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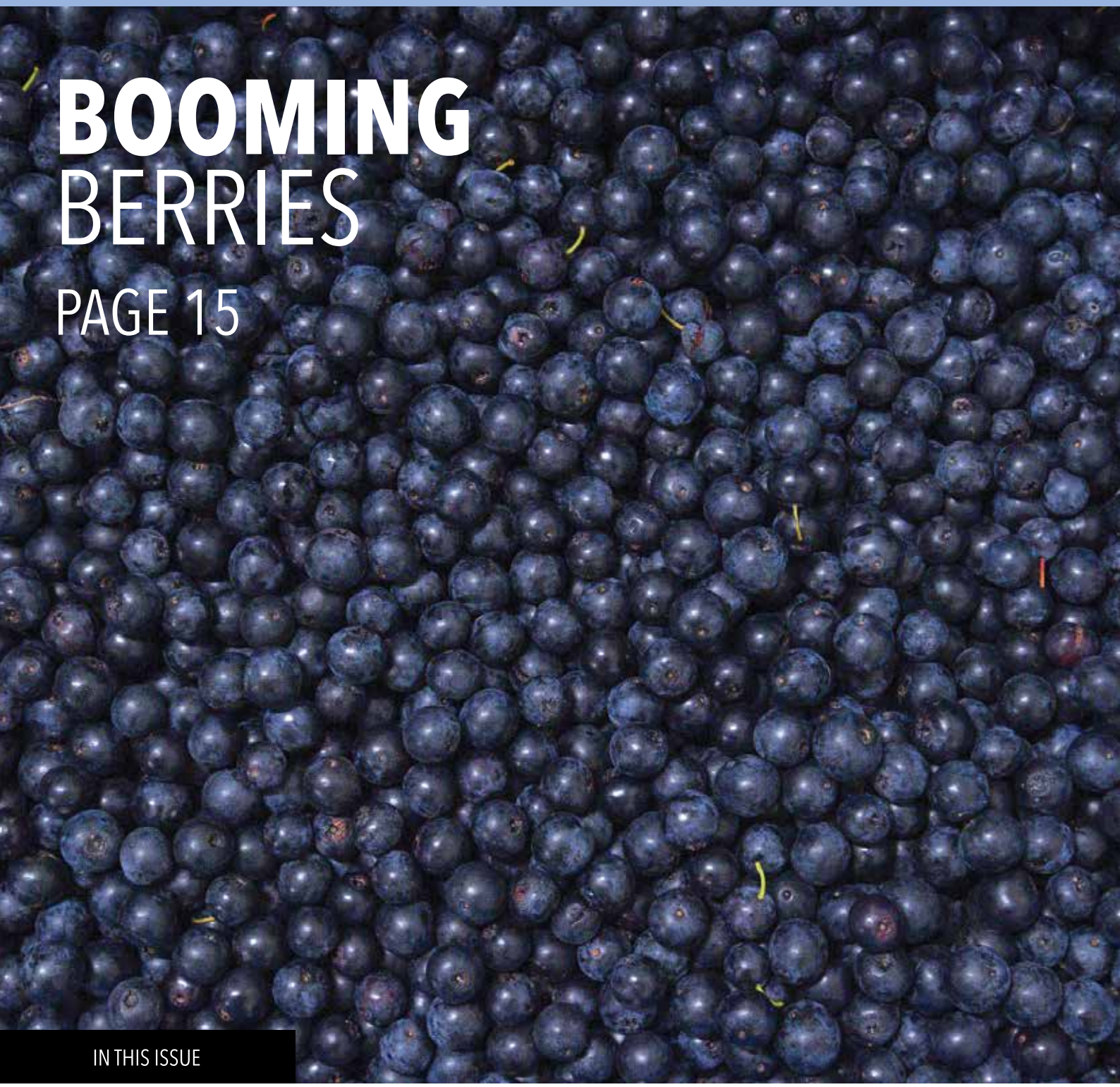

BOOMING BERRIES

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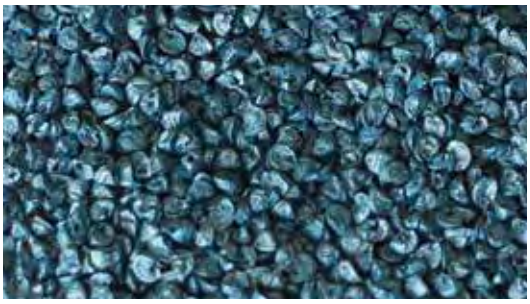

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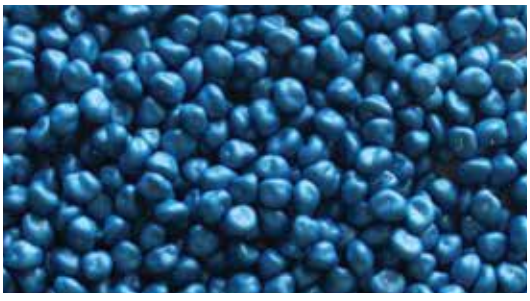

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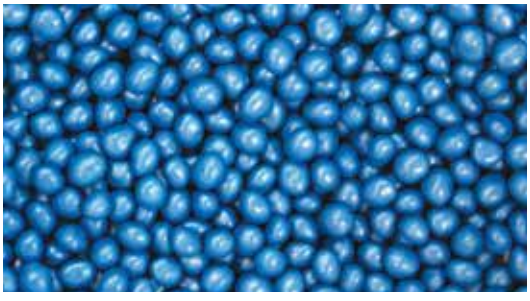

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It's Blueberry Country, see page 15.
Photo by Trefor Ward.

WHAT'S NEW

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

CLIMATE CHANGE IS REAL – SO WHAT ARE WE GOING TO DO ABOUT IT?

Words by Barry O'Neil, President : HortNZ

I had the opportunity in early March to spend the day in Hawke's Bay with the Prime Minister and some of her senior Ministers, along with other Food and Fibre industry leaders. We visited local farmers and growers, and discussed with them the issues and opportunities they are facing.

While there was a clear focus on our future seasonal labour needs, we also spent time on climate change and freshwater reforms. Unfortunately, I came away feeling we have a long way to go if we are to collectively, as the food and fibre sector, agree to address the significant industry, national and global issues facing us.

I am however encouraged that as a nation and as an industry, we are at least identifying these issues as priorities. But I felt at times, the wider primary sector is still looking for excuses not to make changes to how we farm or grow, blaming incomplete science, lack of government support or the need for longer transition times. This to me is disingenuous: to be saying yes, we agree with the need and yes, we absolutely must change, but don't make us do it now as we're just not ready yet!

And while I struggle, along with most others, with the complexity of these issues and what the changes we must make will mean to production and the economics of growing, my bigger concern is that if we continue to procrastinate, it will be too late for us to make the changes that will make the needed difference.

No one wants to see fellow growers being regularly devastated by hail, losing crops to rain and flood events, and crops too often suffering with drought. And we especially don't want to see warmer climates so that our production systems and growing regions are no longer suitable for the crops they currently grow.

Our climate is changing from human activity, and our excessive and at times inappropriate use of the earth's limited resources. We need to change how we are doing things now if we are going to mitigate the impacts. This is much more than just growers – and yes, also much more than just New Zealand – but to me that is no excuse for continuing to delay doing what is needed and what is right.

Internationally we are falling behind what leading countries are doing, so we don't have a unique 'NZ Inc story' to tell our consumers now. Consumers always have a choice, and while our produce has historically commanded a premium, this is now being seriously challenged by others who are doing more and moving faster to address climate change and the environmental issues facing our communities and countries.

Millennials and Gen Zs have been the leading generations marching in the street demanding change. They will also soon become the largest consumer group. What therefore do we think will influence their purchase decisions?

From a purely economic perspective, we need to keep ahead of the competition or we run the risk of becoming another Nokia or Blockbuster.

We know that over time, the environment has suffered from our farming and growing practices. There's actually a win-win here. Changing how we grow will not just achieve carbon neutrality but will help to return the land, water and air back to a healthier state.

> "I like to think 80% of growers, want to change how we grow, do our bit to mitigate the changing climate

The majority of us, I like to think 80% of growers, want to change how we grow, do our bit to mitigate the changing climate so we can continue to supply New Zealand and world consumers with products for which they willingly want to pay a premium.

But as with any significant change issue, there will be the 20% who won't want to change. They will argue it's a croc or changing what they do won't make any difference. And they will argue that people are not causing climate change, it's just a historic earth warming cycle that has happened before, and that the 'greenies' are just crying wolf.

> **We have knowledge of what change is needed, but there is more work and investment required**

The top credible scientists in the world have concluded that we have a problem and have pleaded for decades for climate change to be addressed. That we are leaving the so-called Garden of Eden era and entering the Anthropocene epoch – where human activities dominate, and in this case, have a real negative consequence on our survival on earth. They are also saying that while the Paris Accord was set to limit global warming to 1.5 degrees, our inaction to date means this is probably no longer possible because we have left it too late. But they are still hopeful that acting now will mean limiting warming to 2 degrees, which still provides a future for generations to come.

A 2-degree increase might not sound much because we live in a temperate climate. But those people in the world already struggling with unbearable heat, lack of water and insufficient food, will be seriously affected and displaced from their homelands. And this won't be just a few hundred; we are talking about millions of people being displaced. Where will they end up and what is our response going to be when they knock on our door?

The Climate Change Commission has released its draft report recommending to government the options for New Zealand. I very much welcomed the report as in general, it's a very sound assessment that will result in our country making crucial decisions in order to face the realities.

My one concerns is as with any approach to changing behaviours, regulators often use too much stick and not enough carrot, such as suggesting carbon prices of $140 or $250 a tonne. I am sure most of us will change if growers can be shown what we need to change, and how we can transition to being carbon neutral while still being economically viable.

We have knowledge of what change is needed, but there is more work and investment required. The government will generate revenue of $3.1 billion from the Emissions Trading Scheme according to the Climate Change Commission's report. This money and more needs to be reinvested into finding solutions for things like renewable energy for heating and transport, and to support the transition to these new technologies.

$3.1BILLION

REVENUE GENERATED FROM THE EMISSIONS TRADING SCHEME

THIS MONEY AND MORE NEEDS TO BE REINVESTED INTO FINDING SOLUTIONS FOR THINGS LIKE RENEWABLE ENERGY FOR HEATING AND TRANSPORT

It's going to be hard but we must collectively commit to this, as we just don't have a choice. If we continue to argue why we shouldn't change rather than accept why we should, then limiting global warming to 2 degrees is not going to be possible either, and we absolutely don't want to be part of that scenario.

Ngā mihi.

NZGROWER

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Your Levy AT WORK

MPA Associate Member (NZ)

Horticulture™ New Zealand Ahumāra Kai Aotearoa

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WHAT IS NEEDED FOR RECOVERY?

Words by Mike Chapman, Chief Executive : HortNZ

It is just over a year since the whole of New Zealand went into Level 4 lockdown. At the time, the apple harvest was well underway and kiwifruit was building up to peak harvest, with other fruit and vegetables in the throes of either planting, harvest or pruning. Level 4 lockdown requirements markedly increased production costs and reduced the outlets where produce could be sold.

One of the most notable issues at that time in 2020 was the lack of both permanent and seasonal labour. The horticulture industry – NZ Apples & Pears, NZ Kiwifruit Growers Inc, Summerfruit NZ, NZ Wine, Master Contractors and Horticulture New Zealand – therefore started campaigns to find labour for the 2020–2021 season. This group has to this day kept pushing the government for enabling border policies, worker support and immigration changes so that the horticulture and wine sectors can continue to be productive. We have had some success but the end result has not been what horticulture has needed.

During the first lockdown in March–April 2020, the government started paying wage subsidies to support businesses and workers. The wage subsidies were not aligned or available to our sector as despite increased costs and a struggle finding workers, we kept operating. To date $16.6 billion of taxpayers' money has been paid out in wage subsidies.

The wage subsidies have propped up businesses that in these Covid-19 days are not operating and are not in a position to contribute to the much-needed economic recovery of New Zealand. As a result, I am reaching the view that this is money that has not been well spent. It is delaying inevitable job losses and an economic downturn, while taking workers away from industries like horticulture that are performing and contributing to New Zealand's economic recovery.

As the government works on policy and immigration settings for workers for the next 2021–2022 season, I believe that settings such as the wage subsidy need to be reviewed so that perverse economic outcomes are not perpetuated. Border and immigration settings, especially with vaccine-enabled travel, also need to be reviewed so that what has happened in 2020 is not repeated in 2021.

New Zealand needs a new set of policies for the immediate future, which is what the horticulture and wine collective is pursuing with the government right now.

There are also some clear wins that can be actioned that do not take money or complicated reviews. One of those wins is the timely enactment of the Organics Bill and rapid creation of the regulatory framework under that Bill, which will enable an increase in both the volume and value of organic exports.

$16.6 BILLION

OF TAXPAYERS' MONEY HAS BEEN PAID OUT IN WAGE SUBSIDIES TO DATE

The Bill is going to its second reading in Parliament, having been through the Select Committee phase. It is not perfect but once in place, will enable a rapid increase in organic exports by allowing for the New Zealand organic certification system to be recognised in the countries where we send our exports. At present this is not possible.

The regulations to be created under the Bill can also be tailored to make as cost effective and efficient a national certification system as possible. Industry is ready to work with the government to achieve this outcome, the end result being an enhancement to our ability to earn valuable overseas returns, to keep our rural economies running.

We are at the crossroads when it comes to our economic recovery and the contribution that horticulture can make to it. As I've set out, if we are enabled with smart and appropriate policy settings, horticulture will continue to contribute, otherwise horticulture and our rural economies will further suffer. ●

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INDUSTRY WIDE ISSUES FOR INDUSTRY GOOD

NATURAL RESOURCES AND ENVIRONMENT

WATER

Water Services Bill

The Water Services Bill will implement the government's decision to comprehensively reform the drinking water regulatory system. The Bill establishes the duties and functions of Taumata Arowai as the new national Water Services Regulator.

The new requirements introduced for drinking water suppliers will apply to anyone who supplies water to others for domestic purposes (excluding domestic self-supply). These regulations will capture some irrigation schemes, and small supplies serving more than just a 'stand-alone or single domestic dwelling', such as supplies serving packhouses and worker accommodation.

Horticulture New Zealand has made a submission and presented at the Select Committee in March. Key points HortNZ made in the submission were:

- It is important to retain and clarify provisions regarding proportionality, given many small supplies will be captured, and to provide a longer transition period.
- Clarify and remove duplication between the Water Services Bill and the Food Act, relating to the commercial washing of food.
- Support for the concept of Te Mana o te Wai, and seeking clarity that Te Mana o te Wai is an integrating framework that seeks to provide for the well-being of water and the well-being of people.

Hawke's Bay Regional Council Plan Change 9 – Tūtaekurī, Ahuriri Ngaruroro Karamū (TANK) Catchments

The focus of HortNZ's submission is that water policy provisions provide sufficient flexibility to enable horticulture to continue to thrive on the plains, in a manner that is consistent with Te Mana o te Wai.

> **"The focus of HortNZ's submission is that water policy provisions provide sufficient flexibility to enable horticulture to continue to thrive on the plains, in a manner that is consistent with Te Mana o te Wai**

HortNZ will be supported by expert planning, economic, hydrology, water quality and farm planning evidence. The Council hearing is scheduled for May.

HortNZ supports provisions that:

- Support well designed water harvesting, storage, augmentation and cease take thresholds, to improve freshwater outcomes, support economic well-being and increase climate change resilience.
- Enable crop rotation to support soil health.
- Recognise the importance of domestic food supply of fruit and vegetables.
- Recognise Tangata Whenua values and Māori agribusiness aspirations.

CLIMATE CHANGE

He Waka Eke Noa

He Waka Eke Noa is a partnership between iwi, government and primary sector to manage agricultural emissions. Agricultural emissions include emissions from animals and emissions from fertiliser. Agricultural emissions make up about half of New Zealand's greenhouse gas emissions, but emissions from the horticultural sector make up less than 2% of New Zealand's emissions.

HortNZ supports effects-based thresholds for He Waka Eke Noa milestones, to ensure the key focus of the programme is on reducing agricultural emissions.

Climate Change Commission Submission

HortNZ is developing a submission on the Climate Change Commission's draft advice. Key points include:

- Land use change to horticulture presents an opportunity for New Zealand to reduce emissions and improve freshwater outcomes. We seek joined-up policy across trade, labour and environment to support horticultural expansion.
- Alternative heat sources for glasshouses are not yet commercially viable, largely due to the capital costs of alternative heat. Glasshouses are a resilient and efficient growing system, the importance of which will likely increase with a changing climate. The glasshouse sector urgently requires targeted investment to support its transition to lower-carbon heat.
- Free allocation policy should be used to align with the Paris Agreement outcomes, that is to reduce global emissions and to maintain food security. We seek a clearly articulated free allocation policy that includes explicit criteria for domestic food security and carbon leakage. We seek alignment of free allocation policy across all emissions sources, e.g. industrial, transport and agricultural emissions.
- Industry assurance programmes such as NZGAP can leverage off market requirements for lower-carbon products, to deliver regulatory outcomes. We seek policy to support the use of industry assurance programmes.

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Ahumāra Kai Aotearoa

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A BIOSECURITY THREAT MARCHES CLOSER

Words by Anna Rathé : Biosecurity Manager, HortNZ

Photo by Mr Noy Sopha, as part of NZAID project in Cambodia, Plant & Food Research

Situation update

In April last year I wrote an article in this magazine on an emerging biosecurity threat – the fall armyworm *(Spodoptera frugiperda)* which had recently made landfall in the north of Australia for the first time. Since then, fall armyworm has marched its way south through mainland Australia. After the first detection on two Torres Strait Islands in January 2020 it turned up in Queensland in February 2020, The Northern Territory and Western Australia in March 2020, New South Wales in September 2020 and there have recently been sightings in Victoria. In December 2020 there was a preliminary report of larvae from a single field in New Caledonia.

Fall armyworm has proven itself a highly successful invader. It has made its way to over 60 new countries, none of which have managed to eradicate it. It is clear that this pest is moving progressively closer to New Zealand, and we need all growers to keep an eye out. If it were to arrive on our shores, early detection provides the best chance of managing the pest.

What to look out for

Eggs 	Dome-shaped cream-coloured eggs are laid on the underside of leaves near the base of the plant. Usually, eggs are laid in clusters of a few hundred which the adult moth covers in a layer of greyish furry scales.
Caterpillars 	Caterpillars go through six larval instars. As they develop the larvae grow in size, starting at around 1.5mm and reaching up to 34mm when mature. The instars change in colour from greenish, through to orange and then brown. Fall armyworm caterpillars tend to hide during the day in the whorl or leaf axils. Crop damage is most likely to be observed during the summer and early autumn months when larvae are feeding.
Adults 	Adult moths emerge at night and are highly mobile. The moths have a mottled grey/brown forewing, a white hindwing and a wingspan of 30–40mm.

It can be easy to confuse some life stages of fall armyworm with similar species that are already present in New Zealand, such as tropical armyworm *(Spodoptera litura)* or cosmopolitan armyworm *(Mythimna separata)*. It is important that suspect insects are identified by an expert. If you think you have spotted fall armyworm, **catch it, snap it and report it** by calling the Ministry for Primary Industries exotic pest and disease hotline on 0800 80 99 66.

What is the risk?

Fall armyworm attacks a wide range of crops including grasses, cereals, fruits and vegetables. Maize and sweetcorn appear to be the insects' favoured host with most reports of significant damage on these two crops. Yield losses of over 70% have been reported in cases of severe infestation. If caterpillar populations get to very high numbers they can swarm and spread in search of food. During this phase they can chew though the stem of young plants, killing them. This trait is why they are named 'armyworms.'

Fall armyworm favours a tropical or sub-tropical climate, and is thought to be limited by arid and cold conditions. Year-round populations are only sustained in regions with a favourable climate, otherwise infestations are seasonal.

> **Yield losses of over 70% have been reported in cases of severe infestation**

Climate modelling is an inexact science, but some climate models have indicated that parts of northern New Zealand may be suitable for establishment of fall armyworm. The climate of other regions in the north island may only allow for seasonal invasion. While current climatic conditions may limit the threat of year-round populations establishing in wider New Zealand, small increases in temperature can have dramatic consequences for pest populations like fall armyworm.

If you think you have spotted fall armyworm, **catch it, snap it and report it** by calling the Ministry for Primary Industries exotic pest and disease hotline on **0800 80 99 66**.

FARM ENVIRONMENT PLAN UPDATE

Words by Ailsa Robertson

By 1 May 2021, commercial vegetable growers and those who grow annual crops are required to submit a Farm Environment Plan (FEP) to Gisborne District Council (GDC).

