The ORCHARDIST®

VOL 94 | NO 10 | DECEMBER 2021

HORTICULTURE NEW ZEALAND

Growing golden fruit

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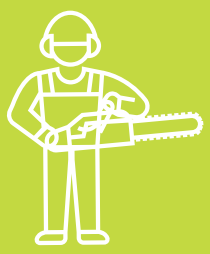

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Contents

DECEMBER 2021

The year that was: Plenty of positives despite turbulent times

The year 2021 was the United Nations International Year of Fruits and Vegetables.

By Barry O'Neil : HortNZ president

The total global fruit and vegetable market is expected to be worth USD $373.5 billion by 2022, at a compound annual growth rate of 7.1% from 2017 to now.

Demand for New Zealand fresh fruit and vegetables is fantastic. We grow amazing produce that everyone wants more of, needs more of, and that ticks all the right boxes. It was a shining light in what otherwise was a very dark year; and with it, carried relief in knowing that demand for our produce will only increase as the world turns to an even healthier diet and to food that has been produced more sustainably.

It may seem like a paradox that there could be any positives in a year like 2021, but believe it or not there have been some. I would like my final article of the year to highlight some of these, along with some wishes for 2022.

In one of the most challenging years on record, the incredible effort from team Hort ensured most crops were still planted, harvested, packed and shipped – an amazing result from all who work in the sector. While you may be feeling like you have been to hell and back to make it happen, to me, it reinforces the calibre and commitment of all who work in this industry.

Congratulations to Melissa van den Heuvel who took home the 2021 Young Grower of the Year finals in Wellington. Fantastic effort Melissa, well done. I wonder what Apata put in their water considering three of their staff have been national winners now! Recognition is also due for all the other contestants who stepped forward in what was an extremely high standard of both regional and national competition this year.

Our conference at Mystery Creek in August was a great event and we were lucky to get 700 people together for an amazing line-up of speakers in a year so disrupted by Covid-19. Mike Chapman was awarded the Bledisloe Cup at conference too in recognition of the incredible work he has done in horticulture, especially during his five-year tenure as Horticulture New Zealand's chief executive.

Another amazing achievement over the last nine years has been the great work and contribution of outgoing Apple and Pears chief executive, Alan Pollard, who has worked tirelessly to drive the expansion of the apple and pears industry in NZ, along with overseas markets access. I wish Alan all the very best for the next stage of his career.

Nadine Tunley replaced Mike as our new chief executive in June. Nadine immediately hit the ground running (maybe sprinting is more correct!) and we are already seeing the results of her leadership. The wider HortNZ team also did a fantastic job during the year with tackling labour and environment issues, as well as driving for Covid protocol certainty, all the while keeping everyone fully informed along the way.

> **"... relief in knowing that demand for our produce will only increase as the world turns to an even healthier diet and to food that has been produced more sustainably**

It wasn't only HortNZ attracting talented new leadership this year. Kate Hellstrom was appointed as Summerfruit NZ chief executive, Colin Bond took the role of NZ Kiwifruit Growers Inc. chief executive, and Terry Meikle was recently announced as the NZ Apple and Pears chief executive.

All great appointments and it's fantastic that such experienced and intelligent people are wanting to work in the horticulture sector.

Being the only primary sector allowed to bring our full quota of 14,400 seasonal workers into New Zealand without having to go through Managed Isolation and Quarantine (MIQ) was another huge achievement for the sector. I recognise all in the industry, product groups and HortNZ, who worked so hard to make this possible. And while we all realise there will still be major shortages of seasonal staff for 2022, without our Recognised Seasonal Employer (RSE) scheme workers we would be in really dire straits.

Finally, my wish list for 2022 – which, by the way, is the United Nations International Year of Glass… transparency maybe?

New Zealand must get back in business. No more MIQ, borders or associated policy settings, enabling RSEs, backpackers and skilled migrants to enter the country without unnecessary costs and restrictions so we can fill work shortages in horticulture and the wider food and fibre sectors.

> **"In one of the most challenging years on record, the incredible effort from team Hort ensured most crops were still planted, harvested, packed and shipped – an amazing result from all who work in the sector**

Shipping, fingers crossed, is showing signs that it will return to more predictable schedules with more reefers available and at more affordable rates. It needs to return to some sense of normalcy, and I especially hope our South Island growers and exporters who were more disadvantaged than others, get supported.

Last but no means least, **NO** new government primary sector reforms to be proposed please Jacinda and Damien, as our cup already overflows with what we have on the table now.

Thanks to all growers and members for working with and supporting HortNZ over the year. I hope you get some well-deserved time off the job to be with family and friends, relaxing and hopefully getting to enjoy the benefits of living in Aotearoa New Zealand.

Ngā mihi o te Kirihimete me te Tau Hou.

Unity and positivity in 2022

I have now been back in the horticulture industry for six months after being away for four years, albeit still in the food and fibre sector as part of the honey industry.

By Nadine Tunley : HortNZ Chief Executive

The horticulture industry is a lot more diverse than say the dairy or meat industries. We grow more than 100 different varieties of fruit and vegetable, up and down New Zealand, for domestic and/or export. Plus, growers are represented by more than 40 groups, including product groups and district associations, all of which are very clear that they advocate for growers' interests.

I often hear it said that working with Government is more difficult than it should be because so many different Government agencies are involved in one topic. Take water for example. There's the Ministry for the Environment and Ministry for Primary Industries, along with the Ministry for Business, Innovation and Employment and the Department of Internal Affairs – and that's just listing the biggest agencies.

But when I talk with Government, they equally say it is very difficult working with the horticulture industry, because we are diverse and there are many seemingly contradictory voices. When I have reflected on this past six months, it is discussion about the differences that I remember not discussion about common challenges, I am afraid.

Many of the conversations I am part of start with the differences not the similarities and often, we never get beyond the differences. There are exceptions, however, for example, biosecurity being a long-term example, and how we have come together to ensure continuation of the Recognised Seasonal Employer (RSE) scheme, despite the border situation, being more short term.

Unity is what we need more of if we are to influence the Government. That doesn't mean forgetting our differences but it does mean focusing on our similarities, of which there are many, so we can get traction with the Government, in terms of policy, regulation and funding.

We also need to be positive because that in turn will foster a positive reception. There are so many things about our industry that are positive and align with Government outcomes, for the environment as well as the economy, to say nothing of the health of New Zealanders.

The ORCHARDIST

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My last point is on perception. We need to be professional, lead by example, and be mindful of Government and public perception. Once again, there are many examples of how we do this well. For instance, how – as an essential industry – we have continued to grow while keeping us, our workers and the New Zealand public safe. That's been no mean feat and is something we can be very proud of.

Next year, I hope as an industry we can become more unified and make more use of what the Government is making available to us, in terms of support for innovation and problem solving. Yes, on the one hand the Government seems like a handbrake, but on the other, there is a genuine desire to support our industry and assist it to reach its potential, as we adapt to Covid and climate change.

Let's make 2022 the year for unity and positivity so we can leverage all the opportunities available to us!

Changes at New Zealand Apples and Pears

I would like to take this opportunity to farewell Alan Pollard and welcome Terry Meikle as the new Chief Executive of New Zealand Apples and Pears.

Alan has worked tirelessly to advocate for the apple and pear industry over the past ten years. I was fortunate enough to be Alan's first chairperson, when we set the strategy of "a billion dollars by 2022". At the time in 2012, we were a circa $320 million industry.

Apples and pears were the first sector to reach the Government's business growth agenda goal of doubling export value. This milestone was achieved in the 2016/17 season with $720 million and had it not been for the hail event in Nelson on Boxing Day 2020, apples and pears would have hit the billion this season, a year ahead of target.

There have been many other achievements during Alan's tenure, including bedding in the Recognised Seasonal Employer (RSE) programme, to the envy of many other sectors.

I would like to congratulate Alan on a fantastic decade and several outstanding achievements. As the horticulture industry, we wish you all the best in your next chapter. Thank you for your service and dedication.

HortNZ looks forward to working with Terry and his team to meet the challenges of the next ten years, to ensure continued growth in returns to apple and pear growers.

YOUR LEVY AT WORK

INDUSTRY WIDE ISSUES FOR INDUSTRY GOOD

Bountiful blueberries

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Natural resources and environment

By Michelle Sands : HortNZ environment manager

Wetland Guidance

Horticulture New Zealand has made a submission on the government's discussion document on Managing Wetlands. HortNZ generally supports the protection of natural wetlands of ecological value, and enhancement of those degraded natural wetlands that have identified ecological value.

Our submission made the following key points:

Definition of wetland

- Generally, HortNZ supports the definition and proposed amendments within the National Policy Statement for Freshwater Management (NPS-FM), but seeks that riparian margins with a functional purpose are included as constructed wetlands.
- HortNZ does not support the interpretation that constructed wetlands are deemed natural wetlands where they have not been maintained over time. HortNZ seeks that this be removed from the Minister for the Environment's (MfE) interpretation guidance.

Restoration, maintenance and biosecurity

- HortNZ supports provision of maintenance and biosecurity works as permitted activities, but seeks separate regulation that enables rapid response from the agricultural sector to unknown biosecurity incursions.

Additional pathways

- HortNZ seeks an additional Discretionary Activity pathway for vegetation clearance, earthworks or land disturbance associated with arable and horticultural land uses outside but within 10 metres of a natural wetland that meet specific criteria.

Greater Wellington Regional Plan

The Proposed Natural Resources Plan (PNRP) decision version was notified in 2019. Since then, appellants, interested parties and the Council have been working to resolve appeals, after which the plan will become fully operative.

The last outstanding appeals are almost resolved, meaning the plan will fully replace the previous regional plans. Through the appeal process, a new framework is being introduced to manage diffuse discharges when there are land use changes enabled by irrigation (through a consenting process) and a phased-in requirement for Farm Environment Plans or Freshwater Farm Plans in catchments most impacted by diffuse discharges. HortNZ will prepare a summary of the new requirements for growers.

