and removing stalks, leaves and the odd spider.

This season marks the first that the company will operate as certified organic under BioGro NZ, a process which has taken four years.

Blueberries as they start to ripen in a bunch

A true family operation…

Eric says the orchard has never required pesticides or herbicides, and the bushes themselves have never needed spray at all, with spray only applied for weed control around the bushes.

Being an organic operation, Blue Willow Blueberries completes regular soil testing to measure chemical residues and determine the overall soil health, with an audit being completed on their orchard management plan once a year.

"There is increased consumer interest in sourcing organic and sustainable product," Vinnie says.

The orchard has grown to 2000 bushes, and opting for an organic operation requires particular effort to control perennial weeds such as ryegrass, plantain, dandelion, curly dock and the troublesome couch grass.

Despite many orchards being affected by October's devastating frost damage, Vinnie says Blue Willow Blueberries were more fortunate and are expecting their season to be "business as usual".

"We have the benefit of being slightly later in the season," Vinnie says. "We had a bit of snow damage that snapped the smaller branches, but nothing too serious."

"And blueberries actually benefit from colder temperatures while dormant over the winter," Noreen adds.

The Blue Willow Blueberry farm will be producing berries from early January through to mid-March 2023.

THE PUBLIC'S LOVE OF PYO

Anne Hardie

Josh Koleff in the boysenberry rows

Picking berries has been a summer tradition for many Kiwi families, but fewer commercial gardens are opening their gates to the public. In the Nelson-Tasman region, Berry Lands is the last sizeable garden to offer pick-your-own berries.

At five hectares, it is considered a small berry garden, but in the days leading up to Christmas, thousands of locals and holidaymakers drive through the gate to buy from its shop or head down the rows to pluck the berries from the vines themselves before sitting down with a real-fruit ice cream.

Berry Lands on the outskirts of Richmond is part of the Connings' family operation which owns the neighbouring Connings Food Market, with vegetables largely supplied from its own market garden. The berry garden is a natural fit with the retail outlet, which sells frozen berries throughout the year as well as fresh berries during the short season.

Simon Connings admits it is not easy running a pick-your-own operation, mainly because it is hard finding staff for a very short period. It would be easier to machine harvest the entire crop, and they harvest the bulk of the crop by machine. But the public likes to pick their own berries and the family has continued to open the garden each year.

"It's a bit of an institution and we will try to keep it going as long as possible."

He suspects that will only be a few more years though. High-density housing is creeping closer and is expected to reach the boundary of the garden in three or so years, depending on the housing market. When that happens, he says it will simply become too challenging to operate a horticulture business that machine harvests in the early hours of morning and needs to apply sprays from time to time.

Two former berry gardens around the town are now under houses, and one of those subdivisions that has replaced one of the gardens has a staged development plan to Berry Lands' border.

Boysenberries at Christmas

A heavy crop of blackberries at Christmas

Simon says it is a sign of the times and the family is planning to shift the garden to a new site, with the first plants transplanted this winter. At this stage there are no plans to continue pick-your-own berries for the public on the new site because of the challenges it poses.

This year they have reduced the pick-your-own time frame to three weeks to give the public the opportunity to get among the berries and harvest their own, but not let it linger too long.

Last year the business did not increase the price of the pick-your-own berries and Simon says they basically did not make any money out of them due to the higher cost of inputs. This year they had to raise the price considerably to cover the increased costs of the past two years.

THIS YEAR, BERRY LANDS HAS EMPLOYED

20 PICKERS

STAFF FOR THE
BUSY SHOP

STAFF FOR THE
PACKHOUSE

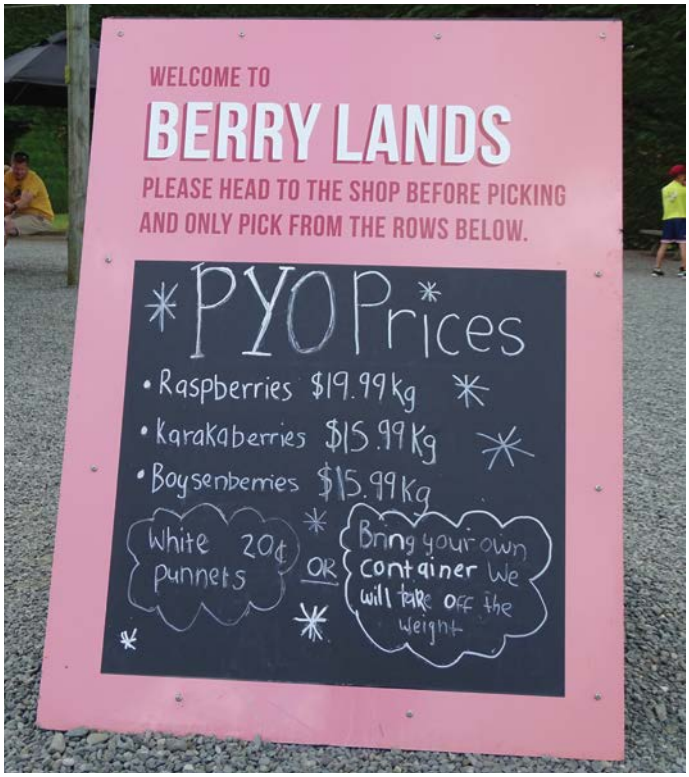
AS WELL AS
DRIVERS

In the garden, manager Josh Koleff has the task of growing and managing the berries, which include one hectare of strawberries above ground that are not open to pick-your-own, plus boysenberries, raspberries, blackberries and a few karaka berries.

In winter, he usually works by himself in the garden, and it is his favourite time of year when he can simply enjoy the growing side of the business. His horticulture career has always focused on growing plants. In the past he grew sunflowers and gourds that he sold to florists, before moving on to pick-your-own potatoes and peas for a local business and then market gardening on part of Berry Lands.

When Connings bought the business, he swapped vegetables for berries and now manages the crops and the hectic summer harvest as well as the public exuberance for berries, which increases in the days leading up to Christmas.

Blackberries fruiting up



PYO was just three weeks this summer

"We open at eight in the morning and customers are here at seven. They don't want to miss out. The day before Christmas, the carpark is full before we open because people want Christmas berries.

"You pick as much as you can and the girls are run off their feet, but everyone seems to have a good time. It's a little farm, but it's a busy little farm."

> **"This year they have reduced the pick-your-own time frame to three weeks**

This year, Berry Lands has employed 20 pickers, plus staff for the busy shop, and packhouse, as well as drivers. In the past they had up to 40 pickers, but they have moved to machine harvesting a sizeable portion of the berries, including raspberries this year to see how that goes. The machine-harvested fruit is quick frozen and bagged at Berry Lands to sell through Connings Food Market.

Working in conjunction with the food market enables some crossover with staff to Berry Lands through the berry harvest, but the garden still needs to find pickers for the short harvest period. Strawberries lead the harvest from the middle of November, with raspberries joining the race at the beginning of December, followed by boysenberries and then blackberries later in summer.

University students make up the bulk of Berry Lands' workforce through harvest, with many returning each year, including one who is now in charge of the packhouse and "telling me what to do" quips Josh.

Josh says he has been extremely lucky with securing good staff, who all turn up at 6am to harvest berries for the punnets they sell in the shops before the heat of the day, when the berries get softer and bruise more easily. A few go on the harvester even earlier on sections of the garden designated for frozen berries. He tries to teach all the staff about every job so they can fill in when required and have variety in their work.

"If you only have one person to do one job and someone gets sick, it's a problem. And who wants to do the same job every day? Nobody."

This year, the crops have been large and customer numbers through the gate greater than ever. Josh says sunny weather through flowering resulted in massive boysenberry and blackberry crops, while strawberries picked up pace in time for Christmas. The raspberry plants are just two years old and hitting full production this season.

Even though he enjoys the solitude of winter, Josh likes the brief harvest when the garden becomes a hive of activity with customers searching through the rows for the ripest berries.

"People like it; they enjoy coming here and I like watching the kids and families picking their own berries.

"If you have the right staff, it's good, and I'm really lucky."

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GROWERS CONNECTING VIRTUALLY WITH CLASSROOMS

Anne Hardie

Taking growers into the classroom

City kids are talking to farmers and growers around the country through virtual classroom sessions called Farmer Time. The programme has been so successful that it is now seeking more growers to meet the demand from teachers.

Farmer Time was introduced to New Zealand at the beginning of 2022, with a pilot programme connecting eight teachers with eight different farms. It has since grown to about 40 teachers, matched with farmers and growers, including an avocado grower in Katikati, a market gardener near Hamilton and LeaderBrand in Gisborne, who have regular live chats with their classrooms.

The programme has been a huge success in the United Kingdom before being introduced into New Zealand. National coordinator, Marie Burke, says it tends to grow organically by word of mouth.

Farmer Time is aimed at primary and intermediate school aged students in a bid to inspire, engage and educate them about food from farm to fork. It is aimed largely at urban schools whose students know little about the source of their food, though Marie says many students in rural schools around New Zealand have little rural knowledge as well.

Students regularly engage in live chats to their matched farmers or growers from their classrooms, discussing the daily and seasonal work, asking questions and developing an ongoing relationship with their farmer or grower.

"They're just engrossed in what they are learning from farmers and growers – and also the teachers who often don't have any rural background and are learning just as much as the kids," Marie says. "They are able to ask questions and get real-time answers."

Marie says it works both ways, with farmers and growers also learning from their classrooms.

"It's connecting us with our consumers and it has been insightful," she says. "They learn what children think about farming and there's a huge range of thoughts, which are all valid.

"We dealt with a class of nine-year-olds who didn't understand that the mince they were eating was from an animal, and unless you have those conversations you don't learn those things."

Marie and her husband have been part of the programme with their own farm which includes a 40ha crop of sweetcorn, and she says the students were enthralled about how it was grown.

"They were fascinated about how many times a vehicle went across the paddock to get that corn and were gobsmacked at the work, effort, fuel and costs of growing their vegetables," she says. "It was a real eye opener for them.

"Once harvested, we planted grass seed to put lambs on through winter and at the same time the students grew their own grass seed alongside us. A weather bomb flattened their crop and we had a similar one, so they learnt what can happen."

Marie says students learn a lot of detail about how their food is grown, and one class retained useful knowledge about nutrients that came in use when they talked with a nutritionist visiting the school.

Apart from the educational side of the programme, she says it may 'plant the seed' in students' minds that agriculture and horticulture can provide an exciting career path.

"You have to plant the seed when they're young and if it's something they enjoy, they're more likely to take it up at high school."

Many of the classes are part of the Garden to Table programme which supports primary and intermediate schools to plant, harvest and cook food, thereby learning about the changing seasons, the full food cycle and then cooking the produce. Marie says many teachers have signed up for Farmer Time to extend their students' Garden to Table knowledge by learning how food is grown on a larger scale.

Growers can give students an insight into horticulture

Farmer Time in New Zealand initially focused on farming, as Beef + Lamb NZ ran the pilot programme. Now it is extending across the primary sector as demand ramps up. Marie says teachers are asking for connections with growers and she expects demand to continue to grow.

Growers can use video chat apps for the programme and talk to classrooms from the orchard or garden about the soil, plants, people and environment. Alternatively, they can take videos and share them from the office. Farmers and growers call their matched classroom every two weeks for a 15 to 20-minute chat about what is happening on their farm, orchard or garden.

To find out more or to sign-up, visit **www.farmertime.co.nz**

IMPROVING VEGETABLE FARMING PRACTICES THROUGH RESEARCH

Helena O'Neill

Researchers are gearing up to plant their first lot of crops as part of a three-year project looking at the impact of growing vegetables regeneratively.

The project, led by LeaderBrand Produce, Countdown, and Plant & Food Research Limited (PFR), is the first industry-wide collaboration investigating regenerative vegetable farming practices, particularly in relation to productivity, profitability, people and environment.