GDC's definitions of 'commercial vegetable growing' and 'cropping' are in the Tairāwhiti Resource Management Plan (TRMP). 'Cropping' includes seed crops, but does not include perennial crops or orchard operations. See Horticulture New Zealand's Gisborne FEP webpage for the definitions and more information.

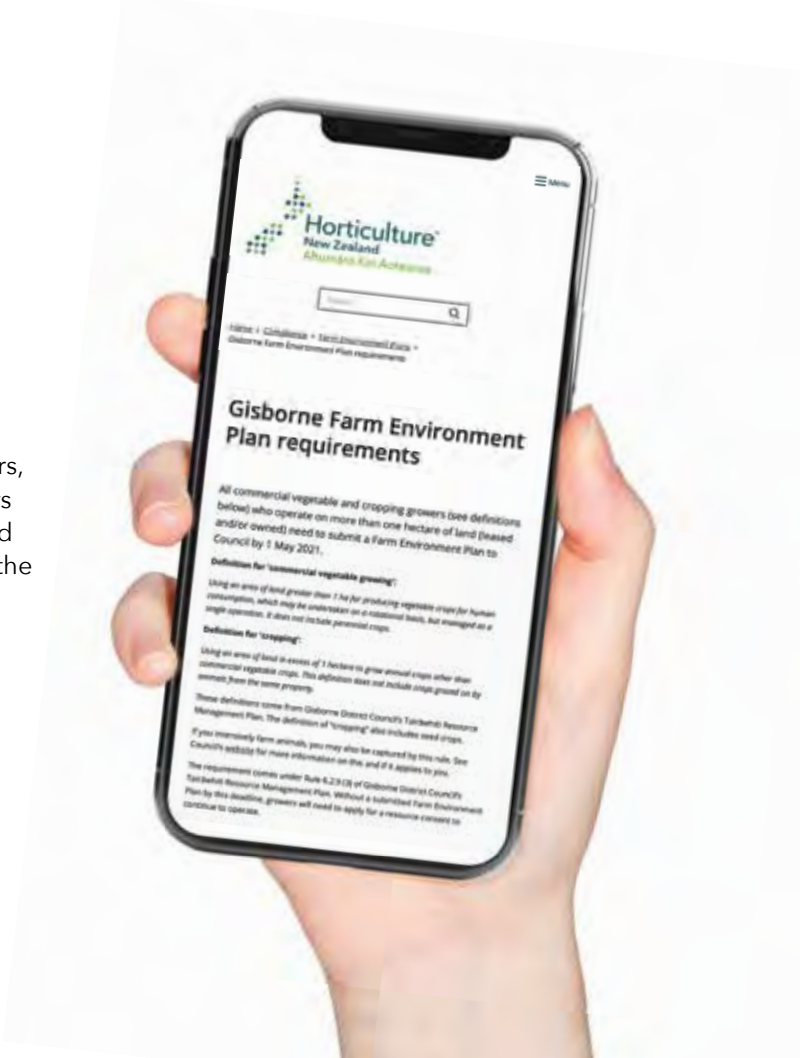
In late February, GDC formally recognised the New Zealand Good Agricultural Practice (NZGAP) Environment Management System (EMS) add-on as an acceptable pathway for growers to meet their FEP requirements in the TRMP, Appendix H20. Horticulture New Zealand (HortNZ)'s environmental policy team and NZGAP are working with GDC on the details of this agreed approach.

> "In late February, GDC formally recognised the New Zealand Good Agricultural Practice (NZGAP) Environment Management System (EMS) add-on as an acceptable pathway for growers to meet their FEP requirements

The EMS add-on, available to all NZGAP certified growers, includes an FEP template and an audit checklist. Growers using the EMS add-on will be independently audited and can attain NZGAP certification for this add-on based on the audit outcome. Other resources on the NZGAP website include environmental Codes of Practice and regional guides, like the one for Gisborne (Tairāwhiti).

HortNZ and Vegetables New Zealand Incorporated (VNZI) have supported vegetable growers in Levin through the Farm Environment Plan process before, through technical workshops, and linking growers to experienced horticulture consultants. Both organisations are confident that their efforts in Gisborne will pay off for growers. Especially those who actively engage in the process and take ownership of their FEP and Action Plan.

As early as April 2021, the New Zealand government will release draft national regulations for Freshwater Farm Plans (also known as Farm Environment Plans). These mandatory and enforceable FEPs will apply to all horticulture operations that are five hectares or above. The regulation will include details such as where and when FEPs are required, who can audit and certify FEPs, and the content of those plans. HortNZ will lead the industry-wide submission, and provide opportunities for growers and affiliated organisations to have their say on the draft regulations.



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TAKING THE HEADACHE OUT OF COMPLIANCE

Words by Elaine Fisher

Horticultural Consultant Carla Clelland is running a regional maturity monitoring programme for Honeycrisp apples

Meeting compliance requirements is a vital part of operating a fresh produce business, but for many growers, navigating the rules, regulations and paperwork can be a headache, says Carla Clelland, self-employed horticultural consultant.

"Many of my clients find compliance overwhelming. They don't have the time or resources to spend on the paperwork, because they are focused on their passion which is producing a quality product, or they are not confident with the technology involved in meeting the requirements."

Carla, whose business is based in South Canterbury, says it's rewarding to help growers navigate compliance issues or write a system manual for them.

"New Zealand's horticultural produce has a reputation for its high quality, food safety and environmental standards so it's vital growers comply. It makes sense for them to focus on what they do best, growing great quality food, and outsource what they find hard or don't have time for," says Carla, who is also a member of Women in Horticulture.

Carla's roles include consultancy and compliance work for growers, post-harvest operators, exporters and industry organisations covering a number of crops, including Honeycrisp apples, and export onions and potatoes.

"My work is about providing growers with timely and accurate data to support their decision-making including crop estimates, budgeting, cash flow and logistics."

Carla is also involved in running a regional maturity monitoring programme for Honeycrisp apples to ensure they are picked at optimum maturity.

Horticulture was not her first choice of career when she decided to study for a Bachelor of Business Studies and Bachelor of Science at Massey University. "As part of my studies I did a horticultural paper and was hooked. That cemented the decision to choose horticultural science as a major in tandem with finance. Many people thought that a strange combination, but in hindsight it was a really good choice. I thought I would pursue a career in rural banking, but then I got a fantastic summer student job with AgFirst in Hawke's Bay and was hooked on horticulture."

> "I got a fantastic summer student job with AgFirst in Hawke's Bay and was hooked on horticulture

The seeds of Carla's future may have been sown even earlier. "My parents had a kiwifruit orchard in Gisborne in the 1980s and my father, Chris Emms, was involved in

Being self-employed allows Carla Clelland to enjoy family time, including with son Jackson, cycling part of the Te Araroa Alps 2 Ocean Cycle Trail between Lake Tekapo and Twizel earlier this year

process tomato production in the early days of Cedenco, working for the Witters family.

"So that probably shaped my early experiences of horticulture. Later as a teenager, I had an enterprise growing sunflower seedlings and selling them through our parents' service station in Napier."

For nine years she was a horticultural consultant with AgFirst Consultants in Hawke's Bay before moving to South Canterbury in 2013 working in a business development role for a vertically integrated pipfruit business.

> **"Horticulture… is full of inspiring people to support you**

The transition to self-employment has – in Carla's words – been "organic," beginning in 2015 with the offer of some part-time work shortly after the birth of her second child. The opportunities and flexibility of being self-employed fitted Carla's family life and she has continued to grow her consultancy business, now working during school hours and in the evenings.

"I can still accomplish a full day's work, but not within the typical eight to five format. For me it is important to define 'working time' versus 'family time' and stick to this."

While being self-employed is not for everyone, Carla says it can be an ideal way to balance lifestyle and work. "Time management is a key requirement, as is business management. Building good relationships with your clients is imperative. It is important to put yourself in your client's shoes and think about how the service or product you provide will help their business create value."

She also advises finding a good accountant to ensure all the tax and financial requirements are met, if business management is not a strength. "If you are passionate about what you do and a self-employed business model aligns with your personal goals in life, then take the risk and do it. Horticulture, which is right up there in innovation and wonderful products, is full of inspiring people to support you."

For more information about Women in Horticulture visit: **https://women-in-hort.co.nz/**

YOUR INDUSTRY

ACROSS THE SECTOR – ACROSS THE COUNTRY

38 LOCAL LETTUCES

IT'S BLUEBERRY COUNTRY

Words by Geoff Lewis. Photos by Trefor Ward

Tshienne Gabay making the final inspection

For blueberry grower Blueberry Country the 2020–2021 season has been positive, after droughts in recent years, and the company looks forward to continued development of its orchards and a promising range of value-added products.

The Ohaupo-based berry grower is New Zealand's single largest blueberry landholder and second largest producer behind industry leader NZ Gourmet. Between them, the two companies cover two-thirds of the nation's blueberry production.

Blueberry Country has four sites – Ohaupo and Ngatea in the Waikato, Waipu in Northland and Otautau in Southland, and produces about 800 tonnes of berries in a good year. This season, output is predicted around 200,000 trays (2.4 million punnets) of fresh berries.

Blueberry Country doesn't use irrigation and the past two seasons 2018–19 and 2019–20, have been a challenge with lack of rainfall in the Waikato.

Chief executive Jerem Wylie says 2019–2020 was particularly difficult with dry conditions reducing production by about 30%.

"This season has been reasonably good, last season was very dry. The berries had good colour but didn't size up."

The 2020–2021 season has almost been the opposite with a useful quantity of rain. If in fact, a bit too much. One drenching dropped 45mm in two days, causing some fruit to split.

Spread from one end of the country to the other, Blueberry Country's orchards grow in differing climates and are at varying levels of development.

All are based on peat, which has the advantage of being a good retainer of moisture. Otautau, 50km north-west of Invercargill, is divided into 65 blocks with 16ha in production and another 40ha headed for planting this winter. Base drains and roading are already established.

> "Blueberry Country has a workforce that ranges from 135 to about 32 over the busy and less busy seasons

Ngatea is almost all planted, with 45ha in production. The operation is about to go into replanting with the more desirable varieties, including BlueCrop which has a reasonably good size and taste and grows well in most places.

Chelsea Foote putting the packs into boxes for export

Up north, Waipu focuses on early and late varieties which help to extend the marketing season, Jerem says.

About 90% of the crop is brought in by contract labour or machine picked. Most of the remainder goes out in Pick Your Own sales.

Labour this season has been a struggle, and with the lack of international travellers due to Covid-19, the operation has relied to a larger extent on the local labour force.

"We have been able to keep up. In Southland we normally have cross-over in pickers with the cherry season. But as cherries were hit by hail many pickers had gone north for Kiwifruit."

Another side-effect of Covid-19 has been a skyrocketing increase in the cost of plastic both for bird netting and for covered growing.

> **"We have identified about 70 added-value ideas from mainstream to mad-scientist**

The market geography for Blueberry Country contains the same parameters faced by many Kiwi horticultural enterprises – New Zealand is a high-cost economy and a long way from its markets.

Blueberry Country founder Greg Furniss can point to the 1980s when New Zealand exported 90% of its blueberry crop.

"We could send product to the United States and get $100 a tray, we were counter-seasonal. It ensured returns for the business were very favourable."

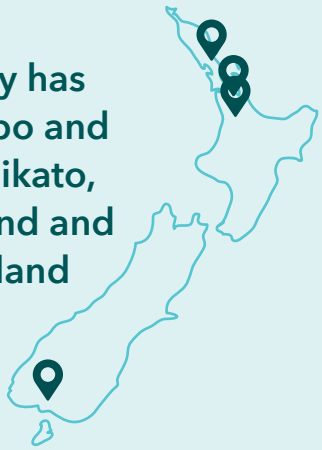
Today only about 10% of the crop is exported while the bulk goes into the local market through distributors including T&G, Fresh Direct and BerryCo which sell direct into the supermarket chains or through independent retailers.

New Zealand, with the third highest minimum wage in the OECD (Organisation for Economic Co-operation & Development) behind Australia and Luxembourg, is now a net importer of blueberries and clings tenuously to its remaining overseas markets as low labour cost competitors in South America dominate what had been useful northern hemisphere outlets.

Luckily, Australia remains a key export market as New Zealand blueberries come on as the Australian season nears its end.

The Covid-19 emergency hasn't helped either with the costs of international airfreight quadrupling from around $1.20 a tray to $5 a tray for some international ports.

Blueberry Country has four sites – Ohaupo and Ngatea in the Waikato, Waipu in Northland and Otautau in Southland



Blueberry bush

> **There are markets where food security is paramount and our aim is to link blueberries into 'NZ Inc' and establish a good solid brand to market from**

Looking to the coming seasons, Southland will play a big part in the launch of Blueberry Country's new range of added-value products designed to make an impression outside the traditional blueberry market. These include the BluesBros range of juices, chutneys, jams, drizzles and sweet sauces.

"We are working with Raglan-based food technologist Jane Stockton and Sensient Technologies, an international manufacturer of food industry colours, flavours and specialty ingredients. We have identified about 70 added-value ideas from mainstream to mad-scientist – icecreams, flavourings, syrups, vacuum-dried tea, carbonated drinks, nutraceuticals, health supplements, insomnia products and pet foods," Jerem says.

"There are markets where food security is paramount and our aim is to link blueberries into 'NZ Inc' and establish a good solid brand to market from."

Blueberry Country is owned by the Furniss family and in 2018 sold its berry sorting machinery development arm, BBC Technologies, to international Norwegian food sorting equipment manufacturer Tomra. With its base at Ohaupo, just south of Hamilton, the berry growing operation remains in the family.

Carol Lodge (L) and Pauline Freidreichs sorting

One of four boys to grow up on a Wairarapa dry stock farm, chief executive Jerem Wylie has been with Blueberry Country since August 2019.

Educated through the boarding school system, Jerem spent time playing club cricket in the United Kingdom before returning to New Zealand and selling fuel to farmers. He has spent 17 years in the FMCG (Fast Moving Consumer Goods) sector, including just over five years with British American Tobacco and ten years with Inghams Chicken at Waitoa.

Overall Blueberry Country has a workforce that ranges from 135 to about 32 over the busy and less busy seasons. Management includes a post-harvest operations manager, each orchard has its own orchard manager, a part-time financial controller, two general managers and founder Greg Furniss who looks after special projects and developments.

WOODHAVEN GARDENS CONTINUES TO INNOVATE

Words by Andrew Bristol

John and Jay Clarke

Woodhaven Gardens – one of New Zealand's major leafy green suppliers – continues to innovate, particularly in the environmental space.

"Over the past season, we have been juggling growing in line with our new, self-imposed environmental compliance regime," says Jay Clarke.

"We've been using vastly different fertiliser rates than we have in the past, and have found areas where we have dialled use back too much.

"The Horowhenua had an extremely wet spring that created growing challenges because we are trying to be tight on nitrate use. We've learned several lessons, the biggest one being the need for soil testing when you get a big weather event. It's best to jump in and test straight away to see what has happened to nitrate reserves in the soil, to see if you have to correct or not correct the situation."

Over the past 12 months, Woodhaven has also been focusing on water use and discharge.

"We've moved all our vegetable washing discharge to land and in doing so, have solved a problem in the Horowhenua," says Jay. "We've got lovely top soil here but a big clay pan underneath, so you get to saturation point really quickly. But under the clay is a gravel layer. What we've done is dig some big soak pits so we can discharge directly into the gravel, which acts as a natural filter, trapping all the sediment. Through this process, we are essentially recharging the aquifer with clean water."

Jay says this solution is one that is replicable for everyone.

"We've not chucked millions at a water treatment plant that no one can really afford to do. What we've done is develop a workable solution, no matter what the scale of growing.

"We're about to lodge a discharge consent, making us the first vegetable grower to take that step."

Woodhaven's other innovation around water is to do with water reticulation. "We're moving to two-stage vegetable washing: dirty wash, clean wash," says Jay. "This change will enable us to use less water overall because you can reticulate your dirty water.

"Reticulation is something that's widely used with kumara but isn't so widely used with leafy greens. We're cracking on with a pilot project, which should be up and running in the next month or two. If it is successful, we will roll it out over all our wash lines, which will save us something in the magnitude of an 80% reduction in water use.

"This frees up water allocation for use elsewhere so it will be a real win.'

Increasing costs

Speaking generally about the growing environment, Jay says it is "extremely challenging, because we are essentially price takers in our business."

"We have a lot of increased costs, affecting everybody, landing on the business at the same time. For example, increased labour costs due to the minimum wage going up plus with the shortage of labour, attracting people is more difficult and therefore more costly.

"But we can't just go out and say, "we charged $1.50 for a lettuce yesterday but need $2.00 now to cover increased costs". It doesn't work like that. Price elasticity in our industry is based on the customer's perception of value. If they consider the produce too expensive, they won't buy it and if they don't buy it, we can't sell it, regardless of the costs we need to cover.

"If you look at our industry and what growers were getting 20 years ago, you will find that it has not moved. That's why you don't see as many small players anymore as if you don't have economies of scale, you can't be in business.

"It's as simple as that and as I've said, extremely challenging."

Impact of Covid

Jay says due to Covid-19, Woodhaven has been experiencing lower demand. "The issues with the tourism industry are well-documented but what people do not understand is the trickle-down effect the whole way through the economy, ending up affecting a business like a market garden, here in Levin.

"Demand for our vegetables is about 10–20% lower than last year, due to there being fewer people in the country. The supermarkets are also saying the same thing, across the board."

Jay says Covid-19 did do one positive thing. "During the first lockdown, Covid highlighted the importance of healthy food, which saw increased demand for fresh greens. As people had more time to cook, I think they were more conscious about making healthy choices. Also, given the very uncertain period of time, they were more aware of their health.

> "During the first lockdown, Covid highlighted the importance of healthy food, which saw increased demand for fresh greens

"Long term, I think our industry needs to capture some of this in its discussions with regulators and in its marketing to consumers.

"The situation also highlighted what we do very well in the Horowhenua: grow fresh healthy food all year round, for New Zealand.

"This has also been highlighted by the summer we've just had. After the wet spring, since January we've had 10 to 20 millilitres of rain every couple of weeks. Because the Horowhenua gets summer rain, we are not reliant on irrigation, which highlights the importance of the area as a low-input growing region."

IT'S EASY ENOUGH TO GET AN ELECTRIC MOTORBIKE TO WHIP AROUND A PASTORAL FARM BUT A UTE FOR TOWING OR TRACTOR FOR CULTIVATION, THAT'S A DIFFERENT STORY AND THERE DOESN'T SEEM TO BE A LOT OUT THERE

Woodhaven lettuces

Labour a major challenge

In terms of labour, Jay says Woodhaven is about 18 staff short. "We are continually advertising, across social media, TradeMe and Stuff, and talking with Work and Income.

"In certain areas, like the packhouse, a role isn't too hard to fill, but a role in the paddock is extremely problematic.

"We moved pay rates last year but that hasn't changed anything, unfortunately. Also, if we lost technical expertise like an agronomist, that's a huge problem because they just aren't in New Zealand and the border is effectively closed.

"We've had success with people we've hired after internships but it takes a minimum of five years to come up to speed as an agronomist. It's a steep learning curve for everybody."

Jay says Woodhaven is looking at mechanical harvesting options, "where you can do it."

'You can't use mechanical harvesting in all blocks or in the wet.

"We are also giving pneumatic distribution of fertiliser a go, using technology solutions from overseas supplied by a company in Feilding.

"It's great to be working with an engineering partner whom we can go to and say, 'This is a problem. You guys tell us the answer as we're not engineers.' They are that sort of company."

In terms of product innovation, Jay cites daikon, Chinese turnip.

"We used to grow it. I spent far too many hours scrubbing it by hand in freezing cold water as a kid, in an old enamel bath!

"We've bought it back as demand for what you would traditionally call Asian vegetables has grown, because it's now considered part of an everyday diet."

Electric tractors?

Looking out a decade, Jay is concerned there won't be viable alternatives to current agricultural vehicles, to meet New Zealand's emission deadlines.

"Unless Europe and America are put on the same deadlines, come to 2030, and we won't have an answer.

"If I was wanting to swap my fleet over in 10 years' time, I would want to see stuff popping up now that looked palatable and could be bedded down so that when the time came, what's available was going to work and be affordable.

New Zealand is not big enough to drive the innovation necessary. Sure, it's easy enough to get an electric motorbike to whip around a pastoral farm but a ute for towing or tractor for cultivation, that's a different story and there doesn't seem to be a lot out there.

"Where that lands farming in New Zealand, I don't know. We will probably need to be able to keep buying diesel tractors, with diesel at a rate that is affordable.

"Else more and more New Zealanders will be priced out of eating healthy food."