Central Hawke's Bay District Plan

The Proposed Central Hawke's Bay District Plan was notified in May 2021 – HortNZ made a submission and a further submission. The key topics HortNZ has an interest in are ensuring Highly Productive Land is appropriately protected, that horticultural structures (such as artificial crop protection structures) are provided for in the rural environment to enable horticulture, that there are provisions which enable a timely biosecurity response and that rules for greenhouses are appropriate.

The next steps will be District Plan hearings of submission, this is expected to get underway in mid-March 2022.

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BIOSECURITY FEATURE

Biosecurity – The year in review 2021

The Covid-19 pandemic has made the general public much more aware of terms that were already familiar to those of us involved in horticulture, pest management and biosecurity.

By Anna Rathé : HortNZ biosecurity manager

Terms like transmission, quarantine, vectors, latent periods, slowing the spread and virulence.

Hopefully the whole nation (and world) experiencing a human health biosecurity event will help with better biosecurity understanding and behaviours from the public in the future – which will, in turn, help to protect the sector.

Whilst passenger numbers remain low, online shopping has boomed. E-commerce is an increasingly important pathway and with international packages comes biosecurity risk that needs to be managed carefully. Supply chain disruption has resulted in major delays with getting important goods and equipment into the country. Despite these challenging delays it is important to take the time to inspect any item from overseas carefully in an enclosed space before taking it out into the field or packhouse.

It is critical to keep up with what is happening with pests, diseases and weeds overseas. International experts have been kind enough to virtually share their knowledge and learnings with New Zealand scientists, industry and officials this year to help us better prepare. Examples include spotted lanternfly, which is present in Pennsylvania and brown marmorated stink bug perspectives from Chile, Italy and the US. We are also watching what is happening over the ditch in terms of emerging risks. Australia has recently seen the rapid spread of fall armyworm as well as detections of two types of leafminer and a shot-hole borer – all pests that we don't want to arrive here in New Zealand.

The usual focus on readiness has continued, with both government and industry recognising how important it is to use 'peace time' to get prepared for what may come. Collaborative readiness work has progressed for high-risk organisms such as fruit flies, brown marmorated stink bug, *Xylella fastidiosa* and Lepidoptera. Those in the biosecurity space are constantly working to reduce the risk of new organisms arriving and preparing for the incursions which do inevitably come. Whilst zero biosecurity risk might be nice, it simply is not realistic with trade, travel and natural wind and water currents; all of which can inadvertently bring pests and pathogens into our country despite New Zealand's strong biosecurity system.

> **"Hopefully the whole nation (and world) experiencing a human health biosecurity event will help with better biosecurity understanding and behaviours from the public in the future**

Unfortunately, responses have also featured this year, such as the pepino mosaic virus that the tomato sector and other Government Industry Agreement signatories have been responding to.

Feeding into government consultations has been a big focus in 2021 too, with HortNZ lodging more than ten submissions (and counting) in the biosecurity space. Topics ranged from border levies, to importation of plant germplasm, to pathogen testing and the need to provide biosecurity information to passengers on their way to New Zealand.

Biosecurity submissions were lodged with the Ministry for Primary Industries, Customs and the Primary Production Select Committee.

The biosecurity business pledge has gained significant momentum this year. The signatories now number over 100 and include a very diverse range of organisations spanning all parts of the supply chain. Signatory organisations have spent the year improving their own biosecurity practices and sharing their learnings along the way.

Looking forward into 2022, we'd like to encourage all growers to play your (very important) part in New Zealand's biosecurity system. You can do this by:

- Committing to the preparation of an on farm/orchard biosecurity plan. Guidance that steps you through how to prepare a plan is available from specific product groups and on the HortNZ website.
- Making yourself familiar with the most unwanted pests, pathogens and weeds for your crop(s).
- Downloading the find-a-pest app and reporting anything unusual. You can use the app or the MPI pest and disease hotline (0800 80 99 66) to report, whichever you prefer.
- Remaining vigilant when you open packages, mail or freight from overseas (including Christmas presents!). Unpack imported goods in an enclosed space and inspect them carefully for any unwanted hitchhikers. ●

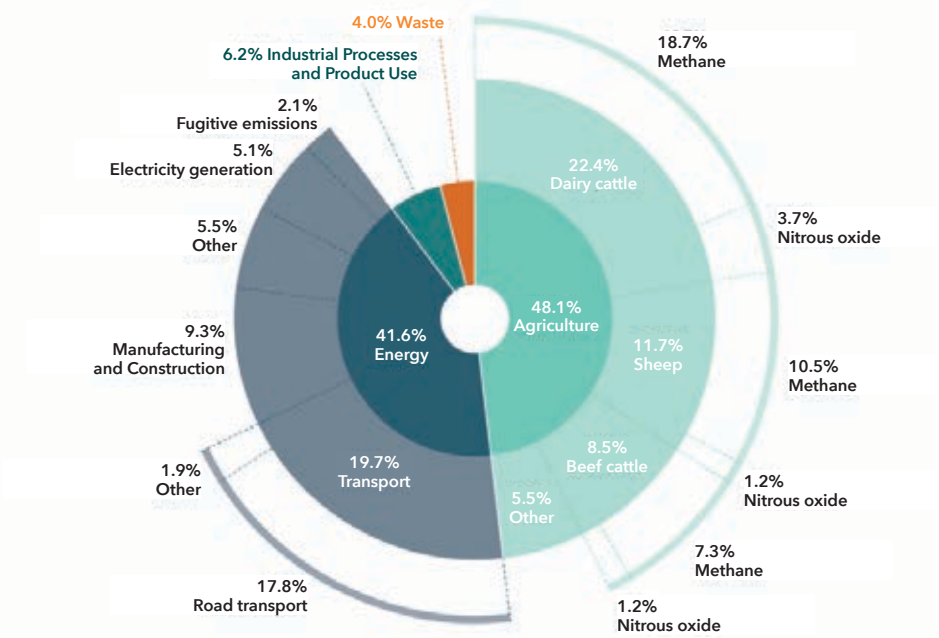


Image: Ministry for the Environment[1]

Putting a price on agricultural greenhouse gas emissions

The buildup of greenhouse gases (GHGs) in the Earth's atmosphere as a result of human activities is causing the Earth's climate to change.

By Ailsa Robertson : HortNZ sustainability and extension manager

These gases trap heat in the Earth's surface and warm the planet. Different GHGs have different lifetimes, with some short-lived gases present for a few years and some longer-lived gases present for thousands of years. GHGs accumulate in the atmosphere over time, with each year's emissions added to the preceding year's emissions.

New Zealand's share of global GHG emissions is small, but our gross emissions per person are high, remaining relatively unchanged since 2005. In 2019, New Zealand's gross GHG emissions were 82.3 million tonnes of carbon dioxide equivalent (Mt CO_2-e), comprising 45% carbon dioxide, 42% methane, 10% nitrous oxide and 2% fluorinated gases.

The figure above shows the breakdown of New Zealand's 2019 emissions by sector, sub-category, and gas type.

The agricultural sector is responsible for 48.1% of New Zealand's gross emissions. Within the agricultural sector, 22.4% of emissions are from dairy cattle, 11.7% are from sheep, 8.5% are from beef cattle, and the remaining 5.5% are from other sources. Nitrous oxide emission from the application of synthetic nitrogen fertiliser is part of the 'other', accounting for 2.8% of New Zealand's gross emissions, and 5.7% of New Zealand's agricultural GHG emissions.[2]

New Zealand has several domestic and international GHG emissions reduction targets.[3] Domestic targets under the Climate Change Response Act are:

- Net zero emissions (i.e. emissions are matched by removals) of all GHG other than biogenic methane by 2050, and
- 24 to 47% reduction below 2017 biogenic methane emissions by 2050, including 10% reduction below 2017 biogenic methane emissions by 2030.

He Waka Eke Noa – a partnership to reduce agricultural GHG emissions

New Zealand's agricultural GHG emissions aren't currently priced in the NZ Emissions Trading Scheme (ETS), whereas emissions from other sources, like fuel and electricity, are priced in the ETS.

He Waka Eke Noa is a partnership between primary sector, government and iwi/Māori to develop a system for measuring, managing, pricing and reducing agricultural GHG emissions, rather than simply putting farm products in the ETS.

He Waka Eke Noa is concerned with methane and nitrous oxide from animal emissions, and nitrous oxide from synthetic nitrogen fertiliser. *He Waka Eke Noa* is designing options for an alternative pricing system to the ETS for methane and nitrous oxide, and a process to recognise sequestration from a broader range of woody vegetation than is currently eligible for the ETS, such as native vegetation, shelterbelts and orchards.

A (methane) + **B** (nitrous oxide) - **C** (sequestration)

For growers that don't have animals, this means from 2025 there will be a price on synthetic nitrogen fertiliser emissions either at the farm level based on annual quantities applied, or for all fertiliser sold at the point of purchase, either the processor or fertiliser company.

There are two pricing options in addition to the 'backstop' default ETS option. The two alternatives are a farm-level levy or a hybrid-processor levy.

The *He Waka Eke Noa* partners, including Horticulture New Zealand, are planning engagement with farmers and growers in February 2022 on these pricing system options. Feedback from this engagement will form part of the final policy recommendations to the Minister of Climate Change and the Minister of Agriculture in April 2022.

The following table summarises the elements of each pricing system, followed by some examples of prices that growers could face based on the price of carbon in the ETS.