LeaderBrand general manager of farming, Gordon McPhail, says the strong research focus of this project will help to create tools that will allow vegetable growers to make informed decisions about implementing regenerative farming practices of their own.

The trial site will run next to a control site on LeaderBrand's vegetable production operation in Gisborne to compare the impacts of regenerative practices over time.

"Trial areas will depend on the final decisions on the treatments and evaluation methods but are likely to be between one and five hectares per crop rotation type," Gordon says. "It is important we can prove and replicate this on a commercial scale."

Compost will be applied ahead of overwintering crop plantings made from next March.

"We started talking with Countdown about sustainable vegetable production and things we have done and could do to improve but also [to] pave the way for others," Gordon says.

Gordon says LeaderBrand has been working with service crops and composts for several years and the project is an opportunity to build on that. Service crops are cover crops grown in agroecosystems for the ecosystem services they provide rather than as a harvestable product, e.g., increased crop water supply.

"We've already been working hard in this space and this joint project will allow us to build on some of our previous and current projects. Having evidence-based solutions for integrated pest management (IPM), nutrient budgeting, soil management and crop rotation is a game changer."

The service crops will include LeaderBrand's previous green manure crop options (barley, oats and sorghum) and in-field and field margin floral resources (buckwheat, alyssum and phacelia).

Gordon says PFR is currently reviewing options for two vegetable rotations: one for overwintering service crops following a summer crop (e.g., broccoli, squash, sweet corn, or watermelons) and the other for summer-grown service crops supporting winter vegetables like leafy salad crops.

PFR are reviewing the science that is needed to build a decision support tool for a selection of service crop species based on their seasonal growth characteristics, the beneficial species that they support, the pests they share with vegetable crops in the rotation and their soil health benefits (e.g., organic matter content, rates of breakdown and nutrient release).

"They are here to design scientifically robust plot trials – comparing service crop species and management techniques – ensuring that the data collection is accurate and relevant," Gordon says. "The results will form the basis of the decision support tool that they will build."

PFR are also looking at the existing research and literature already available and how this may relate or enhance the trial, Gordon says.

The project started with an assessment of nutrient release characteristics from compost applied at various rates on

LeaderBrand general manager of farming, Gordon McPhail

different soil types at PFR's Hawke's Bay research centre. Canvassing nutrient release characteristics is an important first step to understanding alternative sources of crop nutrition and how they might complement or offset conventional fertilisers.

"Where we can, we would like to create a circular use of our waste and otherwise use 100 percent local products," Gordon says. "Compost can be variable, so we need to create both as consistent a process and raw material as possible, as well as a robust testing and measurement process.

"Currently, we're working with a local compost producer. We've also got several sources of compostable raw materials from our own operations."

The project will also focus on the role of perennial plantings in facilitating ecosystem restoration, engaging with staff, community and iwi to create practices that work with and for the wider community.

"We will have some perennial plantings occur within the project window, but measurement of their impact will mainly occur beyond the project timeline," Gordon says. "As those plantings have to fit within the overall restoration of the farm environment, the project team are currently evaluating what is known about interactions between possible perennial plantings and crop pest and beneficial species. That evaluation includes pests and their natural enemies of possible service crop species."

Much of New Zealand's existing research on regenerative agriculture has been focused on pastoral land use so it is hoped the project will provide an invaluable evidence base for the horticulture sector.

Plant & Food Research general manager science – sustainable production, Dr Paul Johnstone, says it is an exciting programme to be working collaboratively on with Countdown and LeaderBrand.

> **"The strong research focus of this project will help to create tools that will allow vegetable growers to make informed decisions**

"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," Paul says.

Countdown's director of corporate affairs, safety and sustainability, Kiri Hannifin, says that the retailer is proud to be supporting the innovative project which will push the boundaries of conventional vegetable growing, and support the work of one of their key produce suppliers on how they can farm for the future.

LeaderBrand Produce and Countdown each invested $300,000 in the project, with research and data support from Plant & Food Research.

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TECH INTEGRAL TO TELEGRAPH SUCCESS

Photographs : Helena O'Neill

Cucumber grower Ranjit Singh

Bombay grower Ranjit Singh may be young, but his willingness to learn and embrace technology has now secured him a spot as one of the country's biggest cucumber growers. HELENA O'NEILL chats with Ranjit about how important technology is to his business.

A short drive from the Auckland Southern Motorway sits the pride and joy of Ranjit Singh's cucumber business. Bmak Evergreen's Bombay site includes a high-tech Apex greenhouse, utilising a range of innovative machinery.

Moving to New Zealand in 2014, Ranjit spent some time working in a kiwifruit orchard before taking up work in greenhouses. He then began growing cucumbers in a 1500sq m greenhouse that he leased in 2016. Now he owns his own property with 4000sq m of greenhouses and leases a further three other sites in South Auckland and North Waikato, including the greenhouse at Bombay.

"My parents had experience working with capsicums, but I wanted to grow cucumbers. They are a four-month crop, if anything happens like losing some plants, I can change within four months. Capsicums, eggplants, or tomatoes have a one-year growing cycle – we can't replace them within four months."

Ranjit solely grows telegraph cucumbers but plans to soon branch out into Lebanese cucumbers. Each week over 100,000 cucumbers are picked at Bmak Evergreen's greenhouses.

> "The business also uses mechanised trolley lifts to speed things up

Reduced sunlight hours led to smaller crops this past year, and Ranjit is hoping for a more balanced year ahead.

"We have had a lot of rain, which has had a big impact on us. We have water, humidity, and a heater system but we

One of the new wrapping machines at Bmak Evergreen

EACH WEEK OVER
100,000 CUCUMBERS ARE PICKED
AT BMAK EVERGREEN'S GREENHOUSES

THE OLD AUTOMATIC MACHINE COULD WRAP
25 TO 30
CUCUMBERS PER MINUTE, BUT THESE DO
55 TO 60
PER MINUTE

don't have enough light. It's the most important for the growing part.

"We're struggling with increased costs this year. Our gas, fertiliser and labour costs are so high."

The business employs around 25 staff, up to 30 in the peak of the season. While securing enough staff over the past year hasn't been an issue, Ranjit is aware that finding staff in the horticulture industry can be challenging.

To keep labour costs down while improving crops, Ranjit has sought to become more efficient and has invested in technology.

He says growers need to be savvy and embrace technology where they can in order to become more efficient, especially as labour and energy costs continue to climb.

"In this industry, we need to do smart work, not hard work. I believe in machinery. But we can't trust it 100 percent; I still need to set it and fix things when they go wrong. The machinery I've bought in the past year has really helped me. Our big challenge is spraying. We have a big area, and we would have one person spraying in the glasshouse with the chemicals. Instead, we can do it automatically with no one around the chemicals."

Likewise last year Ranjit upgraded his automatic wrapping machine. Telegraph cucumbers need to be wrapped the same day as picking to ensure they remain fresh and firm, so efficient wrapping is a must.

> **"We're struggling with increased costs this year. Our gas, fertiliser and labour costs are so high**

"The old automatic machine could wrap 25 to 30 cucumbers per minute, but these do 55 to 60 per minute."

The business also uses mechanised trolley lifts to speed things up and improve safety for staff as they harvest and clip the rows inside the greenhouses.

Freshly picked telegraph cucumbers

Ranjit has invested in Ftek automatic spraying machines which are important tools for controlling insects. These reduce the labour requirement and remove the need for himself or his staff to spray manually.

> **"I'm just a young guy, my suppliers know that the young fella wants to grow his business, so they help me. My [greenhouse crop] consultant John Thompson is a really good guy**

"If you have a good spray system then you can control everything. If people want to invest, invest in something like this. You fill up the tank, press the button, and away you go. No need for a mask, PPE (personal protective equipment), jacket, gumboots, nothing. It's quick and the fertiliser is really perfect.

"I do my best to grow without chemicals, but sometimes there are no other options, especially for controlling thrips in this industry."

Over the past 12 months thrips have been particularly bad, he says.

The greenhouses aren't immune to fungal threats, with Ranjit always on the lookout for *Fusarium* and *Pythium*. He sterilises water and controls watering to reduce crop losses.

"If you have a good sprayer, using good fungicide and insecticide, then you are growing good produce."

The new greenhouse at Bombay features energy screens which Ranjit says have made a significant reduction to the site's energy consumption, estimated to be between 30 and 35 percent less than his older greenhouses.

Ranjit solely supplies T&G and says they help guide him, also referring him to other growers for advice and troubleshooting.

"They really do help me."

Ranjit has been impressed with the support for his business from different parts of the industry – including suppliers, T&G, and other growers.

"I'm just a young guy, my suppliers know that the young fella wants to grow his business, so they help me. My [greenhouse crop] consultant John Thompson is a really good guy. He looks after my crops, fertilisers, and my sprayers. I'm always thinking about how I can fix something when faced with a problem."

> **"In this industry, we need to do smart work, not hard work**

Hiring a greenhouse crop consultant like John has made a positive difference to his business, Ranjit says.

"Before I met John, my cucumber plants were growing maybe 15 cucumbers per plant. Now they are 25 to 30 cucumbers per plant.

"Knowledge is the most important. If you want to run any business, first of all you need knowledge. Look at the industry and get knowledgeable."

The mechanised trolley lifts have also increased productivity

PLANT AND MEAT COMBINATIONS
FUTURE FOR PROTEIN

Elaine Fisher

Instead of replacing meat completely, plant-based proteins will in future complement or combine with red meat to provide consumers with a nutritious and affordable balanced diet believes Andy Wards, Kellogg scholar, who works in business development for Wilson Hellaby Premium Meats.

"It is likely that various food products in the future will contain meat and plant-based blends, in effect meat, plant and three veg," Andy writes in his 2022 Kellogg report "Plant & Three Veg?"

In his report Andy posed the question "Are plant-based proteins going to take a bite out of the red meat market share?"

The answer is not black and white. "When it comes to animal protein versus plant protein it is an 'AND' story, supported by growth in the entire protein category.

"To feed a world population of over 9 billion in 2050 it is highly likely that we will need to see growth in all protein categories, rather than the dominance of one over another.

"It is unlikely that red meat production can be the only contributor to meet demand, due to constraints in the form of environmental impacts, labour and price.

> **"Red meat farmers and processors should be confident in their industry's future and continue to invest in technology, people, minimising their environmental impact, and targeted consumer marketing**

"Globally we have reached maximum capacity for ruminant animals, especially given the impacts of methane emissions from cattle and sheep. In future the only increase in red meat production will come from improved farming efficiencies and better genetics.

Andy Wards, Kellogg scholar, with his sons Harry (7) and Tom (3) on the family farm at Onewhero, North Waikato

"In order for the average consumer to afford protein meals, their weekly menu will be a combination of premium red meat and plant-based protein."

That plant-based protein might be purely plant sourced or a combination of red meat and plant protein in meat pies or processed products like sausages. Combining both proteins would help keep costs down and reduce the potential for supply shortages. Andy even suggests meat and plant protein companies could diversify into producing both forms of protein.

"It is not inconceivable that companies from either side could market plant and meat products under the same banner.

Several traditional animal-based protein companies overseas such as Tyson Foods (US) and WH Group (China) have already established their own brands of plant-based products which compete directly with the likes of Beyond Burger. These large and well-established multinational food companies have the resources to bring new products to market quickly and efficiently."

There is potential for meat processing plants to adapt to producing both protein forms, even though there are marked differences in how they are produced. "The meat industry is a deconstruction process. You deconstruct animals to produce different food cuts. With plant-based protein you take raw materials and put them together to form a product."

Combining both operations makes sense in terms of labour, proximity to market and logistics, but Andy doubts combined protein factories will emerge in New Zealand any time soon.

> **"Meat alternatives have an important place in the industry to further engage consumers in new and different ways**

"The meat industry is currently seriously constrained because of a lack of labour." Future advances in technology may resolve some of those labour issues.

Andy believes plant proteins will continue to cement their place in the retail food cabinet as well as in the food service and ingredients sectors. "They offer a genuine alternative to red meat protein and will be an essential contributor to the overall protein requirements of a growing global population with a focus on human nutrition and environmental impacts.