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Send us your nominations for the

2021 Horticulture Industry Awards

HortNZ is calling for nominations for its 2021 Awards to be presented at the Horticulture Conference Gala Dinner.

HortNZ will present up to one award in each of the following categories each year.

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INDUSTRY SERVICE AWARD
To recognise people with long and dedicated service in a supplier or service role (not a grower) that have worked beyond the call of duty for the betterment of the horticulture industry.

ENVIRONMENTAL AWARD
To recognise a person, or organisation, that has developed and implemented a sustainable environmental project, with identifiable benefits.

HORTNZ LIFE MEMBER
To recognise growers with long and dedicated service as office holders of HortNZ and/or an affiliated Product Group or affiliated Grower Association.

Full criteria for the above awards are available on the Horticulture New Zealand website or can be requested from the Board Secretary.

Who can make nominations?
- Any grower member of HortNZ, an affiliated Product Group or an affiliated Grower Association can make nominations.

How do I nominate someone?
- Complete a nomination form. These are available on our website **www.hortnz.co.nz** or by contacting HortNZ by calling 04 494 9983 or emailing Board Secretary, Kerry Norman (**Kerry.Norman@hortnz.co.nz**)

When will the awards be presented?
- At the 2021 Horticulture Conference Gala Dinner on Thursday 5 August at Mystery Creek, Hamilton.

When do nominations close?
- Nominations must be sent to the HortNZ Board Secretary, Kerry Norman (**Kerry.Norman@hortnz.co.nz**) or PO Box 10232, The Terrace, Wellington 6143 and must be received by **5.00pm on Tuesday, 8 June 2021.**

Send us your nominations now!

LEWIS FARMS' STRATEGY DELIVERS

Words by Andrew Bristol

Geoff Lewis, Catherine Lewis and Cam Lewis, the trio behind Lewis Farms

Lewis Farms' strategy to turn as many seasonal positions into permanent roles as possible is going to plan, with 12 seasonal roles now permanent.

"As we expand our berryfruit operation, this number will continue to grow," says Geoff Lewis.

"The past season was our third harvest of strawberries, and it's gone very well. More growth in this space will benefit the careers we can offer."

At this stage in its evolution, Lewis Farms is probably more famous for its asparagus, which has been marketed under the Tendertips label for more than 35 years.

"This season, net asparagus volumes were down on what we budgeted for because the Horowhenua had a very cool spring, so we had some quite big holes in our production.

"The New Zealand asparagus industry is now predominantly reliant on the domestic market, which doesn't make for an easy supply environment. For the industry to become internationally competitive again and get future export opportunities across the line, we need to become far less reliant on labour. This is why the automated harvest initiative, which the Ministry for Primary Industries is now supporting financially, is so critical to the future of our asparagus industry.

"The world's asparagus industry is also very interested in the project: so interested in fact that they are willing to invest in it, which in itself demonstrates New Zealand's ability to innovate."

While Lewis Farms' interest in automation might seem contradictory to its strategy to grow as many permanent roles as possible, given horticulture's chronic labour shortages, it's actually not.

"Labour is the biggest challenge facing horticulture in the Horowhenua, as well as the rest of the country," says Cam Lewis. "We are competing for the same, shrinking pool of people, along with other industries like the meat works, which offer a greater number of permanent roles." (Also see Woodhaven Gardens story.)

"Horticulture in the Horowhenua has such a lot going for it: soil, climate and close proximity to markets, due to State Highway One. This also makes the Horowhenua very important for the rest of New Zealand's supply of fresh vegetables.

"At Lewis Farms, we are fortunate to have a loyal core workforce. However, it is hard not to be pessimistic in the current environment, and labour for harvest remains our biggest concern."

Geoff expands on the subject of labour. "Let's figure it out," he says. "Young people entering the workforce don't want to be picking asparagus. So, if New Zealanders want to eat fresh, locally-grown asparagus, we need to bring in workers from the Pacific for harvest until a long-term, automated harvest solution becomes viable. Otherwise, we'll need to import asparagus, along with other labour-intensive vegetables like broccoli, or go without."

Geoff says horticulture was always aware there was some vulnerability around the Recognised Seasonal Employer (RSE) labour scheme with the Pacific.

"Covid-19 has highlighted this vulnerability loud and clear. However, New Zealand needs a plan, and that plan could include one dedicated, industry-run Managed Isolation and Quarantine (MIQ) facility to manage the entry and exit of workers from Covid-free Pacific countries.

> **"We love the shop even though it is a lot of hard work, because it enables us to connect with customers**

"I believe the government needs to take some responsibility for the situation, as it encouraged the industry to grow exponentially as part of New Zealand's economic transformation. As a result, horticulture needs time and support to adapt and respond to the new situation.'

Connecting with customers important

Lewis Farms has had a shop in its packhouse for the past 30 years, selling solely asparagus up until three years ago. When the family started growing berryfruit, it expanded the shop considerably.

Catherine Lewis says the shop opens at the start of the asparagus season in September.

"It peaks with pick your own strawberries in mid-January, and we close around Easter. We love the shop even though it is a lot of hard work, because it enables us to connect with customers."

Catherine says the industry is trying to grow demand for strawberries in New Zealand all year round.

"Our strawberry season runs from October to May, but we are trying to make it longer to grow demand. New Zealanders traditionally see strawberries as a Christmas or summer treat, whereas overseas they are eaten throughout the year.

"We see this situation as an opportunity to expand the industry by increasing the number of months in a year that locally grown strawberries are available."

ENERGY AND LABOUR CHALLENGES WITH CAPSICUM

Words by Helena O'Neill

Gaven Naylor's proud of Freshwest's crop

Finding something viable to meets its energy needs is the biggest challenge facing capsicum grower Freshwest.

Gaven Naylor runs the Palermo capsicum growing business with his wife Vanessa on the outskirts of Waiuku.

The property uses coal-fired heating, recycled water in its irrigation system, and is serviced by an environmental computer network.

Capsicum growing is energy intensive in the winter and requires a reliable heating source. Freshwest uses coal as there's no other viable energy source for their size of operation.

"Long term it's definitely our biggest challenge, followed by labour. Both are really going to put the brakes on any future developments in New Zealand going forward. They're really hard [challenges] to answer at the moment."

"This year we've just put on 35kW solar panels. We feed back to the grid what we don't use. It's pretty much taken care of all our electrical needs in the summer … on a sunny day over 50% is going back into the grid."

The business employs six full-time staff, excluding Gaven and Vanessa, and during the summer months they usually employ up to another four staff.

"The key to getting through these tough times is having good staff. I would like more; this time of year we usually have seven or eight staff."

The national lockdown last year was "pretty scary" Gaven says, but he's proud of how his staff handled the changes they had to put in place to meet government guidelines.

As for the timing, the national lockdown came during the quiet part of their growing calendar.

> "The key to getting through these tough times is having good staff

"We were lucky, it was pure luck really. We were right in our low production period … planting had been done and it was basic crop maintenance, with a little bit of picking."

However, with reduced numbers of capsicums being exported, the domestic market has seen a larger volume available across the country.

"The market has definitely been under pressure, it's been difficult."

Freshwest usually exports through New Zealand Gourmet, but not this season.

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Some of Freshwest's best

DEMAND IS HIGHEST FOR THE RED AND YELLOW KING SWEETIES, WITH A SMALL NUMBER OF GREEN PRIMARILY SOLD TO ASIAN STORES

"The export market has been the one we've missed out on this year. It's been tough with the lack of flights and the lack of ships. Hopefully, that will be the big change for the next season."

Gaven and Vanessa bought Freshwest in 2004 and grow their Palermo capsicum crops in one hectare of greenhouses at Pukeoware, southwest of Auckland. They aim to produce all year round.

Gaven has over 30 years of experience in the horticulture sector, gaining a Diploma of Horticulture after finishing school and working for a tomato grower at Whitford in southeast Auckland. That business was one of the first to grow musk melons for the Japanese market.

"I was spending every New Zealand winter in Japan for four years learning how to grow melons. I'd come back and then travel all around New Zealand, teaching these young guys how to do it."

He spent several years growing melons before heading off on an OE with Vanessa.

"It's a pretty unforgiving crop if you get it wrong. That industry died a pretty natural death really."

> **"The export market has been the one we've missed out on this year. It's been tough with the lack of flights and the lack of ships**

Gaven and Vanessa then ended up as flower growers supplying Hypericum berries which are used in floral arrangements.

"We got the opportunity to bring the Hypericum in from Holland, and did that for a few years on 20 acres or so with 50 staff at the peak of packing. It was crazy days!"

"That market started getting under pressure by Zimbabwe and parts of South America. We could see our market getting squeezed, so when this property came on the market it was perfect."

When the Naylors bought Freshwest, the operation grew blocky capsicums and a small number of chillies. A few years later they saw the need to diversify and began trialling Palermo capsicums.

"We were the first in New Zealand to trial it, over 10 years ago."

It all started with one trial row, adding an additional row of King Sweeties Palermo each year until they were fully Palermo with a small amount of Wee Sweeties snack capsicums.

This is the first year that they are solely growing Palermo capsicums.

"The Wee Sweeties were really, really labour intensive and packaging intensive. We had more demand for Palermos, so we got rid of them."

Demand is highest for the red and yellow King Sweeties, with a small number of green primarily sold to Asian stores.

"There are some growers of huge blocky capsicums and we were never going to compete with them. For us, it's to find our little niche in the market. And it's an amazing product."

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HOW ONE COMPETITION HAS CHANGED THE FUTURE FOR THIS BUDDING HORTICULTURIST

A Hawke's Bay Young Fruit Grower of the Year Competition in action

Studying for a Bachelor of Agriscience majoring in horticulture at Massey University helped fuel Regan Judd's passion for horticulture, but taking out the Hawke's Bay Young Fruit Grower of the Year Competition in 2019 has given Regan a lot more than he expected.

With the 2020 competition cancelled due to Covid-19, Regan Judd has offered his advice to those thinking about entering June's competition – 'just do it!'

Hawke's Bay is the home for two-thirds of New Zealand's apple and pear production, so it's not surprising that the region's Young Fruit Grower competition has traditionally attracted its fair proportion of pipfruit contestants.

The competition run by the Hawke's Bay Fruitgrowers' Association (HBFA) is now in its 16th year.

"At the time there was an obvious gap in the industry to support and encourage the development of young horticulturists," says Leon Stallard, past president of HBFA (2005–2014). "So I came up with the Young Fruit Grower concept, twisted a few arms and here we are 16 years on. It's just incredible to see the competition running nationwide and recognised as a very successful framework to identify and develop our future leaders."

"We had 60 or so people turn up to watch the first competition at Pernel Café back in 2005 – most were ring-in's!" Leon says. "There was little planning, or more rightly as we said back then 'what happens is the plan!'"

> "Horticulture is a growth industry and there are endless career options if individuals do the mahi, are determined and want to succeed

With the event growing in popularity every year, the Association starts planning for it five months out, with the final eight spaces strongly contested and an awards dinner that sells out well in advance.

"Horticulture is a growth industry and there are endless career options if individuals do the mahi, are determined and want to succeed," says HBFA president, Richard Pentreath.

"Regan and previous contestants are exactly the kind of people our industry needs and it's great that we can provide them with a platform to showcase their talent."

Regan entered the competition in 2019 to give himself the opportunity to meet other like-minded people and to test his skills and knowledge.

"The competition showed me where my strengths were, and what I needed to work on. But the biggest takeaway was the connections I made throughout the local industry, connections that will no doubt influence me as I continue my career.

It's a great environment to meet new people and learn new things. Both through the competition and through the new connections you make along the way. It is an extremely rewarding experience, one that will open doors to create a great future for you in the horticulture industry," says Regan.

The competition runs in conjunction with the National Horticultural Fieldays and provides businesses with an opportunity to identify emerging talent.

Eight contestants are tested on a range of theoretical and practical challenges on the first day of activities, and then deliver a speech at the awards dinner the following night.

The winner goes on to represent Hawke's Bay at the Young Grower of the Year final later in the year.

"The Young Grower competitions helped me to appreciate just how exciting our industry is," Regan says. "The opportunity to get to know other young growers from across the country has helped me to understand why I do what I do and made me enjoy it even more.

"Winning the title also gave me the opportunity to join the Executive International Horticultural Immersion Programme where we travelled to Europe in early 2020. It opened up my eyes to horticultural practises on the other side of the world. The influence all this has had on my career is massive, it has provided me with a great path to grow my knowledge and to step up in an exciting industry."

Two years on and it's time to hand over the silverware. What's Regan Judd's advice? Just do it! ●

The Hawke's Bay Young Fruit Grower of the Year Competition entries close on 30 April. For more information and to complete the application form online: **https://hbfa.co.nz/yfoty-contestant-entry-form-2021/**

ARE WE ON TRACK FOR GLOBAL SUSTAINABILITY, OR DISASTER?

Words by Heather Woods

Mike Zelkind, CEO and Co-founder of 80 Acres Farms in their newest automated farm, producing 10 million servings annually

According to the most recent estimates from the United Nations, the current world population is around 7.8 billion – that's a lot of mouths to feed.

Throw in the human-dependent animal population and it's clear that food production is a big deal. Birth rates may be trending downwards but we are living longer. Statistics NZ says the current average life expectancy is 82.5 years old, compared to just 71.5 years old in the 1970s. So general population numbers are trending upwards – in a hurry. So what are growers around the world doing to keep up with demand, but stay sustainable and protect the environment, that allows us to carry on each day? It all comes down one of the great challenges of our time: produce more food, but use less resources. And we need to be smart.

Dutch sustainability methods

Sir David Attenborough heralds the sustainability methods of growers in the Netherlands in his book *A Life on our Planet*. He says they are using less water, fewer pesticides, less fertiliser and have less carbon emissions, all while producing more food from less ground, and making the most of innovation – for instance by growing stacked crops. Innovation coming out of the Netherlands is plentiful, like floating farms, research into better ways of feeding livestock using waste food products, and investment into cutting-edge technology. Duijvestijn, a tomato grower, has been ahead of the curve for years using geo-thermal energy and hydroponics – and using 60% less energy. But while it sounds like the Dutch are forging the way – reducing waste and toxins, using less energy and with careful innovation, becoming the second-largest food exporter in the world – it is important to note that there are critics who look beyond the numbers into the geography of where the food production takes place, which is often in foreign territories, and question whether it should count towards their claim of 'second-largest' exporter.

How the US are leading the pack

GreenTech, the global platform for horticulturalists, spoke to Mike Zelkind, the chief executive of 80 Acres Farms in the United States, who said: "Vertical Farms are expensive to build, but with much higher yields and drastically improved control to maximise nutrition, we can take farming to a whole new level." When you dive deeper, it's not just higher yields. Sure, they are producing 300 times more food than an average farm, but they're also 100% pesticide-free, using 100% renewable energy and 97% less water. Further afield, the University of Idaho is experimenting with drone use for efficiencies in orchards, with new planting methods making space for the drones to fly, helping manage water, nutrients, pests, and estimating yield, with a side bonus of creating marketing collateral. And then there's Blue River Technology, a California-based tech company that is taking robotics to new levels – their core mission is "solving monumental

Innovative vertical farm at 80 Acres Farms, Hamilton, Ohio, USA

challenges" in agriculture. Their 'See & Spray' technology means farmers can focus on individual plants in a sustainable way and create clean fields in which plants can thrive.

Is the Kiwi way up to scratch?

A recent news release from Horticulture New Zealand said, "If New Zealand is to meet its climate change and economic goals, growers and farmers need to be empowered to adapt and reduce emissions." And importantly, a new postgraduate school has just launched in Canterbury, through the University of Canterbury, Lincoln University, Plant & Food Research, Manaaki Whenua Landcare Research, and AgResearch. Its purpose? Supporting a "transition to more future-focused, sustainable food systems and preparation." So, while we're doing a great job on education, there's plenty of room for improvement with our current practices. Nicki Sutherland, group manager, investment & engagement at the Energy Efficiency & Conservation Authority (EECA) says, "there's a high level of fossil fuel dependence by indoor growers in New Zealand. The good news is, there's a huge opportunity for indoor growers to eliminate fossil fuels through prioritising energy efficiency and switching to low-emission fuel options, such as biomass and electricity. EECA has an active role in reducing fossil-fuelled process heat in New Zealand, across industry, commerce and the public sectors. We've demonstrated the benefits to be had from adopting clean and clever energy use, including lower energy costs and improved profitability. An energy audit has huge value: identifying and eliminating wasted energy use will have an immediate, measurable impact. From there, growers will likely be interested in technological solutions, and to that end, EECA is working directly with Horticulture New Zealand, Tomatoes NZ and Vegetables NZ to undertake an international technology scan into leading low carbon technologies."

And it's simple to get the ball rolling. The EECA website explains how to make your systems efficient and adopt new technology. And you may be eligible for co-funding and support from EECA to do energy audits, plan an emissions reduction roadmap or adopt new and innovative technology. So even if growers feel they're doing the best they can, research and a few phone calls could be the beginning of change. And just imagine if everyone made just a few small tweaks – the impact could be huge.

NO FOOD, NO PEOPLE

Words by Hugh Chesterman : HortNZ

Mike Chapman spoke about the importance of investment in R&D if horticulture is to continue to thrive

Food security highlighted at the launch of the International Year of Fruits and Vegetables

The importance of food security and people having access to fresh and healthy fruit and vegetables was highlighted at the launch of the International Year of Fruits and Vegetables at Parliament on 10 March.

"Access to fresh fruit and vegetables is essential for healthy people. What often gets forgotten is the vital role that the people who grow fruit and vegetables play in ensuring fresh fruit and vegetables are on the table," said Horticulture New Zealand chief executive, Mike Chapman.

In 2019, the United Nations declared 2021 as the International Year of Fruits and Vegetables; which has become much more significant since Covid-19 struck the global food supply.

"Covid has shown us that we cannot rely on imports and has highlighted how lucky we are in New Zealand that we can grow most of our own food. We need to make sure that we protect this ability.

"But at the same time, fruit and vegetable growers are being asked to meet increasingly strict objectives for climate change and compliance in general, without the important role of feeding people being factored in.

"If New Zealand is to meet its climate change and economic goals, growers and farmers need to be empowered to adapt and reduce emissions.

"The Paris Accord clearly states that producing food while adapting to climate change is vital. No food, no people. As a country, we need to grow fruit and vegetables to feed ourselves and to export, to earn essential overseas revenue.

"The Paris Accord clearly states that producing food while adapting to climate change is vital. No food, no people. As a country, we need to grow fruit and vegetables to feed ourselves and to export, to earn essential overseas revenue

"Give our growers the tools, incentives and time, and we could lead the world in climate change adaptation and global food production. This will require significant research and development to find the tools and techniques needed to make a difference."

From left to right, Agriculture Minister Damien O'Connor speaking to Emma Boase (HortNZ), Lincoln Roper, Jack Keeys (KPMG), George Hyauiason (Massey Hort Society)

WHAT DOES THE INTERNATIONAL YEAR OF FRUITS AND VEGETABLES MEAN?

Horticulture New Zealand, along with partner organisations United Fresh, Plant & Food Research and 5+ A Day, will be using this United Nations initiative to promote the importance of fruit and vegetables for health and the economy.

United Fresh NZ will work to raise awareness and recognition of the nutritional benefits of consuming fruit and vegetables. The successful Fruit & Vegetables in Schools initiative will be highlighted along with the need to expand the initiative to reach more children in vulnerable communities. Consumption of fruit and vegetables will run consistently through 5+ A Day Charitable Trust promotions.

Plant & Food Research will be working to bring attention to the science and scientists working on enhancing New Zealand's fruit and vegetable sector. They will also share nutritional facts about key crops from the Food Composition database through collaborations with 5+ A Day and Horticulture New Zealand.

BEING SMARTER ABOUT THE WAY WE GROW

Words by Andrew Bristol

Kylie Faulkner (middle) with Brittany McCloy (left) and James Kuperus (right), both from Onions NZ

Kylie Faulkner – Sutherland Produce Ltd sales manager and Pukekohe Vegetable Growers Association president – was born to vegetable growing.

"I have vivid memories as a child being put in an onion bin during harvest as my parents did not want me to get run over in the packhouse. The bin was my playpen."

Kylie has been back in the family business for 12 years and says that every time she's out in the paddock, she learns something about growing.

"You have to be continually learning and changing to be successful in growing. We've specialised in lettuce, broccoli and silverbeet for the past 25 years, because we wanted to do a really good job of it and those crops rotate well.

"We've also developed relationships with other growers in the area who are of like mind, in terms of environmental outcomes, looking after the land and food safety. We do land swaps with them so we can rotate crops and look after the soil, ensuring that the best nutrients are retained and pests and diseases are kept out.

"We also grow barley and oats. We just hoe those crops back in to improve soil health."