Pricing system options in *He Waka Eke Noa*

As the partner organisation representing horticulture in He Waka Eke Noa, HortNZ has remained relatively neutral on the three pricing options to date, so long as they do not disadvantage horticulture with disproportionate cost relative to emissions. We want to hear growers' views and feedback on these options when we go out for engagement in February 2022. ●

	'Backstop' ETS	Farm-level levy	Hybrid-Processor levy
Who pays the bill each year	Processor or fertiliser company	Individual grower or collective	Processor or fertiliser company or collective
Tax Type	Trading Scheme	Levy	Levy
Pricing: **1. Approach** **2. Setting** **3. Exposure**	1. Carbon Equivalent 2. ETS Market 3. Free Allocation – 95% in 2025 and 1% phase-out per year	1. Split Gas 2. Independent Body 3. To be determined	1. Split Gas 2. Independent Body 3. To be determined
Who reports	Processor or fertiliser company	Individual grower (landowner or business owner – to be determined)	Voluntary through an Emissions Management Contract
Farm Plan	No	GAP farm plan	Voluntary through an Emissions Management Contract
Sequestration	Earn units for ETS eligible forestry	Offset with *He Waka Eke Noa* eligible woody vegetation	Offset with *He Waka Eke Noa* eligible woody vegetation
Revenue invested back in R&D and technology	Yes		
Administrative cost to participate and operate the system (not including the cost of emissions) per annum	$10,000,000	$113,000,000	To be determined
Emission reduction achieved by 2030	1%	1%	1%

1. https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2019-snapshot/key-findings-of-the-2021-inventory/
2. http://flrc.massey.ac.nz/workshops/19/Manuscripts/Paper_Gibbs_2019.pdf
3. https://www.mfe.govt.nz/climate-change/climate-change-and-government/emissions-reduction-targets/about-our-emissions

YOUR INDUSTRY

ACROSS THE SECTOR — ACROSS THE COUNTRY

Espalier white roses line the road frontage to Golden View Orchard

Golden orchardist brings unique fruit to Kiwis

COVER STORY

With the word 'gold' as part of his last name, perhaps Katikati orchardist Paul Goldsmith was always destined to become the grower of a rare gold fruit.

By Elaine Fisher

Paul is one of a small number of New Zealand orchardists growing gold passionfruit, in his case, a special hybrid variety, *Passiflora edulis v. flavicarpa x edulis*, grown and bred in his orchard where he also grows blood oranges.

It has been a long and circuitous journey from Paul's boyhood days in what was then the rural town of Papakura. Paul held a successful 45-year career in hairdressing, including owning salons in New Zealand, Australia and the United Kingdom, until he later decided to spend his 'retirement' on a 1.5ha orchard in the foothills of the Kaimai Ranges near Katikati – but that too seems almost preordained.

"Papakura was a country town when I was young," Paul says. "We spent our time biking all over the place, in the summer swimming and playing in local rivers and waterfalls. My aunt and uncle had a dairy farm we used to holiday at. They had the usual farmer's home garden and fruit trees. I really enjoyed the time our family spent at that place.

"Those good memories and being here are like the bookends to my life. I wanted to spend my later years living a healthy, relaxing life in the country and I really wanted the challenge of doing something I'd never done before."

However, choosing to be a passionfruit and citrus grower and becoming owner, manager and sole full-time staff member hasn't exactly been relaxing.

"People ask me what it's like growing passionfruit, on what some consider a hobby orchard, and I think a lot of growers would be familiar with that feeling."

Paul grows half a hectare of passionfruit vines under shelter on his property and a quarter of a hectare

1 *Golden View Orchard near Katikati grows three varieties of blood oranges*

2 *Special black liners and tray design highlight the colour of Golden View Orchard's unique golden passionfruit*

3 *Ants on a gold passionfruit flower are among the pollinators in Paul Goldsmith's orchard*

of blood oranges. He bought the property four years ago from Rob and Rosaleen Peden, who, with their son Clint, took 15 years to develop the orchard from bare land.

It was the Pedens who discovered the gold passionfruit almost by accident. Rob was given a yellow passionfruit vine grafted onto a standard purple rootstock and he was going to remove the graft when he decided to let it grow to see what happened.

"Yellow passionfruit (Panama Gold) were generally regarded as feeble plants not suitable as a commercial variety," says Paul. "However, the plant Rob grew proved to be as good as any purple variety, very strong and vigorous with fruit of a good size.

"Over a period of ten years, Rob swung 80% of the original standard purple passionfruit orchard over to this special new hybrid variety of gold passionfruit vines, all grown from cuttings, not seeds."

To complement their passionfruit vines, the Pedens also planted three varieties of blood orange, Tarocco native to Italy, Sanguinello native to Spain, and Moro, the newest variety of the three.

"They take three to four years to mature, so the previous owners didn't get to harvest many fruit before I bought the orchard."

The combination of two quite unique fruit offerings was among the reasons Paul decided to buy the property he has named Golden View Orchard – for the gold passionfruit and the stunning views across the Bay of Plenty – and perhaps a nod to his family name too.

"I knew absolutely nothing about horticulture, in fact I was clueless, so before I took over, I travelled from Auckland and back one day a week for two to three months so the Pedens could teach me as much as they could. Even after they moved to Morrinsville, as agreed, they came back to help me from time to time for the following year.

"There was still so much I didn't know, and in the beginning I didn't know I didn't know. Now after four years I reckon I've served my apprenticeship and feel like maybe I just about know what I'm doing.

"Most of what I've learnt has come from other passionfruit growers. I've had a lot of help from a number of clever growers who have regularly and happily given me their valuable time and knowledge, which has enabled me to continue making a success of my orchard.

"Because passionfruit orchardists are a small group within New Zealand horticulture, there is probably more camaraderie and cooperation between the growers, and there's always plenty of opportunities for new growers to come on board."

Paul has also learnt how to manage his 120 blood orange trees, most of which are around seven years old. Like the passionfruit, they receive fertigation through the orchard irrigation system, plus side dressings of fertiliser, based on the results of regular leaf and soil testing.

> **"I've had a lot of help from a number of clever growers who have regularly and happily given me their valuable time and knowledge**

"Pruning citrus trees is tricky because they have both blossom and fruit at the time when they need pruning." The trees are kept compact, pruned to a chalice shape, open in the middle to let in light and air movement.

"The Sanguinello fruit has a red skin and a reasonable amount of red pulp, and is the only one of the three which has seeds. The trees don't need a lot of pruning as they do not grow very big, though they certainly produce a lot of fruit.

"Tarocco grows the biggest fruit of the three varieties, with beautiful tasting pulp which makes the best juice and are fantastic to eat. But in New Zealand's growing conditions, it is very hard to produce the red colour in the

skin. People who don't like standard oranges generally love Tarocco.

"Moro are a medium size tree and the fruit has a red skin colouring and a really good red pulp inside. Quite good to have some of these around at Halloween time."

Covid-19 brought about the biggest changes to the orchard's operation during the last two seasons, as it has for so many New Zealand horticulturalists.

"Previously all the gold passionfruit grown here was exported, by air, to the United States. None were sold on the New Zealand market. However, due to Covid few planes were flying, and exporters had very limited and expensive freight space. So, like a lot of other businesses, I joined a number of growers going into online selling."

Paul sells his blood oranges through Bay Tropics and his hybrid gold passionfruit through Freshstore. Both are New Zealand owned, independent companies which specialise in online home deliveries of fresh, in-season fruit from local growers.

It's a system which has worked so well for Paul he no longer deals with exporters and he's delighted that New Zealanders get to enjoy his gold passionfruit.

The gold vines require the same treatment as purple vines, and at Golden View Orchard they are grown on a Y-shaped system with leaders trained along several wires.

"Passionfruit are in their prime between three to six years," Paul says. "Some die in six months, some four to five years later, but I have some which are 12 years old and still producing."

Passionfruit vines growing outdoors are usually pruned during September and October. If all goes well, particularly with the weather, a few weeks later blossoms start to open. In Paul's orchard, that means the pure white blossoms on the gold vines, and white blossoms ringed with purple on the purple vines, are all being pollinated by ants and bees.

"It can be a bit like a bee highway in here on a good day. Even though I don't bring in beehives I get around 90% pollination. I have been surprised to discover that ants also pollinate the passionfruit, and these guys are working even when its wet and windy and the bees are laid up in their hives."

Knowing the older vines could die at any time, Paul has planted young vines between mature ones to ensure succession. Each vine is initially protected from the mechanical weed eater, nibbling rabbits, slugs and snails, by a perforated pipe collar. Once the vines are established, these are removed or raised up to allow air to circulate, reducing damp and the risk of fungal disease.

Paul doesn't use much in the way of herbicides or pesticides.

"I believe this orchard has a good naturally occurring balance of predators and pests. Where it's located, I reckon the wind pretty much blows away a lot of pests."

He is also scrupulous about orchard hygiene, which helps reduce the risk of disease.

The previous owners paid attention to every detail, including constructing a purpose-built packhouse and this year Paul has installed a small chiller next door, not to prolong or ripen fruit, but to help bring out the gold colour of his special passionfruit and the red skin of his blood oranges.

"I discovered that the colour develops at cooler temperatures, and another thing about the gold passionfruit, it doesn't wrinkle as quickly or mark as easily as the purple passionfruit."

Although he's the only commercial grower in New Zealand, Paul isn't precious about his special gold variety. "I would like others to grow it so volumes and public awareness increase."

It's a matter of pride for Paul that he keeps the entire property, citrus and passionfruit orchard and the extensive home garden orchard to the same high standards of maintenance and hygiene that the previous owners did. "My goal is, with some minor improvements, to keep it as it was because of the unique fruit which grow here. I also think it's the smart way to run a business and protect my investment in this property.

"It's just so nice here I want to keep it that way."

Paul Goldsmith of Golden View Orchard near Katikati is New Zealand's only commercial grower of gold passionfruit

REGIONAL ROUNDUP

Some vegetable crops were planted later because it was too wet to prepare soil

Market demand remains strong despite a turbulent growing season for Nelson

The challenges came thick and fast for Nelson growers through the year as weather, labour, Covid-19 associated effects and shipping all made it harder to produce a good crop, get it harvested and off to market.

By Anne Hardie

The year began with many growers across a variety of crops counting their losses after the Motueka hailstorm, then the bittersweet irony of needing less labour for the lower crop volumes. On a more positive note, hail-damaged fruit prompted innovation with the likes of Golden Bay Fruit's Stormy Fruit brand, Chia Sisters' pear juice and Mad Melon's diversification into apple juice, to name a few.

Getting export fruit to market was the next battle – a battle experienced around the country but doubly so in Nelson where fewer ships called into the port and a shortage of containers was followed by delays for shipments getting to markets.