"Red meat farmers and processors should be confident in their industry's future and continue to invest in technology, people, minimising their environmental impact, and targeted consumer marketing.

"Meat alternatives have an important place in the industry to further engage consumers in new and different ways."

Andy says while New Zealand sheep and beef farmers recognise the increase in meat-like plant proteins in the market, it's not top of mind for most.

"The large-scale planting of pine trees on former grazing land is the hot topic. Probably no farmer is against targeted planting of pine trees for forestry woodlots or farm-emissions off-setting, but the blanket planting of entire farms is concerning them."

RISING COSTS PROMPT SEARCH FOR EFFICIENCIES: SOUTHERN BELLE ORCHARD

Geoff Lewis

Photographs : Trefor Ward

Maryna Nekhaieva (who has worked for Southern Belle for six years) picking red capsicums

Red capsicums ready for taking to the packhouse for grading

Creating efficiencies is the strategy ahead for feijoa, capsicum and chilli grower Southern Belle.

Located on easy country 10 minutes from Matamata in the central Waikato, the orchard was bought by Frans and Tineke de Jong nearly 20 years ago.

Frans grew up on a dairy farm and studied chemistry and successfully established his own laboratory. Tineke had a background in floristry and she is also a keen gardener.

More recently the day-to-day running of the orchard has been taken over by their son Talbert and his partner Emily – along with their growing family.

Talbert and Emily came from a busy life in Auckland. Talbert has a dairy farming background and has wide practical experience – including running a home maintenance franchise and maintenance for Auckland's city theatres. Emily studied marketing at Waikato University and spent 10 years in the not-for-profit sector.

Southern Belle has three hectares planted in feijoas. Also equipped with a 3000 square metre double-skinned greenhouse, they produce about 90 tonnes of capsicum of six varieties in red, yellow and orange including the long sweet pointed pepper. They also grow several tonnes a year of the 'Kiwi hot' cayenne chilli.

The greenhouse works around a desired temperature of about 22 degrees Celsius and November to December is the peak of the season. Most product goes to market through either MG Marketing or the Farmers' Markets at Hamilton and Tauranga.

Talbert says production overall is down this year due to the gloomy weather. By chance the feijoas missed the damaging hard frost in early October as the plants weren't yet in flower. While prices have held up, insect pests have increased.

"It's been milder. We used to get more frosts which killed off the moths and caterpillars. We use biological control, parasitic wasps and mites, with electric bug traps and some organic sprays," Talbert says.

Sparrows have also become a pest in the greenhouse and a variety of remedies have been employed including sound and smells, but strategically placed bird netting, installed about 18 months ago, seems to do the trick.

Keeping humidity under control in the greenhouse is also important in controlling insect pests. To help with this the greenhouse is vented and equipped with dehumidifiers.

Mark Barton transferring capsicums to the packhouse

"Normally you vent humidity out which means you can keep the vents closed and that creates an efficiency with heating," Talbert says.

Labour hasn't been so much of a problem at Southern Belle as it has in other areas. The orchard has a regular team of four locals, with another six coming in during picking season. But costs continue to rise on all fronts, including labour, and fertiliser which has tripled in two years.

"We are getting higher returns but that doesn't cover the extra costs. We look at any efficiencies we can make including in fertiliser. Our heating (in the greenhouse) is waste oil which has also more than doubled in cost."

> **"Southern Belle has three hectares planted in feijoas. Also equipped with a 3000 square metre double-skinned greenhouse, they produce about 90 tonnes of capsicum ... They also grow several tonnes a year of the 'Kiwi hot' cayenne chilli**

In the greenhouse capsicums and chillies are propagated hydroponically in a substrate of pumice and compost.

"We make our own compost from the capsicum prunings and local horse poo which we cook up in a pile. We've been using pots for the past seven or eight years and we like to keep a soil-like environment."

The growing capsicum plants are sustained by a recipe of seaweed and fulvic acid fertiliser mixed and pumped through from a central point.

"We try to grow year-round, which improves the efficiency of the crop turnover. We've got the time spent in pulling out old plants and replanting to about ten days, so we're back in production very quickly.

"Price can be a bit of a lottery, it can be very good but it can drop a lot as there is a lot of labour and time in picking, grading and hand-bagging chillies."

Outdoors Southern Belle train their feijoas along wires in the espalier fashion, and there is currently a project going on to concentrate production by reducing the gaps between the rows, which were set at a generous 3m many years ago – creating another efficiency.

NZ Feijoa Growers Association manager, Ian Turk, says the 2022 year has provided varied results depending on where growers are geographically located. The industry produces about 1200 tonnes annually, with the larger growers in Gisborne, Waikato and Bay of Plenty. Northland has lost a lot of growers due to guava moth and anthracnose, a fungal infection. Almost all feijoa production goes to the domestic market as the short shelf-life of the fruit makes export difficult.

Feijoa growers have been hit by the same increases in costs – for fertilisers, fuel, and to this could be added compliance, including NZGAP (Good Agricultural Practice) which has created a disproportionate burden on small growers. As most feijoa growers are small operations, labour has not been a big issue as it has been in other sectors, he says.

BROCCOLI MAY BE BLENHEIM'S FAVOURITE VEGETABLE

Elaine Fisher

Crates of Spudz N Greens' vegetables ready for delivery to customers' homes

Market gardeners Kathryn and Alistair Dawson of Spudz N Greens in Blenheim developed their home delivery business during Covid lockdowns

Blenheim consumers love broccoli – or so it would seem from the orders received by Spudz N Greens, the small market garden company which delivers fresh produce to their doors.

"If we don't have broccoli to harvest, orders drop off," says Kathryn Dawson who with her husband Alistair owns the business.

Four mornings a week the couple are in the fields picking vegetables ordered by clients the night before. By lunchtime they have personally delivered as many as 20 boxes of fresh produce to householders and local restaurants, and prepared boxes to be collected from their home near downtown Blenheim.

During summer they offer more than 30 different vegetables from broccoli to onions, garlic to shallots and turnips, beetroot, beans and potatoes, all grown on fertile Flaxton silt loam soils.

"Potatoes are not as popular as they used to be and with the number of diseases now affecting them, are becoming quite costly to grow," says Alistair.

Alistair and Kathryn don't employ staff. They do everything from preparing the ground to planting seedlings, to weeding, applying fertilisers and pest control and harvesting, themselves.

"We have some automation, including for preparing the ground, planting seedlings and planting and harvesting potatoes, but our other harvests are by hand," says Alistair.

Everything is designed to maximise the growing area and protect the soil from unnecessary compaction.

Orders come in via the Spudz N Greens website – designed by their daughter Sophie Dawson. In the evenings Kathryn makes up packing slips for each customer and as soon as it's light, she and Alistair head for the three hectares of gardens close to Blenheim to begin filling crates.

"Everything is picked the morning of the day it is delivered. You can't get fresher than that," says Alistair.

It's not an easy way to earn a living. In common with other growers, they face the impacts of adverse weather such as winds, frosts or too much sun or too much rain. The summer of 2022–23 has been the wettest they have experienced in more than 20 years.

The Covid-19 pandemic threatened to end the business in 2020 when the Marlborough Farmers' Market was among those throughout the country not allowed to operate. "We sold virtually all our produce through the market and lost some crop initially until we got the online business up and running. Then we were so busy we could hardly cope," Alistair says.

Alistair Dawson's trusty International tractor operates most of the machinery used on the Blenheim gardens

Kathryn Dawson operates a seedling planting machine

The success of their new business model encouraged the couple to continue with online sales and deliveries. "Among our customers now are people isolating at home because they have Covid," says Kathryn.

Newer threats to the viability of Spudz N Greens include significant increases in the cost of fertiliser, pest control products, diesel and the overall increases in the cost of living which is affecting their customers. "People's money can only stretch so far. We try to keep our prices competitive with those at the supermarket, but the reality is it's getting more expensive to grow vegetables," says Alistair.

Land use change and irrigation are also concerns. "We are working around the planting of new vines on one block of land we lease," says Kathryn. The land, previously a sheep farm, is converting to grapes for winemaking.

"Pest and disease control is getting harder and more costly, especially for small growers like us who have no influence in the industry," says Alistair. "Many existing products are being discontinued and new ones are not coming on to replace them."

The Dawsons' crops are irrigated by overhead sprinklers and recently they bought part of a water allocation from another grower in order to continue to water their plants.

The challenges of market gardening are nothing new to Alistair who has been involved in the industry since he was a boy.

"When I was ten my father had a smallholding growing vegetables in Canterbury. When I'd finished helping him, I'd jump the fence and help out the neighbour who had a bigger market garden."

The tradition of growing continued when the family moved to Blenheim when Alistair was still at primary school. "My father worked for Montana helping to develop some of the first vineyards in this region, and I worked in that industry too for many years."

Kathryn, who was born and bred in Marlborough, says her father had green fingers. "But I was introduced to market gardening when I married Alistair."

The reward, Alistair and Kathryn say, for their long hours and hard physical work, is knowing their customers enjoy the garden-fresh produce they grow.

BLUEBERRY VENTURE RIPE WITH POTENTIAL

The Frost family: Phillip, Michaela, their three children, and Phillip's parents Harry and Anne

Tucked away on the boundary of the Bay of Plenty and Waikato regions is a family blueberry orchard run by second-generation grower Phillip Frost and his wife Michaela. HELENA O'NEILL talks with Phillip about the highs and lows of being a berry grower.

Phillip's parents Harry and Anne Frost planted their first blueberry blocks in 1982. During the 1980s they were one of about 18 growers in the Rotorua area registered to produce export fruit. Today, they are the only ones left.

At their Maraeroa Road property they cultivated three blueberry varieties on 2.4 hectares of netted blocks: Jersey, Burlington, and Dixi. For the next 15 years, they trialled a variety of redcurrants, blackcurrants and gooseberries, along with 30 different varieties of blueberries.

Through the 1980s and 1990s the farm grew steadily, and with perseverance and a real passion to produce quality blueberries, it has continued to thrive, Phillip says.

"In 2019 Michaela and I bought into the business. And then Covid-19 hit. We had lockdown after lockdown, a whole year of not doing farmers' markets. The sales were just rubbish, and our fruit wouldn't be accepted for export. We mainly sold online and made our postie really busy.

> "The blueberry orchard covers 8ha of the 40ha property, with another half hectare in gooseberries

"Then there was the decision of whether we had to give up. We read through all the reviews from customers, and we knew we had something special there. We tried selling more online, and the juice was doing really well. It's ticking over quite nicely – not huge volumes, but it has kept us afloat. We've been able to support our staff and keep them employed here, even with the wage rises."

Despite the disappointment of seeing increased sales margins being swallowed up by rising labour costs, Phillip and Michaela see great potential in Mamaku Blue.

"It was a very tough three years but we have some absolutely amazing customers, particularly at the Parnell Farmers' Market, who really appreciate that we keep coming back and supplying them with berries.

"We also have some really cool staff here who help out where they can, even doing research on their own time."

The blueberry orchard covers 8ha of the 40ha property, with another half hectare in gooseberries. About 26ha of farmland is certified organic and leased out. Along with the house and sheds, there is also a building that houses a café, shop, and a small museum showcasing some of the Mamaku area's farming and forestry history.

> **"We lost about 30 percent of our first two or three varieties. In early October, Waikato got about –4.4 degrees with some parts down to –5, while in Mamaku it was –7. Even the varieties that can withstand the cooler temperatures like Reka and Duke that they had over in the Waikato didn't get affected at all at –4.4, but at –7 they do start getting a bit grumpy**

Mamaku Blue sells fresh and frozen blueberries and gooseberries at Farro and two farmers' markets in Auckland, as well as through their own website and café/shop on-site at the orchard. They have a range of about 60 products from wine to cold-pressed blueberry juice to dog biscuits.