Kylie says as growers, they all want to be still growing on these farms in 100 years plus.

"At the end of the day, the soil is the stuff that we make our money from. It is what we grow our product in. You can't have it ending up on the road."

This is a reference to a big flood in the mid-90s when soil ended up in the main street of Pukekohe. That major storm resulted in the Franklin Sustainability Project, which won environmental awards, particularly for silt traps.

"What has worked for us in Pukekohe has been shared and adapted for use around the country. Today, growers are a lot better about sharing knowledge and experience because collectively, we all want to do the best for the land and environment."

> "...they all want to be still growing on these farms in 100 years plus

Kylie says that as a grower, "you never put all your eggs in one basket."

"You never grow all of one variety at a time and never grow everything on the one farm either. We have properties to the north in Ramarama, in the Bombay Hills and Pukekohe East, and one in the Waikato. We also lease a property at Karaka and, apart from that farm, all our properties are within 7km of the main farm in Bombay, where our packhouse is.

Young broccoli

THE NEED FOR SCALE

In 2012, LeaderBrand bought 50% of Sutherland Produce. In December 2020, they bought the remaining half of the company.

"You need business scale and regional spread to be competitive these days. That is something that the LeaderBrand Group has now, with farms in Matamata, Gisborne, Christchurch and here," says Kylie.

"I'd call farming a bit ruthless. It's competitive and tough but it's actually lots of fun as well, and that's why we do it. Plus, at the end of the day, I am proud to be able to say that we provide fresh and healthy food for New Zealanders to eat.

"It's not like we're selling chocolate bars or soft drinks. What we're selling is good for you. That's why I want the younger generation to know where their food comes from, its nutritional value as well as the career opportunities. Because the primary industries are the ones keeping New Zealand going, and there's lots of scope and different career opportunities in horticulture."

Kylie shared these insights with representatives of Auckland Council, the Ministry for Primary Industries, Ministry of Foreign Affairs and Trade, and Ministry for Social Development as a part of an Onions New Zealand government officials bus tour in mid-February 2021.

Vacuum lettuce cooler

"This situation is really great for us because we can harvest our green vegetables and get them back to the packhouse and chilled as quickly as possible. We are also right near the motorway, which means we are able to harvest and send to the distribution centres in the same day."

Kylie says the best way to ensure quality on the supermarket shelves is by getting field heat out of the produce as quickly as possible.

"That's why we have invested quite a bit of money in a vacuum cooler. It cools lettuce with a core temperature of 20–25 degrees Celsius at harvest down to 4 degrees in 30 minutes.

"This speed adds several days to shelf life."

Smarter growing

Kylie says to be successful, growers always need to be smarter about the way they grow.

"Technology is constantly changing. We want to ensure we are growing the best crop but that it is not costing the earth either.

> **"Technology is constantly changing. We want to ensure we are growing the best crop but that it is not costing the earth either**

"Take fertiliser, which costs hundreds of thousands of dollars. We're not just going to throw it on and waste it. You've got to be targeted, use the skills of agronomists and experienced people, and make sure equipment is calibrated regularly.

"We also have protocols in place – like New Zealand Good Agricultural Practice (NZGAP) – to ensure we are meeting industry standards."

Kylie says she sees the NZGAP Environment Management System (EMS) add-on "like a toolbox of options".

"There might be a variety of things you could do in a particular paddock or on a particular farm, but they are not always going to suit. What I might choose to do in a broccoli paddock might not suit the grower down the road, growing potatoes in a totally different paddock.

"What's important is ensuring that growers know what the toolbox of options are, and are able to justify their choice and record the outcome."

Kylie says 40 years ago, growers spent a lot of money spraying when they did not need to.

"Today, it's very different with agronomy, crop scouting and Integrated Pest Management, where you work with natural things in the environment to protect the crop.

"We have agronomists who regularly walk the crop. They might see a little bit of this coming through but decide it's going to be manageable so leave it. Or, that it's going to cross a certain threshold, and we need to target the issue.

"It's about doing the right thing for the particular crop on that particular farm, and using the natural environment to your advantage. For example, we grow broccoli in winter when we get a lot of rain high up on hilly parts of our properties, where there's also a lot of wind that can whip through and dry out the broccoli, so you don't get rots."

Labour challenges

Kylie says they would ideally have 30 people working for them, but they're down to 20 at the moment. "We're part of the Pacific quota scheme, which is different to the Recognised Seasonal Employer (RSE) scheme but like that scheme, it's stopped due to the borders being closed because of Covid-19.

"We try and entice people to come and work for us but it's not easy as it's a physical job, five to six days a week, in all weathers, summer and winter."

Kylie looks at vegetable growing from a whole of New Zealand view and is keen for customers to understand potential trade-offs better.

"Take broccoli. There might be a storm that means New Zealand-grown broccoli is short and not available for a week. Retailers might decide that customers want it so they'll import it from Australia. However, Australian broccoli has white blister, which is not something we have in the North Island of New Zealand. If the retailer was to bring in Australian broccoli, there is a risk that we'd get white blister across New Zealand.

"My question is, 'what's the messaging?' Would New Zealand customers prefer to know the risks and decide to do without local broccoli for a week, for the sake of the viability of the New Zealand industry?" ●

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'THE LETTUCE MAN'

Words by Claire Ashton

Ian Kerr, 'The Lettuce Man'

Situated just off State Highway 1 in between Karapiro Lake and the Whitehall Quarry, you will find Ian Kerr. When we meet, he doesn't have a card to swap, as everyone simply knows him as 'The Lettuce Man'.

The way Ian got into lettuce was all very serendipitous, as when he and his family purchased the property, there were growing houses but no hydroponic equipment. After talking with a plant broker about growing beans, and doing a bit of research, Ian discovered "a bit of a fire sale" on some hydroponic gear up in Dargaville. Forty-eight hours later it was all his. Since starting the business in 2006, on average he has 15,000 head of lettuce growing at any given time. Mesculin is very popular and other crops grown include a range of Asian greens, tomatoes, capsicum and herbs.

Ian says, "It seems like stating the obvious, but the secret to good hydroponics is good quality water." Ian's 60-acre property has a bore, is near two rivers and has an artesian water supply, and the pH of the water is sampled and sent off for regular testing. In saying that though, Ian's hydroponics set-up, like most, is not a big user of water, which is one of its advantages. Other than water, fish fertiliser is the only other ingredient used in growing. The water works for him in another way too – a small waterfall supplies power on the property.

He plants seasonally and doesn't use spray as Ian says, "as soon as you use spray you upset the whole equilibrium." However, being spray-free means there are other factors to contend with, such as pests. What Ian does plant is a sacrificial or decoy crop of mesculin oriental mix outside alongside the greenhouse, and this means the commercial crops inside the greenhouses suffer less from the crops' main pests, the white cabbage butterfly and aphids. There are so many white butterfly around this summer that Ian decided not to plant cabbages at all. He was also advised years ago to plant near the bush, as native bush provides a diverse range of predators for the pests which attack crops.

The biggest threat in hydroponics is root disease, so to ensure protection against this, Ian has strict hygiene protocols in the growing sheds, and diligently waterblasts each area as the crops are grown, picked, and rotated. He gets most of his seeds from Kings Seeds and grows all the seedlings on the property using his own trays. When he delivers he supplies extra trays so he is not bringing external trays back onto the property from a buyer or store, and still immediately sanitises the trays upon their return. This closed ecosystem helps to protect against any disease being introduced. He also packs his own produce on-site and delivers in cardboard boxes. Ian admits to being risk-averse – prevention is better than cure. The lettuces are sold with roots on, which he considers a 'value add' and it gives them a good shelf life and means they are alive, fresh, and with the buyer within 48 hours.

ON AVERAGE HE HAS 15,000 HEAD OF LETTUCE GROWING AT ANY GIVEN TIME

Ian helped to start the Cambridge Farmers' Market 13 years ago, and also goes to the Hamilton Farmers' Markets every week. He takes produce to the Hamilton and Waikato weekend markets which both have a zoning requirement; all produce has to be from within a 100km radius so it can be called 'local'. With different seasons there is a bit more flexibility, with 20% allowed from out of the zone. Over the summer months many of the Waikato customers head to the beach, so demand drops and then picks up again in the autumn. Ian plants according to what the market dictates, as via the weekend markets he is in direct contact with his customers, so he knows what and how much to plant – and he tries not to run out. Some customers requested what he calls a 'plum pudding' lettuce variety which is a deep red coloured butter lettuce and so he started growing that.

Though the markets are vital to his business, especially when he was starting out, Ian's main produce buyer is a Waikato company called Direct from the Market, which in turn supplies cafés and restaurants. Ian also supplies Kaivolution in Hamilton, a community service that rescues perfectly good food from being thrown away, and gets it to local food banks and other community organisations.

Ian is also involved in a joint venture with Environment Waikato who have helped with water quality on the property. Removing old trees and bringing in boulders to line the riverbanks to stop erosion, has helped to reduce sediment. The work has also focused on creating fish habitats for trout which swim upstream from the rivers to spawn, and for several breeds of eel, including the long-finned eel. There is a fair bit of poplar planting going on too, as the poplar's extensive root systems help to stabilise soil on the hills. Ian has 60 acres which include glowworm caves, and rocky outcrops for abseiling, and he is awaiting the confirmation of the suspected presence of the New Zealand native bat. Deer roam the property and take advantage of the sacrificial crops outside the greenhouses, but Ian doesn't do much about that as he likes having the deer around.

Ian can get pretty busy and admits he would love to clone himself as he also runs camps and accommodation for groups on his property, often related to sporting ventures on lake Karapiro, and this is a side of the business which is also growing. He has casual staff, his daughter helps out on the property, and Ian has a long history of property management and maintenance, having managed island resorts in Fiji for 15 years. It sounds like Ian is a lot more than just 'The Lettuce Man' but he is a pretty humble guy and is working hard to provide both good fresh produce and good experiences at 9 Karapiro Road.

HORTICULTURAL EDUCATION CENTRE NEARS FUNDING TARGET

Words by Elaine Fisher

Katikati Innovative Horticulture Project donor 90-year-old Jopie Heuseveldt with college principal Carolyn Pentecost (left) and Hilary Johnson, Innovative Horticulture manager

Fundraising to build a dedicated horticultural education centre in Katikati is just $100,000 away from its target, and construction is planned to begin later this year.

The Katikati Innovative Horticulture Trust now has $400,000 of the $500,000 needed for the purpose-built facility on Katikati College grounds, thanks to donations from businesses, organisations and private individuals.

Hilary Johnson, Innovative Horticulture manager, Katikati College, says reaching the milestone is exciting and gratifying, especially given the fundraising began last year, just as New Zealand went into Covid-19 lockdown.

"Despite the uncertain times, generous donations have continued to be received from businesses, individuals and organisations who recognise how important it is to have a dedicated horticultural education centre for college-aged students, young people not in education, employment or training (NEETs) and the local community.

"The impacts of Covid-19 and the restrictions on overseas workers entering New Zealand has also highlighted the urgent need for skilled horticultural workers."

Even before work has begun on the new centre, the popularity of horticulture as a subject has soared among Katikati College students.

The last three years have seen growth in enrolments, in student retention, in academic achievement and a closing of the disparity gap between Māori, Pasifika and other students.

The NCEA (National Certificate of Educational Achievement) results for Katikati College show that:

92.1%
of Level 1 Māori students gained Level 1 in 2020 versus 58.2% nationally.

81%
At Level 2, 81% of Māori students passed, versus 70.5% nationally.

91.3%
91.3% of all students gained Level 1 versus 70.2% nationally, and 88.8% gained Level 2 versus 79.1 nationally.

Across all ethnicities Level 1, 2 and 3 literacy achievement rates were 99.2, 99.1 and 98.8% respectively, and numeracy was also impressive at 96.8, 98.1 and 100% respectively.

"Our class numbers are bursting at the seams now, and we are truly ready for a new building so that community and NEETs classes can also begin," says Hilary.

The project has received a further boost thanks to 90-year-old Jopie Heuseveldt who has committed to support the Katikati Innovative Horticulture Project through her Acorn Foundation fund.

Jopie and her late husband Kees immigrated to New Zealand from Holland and went on to buy a property in Omokoroa. Both worked at Katikati College, where Kees installed a new workshop and taught engineering and technical drawing, while Jopie taught English and history before retiring in the 1980s. Jopie moved to Katikati after Kees passed away.

> **"...her contribution can go towards affecting so many young lives in our community**

Jopie chose to support the Innovative Horticulture Centre due to Kees' passion for growing trees of every type on their property in Omokoroa and her belief that supporting students into careers in horticulture would greatly benefit the area.

"I am hugely grateful to Jopie for not just her generosity, but for her vision in seeing how her contribution can go towards affecting so many young lives in our community, which then of course translates into older lives contributing to our community and society in general," says Hilary.

"To receive support for our project from a private individual with no affiliations to the horticultural industry is truly humbling. She greatly recognises that learning must be relevant and real to the individual. This is something that underpins our personalised Innovative Horticulture programme and is one of the key factors making it successful."

Katikati College principal, Carolyn Pentecost, said, "Quite simply she reminded me why I love my job! Being a teacher is truly a calling for someone like Jopie, and even at 90 she still has a lesson or two to teach others. I imagine she was a game changer for the students lucky enough to have her as a teacher. Her humility and passion are the essence of a good teacher."

The Acorn Foundation has been working with generous donors like Jopie Heuseveldt to support local organisations working in areas of interest to them since 2003. For more information on how you might support the community you love, go to www.acornfoundation.org.nz.

For more information on the exciting work being done at the Katikati Innovative Horticultural Project, go to **www.katikatiihp.com**

NEW LINCOLN HORTICULTURE SOCIETY GROWING RAPIDLY

Words by Hugh Chesterman : HortNZ

The panel (Mike Chapman, Prof Sharon Lucock, Lincoln Roper, MP David Bennett, April Oakley and Summer Wynyard) discussed the opportunities of diverse leadership in horticulture

Grace Mainwaring is excited about the future of the newly established Lincoln University Horticulture Society. Starting in early 2021, they've quickly grown to having 50 members and support from the university, growers and industry groups.

"It's really exciting, and our members are excited too," says founder and president, Grace Mainwaring. "We're looking forward to being able to get more people involved and exposed to the opportunities of the horticulture industry.

Although it's early days, the Horticulture Society has plans to expand the club membership, have more events with growers and the community, and give the students more experience in horticulture.

Grace says she came up with the idea to start the club after a summer internship with Horticulture New Zealand. "I was looking at the Massey Hort Society and thought, 'why can't we have something like that?' I want Lincoln students to be able to get exposure to and experience in the industry too.

"One thing we're really looking forward to is an exchange with the Massey Hort Society. I've been having talks with their president, George Hyauiason, about meeting in Nelson to exchange ideas and see some of the exciting and innovative growers there."

"Our first event on 15 March, a panel discussion supported by Women in Horticulture, had lots of great positive feedback. Students were inspired and really keen to get involved.

April Oakley, human resources specialist at Oakley's Premium Fresh Vegetables Ltd., was part of the panel and says the event was really valuable for the grower community.

"On the panel, we talked a lot about the advantages and importance of having diverse leadership. Within horticulture, women make up half the workforce, but only make up about 20% of people at the leadership level.

> "We're looking forward to being able to get more people involved and exposed to the opportunities of the horticulture industry

"From a business point of view, there are huge advantages to businesses with diverse leadership.

"The event itself was really great to meet all sorts of people from the horticulture community. It brought together industry leaders, an MP, professors, researchers and of course, the students.

> We're excited to see what the club gets up to and help them to achieve their goals

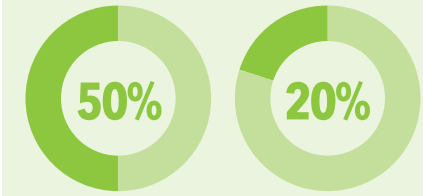
From left to right, Ella Wells, Emma Ritchie, Grace Mainwaring from the Lincoln Hort Society at Grow Ōtautahi

"Talking to other growers, we often struggle to find the best of the best young people to fill roles. This club is a key touchpoint to solve that by being a community of enthusiastic people who are interested in the industry and are showing initiative. The students are also able to build networks and gain exposure within the industry.

Lincoln University Dean of Agribusiness and Commerce, Professor Hugh Bigsby, is a big supporter of the society. "It's really cool seeing students lead this type of initiative," Hugh says.

"We're excited to see what the club gets up to and help them to achieve their goals. Lincoln is here to support their ideas and we're really keen to help make it successful."

"It's an amazing opportunity for the students to expand on what they learn in the classrooms and build connections, leadership skills, and channel their passion for the industry.



WITHIN HORTICULTURE, WOMEN MAKE UP HALF THE WORKFORCE, BUT ONLY MAKE UP ABOUT 20% OF PEOPLE AT THE LEADERSHIP LEVEL

"Employers want people who not only have the technical skills that they learn through their courses, but the people skills and industry experience. This club will give the students enormous opportunities to build these skills, and connect with people in their community."

SUSTAINING PROFIT

Words by Anne Hardie

Mark O'Connor surrounded by fresh, healthy greens

Former Vegetables New Zealand director Mark O'Connor says vegetable growers produce fresh, healthy and sustainable produce, yet growers are very undervalued in New Zealand.

He retired from Vegetables New Zealand late last year after eight years on the board and says growers produce an affordable product, but there's little financial reward for their effort and he worries about the future for many growers.

In an era where sustainability has become a buzz word that he says should never be used in a meeting, the focus needs to be more on profitability because otherwise businesses are unsustainable.

"If you make your growers profitable as the first part of business, sustainability and compliance will naturally fit into the system. If you're not profitable, you're not sustainable."

Mark is part of a family business, Appleby Fresh, that produces 500,000 units of mainly green vegetables per annum on the Waimea Plains near Nelson. He joined the business after 20 years in the meat industry, initially as a meat inspector at the local meat works, and then redundancy led to a decade in the beef boning room. Looking back, he says it was a wonderful period of his life with the camaraderie and lifestyle that went with the job.

His redundancy payout went into the sharemarket in early 1987 and vapourised at the end of the year when the market crashed. Looking for other ventures to make money, he teamed up with a mate at the meat works to buy a plot in the Marlborough Sounds and farm mussels. Weekdays at the meat works were followed by weekends on the mussel farm with a fair dose of hunting and diving, and today they lease out the 6.6ha mussel farm.

Then in the late 1990s he returned to the family business which was an expanding market garden on land the O'Connors had farmed since the first settlers arrived in Nelson. It has continued to expand, and today the business encompasses 150ha in vegetables around the Waimea Plains, with 110ha owned by the business and the remainder leased.

The bulk of its production is greens and increasingly higher-value crops such as beans and zucchini, while melons, pumpkins and corn make up the balance. At peak times such as the corn season, the business employs up to 120 staff which drops to 60 through winter. A sizeable proportion of staff are former refugees from countries such as Myanmar who have become permanent staff due to their work ethics toward the various roles in a market garden.

Eighty percent of the produce is sold via MG Marketing (of which Mark is a board member) to distribute around the country.

He says the lack of tourists this past year due to Covid-19, particularly the large numbers formerly on cruise ships, has been tough on an industry that is still growing the same amount of produce that it did in the past, but for a shrunken market.

"We have so many less people coming into New Zealand and so less mouths to feed, but the same amount of production. We have an oversupply and that drives the price down."

This season they stopped picking zucchinis because the price was below the cost of production, but kept picking other marginal crops because it kept people in employment and provided cashflow.

"There's a lot of reasons why you still cut produce below the cost of production."

At some stage, the table will turn and there will be a shortage of supply, he says, because growers can't keep producing vegetables below the cost of production.

"But everyone doesn't want to give an inch. No-one wants to give up their market share and we all live in hope."

As well as low prices, growers are facing increasing scrutiny and restrictions on nitrate levels, which he says will have an impact on the crops they produce in terms of quality as well as quantity.

"Everybody is working very hard to get their nitrate levels back, but consumers still want pristine products."

While everyone wants better environmental outcomes, he says compliance is a barrier to the smaller growers compared to those with scale to balance the costs. Combined with low returns for vegetables, he says that will lead to an industry governed by corporate and other large-scale operations.

He says he understands why some growers sell their land to housing developers because they need to be able to farm their land profitably or have an alternative land use.

> **"At some stage, the table will turn and there will be a shortage of supply... growers can't keep producing vegetables below the cost of production**

"If you're putting restrictions around nitrates and growing produce, then councils have to allow people to do something else with their land," he says. "On one hand they want to protect the ground and on the other hand they want to put on so many restrictions like the amounts of fertilisers, that you can't achieve a marketable product."

Mark says businesses need to be profitable to be sustainable

Plastic is another environmental issue that is challenging for the industry. Society wants less plastic, but at the same time, customers want the convenience and food safety of buying their vegetables in plastic.