FreshCo Nelson South Island regional manager, Grant Osmond, says a shipment usually takes seven weeks to get apples to Europe but that was pushed out to 11 or 12 weeks as ships worked their way through congested ports en route due to Covid-19 restrictions. Grant is not expecting it to get any better next year and anticipates shipping costs will increase by 100% on this year. Shipping lines that have been losing money over the years due to the sheer number of ships on the water are lifting prices dramatically now they have less competition, he says.

Parts of the region had 2.5 times the five-year-average rainfall through that period, creating ground issues for machinery and affecting pollination and fruit set in places

The soil tells the story of Tasman's wet spring

It is going to be a significant challenge again for apples next year, Grant says. One option under consideration is refrigerated charter ships that take bulk pallets rather than containers. It would be "hellishly expensive" and daunting logistics once the ships reach their destination and pallets have to be unloaded, then transported to other parts of Europe. He says growers are aware of the increasing shipping costs they face.

On the labour front, Freshco Nelson's general manager, Peter O'Sullivan, says labour incentives worked well to attract and maintain a crew through the season and they were finally able to get many of its Recognised Seasonal Employer (RSE) scheme workers back home. He is hopeful the industry will get back to its pre-Covid-19 RSE levels next year but worries about less Working Holiday Visa workers and the very low unemployment rates in New Zealand. Especially now Australia has opened the border for workers to go there.

Motueka Fruitgrowers Association chairman, Richard Clarkson, reiterated those labour concerns and says there is still no certainty about bringing RSE workers in easily because of Covid-19. There are also those RSE workers on apple orchards now who still need to be repatriated.

Richard says growers will also have the added pressure of dealing with vaccinated versus unvaccinated staff, or the possibility of enforcing a vaccine mandate.

Many growers have experienced the ongoing effects from the Boxing Day hailstorm and Mother Nature tossed them a wet winter and spring as well. Richard says parts of the region had 2.5 times the five-year-average rainfall through that period, creating ground issues for machinery and affecting pollination and fruit set in places. Early apple varieties such as Jazz and Braeburn were particularly hard hit, while Royal Gala on the other hand, has had a heavy fruit set. Despite a lower fruit set on some varieties and

Harvesting lettuces which were grown through the wet period

Nelson-based company, Chia Sisters, made the most of a bad situation, using hail-damaged fruit to produce their pear juice

hail-damaged trees producing less flowers, he says the region looks like it has a good crop out there.

Kiwifruit is also shaping up to have a good crop on the vines after warm, sunny weather through pollination and a better than expected result on blocks of severely hail-damaged vines.

Mainland Kiwi's chairman, Evan Baigent, says last year's hailstorm destroyed 2.3 million trays of the region's gold kiwifruit – nearly half of its total kiwifruit crop – and then growers struggled with a cool summer for the remaining fruit. It meant harvest was dragged out as growers waited for the dry matter content to increase and some couldn't pack their smaller-sized fruit.

Though many growers will not have a full crop this season on hail-damaged blocks, he says the overall crop is pleasing considering the level of damage.

Due to the hail, labour wasn't the expected issue this year, but Evan says there are concerns going into this next season. Even though some RSE workers are coming into New Zealand, there is still a lack of travellers with Working Holiday Visas. That combined with record-low unemployment levels, plus increasing production from a range of horticulture crops – it seems the labour shortage will likely persist.

On the O'Connors' family-owned market garden near Nelson, the soil tells the story of the wet spring, but co-owner Mark O'Connor is philosophical about its effect on loss of production and the late start for planting other crops.

Unpredictable weather is a familiar challenge for growers; the greater challenges today, he says, are labour, environmental issues, Covid-19 and now Three Waters which could take over governance of the Waimea Community Dam that is expected to be completed next year.

For the first time in Mark's 22 years as a market gardener, he has struggled to find staff this year. The business employs about 50 permanent employees including many from the local Thai, Myanmar and Vietnamese communities. Staff numbers swell to 100 at the height of the growing season. In the past, seasonal workers have been predominantly international travellers with Working Holiday Visas (WHV), plus a sprinkling of university students and Kiwi travellers.

As price takers, he says market gardeners cannot compete with other jobs luring the dwindling numbers of WHV workers or the local job market. Wages are the single biggest cost for the business, but fertiliser costs have increased significantly, and he says fuel has nearly doubled in price since April last year.

Weather has also been an issue for the region's boysenberries, beginning with the Boxing Day hailstorm that destroyed crops in the Moutere in the middle of harvest, while wind and rain took its toll across the region during the brief harvest.

> **"Climatic issues have plagued crops around the world ... that has pushed up demand**

Boysenberries New Zealand managing director Julian Raine says just two-thirds of the crop was harvested last summer and he describes it as the worst outcome in his 40 years growing the berry.

On the plus side, the weather was good for pollination this season and he says the market is crying out for fruit. The grower-owned co-operative has had requests for 1,000 tonnes of boysenberries from the United States alone, which usually sources fruit from its own domestic supply and from Chile. Climatic issues have plagued crops around the world and he says that has pushed up demand.

At the same time, Covid-19 has prompted people around the globe to seek all types of berries for their health benefits. Ideally, Julian would like 50ha to 100ha planted in boysenberries straight away to meet the increased demand.

"There are a lot of markets crying out for fruit," Julian says. ●

Working together into 2022

By Ray Smith : MPI director-general

I'd like to extend a heartfelt thanks to the horticulture sector for your continued efforts to supply nutritious produce across New Zealand and overseas, contributing significantly to export revenue, and keeping your families, staff and communities safe from Covid-19.

I'd also like to acknowledge Horticulture New Zealand's ongoing commitment towards supporting the sector and working with the Ministry for Primary Industries (MPI) to help navigate the challenges presented by the pandemic, such as integrating Covid-19 measures into work practises and addressing workforce matters.

As you will know, the food and fibre sector is leading the charge in New Zealand's economic recovery from Covid-19 – and the horticulture sector continues to play a vital role in these efforts.

Last year we launched the *Fit for a Better World* roadmap to accelerate New Zealand's economic recovery by boosting productivity, value, sustainability and jobs. For the horticulture sector, this roadmap recognises the opportunity to sustainably grow sector export revenue by $2.6 billion over the next ten years.

Despite Covid-19, the sector continues to meet demand for high-quality, delicious and nutritious produce. We are seeing strong demand for our fresh fruit and vegetables as consumers turn to healthy food options, based on strong environmental credentials. But new growth will require innovation and the development of new products and varieties.

Fit for a Better World contains some clear priorities for horticulture, such as new plant varieties, water storage and market access. At MPI we are committed to supporting this work, including through our Sustainable Food and Fibre Futures fund.

This includes our support to the $27 million *A Lighter Touch* programme, which aims to shift our horticulture sector to more biological and ecological processes. The goal is to meet consumer demands for food produced through more sustainable pest management practices.

We have also backed the horticulture sector through our *Opportunity Grows Here* campaign to attract New Zealanders to primary sector jobs, careers and training.

> **Despite Covid-19, the sector continues to meet demand for high-quality, delicious and nutritious produce**

Ray Smith, MPI director-general

Outside these flagship projects there is a significant amount of other work underway to grow the horticulture sector. This includes development of the *Horticulture Action Plan*.

At the heart of this Action Plan is ensuring government and industry take a coordinated approach towards the future of horticulture in New Zealand. It will create a clear vision for future growth of the sector and identify a series of shared priorities that will make a difference.

It will also identify areas of alignment between government, industry, Māori and science, and help to coordinate policy, investment and science priorities and programmes. Importantly, it will result in clear and actionable implementation and investment plans to grow both value and volume.

Looking to 2022, I'm excited by the opportunity that a focused strategy could bring for New Zealand's horticulture sector and our wider recovery from Covid-19. MPI is committed to supporting the horticulture sector in 2022 and beyond.

Judging by the past two years, 2022 will also present Covid-related challenges, but I am delighted at the sector's resilience and confident we will continue to work well together to overcome obstacles.

For that reason – and for the health of yourself, your whānau and friends, workmates and the wider community – I strongly recommend getting double-jabbed with the vaccine. It is a key tool in New Zealand's quest for life to return to the way we want it.

Finally, I'd like to wish you all a safe and enjoyable Christmas and a successful New Year.

Graphic showing tonnes of nitrous oxide emissions from Woodhaven Gardens, 2017–2020

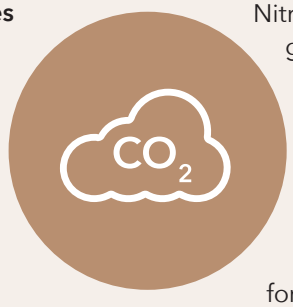
A grower's story, how the Clarkes are getting to grips with GHG emissions

Woodhaven Gardens in the Horowhenua has been figuring out how to reduce their impact on the climate.

By Ailsa Robertson : HortNZ sustainability and extension manager

The Clarke family has been growing vegetables since the 1970s, growing 24 different crops across approximately 900 hectares. Woodhaven employs around 250 staff and sells 27 million individual vegetable units each year, accounting for about 10% of the national supply.

"In order to understand our environmental impact, we've had to get to know all of our paddocks individually," says Jay Clarke. Their journey to understanding their emissions began when they were looking at ways to reduce nutrient leaching to freshwater.



Nitrous oxide is a potent and long-lived greenhouse gas that comes from a range of sources, including farming. In agriculture, it is emitted into the atmosphere when micro-organisms in the soil act on nitrogen introduced either by animal urine or dung, legume plants or nitrogen-based fertilisers.

"Figuring that out was actually really helpful for us because it meant we were getting a two-pronged approach," says Jay. "We were already looking at nitrogen for freshwater quality. By tackling that, we've also been able to lower our greenhouse gas emissions."

In 2019–20, Woodhaven Gardens emitted 588 tonnes of nitrous oxide, expressed as 'carbon dioxide-equivalent' – just under half what they emitted two years prior, and the equivalent of taking over 300 cars off the road.

> **In order to understand our environmental impact, we've had to get to know all of our paddocks individually**

Carbon dioxide equivalent describes the amount of carbon dioxide emissions that would provide the same warming effect over a specified period of time as the gas in question, in this case nitrous oxide.