The Frosts grow eight different varieties of blueberries all from the Northern Highbush group, and are trialling another eight different varieties for future expansions. Some of their original plants were planted 40 years ago (Jersey, Dixi, Burlington) while some others they sell are the most popular varieties in the world, like Bluecrop and Duke. The earliest variety is Reka and the latest variety is Elliot.

Taste the priority

Phillip says the family chose varieties for their taste over everything else – like shape, sugar content, size and extended shelf life. They also aim to grow more disease-resistant varieties, as close to the native American blueberry as possible.

"Our trees take longer to mature and we need to make sure our baby plants can develop their root system first before planting them into compact volcanic soil."

Ripe blueberries ready for harvest

He says the volcanic soil is rich in minerals but its pH (acidity/alkalinity) is not ideal for blueberries, which require lower soil pH (between 4.5 and 5.5).

Their blueberries ripen in the window from January to March, and the latest they have harvested is in early April, as they take longer to ripen and then get hit by early frosts.

"In the pollination season when we get this sort of rainy weather, instead of the bees going to the berries three, four, five times they might only go once. Then you get very small berries. They're full of flavour, full of taste, but you take them to market and people don't want to buy them. So we had to find a product that we could make where the berry didn't matter if it was less appealing visually.

"We started way back with the wine. We made a trial brew of juice as well, which seemed to go quite well, so we made more and more juice."

Blueberry juice in particular is growing in popularity as scientific research finds further links with improved kidney and brain health, supported by feedback from dozens of customers, he says.

"It really gives me a buzz … that's why I stayed on. Some of the reviews from our customers are mind-blowing. This is just something we started making with rubbish blueberries, but now have dedicated varieties for it."

Harvesting styles

The family business uses three styles of harvest: handpicking, handshaking the tree, and machine harvesting.

Two frames are slotted underneath the tree before someone shakes the tree by hand while the ripe berries fall onto the trays below. This method is employed for berries used in their jams and chutneys.

The first January storm split ripe berries

The storm stripped ripe blueberries from the tree

"You can get through a row pretty quick – about a row in a day."

"When we're picking by hand you will have up to 40 people picking a row for a day. With the catcher frames, you will have four people for the best part of a day. – The machine will do it in ten minutes. The quality changes each time with each method. The best picking for fresh sales is handpicking."

In harvest season, Phillip works seven days a week, including driving to and from Auckland twice to man stalls at the Parnell Farmers' Market on Saturdays and the Grey Lynn Farmers' Market on Sundays.

"I tend to work seven days a week from Christmas to Easter. On a good year, we pick Monday, Tuesday and Wednesday and we sort Thursday and Friday. Then I give everyone the weekend off and leave for Auckland early Saturday morning. And do it again on Sunday."

In winter Phillip only attends one market, the Parnell Farmers' Market once a month.

"The rest of the off-season I'll be making products like the juice, the liqueurs, and so on. Along with staff management, we have the café and shop open seven days a week, marketing, and ongoing maintenance and servicing machinery."

Diversification

Mamaku Blue also grows gooseberries, providing work and an alternate crop before the blueberry season starts.

"It's not a huge market by any stretch of the imagination. It's a bit of a sideline, something that we do before Christmas. Gooseberries don't grow in many other places in New Zealand. You can't get them to grow in Auckland; even in the Waikato we find it too hot for the gooseberries to bud. You need something like 1200 hours of winter chill for the gooseberries. It's colder in Mamaku."

The recent gooseberry season was disappointing, with the harvest only about a third of what Phillip was hoping for.

When it comes to pests, the thrips, scale and mealybugs that can plague growers in the Waikato don't seem to affect the Mamaku orchard.

"We get leafroller caterpillar, it doesn't really do any damage to the plant, it might get a couple of leaves and roll them up. We also get grass grub which loves blueberry roots, and once it has eaten the blueberry roots it turns into a little beetle that flies around eating all the leaves and blueberries. It's not a huge issue for us, but it's one we have to monitor," Phillip says.

"We have a small area of tunnel housing, about three-quarters of a hectare. It's basically just rain cover but it's working really well, so we will be investing in that and

installing more in the next few years. I think the weather is changing and we're going to get more of this in the future, so having a protected crop is going to be better."

He hopes the covered crops will provide more consistency in the quality and quantity of berries each year.

In October berry growers in the Waikato were hit hard by a severe frost at the peak flowering time.

> **"When we're picking by hand you will have up to 40 people picking a row for a day**

"Our budding was just starting at that time. I believe we lost about 30 percent of our first two or three varieties. In early October, Waikato got about –4.4 degrees with some parts down to –5, while in Mamaku it was –7. Even the varieties that can withstand the cooler temperatures like Reka and Duke that they had over in the Waikato didn't get affected at all at –4.4, but at –7 they do start getting a bit grumpy.

"As for our later varieties and our berries under cover, they weren't affected at all."

Weather challenges

While the orchard managed to avoid the worst of the frost damage, heavy rain at the start of harvest season has affected crops.

"We started picking between Christmas and New Year just to get some berries off the trees. We were able to pick two rows out of the ten by hand, then we went through with our harvesting machine for the next seven rows. On 4 January when we had the bulk of our pickers turn up, they had the fun of wearing plastic ponchos in the rain and it was miserable."

Since then, the weather has been less than ideal, with an early January storm that damaged berries swiftly followed by ex-Cyclone Hale. Although the cyclone itself missed the orchard, the damage was already done with several days of very wet weather and wind prior to the cyclone.

Just 12 months ago Cyclone Dovi damaged a boiler, destroying fruit and slowing picking considerably, hitting the orchard's profitability last year.

"We had only just secured Farro last year, so we had to pick for them and sell at a loss. We want to have a long-term relationship with them so we don't want to think of the one year, we want to think of the many years." ●

TECHNICAL

THE LATEST INNOVATIONS AND IMPROVEMENTS

SUSTAINABLE ONION PRODUCTION
GAME "SET" AND MATCH!

Martyn Callaghan and Mike Nichols

Mike Nichols and Martyn Callaghan at the Hawke's Bay trial

In New Zealand, onions for storage and for export are normally sown during the winter until early spring. This is because sowing them any earlier will result in the plants going to seed in the spring, while sowing in the spring will result in lower yields due to bulbing only occurring during long days and high temperatures (that is, mid-summer).

Sowing onion seed in the field during the winter months can pose major problems with soil preparation, weed control, disease control and the leaching of fertiliser from the soil due to excessive rainfall. Mildew can be a major problem, requiring significant use of fungicide sprays – generally Mancozeb. Seedling onions do not compete easily with weeds, so herbicide sprays are also required. In addition, as the seedlings have a very small root system, they are unable to seek nutrients from a large volume of soil, so there is a serious risk of fertiliser being leached from the soil by heavy rain.

Not sowing onion seed in the winter allows time for a cover crop to be sown, to build up soil organic matter. Planting onion sets in the spring means that soil preparations are easier, and that not as fine a tilling is required.

In 2021 Onions New Zealand agreed to partially fund our research project to assess the potential of producing bulb onions from onion sets. It was described as a "proof of concept" study. An onion set is a small (about 5 gram) bulb onion, which is grown from seed one year, harvested in the autumn, stored over winter and planted the following spring.

There are several important factors to take into consideration when producing onion sets. The most important one is that the site is free from nematode, white rot and onion smut. Sets need to be sown late (November) and at high density to ensure only small bulbs are produced. The alternative is to use protected cropping (greenhouses) and even better still, a fully environmentally controlled plant factory, which should be capable of growing onion sets from seed in about two months, and four crops per year. The advantage of not using soil is that existing nursery equipment can ensure precise spacing of seed, and a much more even sized grade of onion sets.

Onion sets

The 2021–22 Study

Sets were grown from seed of two onion varieties in the summer of 2020–21, Rimu and 10441 (since named Barbera), and a small number of other varieties were grown for observation.

The sets were harvested in autumn 2021 and stored in a shed at ambient temperature. They were divided into two size grades < 5 grams and 5–10 grams, and planted in three trials:

- Pukekohe: planted on 19 September, 27 September, 11 October and 21 October
- Hawke's Bay: planted on 22 September and 14 October
- Palmerston North: planted on 20 October and 20 November.

Results

The results from both the Pukekohe and Hawke's Bay studies show that:

1. Early plantings result in higher yields.
2. Larger sets result in larger yields.
3. Early plantings and larger sets result in the higher percentage of onions going to seed. Note, this can be overcome by heat treatment of the sets prior to planting, but this was not done in this study.
4. Yields were at least as good from the early plantings as from a direct sowing in the field many months earlier.

Palmerston North study:

This involved a non-replicated study with two planting dates of two varieties, grown at three densities: 50, 100, and 200 plants/m^2.

Figures 1 and 2 demonstrate:

a. Lower yields from later planting.
b. The importance of plant density.

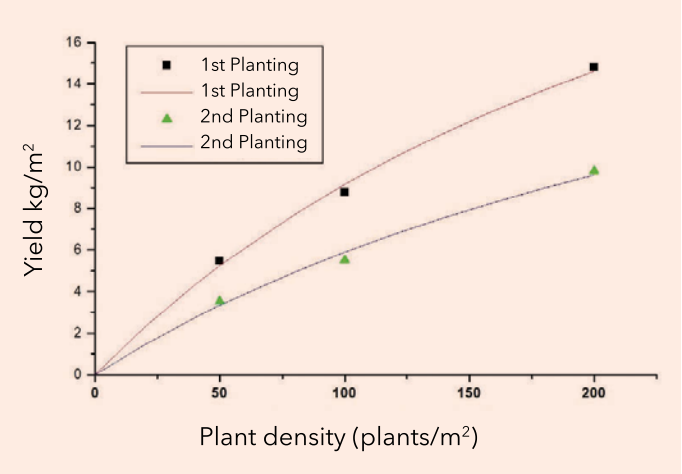


Figure 1: Effect of planting date on yield

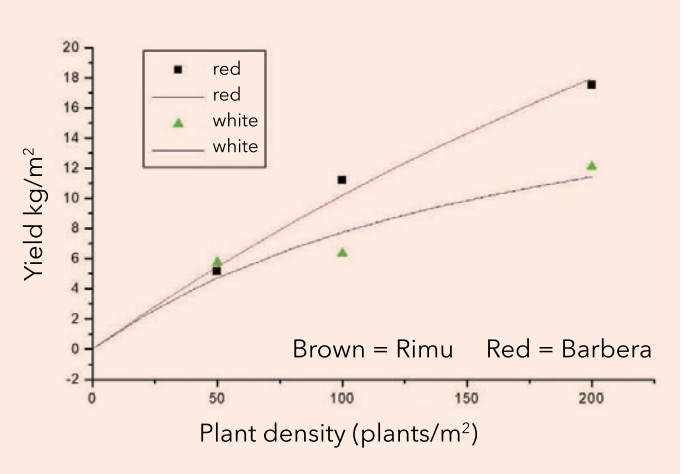


Figure 2: Effect of variety on yield at different densities

Note: This needs to be confirmed, as conventional wisdom suggests that yield differences between onion varieties tend to be small at high densities.

These high yields are primarily because there were no wheel tracks, so commercially the yields should be reduced by 15–20 percent to take this into account. Also, the weather conditions for the first planting were ideal, with heavy rain following a few days after planting the sets, whereas the second planting, although into moist soil, received virtually no rain – hence the lower yields.

Harvesting was in early January for the first planting, and late January for the second planting. As there is a tendency for early plantings to go to seed, this poses the question whether a late planting with irrigation might provide a safe and worthwhile strategy.

The Future

There is currently consideration being given in Europe to prohibiting the use of Mancozeb for onion mildew control. Europe imports about a third of New Zealand's export onion crop each year, so this could have a major effect on our exports. There are alternative fungicides, but they are considerably more expensive.

Global warming is clearly going to influence future weather patterns, and this could make sowing onion seeds in the winter increasingly difficult. Greenhouse-grown seedlings, transplanted in the spring, are an option, but would require irrigation immediately after transplanting. Onion sets (being a dormant onion bulb) do not require irrigation immediately after planting, which is a huge plus.