"As you get older you think more about food safety and you want things in plastic that nobody has touched."

The other aspect of packaging is that it keeps vegetables fresher for longer and reduces the cost of wastage.

The challenge for the vegetable and packaging industries is finding alternatives that are convenient for customers, keep food safe and get the environmental tick.

Mark is still a member of the crop advisory group for Vegetables New Zealand and says there is now a new generation of board members with a diverse set of skills to tackle the issues facing the industry.

"I really enjoyed my time on the board because of the board members and all the growers I met over the years."

POTATO TUBER MOTH IN GROWERS' SIGHTS

Words by Glenys Christian

Pukekohe potato growers check out the mulching trial

The next step in Pukekohe potato growers' battle against potato tuber moth *Phthorimaea operculella* (PTM) is about to get underway with a technical panel formed and field trials being discussed.

At a Potatoes New Zealand (PNZ) potato walk at Pukekawa in mid-March around 25 growers and rural professionals were able to check out a one-hectare trial using straw mulch to suppress PTM, as well as hear from scientists about their best pesticide options. Iain Kirkwood of PNZ estimated that up to 40% of some potato crops in the Pukekohe region were lost due to PTM last summer.

Shane Smith, the chief executive officer of Inta-Ag, showed trial work it has carried out with straw mulch used on a crop of potatoes sown in mid-October. Ten tonnes of barley straw, produced by the grower Murray Aarts, was laid in a thick blanket on the potato crop at emergence to retain moisture and stop PTM larvae getting to potato tubers so easily. Only now were patches of bare soil beginning to be seen. While plenty of PTM had been found in traps set on the property, there was little damage to the crop, which could also be attributed to regular monthly rainfall. Results from the trial will be known later in the year.

Plant & Food Research (PFR) entomologist Frances MacDonald, who is working on the PNZ Potato Tuber Moth project, tested nine commonly used insecticidal sprays in laboratory assays using direct spraying and residue testing. The PNZ project is to determine the tolerance of PTM to a selection of chemical controls at the recommended application rate. Efficacy was variable, with one commonly used synthetic pyrethroid, (*lambda-cyhalothrin*/Karate Zeon®) tested at more than twice the label rate, with a 29% of PTM larvae survival rate after direct spraying and 6% with residue testing.

"We found with this field collected population that two tested synthetic pyrethroids were failing to control PTM in a lab setting" she said.

"There is the risk that with this practise resistance may develop within a population."

While some insecticides were still working, growers run the risk that they might not work so well in the future. One diamide tested (*Cyantraniliprole*/Benevia®) had been very effective in lab trials on the larval life stage of PTM, with a slower kill due to its mode of action, but she suggested that more testing is required in a field situation targeting larvae.

"PTM adults are very hard to kill because they shelter during the day on the underside of potato leaves at the bottom of the plant" she explained.

Further trials could also look at how far-reaching pesticide resistance is in populations, with Pukekohe currently affected and some possible resistance showing up in Waikato and Manawatu potato crops as well. PFR's Graham Walker who led earlier research on PTM at Pukekohe, said sanitation and cultural controls were essential along with using selective pesticides, with some insecticides used earlier in the growing season then rotating to different insecticides at a later stage. Targeting the moths is ineffective because of their impenetrable wing scales, and as they can cover 100 metres a night they could easily spread from crop to crop.

Potato growers also looked at a Masters and Sons block nearby where a mix of different species have been planted on three-metre-wide headlands to attract a range of insects. Buckwheat, linseed, clover, phacelia and Smart radish were used. Shane said PTM seemed particularly keen on the radish, which was used because its deep root broke up the soil. Once trapping figures were collected it could be decided whether the mix could be improved and other pests such as the tomato potato psyllid (TPP) could also be attracted away from the potato crop.

Large hoverfly larvae can eat around 40 TPP or aphids a day if there's no other food source

Frances said trial work previously run with a potato grower using planted phacelia borders beside potato crops reflected documented research that the primary purpose of such a border crop is to attract beneficial insects into it.

Frances MacDonald from Plant & Food Research with a headland planting around a potato crop

Different distances into the crop were scouted to see how far and how many beneficial insects moved into it. While there was no difference noticed when it came to lacewing numbers, a large increase was seen in hoverflies.

"Large hoverfly larvae can eat around 40 TPP or aphids a day if there's no other food source," she said.

It would be useful to see how this increase in beneficial insects translates into a cleaner crop at processing time.

"I would love to validate that beneficial insects are making a difference," she said. "I believe they are."

Iain Kirkwood also asked potato growers to keep a look out for two other pests as well. The red tomato spider mite was found near Auckland Airport last year and a later survey found it at nine different sites throughout the city on weed species. More recently one had been found in Tauranga, but it was unclear if this was from the same incursion or a new one. If growers think the mite is on any of their crops they should take a sample and send it to the Ministry for Primary Industries (MPI). The same advice applies if growers find any signs of potato mop top virus, which has not been seen on the 30% of seed potato crops sampled this year. ●

TAKING INNOVATION WAY BEYOND

Words by Glenys Christian

Jonathan Morgan with a Folium crop monitoring unit

The last year has been a busy one for Auckland-based agri-tech business WayBeyond despite the restrictions of Covid-19. It has employed 15 new staff, mainly in the research and development area, launched several new products for vegetable and fruit growers and intends to pick up the innovation pace further in the near future.

"The pandemic has had its challenges and also created opportunities for creative solutions," says chief technology officer, Jonathan Morgan.

While its rivals overseas have had a lot of their new product development work halted, WayBeyond's staff have been able to visit local growers, run trials and continue business with overseas clients via Zoom.

WayBeyond was incubated as a start-up within Autogrow, which was founded in the early 1990s, and split away in early 2021 as a separate business. While the original company has increasingly focused on automation and control systems, WayBeyond's expertise is in data, artificial intelligence and plant science. It has concentrated on tomato growers and more recently those growing berry crops, providing easy to use measuring and data storage solutions via FarmRoad, its farm management platform launched two years ago.

The Crop Registration app in use in a glasshouse

Here growers can find Folium, a climate monitoring system using readings from a network of wireless sensors, giving data across large growing areas. Each Folium unit measures both PAR (photosynthetically active radiation) and RAD (solar radiation), barometric pressure, carbon dioxide, relative humidity and temperature, with a further two sensors available to give leaf temperature and soil moisture readings.

"Understanding the microclimate and what's happening with your plants gives you the power to make smart decisions," Jonathan says.

One Dutch tomato grower using the system placed four of the sensors vertically in order to know exactly the right amount of CO_2 his plants required at each level. It enabled him to optimise his costs and ensure the plant was receiving the right amount at each growth stage.

In May last year WayBeyond's Yield Prediction tool was released using artificial intelligence to get up to 95% accurate predictions for tomato crops one to six weeks from harvest. This was significant as most growers range between 50 to 75% accuracy one to two weeks out.

> **Even a 10% increase in accuracy can equal tens of thousands of dollars per hectare**

"Even a 10% increase in accuracy can equal tens of thousands of dollars per hectare," he says.

Earlier this year WayBeyond's mobile Crop Registration app was released, which digitises what is for tomato growers a time-consuming manual data process of measuring 10 plants per area in a glasshouse every week using a tape measure, calipers and a clipboard. This information is usually noted down to work out average plant and leaf length, stem thickness, flower numbers and fruit sets. But with the Crop Registration app this information can be directly sent to the Cloud. The app can also work offline, saving data to a grower's device then uploading when there is an internet connection.

Much of the interest in WayBeyond's innovation has come from large growers in overseas regions, including Europe, the Middle East, Africa, and North America. But with many field trials based locally they can ensure products shipped off overseas work well. Testament to that is the story of one Florida grower who when contacted after buying Folium said he was just waiting for an electrician to come and install it. But after WayBeyond staff talked him through the set-up process he had it up and working within 20 minutes.

"That was his default position," Jonathan says.

"He didn't realise he could do it himself as he was used to traditional sensors. If you can't travel to your customers, you need to ensure your products are easy to install and use and can be supported remotely. That's perfect in this current climate requiring social distancing or lockdowns."

Despite fruit and vegetable production being more important than ever to New Zealand, he says he hasn't seen the local horticulture industry benefit fully from available new technology being applied to the sector.

"The technology is here now," he says.

"It's being utilised internationally but here in our own backyard we've definitely seen a slower uptake, which is surprising considering the Kiwi penchant for innovation. Technology, regardless of the industry, is always moving forward at a fast pace. The danger is of being left behind. The biggest thing I would encourage New Zealand growers to do is to take part in trials, pilot studies and don't ignore new tech that comes your way. You may not use it at the beginning, but staying up to date will put you in a better position as the industry continues to evolve."

WayBeyond also ensures their own people understand growing with regular team challenges featuring crops such as zucchini, tomatoes, and chilies. This year the focus is very much on sustainability complete with tracking labour inputs, and benchmarking against supermarket prices. The story behind the product and its packaging are also considered before each 'grower' sells their crop through a virtual shop in hopes of winning a trophy, and more importantly bragging rights.

This fits well with the vision of WayBeyond which is of sustainable crop production using technology.

"We're creating a passionate group of people who not only have a healthy respect for growing produce but continue to look for efficiencies that will help growers do what they do best – feed communities."

TECHNICAL

THE LATEST INNOVATIONS AND IMPROVEMENTS

60 ORGANIC ONIONS

ARE ASSUMPTIONS ON CLIMATE CHANGE BASED ON IRREFUTABLE SCIENCE?

opinion

By Robin Boom : CPAg, Member of the Institute of Professional Soil Scientists

In late January the Climate Change Commission (CCC) released its report to the government on its recommendations on how New Zealand can lower its greenhouse gas emissions based on our commitment to the Paris Agreement signed in 2016.

Public submissions on the CCC report close on 28 March, after which the political process will begin for deciding what measures will and will not be implemented, so that as a nation we can meet our obligations to the Paris Accord. The CCC recommendations will impact everybody in some way or another and will prove costly to many businesses. Almost half of our greenhouse gas emissions come from agriculture, largely from enteric methane produced in the rumen of sheep, cattle, goats and deer, but also from nitrous oxide from animal urine and fertiliser nitrogen. Arable and vegetable crop production also produces greenhouse gases from CO_2 lost through soil inversion, fallowing and plant desiccation, and nitrous oxide from artificial nitrogenous fertilisers. Soil carbon loss can in part be mitigated through the use of composts, manures and biochar, but there will still be CO_2 lost into the atmosphere during the cultivation process from microbial decomposition of organic matter.

> **The CCC recommendations will impact everybody in some way or another and will prove costly to many businesses**

There have been statements made like *'the science is settled'* as far as the anthropogenic global warming (AGW) theory goes, yet real science should be able to withstand the challenges of falsification and not be pressured by political agendas and expediency. There is no question that CO_2 levels in the atmosphere have risen from the pre-industrial level of 280 ppm, to close to 400 ppm today, and that global temperatures have risen almost one degree since 1850. However, 1850 was also the end of what is called the 'little ice age' which was a cooling period which began 500 years previously. There is also no question that sea levels rose about 0.3 metres through ice and glacial melt during the 20th century, but when these figures are compared not with what levels were like 150–200 years ago, but with more distant history, the alarmist narrative of AGW theory could be seen as skating on a lot thinner ice.

Just 20,000 years ago at the peak of the last Ice Age called the Late Glacial Maximum, the Earth was at its coldest point for the previous 250 million years. Twenty thousand years is less than one ten thousandth of 250 million years, so just a blink of an eye in terms of the planet's history. On average the planet has been six degrees warmer than today for the past quarter of a billion years, and there were no polar ice caps to speak of. Fifty million years ago, when mammals were starting to appear, the planet was 16 degrees warmer than today, so claims that life will disappear from global warming are wrong. It was only 3 million years ago that the planet started having polar ice caps through a series of ice ages and interglacial periods which occurred every 40,000 to 100,000 years, known as the Milankovitch cycle, believed to be caused by the relation of the elliptical orbit of the Earth around the sun and its axial tilt.

CO_2 LEVELS IN THE ATMOSPHERE HAVE RISEN FROM THE PRE-INDUSTRIAL LEVEL OF 280 PPM, TO CLOSE TO 400 PPM TODAY

GLOBAL TEMPERATURES HAVE RISEN ALMOST ONE DEGREE SINCE 1850

SEA LEVELS ROSE ABOUT 0.3 METRES THROUGH ICE AND GLACIAL MELT DURING THE 20TH CENTURY

150 MILLION YEARS AGO, CO_2 LEVELS WERE AROUND 2000 PPM, FIVE TIMES HIGHER THAN THEY ARE TODAY

ON AVERAGE THE PLANET HAS BEEN SIX DEGREES WARMER THAN TODAY FOR THE PAST QUARTER OF A BILLION YEARS

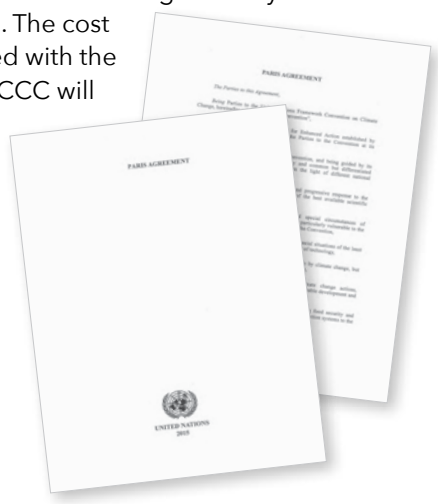
FOR 12,000 YEARS SEA LEVELS ROSE ON AVERAGE ONE METRE PER CENTURY DUE TO GLACIAL MELT

It can be argued that we are still coming out of the last ice age, which when at its peak, cities like Chicago would have been under a kilometre of ice, Boston under two kilometres of ice and Montreal under three kilometres of ice. For 12,000 years sea levels rose on average one metre per century due to glacial melt, which was three times greater than sea level rose for the whole of the twentieth century. Twelve thousand years ago Britain was still covered in glaciers, and our own Southern Alps was one massive ice sheet. Ice Ages would appear to have a much bigger impact on life on Earth than global warming, and perhaps increased CO_2 levels is a good thing to help stop the planet going into another deep freeze. Plants thrive better with higher CO_2 levels, and some glasshouses lift CO_2 levels to 1200–1500 ppm, three or four times the current atmospheric levels, to produce bigger crops. Back in the Jurassic period 150 million years ago, CO_2 levels were around 2000 ppm, five times higher than they are today, resulting in prolific plant growth which would have fed the large herbivorous dinosaurs alive back then. The vilification of higher CO_2 levels may be misguided, and as an agronomist I see there could be positive spin-offs from having more CO_2.

One of the concerns of a warming planet is that there could be a feedback effect as the ice tundras of northern Russia thaw out, and the trapped methane in these will evaporate into the atmosphere, accelerating the speed of global warming. Frozen mammoth bodies have been found in the Siberian ice, proof that 40,000 years ago this area was a much warmer grassland landscape which was being grazed by these large mammals, when a rapid freezing struck their bodies and preserved them from further decay and deterioration, and it is only through recent thawing of the ice that their bodies are being discovered.

> **“...real science should be able to withstand the challenges of falsification and not be pressured by political agendas and expediency**

New Zealand was a signatory to the Paris Agreement of the United Nations Framework Convention on Climate Change and has a duty to fulfil the demands in the Agreement. One of the guiding principles in this agreement is: *“Recognising the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change.”* Article 2 (b) states that one aim of the Agreement is: *“Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner **that does not threaten food production**.”* As a food producing nation which feeds the equivalent of 40 million people through our food exports, it is imperative that any policy implemented on climate change does not affect our food producing ability. Unfortunately these clauses in the Paris Accord seem to be ignored by our current crop of politicians. The cost to our nation if we proceed with the recommendations of the CCC will be immense. Whether it is the best course of action for future generations of Kiwis, only time will tell.



Do you grow, manufacture, store, transport, sell or import fruits and vegetables?

Your business may need to be registered for the Food Act 2014

It's easy. Go to **foodsafety.govt.nz/myfoodrules** to find out:

- the plan or programme you need to use
- where to register your business, and
- who can verify your business.

If you are a member of BRC (for fresh produce only), NZGAP, or GLOBALG.A.P. talk to your **industry association** about how they can help you register.

Any questions about food rules?
Contact New Zealand Food Safety at:
foodactinfo@mpi.govt.nz or **phone 0800 00 83 33**

New Zealand Food Safety
Ministry for Primary Industries
Manatū Ahu Matua

TEMPERATURE EFFECTS ON PLANTS

Words by Elly Nederhoff : Crophouse Ltd

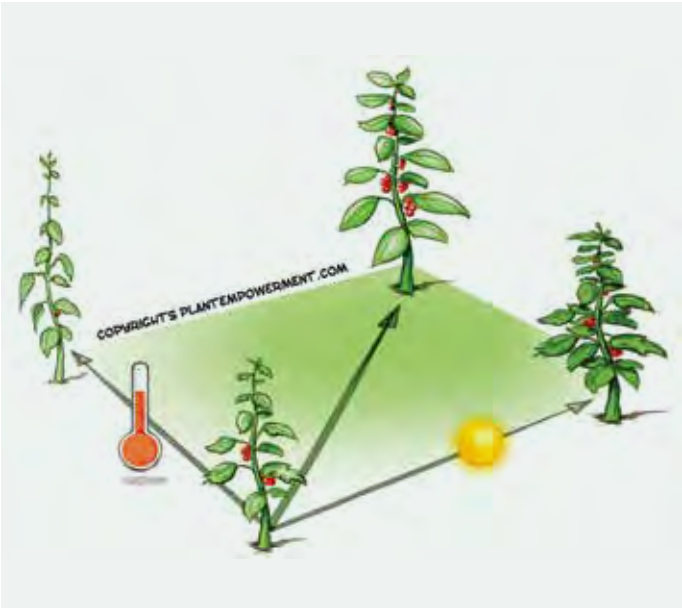


Figure 1: *The right combination of light sum and average temperature gives a tall balanced plant. Too warm but not enough light gives long and skinny plants. A lot of light but not enough warmth creates short stocky plants. Picture with permission from www.plantempowerment.com*

Temperature control in a greenhouse is a key factor for heating costs and for plant growth and fruit production.

Too high or too low temperature costs money, one way or another. By understanding the effects of temperature, we can choose better temperature settings and so improve energy efficiency. The best temperature strategy is maintaining a good balance between average temperature and prevailing light level (or light sum). In this article we describe the background of this rule, by investigating the effects of temperature on plant development, photosynthesis, respiration, assimilate transport, vegetative/generative balance and fruit ripening. The next article will give specific numbers.

Development rate

In all plants, the average temperature over 24 hours has a strong effect on the development rate, which is the speed of appearance of new internodes, leaves and flowers (or trusses in tomatoes). For instance, tomato plants at 17 degrees grow 2.5 new leaves and 0.8 new trusses per week, while at 23 degrees they throw out 3.5 leaves and 1.2 trusses each week (50% faster development). Temperature that is too low results in not enough flowers or trusses, therefore poor production later. Temperature that is too high creates too many young leaves and flowers or trusses, and there may not be enough food (sugars or assimilates) available to support them.

Sugars are produced in mature leaves (see photosynthesis, below). There must be a balance between sugar production in large leaves (called 'source') and sugar consumption in growing plant parts (called 'sink'). Sugar production is stimulated by more light, while sugar consumption is stimulated by higher temperature. The grower must maintain the right source/sink balance to build a balanced plant. This means at low average light levels, maintaining a low average temperature, while at higher average light levels, maintaining a higher temperature.

Photosynthesis and respiration

Photosynthesis is uptake of CO_2 by the leaves to produce assimilates (sugars), which are the building blocks for new plant tissue. Photosynthesis is driven by light, so it happens only during the day, or when artificial lighting is on.

There is gross and nett photosynthesis; the difference between them is the respiration. Respiration is the breakdown of sugars inside the plant to provide energy to keep the plant going. Respiration continues day and night, irrespective of light. In a nutshell:

1. gross photosynthesis is the initial production of sugars;
2. respiration then 'burns' a part of the newly formed sugars;
3. nett photosynthesis is the balance of gross photosynthesis minus respiration.

We are interested in nett photosynthesis, as that tells us the amount of assimilates (sugars) available for growth, after the respiration has taken its toll.