On-farm actions

The team at Woodhaven Gardens works hard to produce the most amount of food for the least amount of fertiliser. Here are the main things they've been doing to manage their nitrogen use:

- Tractor in a ploughed paddock with a planting unit on the back planting the next crop.
- Developed expertise in the crops they grow – understanding each one's growth cycle and fertiliser requirements.
- Regular soil testing (via a Nitrate Quick test) to find out how much nitrogen is already in the root zone.
- Investment in precision agriculture systems to ensure fertiliser is applied exactly where it is needed and tight to the root zone, at the right rate and the right time.

"We GPS'ed our tractors so we know that our inputs go exactly where we want them to, and we don't get fertiliser in the parts of the farm that don't need it," says Jay.

The Clarkes also pay attention to the health of their soil, using crop rotation and cover crops to further minimise the need for fertiliser.

"I never thought we'd get as far as this," says Jay. "But by changing a whole lot of little things, and being willing to try different things, we've been able to add it all up and have a major impact. It's something we're really proud of."

> **...by changing a whole lot of little things, and being willing to try different things, we've been able to add it all up and have a major impact**

Jay says they are continuing to learn as they go and there are still parts of the system that need work, including monitoring whether the new, lower levels of fertiliser are sustainable across all seasons in the longer term.

REGIONAL ROUNDUP

Big crops and big challenges for Bay of Plenty growers

The Bay of Plenty's three major fruit growing industries, kiwifruit, avocado and blueberries, all produced record crops in 2021 but also faced the challenges of labour shortages and the impacts of Covid-19.

By Elaine Fisher

Chairman of New Zealand Kiwifruit Growers Inc (NZKGI), Mark Mayston, says successfully harvesting and packing fruit during the season, which produced an estimated record 177 million export trays, was a remarkable effort and a tribute to all involved given the challenges of labour and Covid-19.

A higher than usual rate of absenteeism was identified in the workplace during the 2021 harvest and was a major concern. Mark says NZKGI has been carrying out surveys to understand the workforce, what hours people want to work and how the industry can meet their needs.

"It seems that wage rates have increased to the point where some people are only working three-quarters of the time they used to, to earn the money they need. It was thought that by paying more, productivity would increase, but that's not true in all cases.

NZKGI has been carrying out surveys to understand the workforce, what hours people want to work and how the industry can meet their needs

"NZKGI spends a lot of time and money on employment. The $100,000 labour attraction campaign we run annually is our biggest spend and the programme starts again shortly to encourage New Zealanders to come and work for us."

The industry is fortunate that Zespri charters its own ships, but even so, some vessels have experienced lengthy delays waiting to berth and discharge fruit.

"So far there have been few fruit quality issues in the markets which is a credit to the work of the post-harvest sector," says Mark.

A highlight of 2021 for NZKGI was the strong support from growers for its levy to increase from 1 cent a tray to 1.1 cents, which Mark says is a vote of confidence that the organisation is working hard for growers, including continually monitoring the performance of Zespri.

BerryCo general manager, Alice Moore, says the 2021 harvest of blueberries was up 70% by mid-November. About 80ha of blueberry crops are grown by 30 growers in the Bay of Plenty, the far North and Motueka.

Harvest, which ends just after Christmas, started early this season.

"An extended period of cloudy weather, high humidity and mild night temperatures, quickly followed by hot weather, amplified the movement of the berries into harvest," Alice says. "More fruit coming through at the same time created challenges as picking berries is very labour intensive."

BerryCo's quality standards require fruit to be coolstored within 20 to 30 minutes of being picked, which means growers need a facility on their orchard and enough staff to meet that timeframe.

Export fruit is sent by airfreight to Vietnam, Thailand, Taiwan and Singapore and other smaller markets in Malaysia and Indonesia.

...the 2021 harvest of blueberries was up 70% by mid-November

In October 2021 BerryCo launched 'Blue Royal', a new premium brand offering high quality super-sized and super-tasty locally grown blueberries to New Zealanders and export markets.

NZ Avocado chief executive, Jen Scoular, says market conditions in 2021 have been very challenging with high levels of supply in New Zealand's largest export market, Australia.

"Western Australia, which has a similar seasonality to New Zealand, is forecasting an 8 million tray harvest compared to 2.5 million trays last season," Jen says. "The very long lockdowns in Australia have slowed demand, cut out food service and there were some bad Covid-19 outbreaks impacting people working in the fruit markets, all of which contributed to a sluggish market.

"Demand for New Zealand avocados is good in Asian markets, however ongoing freight and logistics disruption increases the risks of avocados from New Zealand arriving in non-saleable condition."

Nearly two million trays of New Zealand avocados are forecast for export to Asia this season, up from 535,000 trays last season.

The New Zealand market is currently under immense supply pressure with weekly volumes harvested for local market 50–75% higher than last season.

Global shipping disruption is expected to continue at some level for the next couple of years, Jen says. Australian avocado supply is forecast to continue to increase dramatically over the next five years with some estimates stating that 50% of the planted hectares of avocados in Australia are still yet to reach maturity and produce a crop.

Nearly two million trays of New Zealand avocados are forecast for export to Asia this season

On the plus side, Jen says lower retail prices of avocados this season will attract new consumers to the avocado category in New Zealand, which will help grow demand.

Record export volumes to Asia are helping to increase New Zealand's avocado presence in markets of future importance such as China, South Korea, India and Taiwan.

NZGAP year in review

It has been another challenging yet successful year for the New Zealand Good Agricultural Practice (NZGAP) scheme where we have continued the recognition, development and improvement of our integrated certification system.

By Damien Farrelly : NZGAP manager

The system provides growers assurance for the safe and sustainable production of fruit and vegetables in New Zealand.

Strategy

This year NZGAP embarked on a strategic review to help establish the future direction of the scheme, to ensure that NZGAP continues to service existing certificate holders and to pursue emerging needs and opportunities.
Key considerations for the review were:

- The long-term vision and purpose of NZGAP
- Future scope of certification (i.e., what range of crops and products)
- Future scope of standards (i.e., Food Safety, Social Practice, Environment)
- Understanding future certification needs and drivers for members and stakeholders.

Extensive stakeholder consultation was involved in the review, with all feedback collated by Primary Purpose for consideration by the NZGAP committee. Lockdowns have hindered workshops and delayed drafting of the new strategy, but the draft will be shared with key stakeholders in the new year for consultation before it is finalised and launched.

Global Food Safety Initiative (GFSI)

NZGAP will soon commence the process for attaining GFSI recognition which is increasingly becoming a retailer requirement of GAP schemes worldwide. GFSI is an organisation run by the Consumer Goods Forum which benchmarks and recognises GAP standards so that grower certification can be accepted by retailers (e.g., GLOBALG.A.P.). The project will commence before the end of 2021, and it will take until September 2022 to complete

the benchmarking, consultation, trialling, assessment and recognition process. From that point onwards, growers will be able to attain certification to the GFSI recognised NZGAP standard. Many markets are already requiring GFSI, so NZGAP and stakeholders are negotiating on a transitional phase to allow time for recognition and grower certification.

> **The 'NZGAP Remote' module enables off-site audit (record checks) and remote audits (interview and visual evidence of implementation), to ensure the continued credibility in certification where on-site audits were not possible**

NZGAP remote

With the unfortunate return of lockdowns, NZGAP has had to reinstate processes for remote auditing and certification. The 'NZGAP Remote' module enables off-site audit (record checks) and remote audits (interview and visual evidence of implementation), to ensure the continued credibility in certification where on-site audits were not possible. The module also enables blended audits under Alert Level 2, which are a combination of off-site (record checks) and on-site audits (interview and visual evidence of implementation). Like in 2020, registrations and certifications were also processed remotely, so growers could continue to produce and supply to market while operating as an essential service during lockdown.

GLOBALG.A.P.

GLOBALG.A.P. is currently undertaking a major review of the standard for fruit and vegetables and the GLOBALG.A.P. Risk Assessment for Social Practice (GRASP). NZGAP has provided feedback on the development of version 6 via the New Zealand GLOBALG.A.P. National Technical Working Group. Once version 6 has been finalised, NZGAP can commence benchmarking of NZGAP GLOBALG.A.P. Equivalent so it maintains recognition. The new standards for GLOBALG.A.P. and GRASP are in the final stages of development and will be finalised in mid-2022, then implemented by growers in early 2023.

Food Act add-on

New Zealand Food Safety has renewed recognition of NZGAP (and GLOBALG.A.P.) under the Food Act 2014. NZGAP GLOBALG.A.P. Equivalent has also been added as a recognised standard. Continued recognition of the GAP standards is another major milestone in the development

and delivery of an integrated assurance system that is effective and efficient for growers, while delivering on the outcome of producing safe and suitable food under the Food Act 2014.

NZGAP has been working with growers to renew over 1,600 registrations for the Food Act this year. Registration has to be renewed every two years, and this seamless process has saved growers a lot of administration and over $270,000 in direct costs.

NZGAP has also been collaborating with industry, the GLOBALG.A.P. working group and New Zealand Food Safety, to review and improve the implementation of Food Act via GAP schemes, with a particular focus on auditor training and oversight. This collaborative approach has been successful in making several improvements to the system which will ultimately benefit growers and lead to better food safety outcomes for consumers.

Environment Management System (EMS) add-on

Uptake of the Environment Management System was greatly increased this year with an additional 16,500 hectares registering for certification. It has generally been a proactive approach from growers with the support of Horticulture New Zealand, district associations and product groups which are preparing for impending Freshwater Farm Plan regulations. Uptake has been driven by regulations in Gisborne / Tairāwhiti, for example, where vegetable and cropping growers are now required to develop a Farm Environment Plan (FEP) and establish setbacks or soil loss mitigations along waterways.