Growing a green crop over winter, in place of onion seedlings, would also be a huge plus in terms of reduced soil erosion, nutrient leaching and soil structure improvement.

> **Sowing onion seed in the field during the winter months can pose major problems with soil preparation, weed control, disease control and the leaching of fertiliser from the soil due to excessive rainfall**

New Zealand has some excellent long keeping onion varieties, for example, Pukekohe Long Keeper and Early Long Keeper, and there is the potential to produce onions which will store without the use of maleic hydrazide (plant growth regulator).

There is a very real possibility of tapping in to the highly remunerative, increasing world demand for organically certified onions by using onion sets. Growing onions from seed organically is expensive, as hand weeding is required during the winter months.

Onion sets can be graded by weight prior to planting. This will reduce the variation in onion sizes at maturity, if the different weight grades are planted in blocks. Also if the nutrient content of the onion set can be increased, this reduces the fertiliser requirement to grow the mature onion.

Conclusions

Our results demonstrate that good crops of onions can be grown from sets in New Zealand with a much reduced use of agrichemicals, and without sowing seed in the middle of the winter. The yield potential is at least as good as conventional production, and there is a potential to increase productivity, and increase market return. Barbera is a red skinned onion, which has good storage capabilities (at least until mid-July) and the weight loss in storage during the trials was due to water loss and not rots.

In an observation trial (not replicated) the variety Early Long Keeper was outstanding in terms of yield, absence of bolting and appearance.

A report on the project is held by Onions New Zealand.

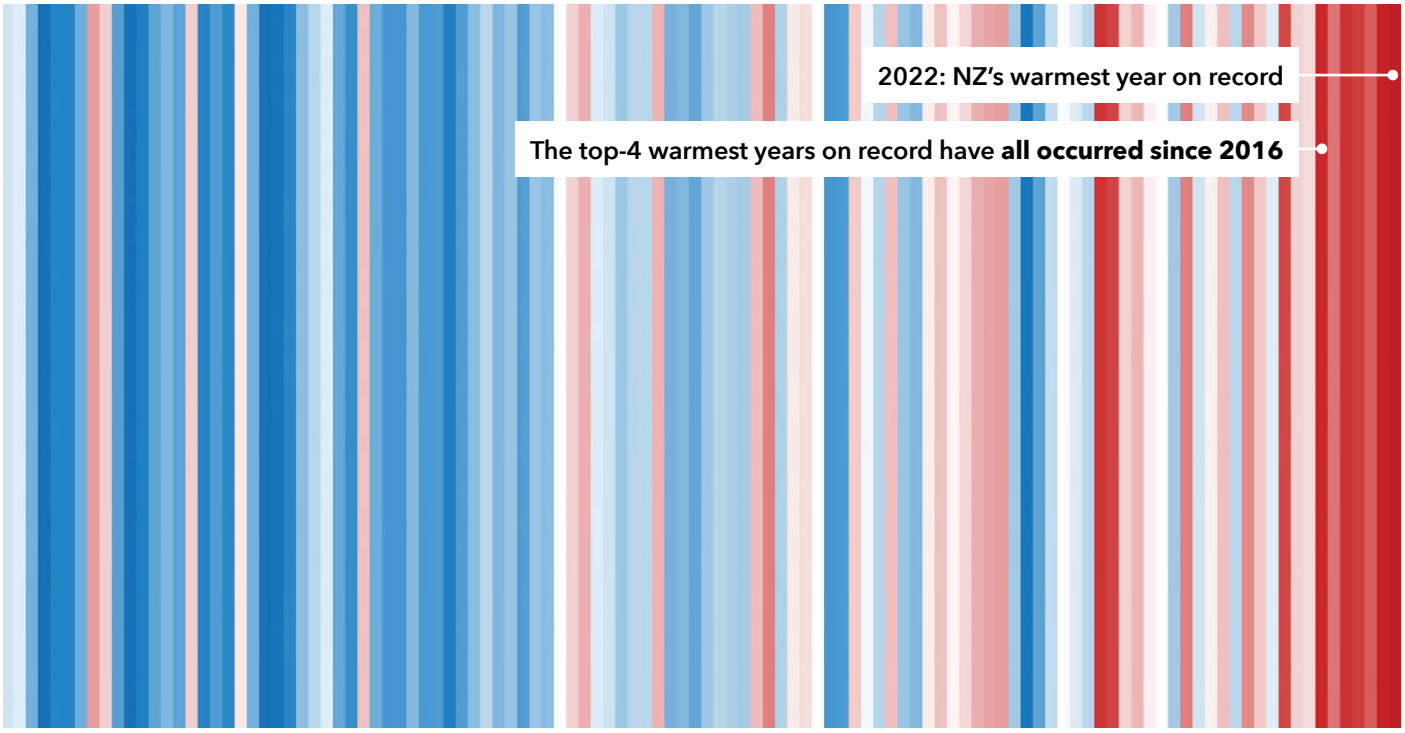
Growing onions for sets in the field

Growing onions for sets in soil in a greenhouse

Growing onions for sets in boxes in a greenhouse

2022 WARMEST YEAR ON RECORD – AGAIN

Tristan Meyers and Ben Noll : National Institute of Water and Atmospheric Research (NIWA)



Based on monthly temperature anomalies from NIWA's seven-station series relative to the 1981-2010 average

Last year was once again New Zealand's warmest year on record, knocking 2021 off the top spot. It was also the eighth most unusually wet year on record, with heavy rain falling in areas that would usually be much drier.

The nationwide average temperature based on recordings taken at stations in NIWA's 'seven-station series' was 13.76°C, which is +1.15°C above the 1981–2010 annual average, and surpasses 2021 by +0.20°C.

The top four warmest years on record have all occurred since 2016, a trend that is consistent with climate change. We would not have had our four warmest years in such short order without climate change.

Warmer than average most months (Figure 1)

Data from NIWA's seven-station series also showed that there was no month in 2022 when below average temperatures (more than 0.50°C below the monthly average) were experienced, and during ten out of the 12 months temperatures were above average (+0.51°C to +1.20°C above the monthly average) or well above average (>1.20°C above the monthly average).

> "Rainfall is most likely to be above normal in the east of the North Island, below normal in the west of the South Island, near normal in the west of the North Island

Unusually wet across the country (Figure 2)

Last year was also New Zealand's eighth most unusually wet year on record, and the most unusually wet year since 2018. This is based on data from NIWA's Virtual Climate Station Network, which goes back to 1960.

The nationwide rainfall anomaly during 2022 was 110 percent, meaning that it was ten percent wetter than normal – a substantial departure from the norm when averaged across an entire year.

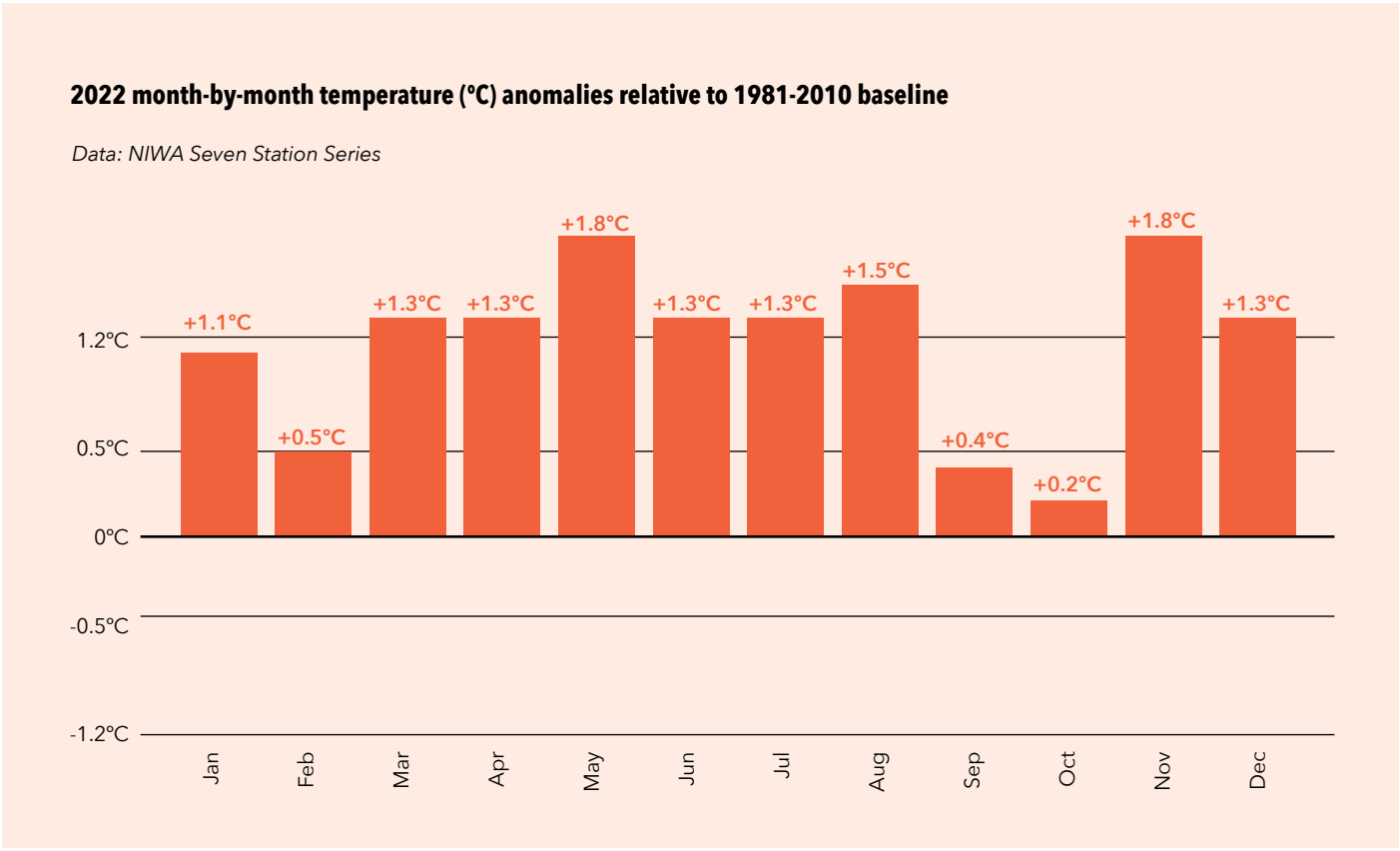


Figure 1: Monthly temperature anomalies calculated from NIWA's seven station series. All bars are red, indicating that no month had an anomaly below 0°C. Values above 0.5°C are considered "above average", while values above 1.2°C are considered to be "well above average"