Nett photosynthesis

Generally speaking, photosynthesis means nett photosynthesis. It depends on light, temperature, CO_2 and more. Under perfect conditions, with CO_2 elevated to 1000 ppm, the photosynthesis increases with increasing temperature between 15 and 30 degrees Celsius. Above about 30 degrees the nett photosynthesis drops due to fast increasing respiration. (See the red line in the graph.) However, if the CO_2 concentration is below 350 ppm, temperatures above 24 degrees already reduce the nett photosynthesis. (This is because gross photosynthesis is

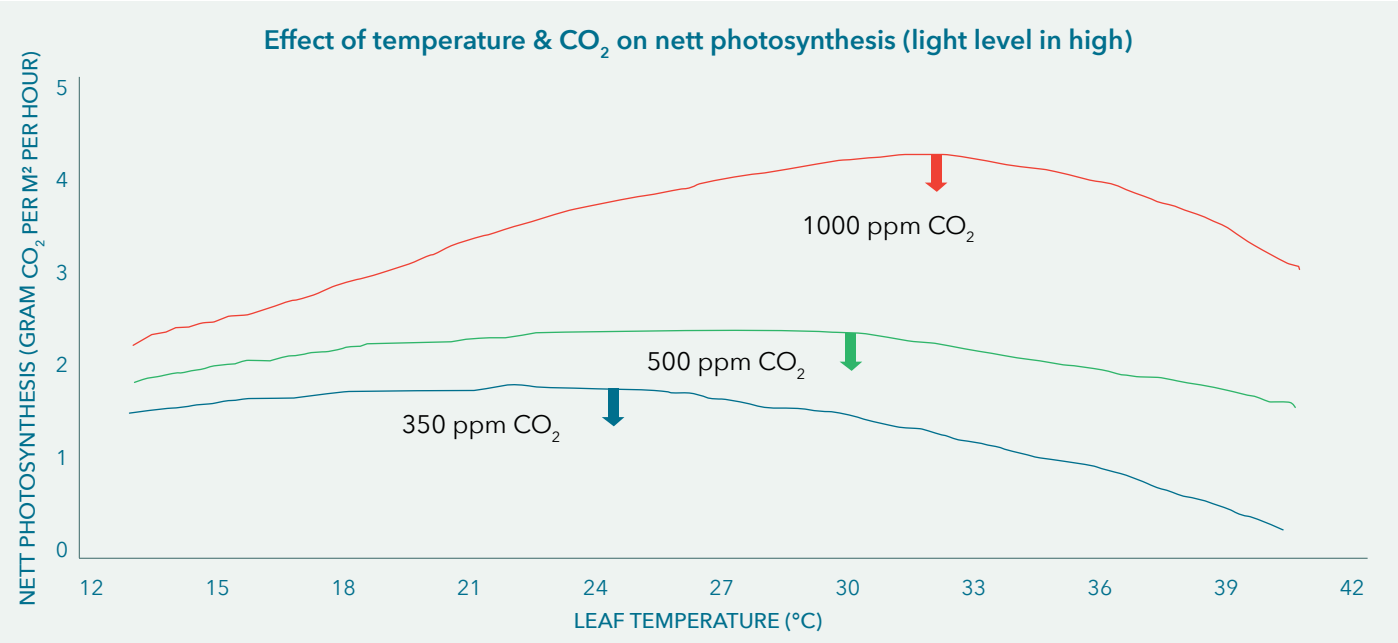


Figure 2: *Higher temperature is especially good at high light and high CO_2 levels*

restricted by low CO_2 and respiration is fuelled by high temperature.) At moderate CO_2 levels (say 450 – 600 ppm), temperatures up to 30 degrees have little effect on nett photosynthesis. (See the green line in the graph.) But there is another good reason to maintain high temperature at high light levels, namely to stimulate the transport of assimilates.

Assimilate transport

On a sunny day, leaves produce large amounts of assimilates (sugars). These must be exported out of the leaves quickly, so the leaves don't get saturated. Warmth is essential for speedy transport. In sunny weather the sun provides the necessary warmth.

After a very sunny day, the assimilate export must continue until well into the night. Therefore the night temperature must be set higher after a bright day than after a dark day. If the night temperature is too low this inhibits the export of assimilates, so the surplus sugars are converted into starch and stored in the cells. A trained eye can see if the leaves of a tomato plant are filled with starch in the morning: they are thick, firm and slightly purple. In contrast, after a dull day with a low light sum, the night temperature must be set accordingly lower, to prevent respiration burning up too much assimilate.

Vegetative/generative balance

The development rate (see above) determines the number of leaves and flowers or trusses in a plant. Assimilates are transported out of mature leaves towards the various plant parts: growing points, young leaves, stems, roots and generative organs (flowers, trusses, fruit). The warmest plant parts attract the most assimilates and grow the fastest. If there are many flowers, and if they attract a lot of assimilates, the plant becomes very generative and potentially very productive. But there must be enough mature leaves to produce the necessary sugars. If relatively more assimilates go to the leaves, the plants become more vegetative.

The vegetative/generative balance is very important, and should be kept stable. Temperature, in relation to light sum, plays an important role in this.

Fruit ripening

Higher temperatures strongly stimulate fruit growth and fruit ripening. If the fruit are warmer than the leaves (e.g. due to sunshine or heating pipes) they attract more assimilates than the leaves, so they grow faster. High temperature also makes them ripen faster. This shortens the fruit growth duration, and leads to faster picking, which reduces the 'fruit load' on the plants. In contrast, low temperature means that fruit hang on the plants longer. Cucumbers that hang on the plant for too long may have a shorter shelf life.

> **By understanding the effects of temperature, we can choose better temperature settings and so improve energy efficiency**

Conclusion

Temperature has many effects on many levels, even more than described above. Research and practice have proven that the best strategy is to strive for a balance between average temperature (over 24 hours) in the greenhouse and average light level (or light sum, also referred to as radiation level or sum).

In the next article we will look at the Radiation–Temperature Ratio and give some clear guidelines for average temperature. Also, we will distinguish between day and night temperature, as they have quite different effects. After that we will look at temperature control in relation to energy use.

STILL RATHER DRY IN THE EASTERN SOUTH ISLAND

Words by Georgina Griffiths : MetService Meteorologist

At the time of writing (mid-March), the eastern South Island (Marlborough through to south Canterbury) year-to-date rainfall accumulations were running below normal.

Figures 1 – 4 show year-to-date rainfall accumulation at Blenheim, Culverden, Christchurch and Ashburton, comparing the 2021 tally with the average year-to-date rainfall accumulation, as well as comparing to the last five years. All four locations continue drier than normal so far in 2021, with the dryness being most marked in Marlborough and north Canterbury, but less unusual for Christchurch and Ashburton.

Non-linear response to El Niño Southern Oscillation (ENSO)

Research in the early 1990s by one of our most highly respected climate researchers, Dr Brett Mullan, investigated the effects of both La Niña and El Niño events on seasonal rainfall across New Zealand. He identified a 'non-linear' response on rainfall in some regions of the country.

Put simply, that means that the typical effects of La Niña are NOT equal and opposite to the normal outcomes during El Niño phases, for some regions of New Zealand.

Canterbury and Otago are the standouts – often experiencing dryness or drought under persistent westerly regimes during El Niño events, AND drier than normal conditions while persistent Highs sit over the South Island during La Niña phases. Marlborough is a little less clear-cut, but La Niña summers can often by drier than usual, due to the influence of frequent Highs over the South Island.

Some years are drier than others – because of other climate drivers

Together, El Niño and La Niña are known as El Niño-Southern Oscillation (or ENSO). The ENSO pattern exerts an important influence on New Zealand's climate during its stronger phases. However, overall, ENSO only accounts for around 25% of the year-to-year variance in seasonal rainfall and temperature at most locations.

Other factors, such as the Southern Ocean storminess, and what the Tasman Sea is getting up to, are also very important.

Here at MetService, we routinely monitor a number of climate drivers that influence the New Zealand weather maps over the coming weeks and months. One of the reasons that the South Island has been 'relatively' quiet this summer is a relative lack of vigorous Southern Ocean weather systems (Figure 5).

Looking ahead

The waning La Niña should be gone for winter 2021. Under neutral ENSO conditions, the state of both the Tasman Sea weather systems and the Southern Ocean storms, will drive our winter weather patterns.

Figure 5: The Southern Annular Mode (Southern Ocean storminess)

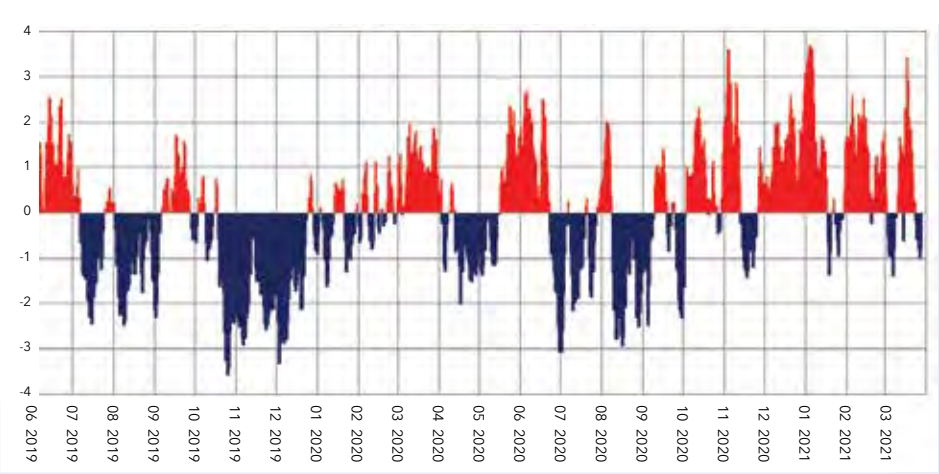
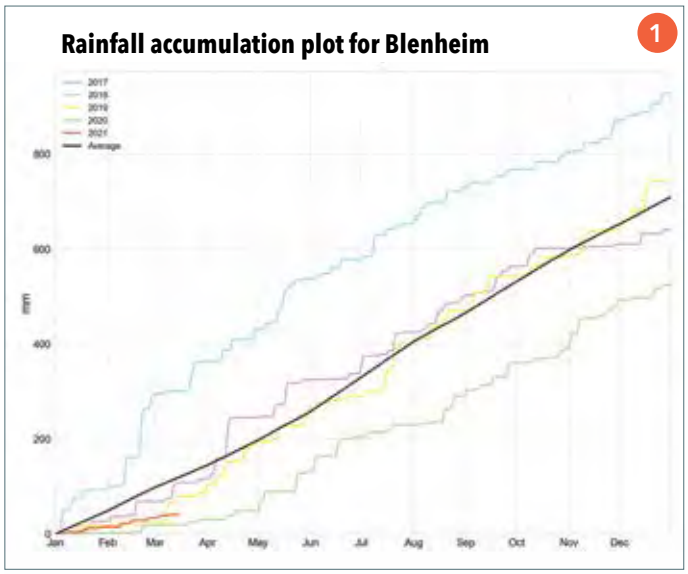
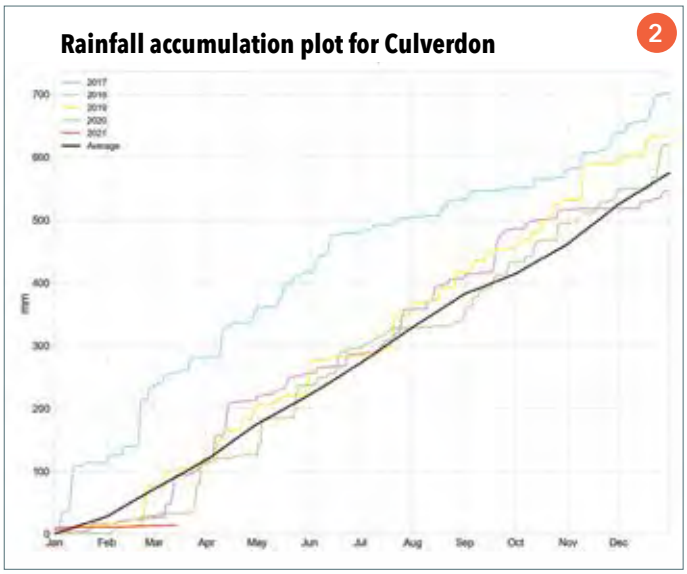
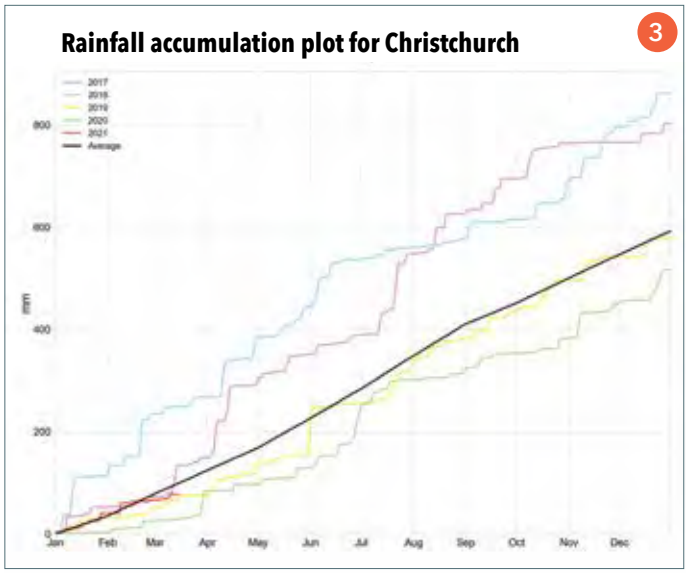


Figure 5: *A plot of observed Southern Annular Mode (SAM, also known as Southern Ocean storminess) from 1 June 2019 to 16 March 2021, with forecast SAM values shown for the period 16–29 March 2021.*

Note the persistence of the positive phase since October 2020. The positive phase of the Southern Annular Mode implies a 'quiet' Southern Ocean in the New Zealand region. In other words, a lack of Southern Ocean storms washing up and over the country. The day-to-day weather maps often show High pressure near the Chatham Islands or lying across the South Island.







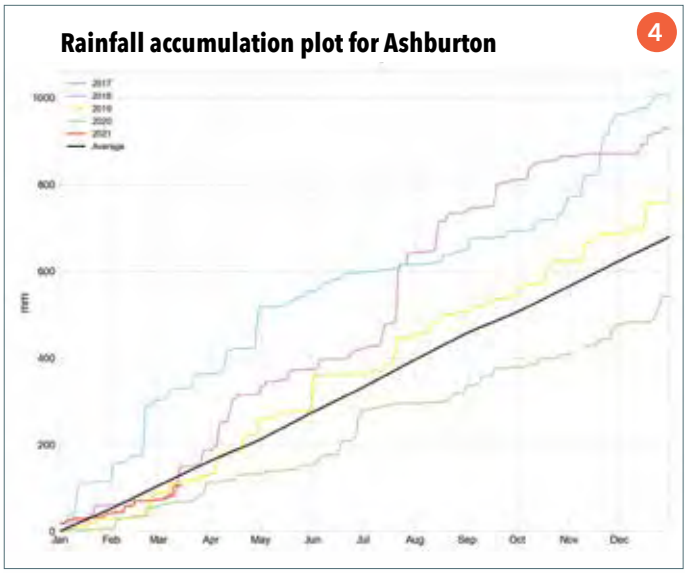


Figure 1: *Blenheim annual rainfall accumulation (mm) for the last five years (2017 to 2021). The annual average rainfall accumulation is shown in black.*

Figure 2: *Culverden annual rainfall accumulation (mm) for the last five years (2017 to 2021). The annual average rainfall accumulation is shown in black.*

Figure 3: *Christchurch annual rainfall accumulation (mm) for the last five years (2017 to 2021). The annual average rainfall accumulation is shown in black.*

Figure 4: *Ashburton annual rainfall accumulation (mm) for the last five years (2017 to 2021). The annual average rainfall accumulation is shown in black.*

As always, you should keep up to date with the MetService long-range forecast at **http://metservice.com/rural/monthly-outlook**. Or sign up to the Monthly Outlook for delivery straight to your email inbox at **www.metservice.com/emails**.

USING A SOIL TEST – LANDWISE SUMMER TRIALS

LandWISE

By Luke Posthuma

Image 1: *Deep soil sampling as part of a sweetcorn side-dressing trial in Gisborne*

Over the past year, we have discussed nutrient budgeting and fertiliser equipment calibrations and the like. Through the Sustainable Farming Fund (SFF) *Future Proofing Vegetable Production* project, the key lessons have shown time and again that fertiliser savings can be made by applying the right rate of nitrogen fertiliser based on cropping goals and soil test values.

Over late winter, we collected soil samples from a few different growers' blocks to measure how much nitrogen was left in the soil coming into spring. The variation was surprising – with some very high values appearing (see Table 1). Where there is a significant quantity of mineral nitrogen in the soil, there is an increased probability of nitrogen leaching occurring whenever there are drainage events.

One of the simplest methods of reducing nitrogen leaching is to reduce the excess mineral nitrogen left in the soil after a crop is harvested. Paddocks with different management histories and crop rotations should have a customised fertiliser recommendation for each crop based on a soil test and an expected yield.

Nitrogen Soil Test Types

As we talk about soil tests, it can be valuable to pause and quickly refresh the terms. The *potentially available N test* is completed on a 15cm soil sample and measures the soil's potential to mineralise nitrogen from the soil's organic material. This nitrogen needs to be 'mineralised' before it will be accessible for plant uptake at which point it can be measured by a *mineral N test*.

From experience, it is common to see the *potentially available N test* as low as 30–50 kg N/ha on long-term vegetable cropping ground. When ploughing in permanent pasture, this test can return values of 200 kg N/ha or greater. In these situations, growers are unlikely to require much nitrogen fertiliser for the next crop.

The *mineral N test* tests both ammonia and nitrate, which indicate how much plant available nitrogen is currently available in the soil. Samples for this test are commonly taken to 60cm or ideally, whatever is the active root depth of the crop (see Image 1). By sampling to the crop's rooting depth, a grower can get a snapshot of how much nitrogen is in the soil at a given point for the growing crop.

On long-term cropping soils, it is common to see a low *potentially available N test* value but a significant range

Sample Depth cm	Block 1 kg N/ha	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7
0-30	41	58	12	58	41	22	71
30-60	23	88	23	23	94	16	39
60-90	98	92	43	24	122	22	23
Total (0-90cm)	**162**	**238**	**78**	**105**	**257**	**60**	**133**

Table 1: *Post Winter Nitrate Soil Testing on long-term cropping blocks*

between paddocks for the *mineral N test* when tested to the crop's rooting depth.

The *Nitrate Quick Test* is a quick, grower friendly tool developed in the United States and field validated for New Zealand conditions by Plant & Food Research. Instead of sending samples to a lab, the grower uses simple test strips to get an estimate of nitrate concentration in the soil sample (see Image 2).

Our work with growers shows that by using both the soil tests, together with a calculator such as the Foundation for Arable Research (FAR) 'Quick Test Mass Balance Tool', to create a side-dressing recommendation, the right fertiliser rates can be determined. Use nitrogen where it is required.

Summer Trials

This summer, we set up 12 split-paddock sweetcorn trials in Gisborne and Hawke's Bay. We compared current grower practice with a side-dressing rate determined using the *FAR Nitrate Quick Test Calculator*.

Using the grower's expected yield for a given planting, a pre-plant soil test with a potentially available N result and a *Nitrate Quick Test* with soil collected to 90cm just prior to side-dressing, we found growers can often get away with significantly less fertiliser than they are currently applying.

In one case, the grower's planned nitrogen application rate was correct. On the remaining 11 paddocks, the side-dressing was either decreased by 50% or eliminated altogether. But what about the yields?

From the first two sweetcorn trials harvested so far, there was no difference in marketable yield using the grower's practice of side-dressing 250–300 kg Urea/ha compared to not applying a side-dressing based on a recommendation using the *Nitrate Quick Test* results. After harvest, there was however a great reduction in residual nitrogen left in the soil to 90cm depth. Measurements found a range from over 200 kg N/ha left under the growers' practice compared to about 70 kg N/ha where no side-dressing was applied. Over the next month, we will harvest the remaining sweetcorn trials and present all the results at the LandWISE Conference on 19–20 May in Havelock North (see www.landwise.org.nz for details).

Image 2: *Using a Nitrate Quick Test strip to measure soil nitrogen*

DIY for growers

For growers facing continued environmental pressure, soil testing is a tool that can be used to justify nutrient applications. A *Nitrate Quick Test* costs $2 plus the time taken to collect the soil sample. The *Nitrate Quick Test* will show whether more or less fertiliser is required, and if your current fertiliser plan was about correct.

We want to apply sufficient nitrogen to maximise crop yield without leaving significant quantities in the soil after the crop is harvested. Following good practice means applying the right rate of fertiliser for each of your crops. The right rate will vary based on the soil test results and your expected yields.

For more information, get in touch with us at LandWISE (**info@landwise.org.nz**) and check out our podcasts on Spotify or through our website (**www.landwise.org.nz**). The *Future Proofing Vegetable Production* project is funded by the Ministry for Primary Industries' Sustainable Farming Fund, Horizons Regional Council, Potatoes New Zealand, Gisborne District Council, Ballance AgriNutrients and LandWISE.