> **An additional 16,500 hectares registered for certification this year**

NZGAP is intending for the EMS to be recognised as a pathway for growers to meet upcoming regulations for Freshwater Farm Plans. The Ministry for the Environment consulted publicly on Freshwater Farm Plans earlier this year, so NZGAP prepared a submission in support of the HortNZ submission to enable growers to develop and implement Freshwater Farm Plans using the industry assurance programmes. However, the proposed framework and assurance processes are not currently well aligned with GAP. As a result, NZGAP has proposed an alternative pathway, which recognises the existing GAP framework and standards like the EMS add-on which is a robust and credible system which is already being adopted by growers across New Zealand. Draft regulations are expected in early 2022 so there will be some clarity soon on whether the EMS can be nationally recognised as a relevant, credible and integrated compliance pathway for growers.

The EMS has also attained 'conditional approval' for *He Waka Eke Noa* as a pathway for growers to measure and manage their nitrous oxide emissions from fertiliser use. Minor development is required to the EMS within the next year to attain an 'approved' status. This development can commence in mid-2022 when there is clarity in policy on the long-term options for measuring and managing agricultural emissions. In the interim, HortNZ will engage with large growers (those with over 80 hectares) to measure and manage their nitrous oxide emissions to meet current *He Waka Eke Noa* commitments.

Social Practice add-on

Over 200 additional growers have registered for the Social Practice add-on this year. Audits and certifications have been rolled out since version 2.0 was launched in November 2020, with 23 certificates issued so far despite lockdown disruptions. Registered businesses can expect Social Practice to be audited as part of their next NZGAP audit.

The priority for 2022 will be to attain recognition of the Social Practice add-on in international markets which sometimes require a Sedex Members Ethical Trade Audit (SMETA), which is not practical or affordable for growers.

Contractor Standard

There are now 20 contractors registered for the NZGAP Contractor Standard and six have been certified so far. This standard has been developed specifically for contractors providing services to NZGAP, Social Practice add-on, GLOBALG.A.P. and GRASP certified growers or supply chain operators. It is not a NZGAP requirement for growers to use certified contractors, but is demanded for some sectors and markets.

The aim of the contractor standard is to reduce the burden of growers having to check a contractor's compliance to Social Practice requirement themselves and enable them to check the status of contractors on the new NZGAP public register for contractors (e.g., those registered, approved, suspended, cancelled).

Looking forward to 2022, there is likely significant development needed to attain recognition for GFSI and Freshwater Farm Plans. NZGAP is looking to better integrate standards and processes for add-ons too, while also using tools and technology to minimise the compliance burden for growers. ●

Check the website or contact us for more information: **www.nzgap.co.nz**

E: **info@nzgap.co.nz** Ph: **04 470 5867**

Amy Miller (left) and Tanya Pouwhare

'Tornado twins' take RSE scheme by storm

Once you have met the tornado twins, you will never forget them.

By Glenys Christian

Horticulture New Zealand's events manager, Amy Miller, and chair of New Zealand Ethical Employers, Tanya Pouwhare, are the duo who have worked tirelessly behind the scenes to ensure seasonal workers from the Pacific Islands could continue to travel to New Zealand for work despite a worldwide pandemic.

In the space of just four months, the pair have coordinated eight flights, bringing more than 1,500 Recognised Seasonal Employer (RSE) scheme workers into the country once border exemptions were in place. Amy concentrates on Managed Isolation and Quarantine (MIQ), flights and internal travel while Tanya, who is an employer herself, liaises with employers and Pacific Labour Sending Units bringing RSE workers in.

Their efforts were equally fundamental in the successful execution of the one-way Quarantine Free Travel (QFT) scheme approved on 10 September, which facilitated a much-needed influx of RSE workers from Tonga, Samoa and Vanuatu, without the need to pass through MIQ.

"The RSE workers were coming from Covid free countries, meaning they could bypass MIQ and make valuable MIQ spaces available to others." Amy says.

What seemed like a simple process in the public eye involved a great deal of detail.

"We dealt with a myriad of different government departments," says Tanya. "Along with travel agents from World Travellers in Motueka, we collaborated with international airports, two MIQ facilities, labour sending units in the Pacific and employers just to get the workers to the growing operations where they were so desperately required.

"With such a myriad of stakeholders involved, it was a 24/7 job with a lot of moving parts."

One of the RSE worker groups travelling from Vanuatu

Before the border exemption was in place, no RSE worker from the Pacific was permitted to come to New Zealand due to Covid-19 restrictions.

"It doesn't seem like a long time, but the beginning of the year was an anxious period for employers who weren't sure whether they would have the labour they needed for harvest," Tanya says. "In the workers' case, it was a matter of these warm hearts wanting to be here working, so they could support their families by sending much needed money home."

Tanya and Amy say the opportunity for industry to sit down with Immigration minister, Kris Faafoi, every two weeks was invaluable, as was former HortNZ chief executive Mike Chapman's involvement and confident leadership.

"The minister is extremely engaged and open, he understood our pain points. Without his push we wouldn't have been able to do it," says Tanya.

For each flight, Tanya and Amy had just a seven-week timeline to gather over 40 pieces of data per worker. This included allocation of flights, gathering Approval To Recruit (ATR) details, gathering visa and passport numbers, full medicals, police checks, vaccination details and room pairing preferences and then teeing up where they would be placed for work in New Zealand. All that before those workers could even step onto a plane bound for New Zealand.

"It was a huge task," says Amy. "In one instance, 85 of the soon to be departing workers didn't have the required chest x-ray. We had to phone the New Zealand High Commission in Port Vila to help organise an emergency clinic at the health centre on a Saturday.

"Every worker's passport also needed to be scanned but achieving that was a challenge in itself, as not every office on those islands has a scanner."

Landing schedules were tight, with MIQ providing a rigid window of 9am to 3pm to land the flights.

"It sounds simple, but when you're in the midst of a pandemic those landing slots simply aren't available," says Amy. "Three scheduled flights needed to be deferred indefinitely to allow space in MIQ for the evacuation of New Zealanders from Afghanistan.

"With growers having paid $8,000 each for the workers to come, excluding the cost of the flights, it was a tense time."

Having some flexibility to ensure emergency spaces were made available gained the horticulture industry some valuable Brownie points with government, says Amy. The trust government invested in the industry's MIQ scheme served as a trial run for the new, shorter MIQ stays for all arrivals which were announced recently.

"We are both very passionate people that think broadly, so we were able to work all those things out," she says.

"The people and their welfare were at the forefront of our minds the whole time" says Amy. From dealing with workers' difficult personal circumstances, to working with Pacific Island Liaison representatives and providing warm clothing – it was all part of the role.

Looking back, they agree they spent a "freakish" amount of time collaborating and communicating.

"We are both mums with busy schedules so have restricted time in our offices, and somehow managed to juggle all that and working remotely during a pandemic," Tanya says.

The duo spent hours emailing and texting one another, timetabling Zoom meetings and spending a lot of time on their phones working with employers, officials, government stakeholders and other invested parties, until they sensibly imposed an 8pm curfew.

"At one stage we did a tag team, working different hours throughout the day to cover everything" Amy says. "We were good support for each other."

Thinking back to where we started and what we have both achieved, it is pretty amazing. It took a great deal of effort, collaboration and commitment from all involved, but we got there.

"The RSE scheme has been a win-win. For growers on the field in New Zealand, to the people in the Pacific, their families and both our economies – we have all benefited."

Ibis Hotel Hamilton staff receiving a painting created by RSE worker Maxson Foethao (below)

Another of Maxson's paintings that was gifted to Ibis hotel

Plenty of hospitality at RSE worker hāngi

There was plenty of manaakitanga (hospitality) extended to the 147 Recognised Seasonal Employer (RSE) workers from the Solomon Islands as they completed their stay in Managed Isolation and Quarantine (MIQ) on Friday 12 November.

Workers were treated to a New Zealand hāngi, known as 'motu' in the Solomon Islands, organised by Ibis Tainui, Jet Park Hamilton and the Waikato MIQ Pou Tiaki (wellbeing coordinators) team. The hāngi marked the end of Pacific RSE workers having to pass through MIQ thanks to the new Quarantine Free Travel scheme.

The workers responded with their own expressions of appreciation, including a mighty Solomon Island haka performance.

RSE worker, Maxson Foethao, also gifted two symbolic paintings to the Ibis hotel on behalf of the Salomon Islands group in recognition of the respect and kindness shown during the group's stay.

Maxson says that the painting represents the journey of the RSE workers coming to New Zealand to work.

The blue symbolises the Pacific Ocean and the ants people coming from Pacific countries. The ants form a line towards the fish, a cultural symbol typically used to decorate canoes. In this instance the fish represents the plane Maxson and his group flew in on.

Waikato MIQ Pou Tiaki team leader, Trent Brown, says there is a wonderful spread of knowledge and experiences within the Pou Tiaki group who supported the 147 RSE workers from the Solomon Islands.

As well as the Pou Tiaki team, K'aute Pasifika support workers and dedicated translators from Straker assisted with communicating with workers in Pidgin during their stay.

They also designed special menus to make the workers feel at home, before the group left the Waikato.

"I am absolutely humbled to be a part of this team servicing the needs of our Pasifika cousins who are currently completing their managed isolation in the Waikato," Trent says.

A Redpath shadehouse with 50% shadecloth netting fitted

Planning ahead key for supply of crop protection products in 2022

Orchardists and growers are being urged to order crop cover and protection products well ahead of time due to ongoing supply delays caused by Covid-19.

By Glenys Christian

Richard Clarkson, pipfruit manager at Birdhurst Orchards in Motueka, says many orchardists are experiencing delays in deliveries of orders, with some having goods held up at overseas ports, being shipped to other destinations or delayed in transit.

It has been "quite challenging" this year and he is picking the present shipping issues will last for another 12 months. As most of the drape and hail net products orchardists use are made in Asia, all they can do is plan ahead and order more than required so they have surplus stock on hand.

"I'd rather have the problem of it turning up earlier than expected and figuring out where to store it," Richard says.

While most orchardists have been heeding suppliers' warnings about ordering early, this has proved stressful when deposits need to be paid upfront, causing cashflow problems for some and making businesses more reliant on a good production season.