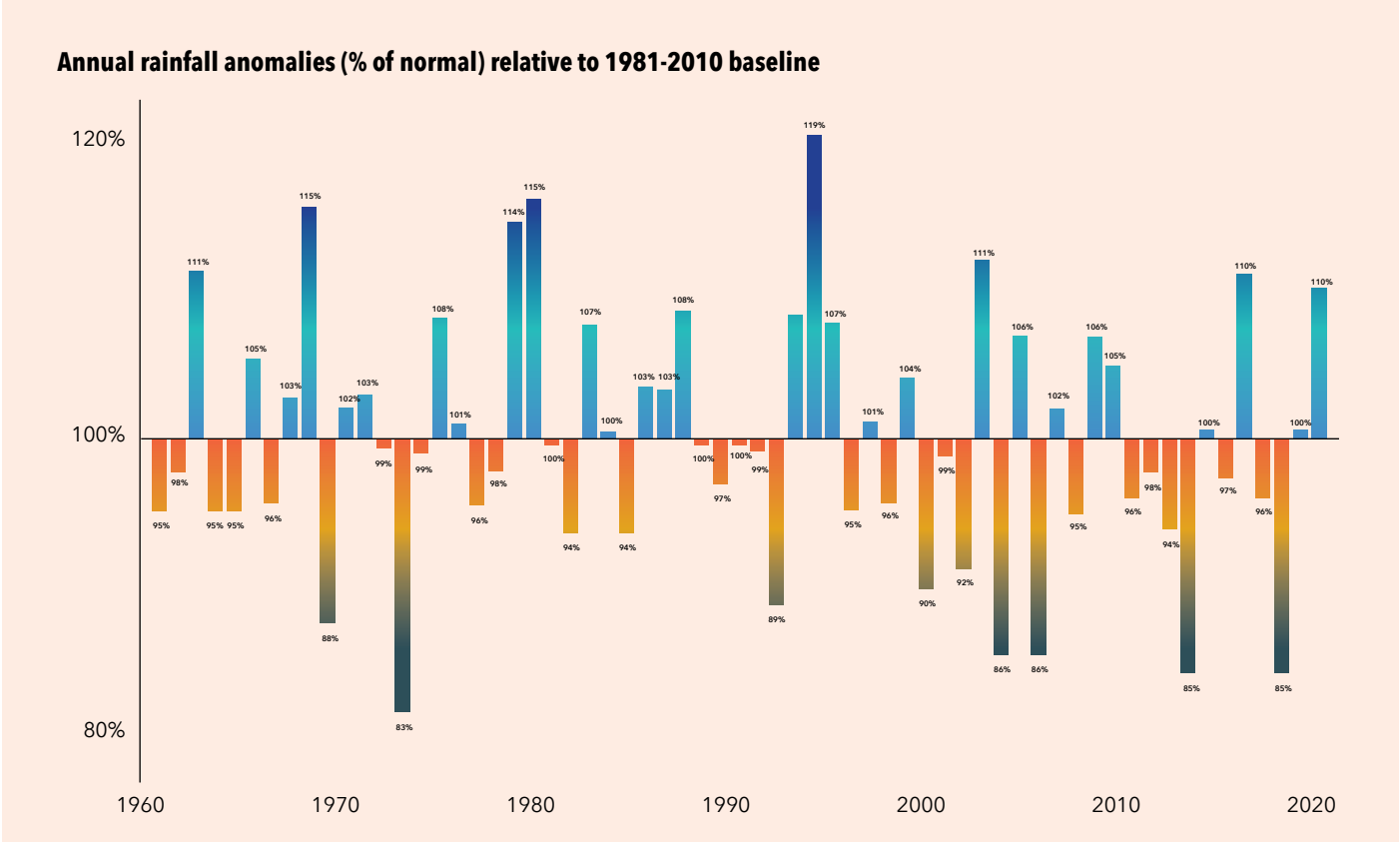


Figure 2: Annual rainfall anomalies from 1960-2022 from NIWA's Virtual Climate Station Network relative to the 1981-2010 baseline, averaged over New Zealand

Which locations took out the 2022 weather records?

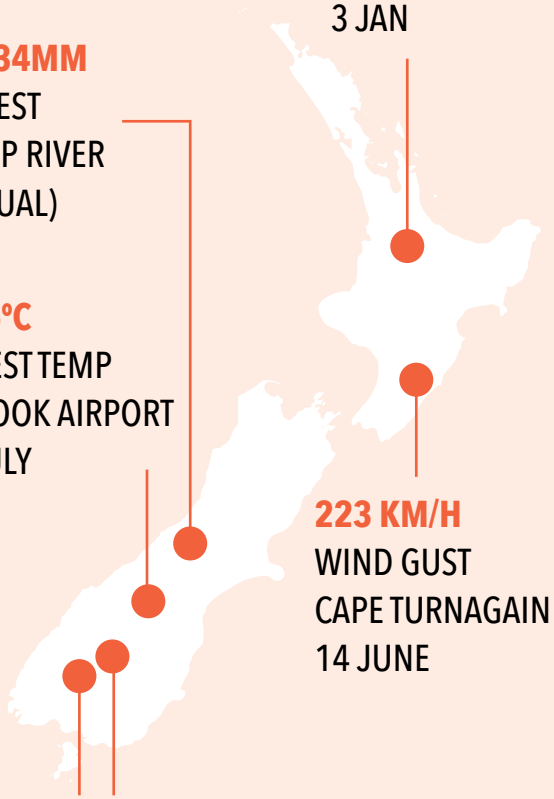
The highest air temperature was 34.7°C at Lake Karapiro on 3 January and the lowest was minus 11.6°C at Aoraki/Mount Cook Airport on 17 July.

The wettest location was Cropp River on the West Coast (975 metres above sea level) with 11034 mm rainfall. The lowest annual rainfall was at Roxburgh and Middlemarch, both in Otago, with just 368 mm recorded for the year.

Taranaki experienced New Zealand's highest annual sunshine total for the second year in a row, with 2659 hours recorded at New Plymouth. This was consistent with more easterly winds, which warm and dry as they blow down off the North Island's Central Plateau.

The typical sunshine crown wearers, such as Nelson, Marlborough, and Bay of Plenty, had some extra cloud during the year.

2022 WEATHER RECORDS



Why was 2022 so wet and warm?

Several climate drivers contributed to the unusual warmth and wetness in 2022.

The primary driver was La Niña. The 2022 La Niña event came with higher-than-normal air pressure near and to the east of the country and lower pressures to the north. This pressure set-up caused more sub-tropical, northeasterly winds than normal, driving up air and sea temperatures.

> "New Zealand's risk for ex-tropical cyclone activity is normal-to-elevated

Sea surface temperatures (SSTs) near New Zealand also had a big impact. Warmer than average sea surface temperatures can drive up humidity and lead to persistently above average air temperatures, especially near the coast. This can contribute more moisture to approaching low pressure systems. During 2022, coastal SSTs were above or well above average every month, culminating in a marine heatwave event around our coastlines for much of the year.

Another climate driver, called the Southern Annular Mode (SAM) – a measure of the strength and position of the westerly wind belt that encircles the Southern Ocean and brings storms to New Zealand – played a role too. The Southern Annular Mode was positive 76.2 percent of the time in 2022, its highest annual percentage since at least 1979. A positive Southern Annular Mode is associated with higher-than-normal pressures over the New Zealand region.

In the Indian Ocean, a sea surface temperature seesaw known as the Indian Ocean Dipole (IOD) became active during winter and continued through spring. This was associated with higher-than-normal atmospheric moisture across the wider Australasia region. This extra moisture was picked up and transported into New Zealand by mid-latitude low pressure systems and fronts.

Climate change continues to influence New Zealand's long-term temperature trend, which is occurring at a rate of approximately 1.17°C (± 0.2°C) per century according to NIWA's seven-station series.

What should we expect for the rest of summer and early autumn?

While La Niña continued during January and sea surface temperatures remained above average, La Niña is most likely to ease to neutral by early autumn. However, there can be a lag between when oceanic patterns change near the equator (where La Niña occurs) and when atmospheric patterns change closer to New Zealand.

During February and March air pressure is forecast to be higher than normal over and to the south of the South Island, and lower than normal north of the country. Temperatures are about equally likely to be near average or above average in the north and east of the South Island and east of the North Island, and very likely to be above average across the remainder of the country. In other words, it is unlikely to be a colder than average start to the year.

Rainfall is most likely to be above normal in the east of the North Island, below normal in the west of the South Island, near normal in the west of the North Island, and about equally likely to be near normal or above normal across the remainder of the country. Patterns of heavy rain that frequently reached our shores during December 2022 and early January 2023 will likely repeat a few times in the months to come. Regions that will have weather ripe for holidaymakers but possibly challenging for farmers are the West Coast, Otago and Southland – here, rainfall is most likely to be below normal.

> **Another climate driver, called the Southern Annular Mode (SAM) – a measure of the strength and position of the westerly wind belt that encircles the Southern Ocean and brings storms to New Zealand**

Soil moisture levels are most likely to be near normal in all regions, although soggy grounds are expected following the more frequent deluges.

New Zealand's risk for ex-tropical cyclone activity is normal-to-elevated through to April. As we saw in January with Cyclone Hale, these systems can cause flooding rainfall, strong winds and coastal hazards.

The information in this article comes from NIWA's Annual Climate Summary and January to March Seasonal Climate Outlook – you can read the summary at **www.niwa.co.nz/climate/summaries/annual-climate-summary-2022** and the outlook at **www.niwa.co.nz/climate/sco.**

APPLYING FOR AN INDUSTRIAL ALLOCATION IN THE NZ EMISSIONS TRADING SCHEME

Supplied

The Environmental Protection Authority (EPA) has put together guidance to help you with the industrial allocation process for the Emissions Trading Scheme. If you produce fresh tomatoes, cucumbers, capsicums or cut roses you may be eligible for an allocation of New Zealand Units (NZUs).

Part 1 in the series explained industrial allocations and how to set up an account in the New Zealand Register (December 2022 edition, page 61). This article will guide you through the application process.

To recap, growers of fresh tomatoes, cucumbers, capsicums and cut roses are eligible for industrial allocations because they are emission-intensive and trade exposed. This means that, because of the Emissions Trading Scheme (ETS), they face an increase in the cost of heating their greenhouses. Due to international competition, they are not able to pass these increased costs on to their customers. The government has attempted to mitigate this cost by giving an allocation of NZUs, which a grower can then sell or use to pay for energy costs.

How to start your application

First, you will need to check on the EPA's website that you are eligible for an allocation: **www.epa.govt.nz.**

The next step is to sign up or log into the Register: **www.emissionsregister.govt.nz**.

When you are ready to make your application: log in to the Register, go to your organisation's account and select 'ETS Activities' from the left-hand menu. Select 'Industrial Allocations' and start your application.

Choosing a Provisional or Final Allocation

There are two ways you can choose to receive your allocation.

You can receive your NZUs in advance. This is a Provisional Allocation and is based on your production from the previous calendar year.

Or you can apply for a Final Allocation to get your NZUs in arrears. This means your allocation is based on your actual production for that year.

If you are applying for the first time or if this is the first year you are producing fresh tomatoes, cucumbers, capsicums or cut roses:

You will need to have 12 months' production data from the previous year (e.g. 2022) and apply for a Final Allocation (for 2022).

Once your application has been approved you can then choose to apply for a Provisional Allocation for your second year of production (e.g. 2023). This will mean you will get your NZUs (for 2023) in advance.

If you have had an industrial allocation in the past, and would like to apply again:

You will still need 12 months' production data. The application type will depend on what you applied for last year. If you received a Provisional Allocation, you must either keep applying for a Provisional Allocation or complete an annual allocation adjustment. If you had a Final Allocation, you can continue applying for a Final Allocation.

If you applied for a Provisional Allocation last year:

You will need to 'square up' the NZUs you received against what you actually produced. This adjustment will be done as part of your next year's Provisional Allocation process. If you are not applying for a Provisional Allocation, please contact the EPA.

Important dates

For provisional allocation applications

Make sure you apply between 1 January and 30 April of the year for which you wish to receive NZUs. For example, apply in February 2023 to get a provisional allocation of NZUs for 2023.

For final allocation applications and annual allocation adjustments

Please apply between 1 January and 30 April of the year following the year for which you wish to receive NZUs. For example, if you apply in February 2023, you will receive a final allocation for the year 2022.

For closing allocation adjustments

If you stop producing or carrying out the activity, you must complete a closing allocation adjustment within 20 working days and repay any units owed. For example, if you stop growing fresh tomatoes on 6 August, you have 20 working days to submit a closing allocation adjustment in the Register.

Please get in touch with the EPA as soon as possible and they can help you through this process.

Part 3 of this series will explain how to transfer units in the Register and what records you need to keep.

If you stop producing altogether:

You must notify the EPA within 20 working days, via 0800 254 628 or info@epa.govt.nz. If you have received a Provisional Allocation of NZUs you will also need to submit a closing allocation adjustment in the Register and repay any necessary units within the 20 working days. Failure to do so will result in penalties.

Need help?

If you are unsure of what do to, please talk to the EPA.