GROWING ORGANIC ONIONS

Words by Mike Nichols & Martyn Callaghan

Martyn Callaghan with onions grown from sets, early January, Pukekohe. Direct seeded already harvested

Though production costs for organic onions can be higher than conventional onion growing, there is a considerable price premium for the product due to consumer demand.

Organic onions can fetch prices double that of the conventionally grown product at times. However, the use of set grown onion production has the potential to reduce organic onion growing costs. The profit margin for growing onions conventionally is considered to be only about $NZ2.00 per bag, which on a per hectare crop of 50 tonnes is not huge for the use of land for nearly 12 months.

Of course, if you are producing organically then the crop must be grown on an organically certified site, which takes a few years to obtain, but clearly the potential rewards are considerable.

John Bostock is one of the few growers of organically certified onions in New Zealand, and in *NZ Grower* some years ago (Anon, 2019) it is stated that one of the major costs of organic onion production is weed control as no chemical herbicides are permitted, and there is a limit to how much mechanical cultivation is possible, so hand weeding becomes a necessity. This is because onions are very small seedlings initially and do not compete strongly with weeds. This is exacerbated due to their upright growth habit.

Flame weeder

When growing onions conventionally the practice is to spray with a contact weed killer just prior to seedling emergence, and to combine this spray with a residual herbicide which will kill weed seedlings germinating later. Thus the onions emerge into a weed free soil, which remains weed free for several weeks. Once the onions have become established there is a wide range of herbicides which can be safely applied to the onions as they grow larger.

With organic onions the standard weed control method is to use a flame weeder (see photo) just prior to seedling emergence, and then to use a combination of between the row hoeing (using a steerage type hoe) supported by in the row hand weeding. Because direct seeded onions require a long growing season (June to January), much of the critical




1 *Onion sets being grown in a greenhouse, Onions (variety Early Long Keeper) late January, Palmerston North.* 2 *Sets planted mid-November*

weed control is a winter to spring operation, when conditions for mechanical weeding methods are not good.

The potential of using onion sets as a means of growing organically certified onions would appear to have considerable merit. In the summer of 1999–2000 Mike Nichols grew onion sets in seedling trays. The sets were harvested in February and stored at 2 degrees Celsius over the winter. He made two plantings of the sets, the first in early October and the second in mid-November, and was amazed how rapidly the sets grew and bulbed. Early Long Keeper, for example, matured in late December from the early October planting, and in late January from the mid-November planting. This means that the onions would only be in the ground for a mere three months, compared with the more normal six months plus for a direct seeded crop. Furthermore, the risk of diseases such as mildew are reasonably high when sowing in the winter due to the cool humid conditions, and are reduced during the dryer summer months. This becomes even more pertinent with the banning of the fungicide Mancozeb for use on onions in Europe recently. In New Zealand, a conventional onion crop may receive in excess of 10 sprays of Mancozeb.

ONION SETS ARE ESSENTIALLY SMALL BULB ONIONS, WHICH ARE GROWN BY SOWING SEED AT A HIGH PLANT DENSITY ... AND ARE HARVESTED IN SUMMER WHEN THE TOPS DIE DOWN

Onion sets are essentially small bulb onions, which are grown by sowing seed at a high plant density in October or November and are harvested in summer (February) when the tops die down. They can then be stored (dry) over winter and planted in the spring when conditions for soil preparation and growth are good. The onion sets should weigh 3–6 grams, and can be stored in a cool dry shed, or preferably in a coolstore at 2 degrees Celsius. Depending on the variety it is possible that the larger sets will go to seed when planted out, but this can be overcome by giving a short burst of high temperature (20 degrees Celsius) for two weeks just prior to planting. The larger the set you plant the larger the onion plant at emergence, and the easier the mechanical weed control, but of course the greater the establishment costs, as essentially sets must be valued by weight. It is necessary to grade the sets by weight to minimise size variation of the final crop, and to plant sets of the same weight grade in each planting. Of course, the larger the sets, the larger the weight of the individual onion at maturity, but plant density will also play a role in this aspect of production.

This summer (2020–21) Mike Nichols produced onion sets in a greenhouse, using large seed trays filled with coir. Sown at high density in mid-November, by mid-January many of the varieties had already started to bulb. (See photos.) There are huge advantages in producing sets under protected cultivation, including the fact that you are not hostage to the weather and can sow when you wish, harvest when you wish and have excellent control over plant density. For example, by using seeders developed for the nursery industry it is possible to accurately sow a seed tray to any desired seeding rate. The seeded trays can then be transferred to a temperature-controlled germination room until just prior to emergence, when they are moved into the greenhouse.

Although the price of hybrid onion seed is higher than open pollinated onions, there can be advantages in using hybrids such as a greater diversity of maturity time and partial resistance to some diseases such as Downy Mildew and Pink Root. The uniformity of size is commonly better than with open pollinated onions. With the use of onions grown from sets the uniformity advantage and partial disease resistance can be enhanced.

Of course, another advantage of using sets is that by delaying the planting date until the spring, planting can be undertaken with more information on the optimum size of onions required for the market, and thus planting density can be adjusted accordingly. The size of the resulting bulbs will then depend on variety, plant density, planting date and of course the weight of the individual sets being planted.

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SILVER SKIN ONIONS

final word

By Mike Nichols

Some 50 years ago I spent a sabbatical year at the University of Guelph in Canada. I went there because the University of Guelph had originally been an agricultural college, and had expanded over the years to become a multi-faculty university. This was also the background at Massey University which was slowly changing from an agricultural college to incorporate other faculties.

I spent 1971 as a Visiting Professor in the Department of Horticultural Science and researched amongst other things the effect of plant spacing on process pea and process tomato production. Both crops were important in Ontario, Canada at that time. In the middle of the year I was asked if I would do some work on the production of silver skin pickled onions, sometimes called cocktail onions because they are often included in martini cocktails on a toothpick. It was an interesting study because it involved growing a crop of onions for their bulbs but harvesting them once they had bulbed but before they had reached maturity. Of course like all pickled onions, size is very important, so it was necessary to sow the seed at the right time, but also at high density and to harvest at the correct time. We used a Stanhay drill for the high-density sowing. The harvest time was critical because the objective was to harvest the onions when the bulbs were still quite soft and the tops had not died down so the outside skin could be easily removed by machine rather than tediously by hand, as is normal for pickled onions from dry bulb onions.

I can't recall the name of the variety I used in Canada, but I was reminded of this project recently while working on the production of onion sets, because one of the varieties I was growing is also considered suitable for silver skin onions.

In fact, only a few varieties are suitable to produce silver skin pickle onions. Names that come to mind are Barletta, Paris Silverskin, Pompeii and Pearl Drop. I used Pearl Drop (supplied by Kings Seeds), and sowed them in a seed tray along with the other onion varieties I was trialling as sets.

Even more interesting was the fact that the size of onion required as a set was very similar to that required for silver skin pickling. Care must be taken to sow at the right time and plant density to ensure that only small bulb onions are produced. The optimum size of a silver skin pickle onion is between 18 and 23 mm diameter.

Pearl Drop variety grown in a seed tray. At about optimum harvest time. Density could be a little higher, and the plants more evenly spaced

The key is to harvest the bulbs just before the onions have properly dried off, with the roots and tops still attached. They are then immediately put in a machine which rubs off the foliage, roots and outer skin of the bulb, leaving a small round white onion rather like a fish's eye. Once washed clean the onions are then soaked in brine and finally pickled in white vinegar.

Apart from the nice shiny white appearance of the processed onions the big attraction is the taste and size and the fact that they are sweet rather than pungent, crisp, and come in bite size portions. This clearly puts them in the gourmet food arena. This is apparent when purchasing them retail in a supermarket, as the price in the United Kingdom tends to be about $5/kg (drained weight). The only ones apparently available in New Zealand are imported from either UK or from Spain and are priced at up to $35/kg. There is clearly a potential local market for this product, and presumably some export potential.

Thinking vegetable seeds? Think **Terranova.**

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PRODUCT GROUPS

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Process Vegetables NZ

A SECTOR UNDER AN INCREASING BURDEN

Words by Leanne Stewart : General Manager, Process Vegetables New Zealand

Pea viners at work in Canterbury

The theme of the April magazines is for sectors to speak about the current pressures we're under and the impacts that are occurring. From the conversations I've had with growers and processing companies the most pressing challenge is the increase in regulation to businesses.

Regulation isn't necessarily a bad thing. The horticulture industry and the wider primary industries benefit from legislation like the Biosecurity Act 1993 that aims to protect our sectors from the introduction and spread of pests and diseases, or the Health and Safety at Work Act that seeks to ensure all employees return home safe from work every day. However, the occurrence of regulation being developed for almost all areas of a growing and post-harvest operation is becoming increasingly difficult to implement, from both a technical and financial perspective.

Currently we are seeing regulation being developed for climate change, freshwater management and possibly other areas. It is the job of central government to identify environment outcomes they want to see achieved by the primary industries, but it's how these outcomes are reached and verified that is the important thing.

> **"The horticulture industry is in a fortunate position to already have industry schemes in place that provide a framework to achieve best practice food safety, environment and social outcomes**

The horticulture industry is in a fortunate position to already have industry schemes in place that provide a framework to achieve best practice food safety, environment and social outcomes. These Good Agriculture Practice (GAP) schemes are independently audited and growers receive certification in the areas they're seeking recognition for, to gain access to both domestic and overseas markets.

By being certified to GAP schemes growers have the ability to be recognised as responsible producers in areas of importance to markets and very discerning consumers. Process Vegetables New Zealand will continue to support Horticulture New Zealand and other horticulture industry groups who are seeking central and regional government recognition of GAP schemes to ensure that we can meet regulatory requirements by having one auditor up the drive instead of three or four. Thus saving growers' precious time and money meeting current and future regulatory requirements.

FOOD SECURITY'S A JOINT EFFORT

Words by Antony Heywood : General Manager, Vegetables New Zealand Inc.

NZ Cucumber is our largest producer of cucumbers. Without labour, its multimillion-dollar business is at risk

Food security needs to be a joint effort by all of New Zealand because we all have an interest in it:

- **Growers need labour to pick their crops.**
- **Government needs employment.**
- **People need work.**
- **People need locally produced food.**

It seems a simple equation but for a number of reasons, the planets do not align and growers are in desperate need of labour to pick their crops.

Why is this year different from any other year? Why is labour an issue? Much of it falls at the feet of Covid-19 and how it has severely limited the number of Recognised Seasonal Employer (RSE) scheme workers and seasonal holiday work visa holders in New Zealand. This tap of seasonal labour was turned off as our border closed. The government has also restricted RSE labour due to the perceived notion that the Kiwi labour force is in need of work, and will work in horticulture. The Government is poorly advised, it would seem.

> "Food security needs a national plan!... Food is survival

If growers are unable to harvest their crops, their survival is at risk. Growers have large amounts of capital invested in their properties and plant. A covered crop entity growing cucumbers has invested millions of dollars in erecting glasshouses and other infrastructure, to grow and harvest the crop. They need a viable crop to service business cost.

If their operation fails at any point – for example, not having labour to harvest – the business could fail, and another producer will succumb to market conditions.

The public tends to forget that market conditions are critical to keep food on the shelves at reasonable prices. If a grower fails and no product flows from an entity, it disrupts the market. Prices will fluctuate, and at worse, there are empty food shelves.

This is why VNZI is advocating on three crucial topics currently before the government and the public.

1. Access to labour at critical times.
2. A grocery market survey.
3. Planning for food security when developing Regional Plan Change conditions. Also, food security as a defining pillar for Climate Change mitigations.

1 Access to labour at critical times is a hot topic and is being discussed at all levels of local and central government by all horticulture industry bodies. It has gravitas, and I hope it has the ear of a government that is able to act quickly to open the borders to labour from Covid-19 risk free areas. I would be extremely disappointed and angry if growers fail in their business before this is realised.

2 The grocery market survey is underway and a number of grower views have been collected and presented to the Commerce Commission. This process will be transacted over the year, and I would encourage all growers to take the survey: https://comcom.govt.nz/about-us/our-role/competition-studies/market-study-into-retail-grocery-sector/supplier

At the very least, growers need to understand that they have a voice. Now is the time to use it to articulate what they need in the supply chain to ensure their business is resilient, now and in the future. I make no excuses in the blatant support of a Code of Conduct for the grocery trade. This is not more compliance, as I have been told by several growers. It is a chance to get a framework in place so the grower voice can be heard.

3 Food security needs a national plan! The one lesson we can learn from Covid-19 is that the food supply chain i s critical in any lockdown. Food is survival. I would like to call on the government to make this a priority, and a national plan.

Food security needs growers in regions.
It is fine having policy addressing climate change. But if a perverse outcome is that the policy also removes many food growers in the regions, what does that say about people in the regions? What does that say about a national food security plan? And what does it say about the Paris Agreement, a legally binding international treaty on climate change, that spells out the need to also safeguard food security?

POTATOES AS PART OF A REGENERATIVE FARM

Words by Gemma Carroll : Communication & Engagement Officer, Potatoes NZ Inc.

Potatoes NZ made the most of their 2021 Field Walk in the Horowhenua District this March by including a visit to Mingiroa Farm, tucked away in the nearby Rangitikei District

Potatoes NZ made the most of their 2021 Field Walk in the Horowhenua District this March by including a visit to Mingiroa Farm, tucked away in the nearby Rangitikei District.

Mingiroa is a small farm on rolling hills with pockets of native bush, the Rangitikei river nearby, a herd of 300 cows, some sheep, paddocks full of grasses and herbs, four hectares of vegetable crops including asparagus, squash, pumpkins, brassicas and potatoes as well as fruit trees like figs, feijoa, and apples. There is also a nursery for retail vegetable seedlings. Mingiroa has a total of 248 hectares of organic farmland, 90 hectares of which is leased.

Since 1852, the Hogg family have tended to the land and grown food for their community.

Mingiroa Farm is organically certified by BioGro New Zealand and is utilising regenerative methods to build nutrients, life, and carbon in the soil. The organic dairy herd are moved four to five times a day through diverse pasture including cocksfoot, fescue, legumes, forbs, other cover crops and vegetable cropping areas. It is a good life for the cows with a healthy diverse diet.

The family fully converted to organics in the early 2000s. Initially they grew and marketed organic vegetable boxes and organic peas for processing. At the time it did not seem like the market was ready and it was a bit of an uphill battle. So they withdrew and grazed heifers and dairy cows before converting to dairy in 2008.

Due to the high input, high financial and high environmental cost of conventional dairy farming, Mingiroa returned to farming organically three years ago and are now growing organic vegetables alongside the dairy cows.

Sam Hogg reckons spuds are great for dairying and offer a nitrate mitigating crop.

Five to ten percent of the potato crop will be seconds but are not wasted as they then become food for the herd.

To date Sam has grown his 1.5 hectares of spuds with zero inputs and achieved around 35T/hectare in his Agria crop this season. By way of comparison, a nearby conventional grower with a similar climate may expect to achieve 50T/hectare but uses applied fertiliser to achieve this, pesticides, herbicides and more tillage or cultivation.

For Sam there is constant learning, especially in these early stages. He planted tubers shallow and only mounded three times using a Lilliston cultivator but thinks he will use a traditional mounder next season and the Lilliston for weed control only. There is also the possibility of trying different varieties such as Moonlight, which set tubers deeper and so can respond well to shallow planting, allowing for maintaining the regenerative method of minimal tillage.

Harvesting also uses minimal soil interference and there is no spraying off, as seen on conventional farms. The foliage dies off and then the crop is mowed. This might seem like a risk for pest and disease exposure but when we visited there were no signs of Tomato-Potato Psyllid (*Bactericera cockerelli*), and PNZ will be visiting again to take a closer look at what factors have influenced the absence of this common potato pest.

New Zealand potato growers struggle with psyllid and use sprays, netting, or in some regions biological controls (*Tamarixia Triozae*).

The unexpected or accidental management of this pest may be due to micro-climate, altitude offering good air movement, companion planting, an emphasis on building soil life, biological crop nutrition and diverse crops bringing beneficial insects. Psyllids are drawn to yellow, hence their arrival when potato crops start dying off (yellow foliage) but perhaps the nodding heads of sunflowers close-by are a more attractive option.

The current market for Mingiroa organic potatoes is high-end, premium organic retail table potatoes, but there are opportunities to diversify their market to include organic crisping and organic seed potato.

The question for many in New Zealand is, what is 'regenerative agriculture'?

According to the Mingiroa website, regenerative agriculture is a system of farming that aims to rebuild the soil and pasture health of farms by working with and supporting nature's systems and processes.

This whole system approach to farming includes:

- long grazing rotations that mimics the grazing of traditional herd animals.
- encouraging and planting diverse pastures with different species of herbs, legumes and grasses, each with a unique role to play in soil and animal health.
- vegetable cropping rotations, that uses the fertility from grazing animals to grow nutrient dense food and rests the soil between harvests.
- minimal tillage, supporting the structure and water holding capacity of soil, carbon stores, biological life and preventing erosion.
- supporting life and preventing desertification (lifeless soil) by not using chemical sprays (pesticide and herbicides such as Roundup) and synthetic fertilisers.

Mingiroa believe that because healthy soils sequester carbon, this farming method has the potential to change the way we grow food and restore the health of our soil and climate.

Benefits for the environment, human communities, and the planet, include:

- improving physical health of farmers by growing safe, healthy, and nutrient dense food without chemicals.
- improving mental health of farmers by farming in a way that is part of the solution and not part of the problem.
- improving community health by supporting thriving eco-systems, bird populations and clean waterways.
- creating financial resilience and profitability by working with natural living systems and farming with freedom from expensive inputs.
- improving animal health by offering nutrition in the paddock that supports the welfare of animals.
- environmental health by increasing the absorption of carbon dioxide by diverse plants, pastures and trees and reducing greenhouse gas emissions.
- environmental resilience by building the water holding capacity of the soil and having a diversity of plants that thrive in different seasons.

Regenerative agriculture has caught the attention of governments and global environmental leaders.

On 22 February 2021 Manaaki Whenua – Landcare Research and Our Land Our Water released a Regenerative Agriculture White Paper setting out pressing research priorities for New Zealand.

The recent white paper mostly considers regenerative farming in the arable and livestock sectors. Not much is known or has been researched in the horticulture sector yet, however there is a global trend in the marketplace for sustainable farming methods and Potatoes NZ hope to explore how the vegetable sector might benefit from a regenerative project, especially as the Ministry for Primary Industries has funding available for this work.

Key points from the Our Land Our Water press release:

- There is a pressing need for scientific testing of the limited evidence and anecdotal claims being made by regenerative agriculture practitioners and proponents.
- The new white paper sets out 17 priority research topics identified by 200+ representatives of New Zealand's major agricultural sectors, regenerative agriculture farmers, and professionals in the wider agri-food system.
- The white paper introduces 11 principles for regenerative farming in New Zealand emerging from farmer focus groups, applicable to all sectors.
- There is significant overlap on the continuum of practices between mainstream and regenerative agriculture. The white paper examines areas of compatibility between mainstream and regenerative farming practices and strategies.
- Regenerative farmers appear likely to question the status quo and look for new opportunities and different ways of living, working, and improving their farming system.

Regenerative agriculture has been proposed as a solution for some of Aotearoa New Zealand's most acute challenges. Advocates suggest it can improve the health of our waterways, reduce topsoil loss, offer resilience to drought, add value to our primary exports, and improve the pervasive well-being crisis among rural farming communities.

> **"Regenerative agriculture has been proposed as a solution for some of Aotearoa New Zealand's most acute challenges**

With a groundswell of farmers transitioning to regenerative agriculture in New Zealand, there is an urgent need for clarity about what regenerative agriculture is in New Zealand and for scientific testing of its claimed benefits.

The white paper refrains from offering a definition for two reasons: the risk of constraining an evolving concept, and the need for any New Zealand definition to be anchored in Te Ao Māori (the Māori world view). Collective work by Māori experts and practitioners is currently in progress to identify linkages between Te Ao Māori cultural concepts and regenerative agriculture principles.

Lead author Dr Gwen Grelet, senior researcher at Manaaki Whenua – Landcare Research, says that although evidence is urgently required, regenerative agriculture potentially has an important role to play in New Zealand.

"Regenerative agriculture has huge momentum internationally in all parts of the food system. It is not a magic bullet but its grassroots popularity with farmers and food consumers means it has huge potential for driving the transformation of Aotearoa's agri-food system to move our country closer to its goals.

"Our consultation found many areas of strong agreement between advocates and sceptics. It's time to stop bickering and focus on identifying any true benefits regenerative agriculture might have for New Zealand."