Glen Williams, the owner of Palmerston North-based Redpath Pacific, advises growers and orchardists to think not only about requirements for the upcoming season, but the one after that. His company builds around 40 commercial greenhouses a year in New Zealand and a similar number in Australia. This November he was involved in a budget meeting for projected 2023 building sales to ensure

suitable inventory would be on hand 12 months in advance.

"It's a very unusual way to do business so far in advance," he says. "You need a pretty big crystal ball."

As a pre-Covid-19 effect mitigation plan put in place two years ago, the company has substantially increased its local stock holding levels and storage capacity by a factor of three. Import freight costs have tripled and delivery times doubled, pushing some of the company's material deliveries out to nine to 18 months' delay. Growers and orchardists would be wise to think hard about ordering outside of their traditional seasonal strategies.

"It's pretty challenging at the moment because many New Zealand businesses are set up to deliver on a 'just in time basis' which has worked well during normal supply chain timeframes, but that's not the case currently," Richard says.

Niche and specialist products which have a low turnover are under particular strain. Distributors are working on timeframes of six months rather than the two months they previously used, and manufacturers are often looking to over 12-month lead times.

> **"It's a very unusual way to do business so far in advance ... You need a pretty big crystal ball**

Sea freight costs have more than doubled and are likely to go higher, with the cost of shipping 20-foot containers from Europe already up from €2,000 to €6,000 in some cases. The impact has been felt most on lower cost materials which takes up more container space, such as shade cloth. Brokers and shipping companies aren't expecting any change in the next year.

Some shipping companies have pulled out of Australasia to concentrate on the more lucrative, higher volume global shipping routes, with New Zealand becoming a 'niche' destination. As a result, cargo is being sent on smaller shipping companies and 'bunny hopping' from port to port around the world before finally arriving here.

Richard says that from a customer enquiry perspective, there has been much negotiation on price too.

Redpath Pacific owner, Glen Williams

"The questions are much more surrounding 'do you have the stock, what are the delivery times, and when can you build?'"

A lack of locally based manufacturing industries is another weakness the pandemic has exposed, as under free trade agreements they are unable to compete with overseas suppliers.

West Auckland company, Cosio Industries, which supplies a range of shade cloth and wind break fabrics, isn't holding much stock either and urged growers to notify them in advance as to their requirements four to six months ahead, a spokesman said.

James Harris, operations manager at Waiuku-based company, Apex, which provides turnkey solutions for design, manufacture and construction of glasshouses, says there is quite high demand for low iron glass due to Chinese factories shutting down. Consequently, lead times have been stretched out from the usual 20 weeks to 25 weeks. Shipping costs have increased by 70 to 80% but there are indications this could settle shortly.

The building consent process has also been delayed, affecting around two hectares of developments Apex is involved in.

"Growers are still wanting to expand and the greenhouse industry is getting busier," James says. "We are hoping things [shortages and costs] will pan out in the second quarter of next year."

Jono Sutton in the midst of this year's flowering

Boysenberry harvest a three-generation labour of love

Three generations of the Sutton family will be involved in the "organised chaos" of the boysenberry harvest that is about to crank into action on their Nelson orchard.

By Anne Hardie

Jono Sutton has always associated summer with the frantic pace of the boysenberry harvest, working alongside his father, Stephen, and grandfather, David, to get the berries off the vines at the point they are ready to drop to the ground. And he thrives on it.

"I'm a bit of a freak in the sense that I enjoy being under the pump."

Winner of the 2019 Young Grower of the Year competition, Jono is the younger generation on the family's horticulture enterprise which grows 30 hectares of boysenberries and 30 hectares of apples.

Today, Eden's Road Fruit sits on the Waimea Plains west of Richmond where the family moved the business after urban sprawl overtook their original Daelyn's Orchard. Back then, the business was largely selling fruit direct to the public and it was a summer destination for locals and visitors.

Despite the site shift, boysenberries have remained part of the family's operation, with a transition to five harvest machines instead of hand picking. For 11 months of the year the machines sit in the shed but come December 15 they are powered up to take the crop off the vines. Jono says the technology for the machines has been around since the 1980s but the newer models still have the same picking apparatus that was designed back then.

A limited window for harvesting means the harvesters are working whenever the crop and weather allow.

Consequently, the orchard needs a fully stocked spare parts department to rectify any failure on the machines as quickly as possible.

The harvesters start at 4am, weather permitting, and continue through to midday with a team of regular staff – many of whom only work for the Suttons during the boysenberry harvest. One or two of the staff even take annual leave from other jobs to spend a month in the berry garden.

Early morning is the best time for the harvesters to shake the soft fruit from the vines. Jono says it's all about the physiology of the plants; capturing the fruit when the plant is relaxed.

"Plant activity is driven by heat," says Jono. "So, when it's hot the plant is active, whereas at night it's not hot and the plant isn't respiring and doesn't have to do anything. It's like relaxing its grip on the fruit.

"Boysenberries fall off and they either fall on the ground or fall into a box, and you have to be there to catch them."

The family grows three boysenberry cultivars with the regionally apt names of Tasman, Mapua and Riwaka. The slight difference in their maturities helps spread the harvest over the month.

Weather has been the cause of three poor crops in a row now, including the wet, cold growing season last year. The Suttons were hoping for better boysenberry conditions this year and were grateful when the sun shone through much of flowering – a fortunate change given it was an extremely wet spring.

Wet weather is not only challenging for pollination, but can also let disease into the plant, says Jono. The orchard passed their average annual rainfall by mid-spring, so he is optimistic for a dry summer for the arid-loving boysenberries.

When there is wind and rain, the fruit becomes heavy and can be blown off the vine by the wind before it can be harvested. The crop needs constant assessing. Leaving the berry on the plant a little longer can significantly increase yield but when a big weather event is imminent, it is better to tighten up harvest, says Jono. However, this means they lose yield.

Rain or shine, it's a balancing act between leaving fruit as long as possible – when brix is also up – and harvesting it before it falls to the ground. David, now in his mid-80s, has a good eye for timing harvest on each block of boysenberries and Jono says he is trying to learn everything he can from both his grandfather and father.

Harvested boysenberries head to Boysenberries New Zealand where they end up block frozen, individually quick frozen (IQF), or made into juice concentrate or purée for local and export markets.

The 30ha of apples on the family's orchard complements the boysenberry harvest and helps to diversify the business too, says Jono.

"Often one crop will prop up the other during a tough year."

The Suttons are fortunate to have a good team of permanent staff who manage apple thinning when the boysenberry harvest is in full swing too.

As much as Jono enjoys the organised chaos of the boysenberry harvest, he says one of the best things about growing boysenberries is the long down time after harvest.

"There's nothing we need to do through to May, whereas apples never have a down time."

When Jono isn't on the orchard, he is helping to organise and facilitate the Nelson Young Grower competition to give other contestants the opportunity to broaden their horizons in the horticulture sector.

REGIONAL ROUNDUP

Zica Manuni (left), Patrick Tau and Manuev Sine arrived in Hawke's Bay from Pentecost, Vanuatu on 23 November. It is the first time the trio have been to New Zealand as part of the RSE scheme. Patrick says they wanted to come to New Zealand to help pay for school fees at home

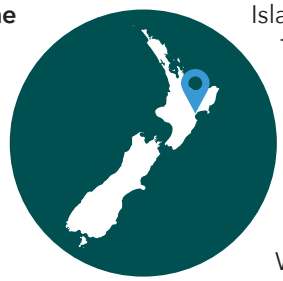
Bumper apple harvest ahead

A bumper apple harvest exceeding 22-million cartons is expected this season as new plantings come into production.

By Rose Mannering

New Zealand's apple volumes are approaching the 2020 record of 22,345,510 export cartons.

New Zealand Apples & Pears manager trade policy and strategy, Gary Jones, says the industry is gearing up for a big season, although he acknowledges it is a long growing season yet to come, with memories of last year's devastating hailstorms in Nelson wiping 40% off the region's crop.



The industry has welcomed the return to pre-Covid numbers for Recognised Seasonal Employer (RSE) scheme workers, with 14,400 bound for New Zealand who will no longer be required to transit through the 14-day MIQ (Managed Isolation and Quarantine) system. Forty-one in-bound flights have been organised to bring the Pacific Island labour force from Vanuatu, Samoa and Tonga through the new Quarantine Free Travel arrangement. Workers have been vaccinated before leaving their home country and will be tested for Covid-19 on arrival.

Despite this, labour will still be tight, with only 10% of the usual number of backpackers, or Working Holiday Scheme visa holders, in the country. Unemployment is at a record low, meaning local workers will also be scarce.

Gary holds concerns for small to medium sized growers who are less able to access RSE scheme workers.

The next big challenge will be managing Covid-19 outbreaks in the industry, and the community, to keep everyone safe and get the work done.

"There is no tolerance of Covid infection in packhouses and coolstores for China markets," Gary says.

Exporters are acutely aware of disruption to logistics and freight, and Gary expects the industry to forward plan early to avoid punishing shipping spot markets.

European market drops

Mt Erin marketing manager, Jono Wiltshire, says the final twist in what has been a tricky season for the whole industry has been a drop in later sales of Braeburn and Pink Lady in the European market. Quality issues have led to claims and a weakening in demand at the end of the season. However Asian markets were mostly good.

> "Overall though we have done pretty well in what was a tricky season

"Overall though we have done pretty well in what was a tricky season," Jono says. The first challenge was a labour shortage for both picking and packing of fruit, followed by the unpredictability of shipments to many markets.

Hawke's Bay Fruitgrowers' Association president, Brydon Nisbet

Covid outbreaks in receiving countries of New Zealand apples had varying effects at varying times, meaning exporters had to think on their feet.

"Planning in relation to logistics was impossible; the whole industry pulled together to get the best outcome," Jono says.

A shortage of ships coming to New Zealand led to the unprecedented step taken by some companies of chartering ships, particularly for exports from Nelson.

"It is easy to point the finger at a particular sector, but shipping companies were doing the best they could too; they didn't plan to not provide containers when they were needed."