Call **0800 254 628**

Visit **www.epa.govt.nz/register-guidance**

FUTURE CHALLENGES FOR THE GREENHOUSE INDUSTRY

Mike Nichols

The greenhouse industry is facing several major challenges, which are going to change the way in which many of our crops are produced in the future. High on the list is the management of the greenhouse environment. This is not specifically a New Zealand problem, but a problem facing many of the world's greenhouse crop producers.

Over the past 20 years, we have seen a rapid uptake of the use of natural gas to provide us with carbon dioxide in the greenhouse during the daytime, to provide enhanced photosynthesis (and therefore productivity) and supplementary heat mainly during the night-time. This will inevitably disappear due to decarbonisation policies of governments, and will need to be replaced by a more environmentally friendly system. Europe is currently going through a similar process, but aggravated by Russian gas supply problems.

In New Zealand, one possible alternative is to make use of our unique geology. Geothermal energy offers the potential to provide both energy and carbon dioxide, but will require considerable investment. The best example of this in horticultural terms is Iceland, which is situated two-thirds of the way to the North pole from the equator. (New Zealand is mid-way between the South pole and the equator, and Oamaru is 45° S).

“In New Zealand, one possible alternative is to make use of our unique geology. Geothermal energy offers the potential to provide both energy and carbon dioxide, but will require considerable investment

Iceland is much colder (and has much less winter light) than New Zealand, but produces fresh vegetables in greenhouses year-round by using geothermal steam for heating, and supplementary light from geothermal and hydro-produced electricity. There is no reason why New Zealand should not exploit its own geothermal resources this way. Some 30 years ago, I was invited by the New Zealand Electricity Department to view the small greenhouse project, the Ohaaki Geothermal site. A short time after this visit, the NZ Gourmet Mokai

geothermal greenhouse was established, and currently, a new geothermal field is being developed by Contact Energy just south-east of Taupo. Winter light is not good near Taupo, but supplementary LED (light-emitting diode) is becoming the norm for winter tomato production throughout New Zealand.

Of course, it does not have to be geothermal steam, as there is plenty of heat just beneath the earth's crust. In simple terms for every 1km of depth the temperature increases by 25°C. This is already being exploited in the Netherlands to provide greenhouse heating.

Most horticultural greenhouse crops in New Zealand are now grown hydroponically. For tomatoes the most common medium is rock wool, which is produced from molten granitic rock. This is the gold standard for hydroponic growing media, because it can be produced to very precise standards in terms of aeration and moisture holding characteristics, so that every slab is the same. However, no matter how efficient the system, this must use a considerable amount of energy. Each module is then wrapped in a single use plastic and freighted by container to New Zealand.

> **"Iceland is much colder (and has much less winter light) than New Zealand, but produces fresh vegetables in greenhouses year-round by using geothermal steam for heating, and supplementary light from geothermal and hydro-produced electricity**

Another common medium is coir – a by-product of coconut production. This is produced by cutting up the coconut husk by machine, and then after size grading the particles, drying it in the sun, and then compressing it into modules, which are then slipped into single use plastic sleeves.

Coir has several advantages over rock wool – at least for New Zealand producers. It is described by one Australian grower as far more forgiving than rock wool, because it is well buffered in terms of water and nutrients, whereas with rock wool a missed irrigation could be quite serious. Coir is cheaper to freight to New Zealand because it is compressed, and disposal is easy after cropping. The chief disadvantage is the lack of standardisation (in terms of particle size) and therefore air-filled porosity and water holding characteristics.

There are a few other natural waste materials in New Zealand. Probably pine bark is the best example, but it requires pre-treatment, and also does not have good water holding characteristics. Possibly a mixture of coir and pine bark would be worth considering. Pumice is an option, but is pretty heavy and needs to be free from potential disease organisms. In Australia, there is an interest in using wood processed into almost a candy-floss constitution, but this is not really making use of waste product.

With any growing medium, the percentage of air-filled porosity and moisture holding characteristics vary according to several factors. Rock wool, for example, has about 93% of air-filled porosity, but this is a dynamic figure which varies with the number of roots and the irrigation frequency.

Good aeration is the key to good plant growth. Many years ago, I undertook a small research study with aeroponics in which the root zone was supplied with supplementary oxygen, and the growth rate (no doubt aided by improved nutrient uptake) was enhanced. I suspect that this is one reason (but not the only reason) why hydroponics is superior in productivity to crops grown in soil.

With the possible disappearance of the single use plastic wrapped coir or rock wool growing module due to the unrecyclable nature of plastic, this poses the question of whether they are the appropriate dimensions. Historically they were developed for growing tomatoes, really based on the depth of rock wool for good aeration at the top, and adequate moisture at the bottom of the slab. It is highly possible that strawberries in coir could perform better in slightly narrower, but deeper modules. It would enable the fruiting trusses to fall clear of the plants. This would not however, provide a solution to single use plastic, which is likely to continue to be a problem not only for horticulture but for many different industries in the foreseeable future.

THERE IS PLENTY OF HEAT JUST BENEATH THE EARTH'S CRUST. IN SIMPLE TERMS FOR EVERY

1KM OF DEPTH THE TEMPERATURE INCREASES BY 25°C

PRODUCT GROUPS

ALL THE LATEST NEWS FROM YOUR PRODUCT GROUPS

HUMBLE TO HERO NEW SEASON ACTIVITIES – GET INVOLVED

Kazi Talaska : Onions New Zealand

The 'Humble to Hero' Sustainable Food and Fibre Futures (SFFF) programme is a six-year partnership between Onions New Zealand and the Ministry for Primary Industries to transform the New Zealand onion industry.

Humble to Hero supports projects and workstreams around three themes: market validation and diversification, enabling value by providing assurances, and capturing value by sharing the onion story with food science and provenance claims.

The programme is now halfway through year two, with projects set up to support the new 2022–23 growing and export season.

Nutrient and beneficial analysis

What is the difference between the New Zealand onion and any other onion around the world? Identifying the New Zealand onion's unique selling point is the first part of creating value for the product internationally.

Work on the constitution of the New Zealand onion was completed last year, but this season there will be increased testing to validate research findings. Onions New Zealand will be asking growers to support the project by sending samples from growing regions across the country. The cost of sending onions will be covered by the project.

Waste stream value-add research

Small, damaged or otherwise unmarketable onions provide little to no return for growers. Through the Humble to Hero waste reduction project, we aim to explore opportunities for value-added products that will support sustainability and grower return.

The programme has engaged summer student Grace Petersen from Otago University to identify the volume and characteristics of the onion waste streams across the region. Growers, packers and exporters are asked to participate in short interviews over the summer growing period.

Providing assurances and residue testing

Residue testing is ramping up for another onion season. As uptake to the programme increases, the onion industry becomes better equipped to face market access and regulatory challenges. Growers can submit samples regardless of whether onions are exported. A copy of results will be sent to participants.

Shipping best practice

Developing the tools and knowledge needed for exporters to ship onion products that arrive in market with the best quality and value is essential. This project intends to wrap up at the end of 2023 with a guide on shipping and storage settings.

This export season more shipping container trials will be sent worldwide with data loggers collecting data on temperature and humidity. The research provider will be working closely with onion exporters to ensure good data capture.

Trial shipment fund

Establishing, retaining and developing market access encourages increased and higher quality trade for New Zealand onion exporters. Without testing of market access, markets can close, regulations can be put in place, and the potential of the market is lost in the short term.

A trial shipment fund has been set up through this programme to support the costs of sending product to new markets. Applications are open for this export season.

Humble to Hero is a programme designed to obtain outcomes for the industry, and its success relies on industry support.

If you would like to know more or want be involved with the projects above reach out to Kazi at **kazi.talaska@onionsnz.com**

SUMMER SPUD REPORT

Gemma Carroll : Potatoes NZ Inc. communications & engagement officer

Happy New Year!

It has been a spring-summer spud season of weather extremes, with either too much sudden rain or not enough. I asked around the industry to see how this situation has affected quality, yields, pests and disease management.

New Zealand agronomists and growers in our main growing regions had the following to say about the 2022–2023 potato season.

> “The team remains focused on research and development (R&D) projects

Canterbury

Potatoes New Zealand (PNZ) seed inspector, Cyril Hickman, along with the PNZ seed team, are tasked with looking for potato pests, disease, fungal, viral and bacterial infections, and subnormal or not-true-to-type plants in the potato seed crops.

Cyril is only seeing minor incidents of liberibacter so far this season, which is lower than the previous season. He admits that psyllids can still come later in the season and that the spread of liberibacter can still then affect plant health. Crop monitoring must continue and spray programmes must be quickly responsive to any detection.

The Canterbury weather has been quite favourable, with intermittent rains, and most crops are under irrigation as well. There is still a bit of the Canterbury growing season to go yet and harvest won’t really kick in until around 20 January. Plants are looking similar to last season, tall and soft, but there’s not much of a downside to that.

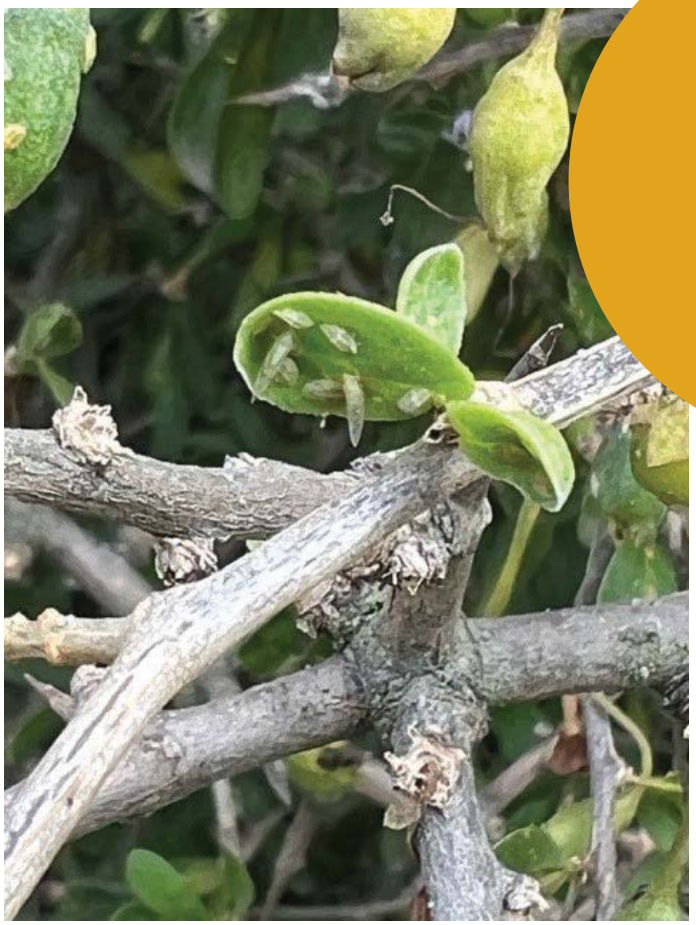
Canterbury has experienced many cloudy days this season, so the plants are showing a very light yellowing due to lack of photosynthesis, however this doesn’t affect plant health or yields.

The feeling at this stage in Canterbury is definitely more relaxed than our spuddies in the north.

Happy spud paddock

Roger Blyth, Canterbury Seed and Field Services agronomist, observed that even though psyllid field pressure seems low so far this season, boxthorn infestations still look very high. His colleague Nick Proudfoot warned that industry cannot become complacent about Tomato Potato Psyllid (TPP). He knows of at least one grower who had backed off his spray programme because of low numbers on traps but then both nymphs and adults were soon found in a big crop infestation.

TPP is known to introduce the infection liberibacter, which then causes the tuber defect known as zebra chip. This results in tuber rejection at the processor end and is a big economic hit to process growers.



Psyllid on Boxthorn

Pukekohe

So far, this season has been the total opposite to the previous spring-summer season, says Daniel Sutton, Fruitfed agronomist.