The white paper is the result of intensive collaboration and consultation with more than 200 people from June to November 2020. Collaborators include farmers and growers, researchers, primary industry bodies, banks, retailers, non-governmental organisations, government departments, large corporates, consultants, marketers, overseas researchers, and educators.

The project was funded by the Our Land Our Water National Science Challenge, the NEXT Foundation and Manaaki Whenua – Landcare Research.

You can find the paper on our PNZ Sustainability page **https://potatoesnz.co.nz/growing-certifying/growing-potatoes/sustainability/**

UPDATE ON FREE TRADE AGREEMENT NEGOTIATIONS

By James Kuperus : Chief Executive, Onions NZ Inc.

With no international travel able to take place due to Covid-19, Free Trade Agreement (FTA) negotiations took a brief hiatus.

FTAs provide the enabling blocks for trade such as tariff reductions and country of origin rules. Like private businesses, the government has moved to meeting online rather than in person. This has allowed government to recommence negotiations, which have accelerated in recent months.

The following is a brief update on the latest developments which are relevant to the New Zealand onion sector.

NZ-UK FTA

The fourth round of negotiations is scheduled for mid to late April. Steady progress has recently been made across the agreement with the small and medium sized enterprises (SMEs). Both parties have welcomed the initial goods market access offer exchange in the previous round (round three). During the round, both parties introduced their respective goods offers and discussed their positions and expectations.

Onions New Zealand is seeking tariff removal from the current 8%. This is essentially an 8% tax that New Zealand is paying over and above our competitors such as the Netherlands and South Africa.

PACER Plus (Australia, Cook Islands, Kiribati, Nauru, New Zealand, Niue, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu)

PACER Plus entered into force on 13 December 2020, and the focus now is for PACER Plus Parties to stand up the institutional structures to support implementation of the agreement. This agreement focusses on not only trade but also economic development of the Pacific. Tariffs are already very low or 0% for onions with those involved in the agreement.

Regional Comprehensive Economic Partnership (RCEP)

RCEP was signed in November 2020 and presented to the House of Representatives on 8 December 2020 for Parliamentary Treaty Examination. RCEP is being considered by the Foreign Affairs Defence and Trade Committee (FADTC). Fifteen countries are party to this agreement, including China, South Korea and South East Asia nations. Almost all of the countries involved have 0% tariffs on onions already. This agreement however, has benefits for the onion industry around rules of trade, and times to clear customs etc.

EU-NZ FTA

The ninth (virtual) round of EU-NZ FTA negotiations took place in November. New Zealand onion growers and exporters currently pay a 9.6% tariff into Europe. As our largest trading partner this is a substantial and trade prohibitive tax that we face. Removing this tariff will make New Zealand more competitive on pricing against our competitors who have no tariff currently.

ASEAN-Australia New Zealand Free Trade Area (AANZFTA)

AANZFTA senior officials agreed on 2 October 2020 that the first round of upgrade negotiations will be held in first quarter 2021 (likely March) with a view to concluding an agreement within two years. The negotiations will be held virtually, with some preparatory work occurring during the remainder of the year.

To date, AANZFTA has delivered great benefits and results for the New Zealand onion sector, with exports increasing 658% since the inception of the agreement in 2010. Onions New Zealand will work with government to identify areas of improvement for our sector to assist with the free flow of trade.

Comprehensive and Progressive Trans Pacific Partnership (CPTPP)

On 1 February, the United Kingdom became the first to formally request accession to the CPTPP since its entry into force on December 2018. The UK's formal request triggers a process of consultations before the UK can be accepted as being a member of CPTPP. It would be expected that the UK substantially reduces tariffs to enter this agreement, which will benefit our sector significantly. We currently pay an 8% tariff on onions when they enter the UK.

TANTALISING TOMATOES

Words by Helen Barnes : General Manager, TomatoesNZ Inc.

Fresh tomato summer promotion

TomatoesNZ invested in a new fresh tomato promotional campaign to remind Kiwis to enjoy tomatoes during the peak of the summer season, from mid-November to the end February, whilst supply was plentiful.

A series of rotating ads were used on Facebook and interactive stories on Instagram under a new '**NZ Tomatoes**' handle. The social media-based campaign's objective was to increase the frequency of purchase by encouraging shoppers to add tomatoes to their weekly shopping basket. The plan involved providing recipes, inspiration and nutritional facts to remind consumers of reasons to purchase fresh tomatoes.

To enhance our social media campaign, we also teamed up with 5+ A Day to use their extensive social media and publicity channels to promote fresh tomatoes. The team targeted younger Kiwis on Instagram to encourage them to eat tomatoes. They also used a handful of influencers to create and share recipes and inspiration with their large audiences using top quality tomatoes kindly arranged by NZ Hothouse. The tomato influencer promotion reached over 370,000 people with 3,100 engagements (which is people who react to the content with likes and comments), whilst 5+ A Day's Facebook posts had over 5,000 engagements. The full report from 5+ A Day is available – if you would like a copy please contact Karen Orr at TomatoesNZ.

We also had four short, sharp fun tomato promotional videos developed, along with a series of thirty catchy images for use on social media, websites and marketing campaigns. Growers can share these with their customers, friends and marketers. The images are available on our website under the **Promotion** tab, and we can send you the videos – please get in touch and share these widely.

Tomato brown rugose fruit virus (ToBRFV) update

Following the early detection of the unwanted virus, the tomato brown rugose fruit virus (ToBRFV), in a small tomato seed lot last year a group of growers, GIA (Government Industry Agreement) industry partners and Biosecurity NZ met in February to discuss measures growers can adopt for good greenhouse hygiene to prepare for, and help prevent spread of this virus. This virus is mechanically transmitted so it can be easily spread and can survive on greenhouse surfaces for up to six months.

From the meeting, TomatoesNZ and Vegetables NZ are working together to develop information tools for greenhouse growers on effective hygiene practices including a poster with high-resolution photos of virus symptoms for display in key areas, and an information sheet. The hygiene measures required are similar to those for managing bacterial canker, with which many growers have some prior experience.

Key recommendations are:

- Start clean, stay clean
- Maintain or enhance good hygiene practices
- Staff training and vigilance
- If something looks wrong, report it to MPI 0800 80 99 66 and get it tested.

A guide for vegetable covered crops biosecurity was published last year and sent to all growers.–More copies are available so if you would like one please contact us. We also have resources available for growers under the **Biosecurity** tab of the Tomatoesnz.co.nz website. Once the new resources are ready we will send copies to all TomatoesNZ growers, with more available on request.

Collaboration agreement with EECA

We are pleased to advise that we recently signed an industry collaboration agreement with the Energy Efficiency Conservation Authority (EECA). The collaboration agreement means that we will partner on projects to help the sector with energy efficiency measures and renewable energy conversions. Vegetables NZ, on behalf of other covered vegetable crop growers, are also working with us on this.

So far EECA have co-funded a couple of projects including some data analysis and a technology scan that is looking at what renewable energy options may be available for growers to consider. More projects will be added as our partnership progresses.

Save the date – Grower workshops

We are planning the following workshops to provide information for growers, this time having a key focus on energy for greenhouse tomato and vegetable growers. Details are being developed and will be emailed to members once finalised, in the meantime please save these dates:

Christchurch, Wednesday 12 May, morning
Auckland, Thursday 18 May, morning.

INTRODUCING IRONMAX$^{PRO®}$ – NEW ZEALAND'S FIRST BIOGRO CERTIFIED SLUG AND SNAIL BAIT

At UPL we remain committed to providing sustainable agricultural solutions to New Zealand growers and are actively driving the adoption of bio-based solutions. Through our concept of OpenInnovation we leverage our partnerships and networks to address grower challenges. Our aim is to provide resolutions and tailor products that meet the unique farmer requirements.

This season UPL launches the first BioGro certified molluscicide in New Zealand, **IRONMAX$^{PRO®}$**, developed and manufactured by De Sangosse, global leaders in slug and snail bait formulation. "It offers the same best-in-class efficacy as Metarex inov®. It means those growers seeking a high-quality alternative to metaldehyde have a proven choice," says Scott Hanson, New Zealand country manager.

> "It means those growers seeking a high-quality alternative to metaldehyde have a proven choice

The high performance delivered by **IRONMAX$^{PRO®}$** is the result of a combination of unique innovative technologies, IP^{MAX} and COLZACTIVE®. IP^{MAX} is the maximised performance of the active ingredient at a lower concentration that clearly differentiates **IRONMAX$^{PRO®}$** from the standard basic iron-based molluscicides. And it does not stop there, the innovation continues to utilise the innovative bait technology of the premium metaldehyde slug bait in the market, Metarex Inov®. **IRONMAX$^{PRO®}$** is engineered with the exclusive COLZACTIVE® technology to deliver exceptional palatability and attractiveness, ensuring fast-acting performance, with the pellet physics to give persistence and spreadability. George Follas, UPL's R&D lead, explains that "a key feature of the technology is that **IRONMAX$^{PRO®}$** enables mortality at lower ingested doses in comparison to other iron-based molluscicides.

As a result, there will be more bait remaining available for other slugs to be attracted and killed. This ensures continued protection for a longer period."

Trials showed that **IRONMAX$^{PRO®}$** has a different mode of action that matches the high in field performance of the best in class metaldehyde-based Metarex Inov®. **IRONMAX$^{PRO®}$** works as a stomach poison, fatal once ingested. It leads to vital organs (such as the digestive gland) being overloaded with iron, which impairs the digestion process and ultimately the ability of a slug to process food. Feeding stops almost immediately and slugs may retreat underground to die. Because of this, effects on slugs can be less visible, and it is therefore recommended to observe that crops are protected rather than looking for dead slugs.

George reiterates that due to the extensive damage caused by slugs and snails it is imperative for growers to have reliable and effective control. Now they can do this with a low hazard, lower environmental impact solution. The UPL team is looking forward to bringing these benefits of **IRONMAX$^{PRO®}$** to New Zealand growers this season.

IRONMAX PRO®

UPL OpenAg™

For more information about **IRONMAX$^{PRO®}$** go to **www.ironmaxpro.upl-ltd.com** or email **enquiry.nz@upl-ltd.com**, **www.upl-ltd.com/nz**

DO YOU KNOW YOUR FOOD RULES?

If you grow, import, manufacture, store, transport, or sell fruit and vegetables, you need to meet food safety requirements. This may include registering with New Zealand Food Safety or your local council.

New Zealand Food Safety (a business unit of the Ministry for Primary Industries) is urging owners and managers of all existing New Zealand businesses that trade in food, to find out if they need to register a plan or programme. Even if food is only a part of a business's activity, registration may still be needed.

New Zealand Food Safety's director of food regulation, Paul Dansted, says registration helps to ensure food is safe and suitable for customer use, and provides an important link in the chain to help with tracing food products if a problem is identified.

"Food rules are more flexible than they once were, when they used to focus on the place food was made and facilities provided," Dr Dansted says. "These days, there is a more common-sense, risk-based approach to food safety – which puts food businesses in the driver's seat when it comes to managing any food hazards that might arise."

Unregistered businesses risk fines, delays, prosecution and recalls

If you don't register, New Zealand Food Safety and local councils may take enforcement action (ranging from educational advice, warnings and instant fines, through to harsher penalties including preventing your business operating and prosecution). As well, customers may refuse to accept your goods or use your services if you don't comply with food safety requirements.

You need to register as a food business (with some exceptions) under the Food Act 2014 if you:

- Grow horticultural crops.
- Process harvested foods, such as grain, herbs or spices, nuts and seeds.
- Manufacture foods, including dried or dehydrated fruit or vegetables, shelf-stable grain-based products, and frozen fruit and vegetables.
- Brew, ferment, distil or manufacture alcoholic beverages (including fruit wine), or non-alcoholic beverages (including fruit juice).
- Prepare, serve or retail food (whether from a shop, a market stall, online or via social media).
- Transport or store food (such as providing a food storage or distribution service).
- Import food and beverages for sale (including ingredients).
- 'Give' food away to promote your business.

"For the horticulture industry, what you need to do depends on the type of food you make or sell," Dr Dansted says. "Some foods pose fewer food safety risks than others, so growers have fewer rules to follow."

Under the Food Act, businesses that make or sell food (unless exempt) need to follow either a Food Control Plan or a National Programme. A Food Control Plan sets out what steps a higher-risk business making or selling food needs to take to make safe and suitable food. Medium to low-risk businesses can follow a National Programme which means they don't need to use written Food Control Plans, but must still register the business, meet food safety standards, keep some records, and have the business verified.

> "Some foods pose fewer food safety risks than others, so growers have fewer rules to follow

To support the horticulture industry New Zealand Good Agricultural Practice (NZGAP), Global Good Agricultural Practice (GLOBALG.A.P.) and British Retail Consortium (BRC – limited to fresh produce) have all been approved as Template Food Control Plans under the Food Act. If you are a member of these programmes, talk to your industry association about how they can help you register.

Uncertified growers, packers, transporters and wholesalers have the option of joining a GAP scheme or may need to register a National Programme with their local council.

You can go to www.foodsafety.govt.nz/myfoodrules and complete the online questionnaire to find out:

- Which plan or programme you need to use.
- How to register your food business.
- Who can verify (check) your business.

Do you import fruit and vegetables for sale?

Imported food includes ingredients used in the manufacturing of beverages (e.g. hops).

If you want to import food and beverages into New Zealand, you must:

- Be registered as a food importer with New Zealand Food Safety or use an agent who is registered. For details, go to www.foodsafety.govt.nz/register-as-a-food-importer
- Check the food you want to import for sale is safe and suitable.
  - Know the ingredients in the food, so that Australia New Zealand Food Standards Code rules are met, such as correctly labelling the presence of allergens.
  - Ensure the food is stored and transported safely.
  - Keep good records to show how you've sourced and kept food safe.
  - Have a plan in place to recall any food you have imported, knowing who you sourced it from and sold it to.
- Comply with other New Zealand laws, including the Biosecurity Act 1993, and Customs and Excise Act 2018.

If you import food, and are not correctly registered, your consignment may get stopped at the New Zealand border. It could also be delayed or recalled. Either way, this will cost you more.

Find out more at **www.mpi.govt.nz/importing-food**

Any questions about food rules?
Contact New Zealand Food Safety at
foodactinfo@mpi.govt.nz or 0800 00 83 33.

MYCORRHIZAL FUNGI WIN/WIN FOR GROWERS AND ENVIRONMENT

Farmers are in a position of power to help restore the environment whilst improving production.

A healthy soil colonised with beneficial microorganisms is a win/win for the profitability of the growing operation and the health of the environment.

Modern day farming practices have seen increasing use of synthetic chemicals strip our soils of microbial life. However, for many growers, re-introducing select, concentrated microorganisms into the soil has increased their produce quality and yield while satisfying increasing consumer and environmental concerns and enabling growers to meet agrichemical regulations.

One major player you need to know about for longer growing crops is Mycorrhizal Fungi (product name Rootella®). Other beneficial organisms (Superzyme®) are prescribed for faster growing leafy crops.

Mycorrhizal Fungi attach to root hairs to create vast networks of superfine fungal filaments that increase the absorption area of roots up to 1,000 times. This improves the ability of the plant to penetrate parts of soil and reach nutrients that roots can't otherwise access. The fungi in Rootella® are able to absorb and transfer 15 major macronutrients and micronutrients required for plant growth. Mycorrhizal fungi release powerful chemicals into the soil that dissolve hard to capture nutrients, in particular phosphorous.

The thing about beneficial microbes is they benefit crops in many different ways...

1. Increase the survival rate of new plants – which in turn increases yield.
2. Higher quality crops – the plant can uptake more minerals from the soil, meaning enhanced nutrition for the plant for better vegetable production. Get paid for higher quality produce.
3. Less fertiliser needed – improved utilisation of applied fertiliser and native minerals results in cost and time benefits.
4. Drought and heat resistance – helps plants cope with extreme weather conditions or irregular precipitation.
5. Form soil aggregates – improves soil tilth and reduces the loss of valuable topsoil.
6. Resilience – robust plants are more resistant to pests and pathogens, so fewer sprays are needed.

Mycorrhizal Fungi benefits the environment

Mycorrhizal fungi help combat climate change. Glomalin (an enzyme produced by the fungi) is a vital link in carbon storage; plants move carbon CO_2 from the environment and store it in the soil. Less carbon in the atmosphere will have positive impacts to moderate climate change. There are clear links between healthy soils and soil capacity to store higher amounts of carbon for longer periods of time.

If you want to explore how Mycorrhizal fungi or other beneficial organisms can benefit your crops please call nutrition specialist Molly Callaghan on **09 372 9155** or email **rsf@rd2.co.nz**.

Classified advert rates

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

Custom $40 per column cm

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

HAPPY (3)1ST ANNIVERSARY ENZA ZADEN!

ENZA ZADEN

Enza Zaden New Zealand turned one in January this year. But we're calling it our (3)1st Anniversary because we can't forget about the 30 years of service we have had in New Zealand before supplying direct to growers. Have we helped you in the past three decades? If not, please lettuce know, better still, if we did help you, lettuce know what went well.

This is the re-start, and in some cases re-connect, of our long association with New Zealand growers. Our varieties continue to help growers to succeed. With winning varieties such as Wildebeast, the green incised lettuce famous for its huge yield. Oriola, that produces large iceberg lettuce over summer. Sampson, the pumpkin for high yield. Marando, the fastest maturing red variety capsicum. Altair, an amazing cauliflower for winter curd quality and Campari, the tastiest tomato.

In the last year, we sometimes failed but from this we learned, we got up and then we tried again. Thank you for supporting the change in the way our vegetable seed is delivered in New Zealand. We appreciate it when you choose Enza Zaden.

Did we help you succeed with our lettuce, onion, pumpkin, spinach, cauliflower, capsicum, tomato, cucumber, zucchini and herb varieties? Please reach out to us so we can connect (or re-connect) you with varieties that perform best for you. Contact Bev on 09 963 0122 or sales@enzazaden.co.nz now to lettuce send you trial seed.

For technical advice on open field crops: Aneil Hari 021 367 242, or sales manager Herman van der Gulik, 021 858 939. For glasshouse crops: Louise Millar 021 711 709. **www.enzazaden.co.nz**

"Lettuce help you to grow an excellent lettuce crop. Our breeders have been producing lettuce varieties for New Zealand growers for over 30 years." says Herman van der Gulik, Sales Manager, Enza Zaden New Zealand.

INTRODUCING ENZA ZADEN LETTUCE

AUTUMN ICEBERG:

Nolaf NEW! autumn to late autumn, medium size, dark green colour, sure heading and fast maturing, adaptable.

Kravitz NEW! autumn harvest, faster maturing, medium sized, fast filling, sure heading, good tolerance to pinking.

Witiza NEW! autumn harvest, medium to large-sized heads, highly uniform, dark green, sure heading smooth leaf.

AUTUMN – WINTER ICEBERG:

Pedrola, autumn standard, reliable, adaptable, produces medium sized heads with high pack out in changeable weather.

Diegola, robust, adaptable winter variety, large frame and good wrap for head protection, uniform round heads.

Icemaker (aka Icefall), late Autumn and late winter excluding mid winter, medium to large framed, with large heads, adaptable to go into Spring period.

WINTER:

Botiola (aka Icebreaker), winter standard, reliable, large size heads, firm heads with good volume, even under adverse conditions.

Pelayo, for very cold climates with large frame and large heads for Southern climates mid winter.

Sancho (New to Trial), the largest mid winter variety in our assortment that handles cold conditions with large head size and large frame.

SPRING ICEBERG:

Pedrola, spring standard, reliable, adaptable, produces medium sized heads with high pack out in changeable weather.

Nolaf NEW! spring and autumn, medium size, dark green colour, sure heading and fast maturing, adaptable.

Berruguete NEW! true spring variety, med-large head and frame, cold tolerant, versatile, uniform and high cut out, strong against big vein.

SUMMER – AUTUMN:

E01E.12373, (New to Trial), flexible summer to autumn type, flexible wide harvest window, large heads, suits fresh market best with good recovery for processing, excellent results in the 2021 summer.

VICENTOLA, flexible variety for later Summer and into Autumn, flexible variety, beautiful flat round shape for easy harvest, dark green.

EAZYLEAF - YEAR ROUND:

Wildebeast, standard high yielding mid-dark green incised coral, serrated spiky leaves, fine leaf attachment with crisp texture, pair with Rhone.

Rhone, high yielding deep red incised coral type, spiky serrated leaves, fresh green highlights, fine attachment, pair with Wildebeast.

Budgee, compact green multi cos type, great taste, many leaves of the same size, perfect for salad mix leaf.

GREEN OAKLEAF:

Alvier NEW! mid green fresh shiny oakleaf, with smaller lobes, very uniform, high yield of well filled heads, open field and NFT, year round production.