"In 2021–2022 we were so dry that we were struggling to harvest from hard, cracked earth.

"Most recently Cyclone Hale has resulted in lower yields and quality issues. Physically managing the crop is incredibly difficult; planting, harvesting and every aspect is under pressure.

"Plant quality has been affected by wind damage and rain. The excessively wet soils become anaerobic, which creates plant stress and disease."

Daniel guesses there may be a 20 to 40 percent crop loss due to the weather at this point in the season.

When harvesting, growers are finding half the bins are just full of dirt. The clay soils are more sticky and so harvesters pick up all that in a load, which slows the process of getting to the actual potato tubers. It is far more dirt when harvesting than usual. This in turn means it takes more time and cost to harvest.

Crop loss due to pests is lower than usual due to the wet conditions. Potato tuber moth numbers are generally a little lower than the previous season; because it's been so wet the furrows aren't cracking, so the moths can't get into the ground to lay. Psyllid numbers in the region are also currently lower.

The only insects visible in the fields are whitefly and aphids, which are manageable and do not destroy crops.

The region is seeing more bacterial diseases such as potato blight, that is caused by the water mould *Phytophthora infestans*. Also present is early blight which is caused by the fungal pathogen *Alternaria solani*. The disease affects leaves, stems and tubers and can reduce yield, tuber size, storability of tubers, quality of fresh-market and processing tubers and marketability of the crop. The moist soils continue to host a bit of powdery scab as well.

Daniel says consumers can expect to see a few more scabby potatoes in store, but there is no food safety issue and if preferred they can peel it off.

There won't be much ground storage this season due to moisture and the risk of rot. If crops can be sold quickly or put in a coolstore, that is preferable.

There could be an explosion of insect populations if the region goes from warm and wet to hot and dry. There's talk of another cyclone coming through, but it is hoped this won't coincide with the main harvest period from February to April.

> **"Plant quality has been affected by wind damage and rain**

If there is any positive aspect to this wet weather, it could be that growers are using less insecticides – however, there is a need for more fungicides. In addition, machinery maintenance is now a higher cost due to sticky clay soils, and more time is needed to clean vehicles.

Growers aren't saving any money because of this weather.

Manawatu

Grower Chris Pescini says there were delays in planting potatoes due to the wet weather last year. This meant waiting until mid-September to plant, rather than July as usual. However, the spring and summer hasn't been too bad in terms of rain and it's warmer than usual.

The crop quality looks good for now, with no heavy rain, just enough. In fact, they have their irrigators operating. Cyclone Hale was not a major event for the area.

Plants are looking healthy, although there are higher psyllid numbers than usual. Spray programmes are underway and monitoring is done with simple plant visual checks by the crew in the field.

Early blight is already apparent and being treated with fungicide. It is hoped that harvesting will start in February.

Economically there's a lot of catch-up to do to recoup losses over the last two years, when weather impacts and flooding brought huge crops losses. Fertiliser costs are also "through the roof", up by around 30 percent. The weather events also impact how much fertiliser is needed, especially if growers lose a crop and then have to replant.

> "Crop loss due to pests is lower than usual due to the wet conditions

The year ahead for PNZ

The team remains focused on research and development (R&D) projects and will be building on extension activities this year.

The first round of events is in late March with the PNZ R&D breakfasts. We visit Canterbury on 28 March for a shared breakfast and guest speakers.

Topics	Speaker
Onside Biosecurity	Guy Davidson
Sustainable Vegetable Systems	Andrew Barber
TPP/Canterbury Potato Liberibacter Initiative	Clive Kaiser, Kate Braidwood, Ping Koay
Integrated Pest Management	Paul Horne
Powdery Scab update	Iain Kirkwood
Biosecurity updates	Iain Kirkwood, Cyril Hickman

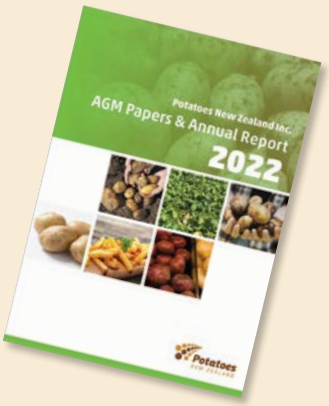
We then visit Pukekohe on 30 March and cover the same topics, with the addition of the potato tuber moth programme updates and an opportunity for grower feedback.

You can check our events page for details, and make sure to RSVP for breakfast catering.

The PNZ Winter Conference will take place in Christchurch on 23 and 24 August. We have a draft programme which will be emailed to growers for their feedback. We want to ensure that content is relevant and stimulating for our members and other stakeholders.

You can see an overview and themed videos about our Sustainable Vegetable Systems programme on our YouTube channel: **www.youtube.com/potatoesnewzealandinc.8524/videos**

We also encourage you to watch our Sustainability Champion, Canterbury grower Robin Oakley, in the AgMatters Greenhouse Gas video: **www.agmatters.nz/case-studies/robin-oakley/**



The PNZ 2022 Annual Report can be found on our website: **www.potatoesnz.co.nz/administration/annual-reports/**

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

GETTING MORE DONE

Antony Heywood : Vegetables New Zealand Inc. general manager

Ellery Peters with Adeline Bartoletti, Hot Lime Labs process engineer

Ellery Peters and Robert Lindsay look at Jade Garden's glasshouse boiler to assess its potential for biomass conversion

Vegetables New Zealand's new year's pledge is to get more done.

In a pledge to get more done, the first action Vegetables New Zealand (VNZI) has taken is to employ Ellery Peters as an energy engineer. His appointment is made under a joint project with the Energy Efficiency and Conservation Authority (EECA) to assist the vegetable industry to decarbonise. This is especially important in the covered crop industry which predominantly uses carbon-based inputs like coal and gas to heat its glasshouses. Ellery started just prior to Christmas and has spent much of his time getting a feel for the industry, and its challenges and opportunities.

Ellery will engage with all South Island covered crop growers in 2023 to assist them in determining the best course of action to decarbonise. Ellery will be using the data that has been developed in the six case studies in the EECA project, Industry transition plans. He will extrapolate the findings and propose feasible solutions to switch fuel sources.

> "In a pledge to get more done, the first action Vegetables New Zealand (VNZI) has taken is to employ Ellery Peters as an energy engineer

The second action that VNZI is determined to put in place in 2023 is greater collaboration with the other vegetable product groups. In the last VNZI Board meeting, a new strategy was adopted to ensure more visibility, and the development of resources for all vegetable growers. This has already begun with the employment of Ellery Peters, and there will be other new appointments in 2023. The new staff will generate more action and resources for growers.

Chris Claridge (right) looks over the biodiversity project at the Pukekohe Demonstration Farm under the guidance of Olivia Prouse and Howe Yung

Biodiversity plantings at Pukekohe Demonstration Farm – Cronin Road site

The third action in which VNZI plans to advance the collaboration in the industry is in the field of research, in particular Integrated Pest Management (IPM) programmes. There is a view that vegetables grown in rotation need to have the same IPM programme. Vegetable groups will be working together to ensure we share our resources and outcomes.

In 2022 VNZI implemented a biodiversity project on the Pukekohe Demonstration Farm. The idea of this project is to enhance biodiversity on vegetable farms by establishing native perennial plant species in the surrounding farm landscape and field margins (e.g. riparian areas, shelter belts). The principle is that these perennial plantings will provide refugia for beneficial populations and provide habitat year-round. This work will be important to demonstrate to vegetable growers that on-farm and landscape management can have a big impact on pest management, alongside other co-benefits such as control of weeds, and the improved management of soil loss and nitrogen leaching.

The biodiversity project is a first step that VNZI is undertaking to revitalise its IPM programme. In conjunction with Plant & Food Research, VNZI will be undertaking an IPM reset between 2023 and 2025 to give growers more resources to adopt IPM approaches. Chris Claridge, Potatoes New Zealand chief executive, is also looking at developing an IPM programme for potatoes, and is keen to share resources and grower experiences.

The final action critical for the VNZI Board in 2023 is internal and external engagement plans and actions. The Board adopted the Vegetable Sector Policy Strategy in 2022. This will be rolled out in 2023. Engagement cannot be done in isolation if it is to be effective. VNZI will be seeking the support of all vegetable product groups to drive home our vegetable messages. Jay Clarke pushed this point with a Ministry for Primary Industries (MPI) tour group to Woodhaven Gardens in December.

Growers are constantly faced with many factors outside their control when trying to grow a crop. There are some factors that growers should be able to control, and they should be a mutually desirable outcome from the growers' ministry, MPI.

This is Jay's hypothesis. He did not hold back in giving the MPI team a dose of truth about how much government policy is influencing his family business. Jay would say it is getting close to a day of reckoning for his family – growing vegetables is just getting too hard. He would make more money turning it all into houses. I think MPI was listening, but time will tell.

TomatoesNZ

PSTVD UPDATE

Dinah Cohen : TomatoesNZ Inc business manager

If you are a fresh tomato grower, you will have received an email from TomatoesNZ in December about Potato Spindle Tuber Viroid (PSTVd) being found in greenhouses in the South Island. This is a further update on the situation and a reminder about good hygiene practices.

You are probably aware that this was not the first time that PSTVd has been found in New Zealand tomato plants. Previous incidences were irradicated, and GIA (Government Industry Agreement for Biosecurity Readiness and Response) partners have pursued this same outcome for the most recent cases. The three infected greenhouses were stripped of all plants in December with all material buried on site, under Ministry for Primary Industries (MPI) direction, thoroughly disinfected and then replanted. As you can imagine, this was a stressful situation for the grower involved but they worked with the GIA partners and were fully compliant with the MPI directives. In terms of the source of this infection, the seeds tested negative and plant matter from outside of the greenhouses has to date also tested negative. It is likely that the source of the infection will never be known. As with all potential infections and incursions, it is better to be prepared and over cautious. While some PSTVd infected plants may show no signs at all, others could display some of the following symptoms:

- a lower-than-normal yield
- stunted spindly growth
- fruit not ripening
- spots or streaks of dead tissue on fruit
- yellow, purple or grey leaves which can roll up or die.

Clothes and on-site laundry as part of hygiene practices?

You might have seen an article published by *In Greenhouses* magazine on the benefits of clean workwear. Research has shown that clothes, including shoes, are a source of contamination when workers move around the greenhouse, with some viruses living on material for over a month. This has led some businesses to not only provide full work clothes for their staff, including shoes, but also for these items to be removed and laundered on-site.

For best hygiene practice it is recommended that dirty clothes are removed and placed in one room, moved to the washing machine and then the dryer, and exit at the other end of the laundry to a 'clean room' for folding and storing. Ensuring that dirty and clean clothes do not come into contact with each other is essential. Some businesses even go to the length of banning personal items like phones, earphones and caps or hats as these also pose a possible contamination risk.

The cost of such measures must always be weighed up by each individual company, but as any grower who has had to destroy crops due to an outbreak of disease will tell you, the costs of having good hygiene practices cannot be underestimated.

Reverse decay whitefly trial

TomatoesNZ is looking to set up a trial that will test a number of different insecticides for whitefly that are not registered for tomatoes (i.e. are currently used off label) to determine what withholding period is needed to meet the default New Zealand Maximum Residue Limit (MRL) of 0.1mg/kg. This will help growers to know how long they need to wait after spraying before crops can be harvested.

To set up this trial we need a trial site within a greenhouse that can be fully handed over to the trialist for approximately ten weeks over winter this year. This will include heavy use of insecticides, so will require a greenhouse that does not have beneficial insects in it, and the crop will need to be destroyed after the trial has been completed.

We also want suggestions of insecticides to use during the trial – do you have one that you would like to be included?

Conferences

The Horticulture Conference will be held in Christchurch from 1 August to 4 August 2023. Please mark this date in your diaries now. The date and time for the TomatoesNZ conference is yet to be confirmed but it will be part of the Horticulture Conference.

Please send suggestions and questions to **dinah.cohen@hortnz.co.nz** as soon as possible.

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