Planning for the best

Ongoing logistics issues are expected to continue into 2022, especially for trans-shipped product that goes through a major intermediary port. Shipping rate increases are inevitable, but by just how much is still being negotiated.

Internal cost increases for labour, power and fuel will be felt from the orchard through to the customer. Labour will once again be challenging, although with some improvement on last year.

"But we are producing good quality fruit, people need to eat, there will be demand at some level; we found a way through last year and we will again," Jono says.

Hawke's Bay Fruitgrowers' Association president, Brydon Nisbet, says for the most part the Hawke's Bay apple crop is looking good, although a sprinkling of early hail in several growing areas has already affected individual growers.

> "The association will be ringing every member for a mental health check as the industry prepares for the 2022 season

The association organised a 'Gumboot Day' in mid-November as a chance to get members together talking to each other to help morale. New Zealand Apples & Pears and representatives from the Ministry for Primary Industries spoke on labour schemes available and growers were encouraged to look out for one another and work together to try and avoid the pitfalls of last season where some crops were left hanging on the tree. Brydon challenged corporate growers to look after their smaller growing neighbours and suppliers to help them through.

"Networking is key," Brydon says.

Not being able to harvest their crop can take growers to dark places, he says.

The association will be ringing every member for a mental health check as the industry prepares for the 2022 season. ●

Six months after his family took over what is now Village Berry Orchard, manager Chris Hunt (left) still gets to call on former owner Geoff Meade's experience and advice

Family traditions continue at historic Gisborne orchard

A Gisborne orchard with a family connection going back more than 100 years changed hands in July, but former owner Geoff Meade says while the family name has changed, its heart remains.

By Kristine Walsh

"We went out to celebrate the sale and to see the new owners' enthusiasm, and the way they interacted and had fun together," Geoff says. We knew we had made the right decision and these were the right people."

Geoff's own connection to Bruce Estate dates back to 1920 when the original settler family, the U'rens, sold the property to John McMillan, grandfather of Geoff's former wife, Kath Jones (née McMillan).

The Estate was then passed on to Kath's parents, Bruce and Melba, who established the two-hectare property just out of Gisborne as a successful vineyard.

In 1978, Geoff and Kath took over to allow Bruce and Melba to retire and indulge their love of travel. A year later, Geoff, a teacher, was out on a field trip with students while Kath and their one-year-old daughter, Kirsten, headed west to Auckland to collect her parents, who were due back from their trip of a lifetime.

Then they received the worst news imaginable: Bruce and Melba's flight – Air New Zealand Flight TE901 – had gone missing over Antarctica and was eventually confirmed to have crashed into Mount Erebus, killing all 237 passengers and 20 crew on board.

"It was the worst of times, the most horrible of times, and of course, even worse for Kath," Geoff says. "That was why we named the orchard Bruce Estate and that is where I put most of my energy over the next few years."

After decades of developing Bruce Estate, Geoff and Raewyn Meade say they are delighted to see it go to buyers who will continue the family focus

For a self-confessed "couple of townies", Shelley and Chris Hunt have exciting plans for the two-hectare orchard they have bought, just out of Gisborne

Although the orchard was passed down from the McMillan family, it was really Geoff's passion. So, when the couple parted ways, Kath opted to sell her half to Geoff's colleague, Richard Ludlow, and his wife Diane.

"Kath remains a wonderful friend," says Geoff.

"At the time we were harvesting grapes for Cook's Wines, but it was a fairly low-value crop and then the grapes got phylloxera [a grapevine pest]. We ripped them out in 1985, just a year before the government paid growers to do that."

Richard and Geoff decided to replant with 1,000 nashi (Asian pear) trees, the glamour crop of the mid-1980s that, though in its infancy, was making big inroads into the export market.

"Being in Gisborne, we found they didn't travel well, so we'd grown this beautiful fruit which by the time it got to market, was ruined," says Geoff.

"Rather than start again we decided to stick with the nashi but focus on selling locally and that's what we've done ever since."

A decade after the Erebus tragedy, Geoff remarried – his wife Raewyn bringing two more children into the family – and in 1993 they bought out the Ludlows to take full ownership of the orchard.

Over the following years they combined working their day jobs (Geoff retrained as a career consultant) with tending to the orchard and further developing their local market.

Some of the nashi did get sacrificed and that, along with the removal of some excess shelter belts, made way for plantings of Amredark nectarines, Spring Crest and Spring Lady peaches, a variety of plums (including Fortune, Black Doris, Omega/George Wilson, Angelino, Santa Rosa and Luisa), with a few feijoas (Kaiteri, Kakariki and Anatoki) to boot.

That, says Geoff, made for a nicely staggered harvest – the peaches and nectarines coming on before Christmas, followed by the nashi in February and the various plums spread throughout.

"While we had some of the best soil (Waihirere silt loam) and climate conditions in the world, Gisborne can still present challenges for stonefruit. With no netting and a gentle spray programme, we just had to accept some losses to the birds and bugs," Geoff says.

> **"The orchard was always a healing place for me**

"Raewyn comes from an orcharding family, the Forges, who also have 100 years of history in orcharding. So, she's a quality controller par excellence and that's why we always put out such beautiful, award-winning fruit."

After more than 40 years on the orchard and countless days operating gate sales and the Gisborne Farmers' Market, Geoff decided it was time to retire.

"The orchard was always a healing place for me, from the grief of losing Kath's parents to the intensity of working with young people who are facing some really big life challenges," he says.

"It's been really special to keep the line going through our children to our beautiful grandchildren, who have a fifth-generation connection to the orchard, so it was pretty hard to make the decision to sell."

But it's not over yet. Geoff is still a regular visitor to the now-renamed Bruce Estate and is sharing on-orchard practices with the new owners.

"You get a real feel for the land, a real feel for the trees," he says. "We are more than happy to pass on what we have learned for a new family to take into their future."

Shelley and Chris Hunt and family are the proud new owners of the orchard, which they will use to supply their fresh fruit ice cream shop, Village Berries.

For more than a decade the shop has provided holiday jobs to many students, including the Hunts' four children and now it has its own orchard with Chris on board as orchard manager.

The duo initially bought a fresh fruit ice cream shop to support their university children with summer jobs so they could pay their way.

More than a decade on, Shelley is now sole owner of Gisborne's Village Berries. The shop has provided holiday jobs to many students and now that it has its own orchard, they can set up a circular supply system and stock their own produce.

Having bought the former Bruce Estate – two hectares at Ormond, just out of Gisborne city – Village Berries has installed dad, Chris, as orchard manager.

"We [are] both really a couple of townies but Chris has a history in viticulture and has always been a great gardener," laughs Village Berries matriarch, Shelley.

"In any case, former orchard owner, Geoff Meade, is always on hand to offer his experience and advice."

As the primary shareholder in Village Berries, Shelley has over the last 11 years been hands-on, juggling the demands of the business with her nearly 40-year career as a health and physical education teacher.

She's soon to have her last day in the classroom as she pivots to focus on bringing the shop and the orchard together.

But she won't be on her own. As well as having Chris work the land, son-in-law, Tom McCann, manages the shop while son, Dougal Hunt, does the heavy lifting at the store. The rest of Team Hunt – daughters Harriet Anderson and Madeline McCann, son Jack and their respective partners – are also on call to help out when required.

"I'm certainly not retiring, it's more of a change of careers," Shelley says. "I loved working in education and still do, but something had to give and that was it."

Although the orchard has been renamed as Village Berry Orchard, its history and crops remain, with the Hunts inheriting the Meades' mixed plantings dominated by nashi, with supplementary crops of nectarines, peaches, plums, and feijoas.

And yes, that does mean that Black Doris ice creams will soon be on the menu at Village Berries.

"We'll likely take out some nashi so we can experiment with things like bramble berries," Shelley says. "We see it as a 'tutti-frutti' orchard, rather than one offering a single main product. We're keen to start small and see what works so we'll be learning along the way."

As it stands, Village Berries has already evolved from a summer ice cream and berry shop to one that operates year-round, selling a limited range of prepared foods as well as fruit and vegetables.

Growing their own gives them the opportunity to sell nashi through a local marketer and packhouse, keep the shop stocked with fresh produce and set up at the Gisborne Farmers' Market to offer any overflow.

"We've always made a point of getting to know our growers personally and working with people who grow ethically on smaller holdings," Shelley says.

"Making the supply chain even more transparent by growing our own means customers know exactly where their produce is coming from and can join us on our journey as we develop and experiment over the years to come."

Waikato production manager, Tony Graham (left), Waikato operations manager, Brad Cooper and Derek Edwards

Genesis of nursery and IP business in NZ

A strong new player has emerged in the nursery and plant intellectual property (IP) space in New Zealand with the formation of Genesis Nurseries Ltd.

By Rose Mannering

Ashburton-based Genesis Private Equity has purchased and combined two longstanding owner-operator fruit tree nurseries to form the new business.

In 2019, Andy McGrath sold his Waikato-based McGrath Nurseries to Genesis but retained his interest in sourcing new international plant varieties. In August, Genesis added Pattullo Nurseries to the business, purchasing the Hawke's Bay nursery from Kerry Sixtus.

These two assets have been joined to form Genesis Nurseries, a commercial fruit tree growing business. Genesis Nurseries chief executive, Derek Edwards, says part of the process has been gaining access to all-important intellectual property of new and promising varieties.

It is a considerable change in this space, with two renowned, long-established businesses brought under one umbrella.

With protected and new varieties becoming so important to the marketplace, the merge will help Genesis Nurseries in accessing greater varieties from New Zealand Fruit Tree Company (NZFTC).

The business, which represents 40% of the market, has not fundamentally changed, says Derek. Genesis is heavily invested in growing cherry trees and is the main supplier throughout New Zealand. Exciting new apricot trees developed by Plant & Food Research Ltd in Clyde, known as the Summer series, will also be offered.

Genesis will have a number of proprietary apple varieties in its listing, including Honey Crisp, KORU®, Tazi and Rockit™.

"We are servicing growers from Cambridge to Central Otago," says Derek.

The launch of Genesis fits well with the way orcharding has developed in New Zealand, with a shift from smaller owner-operator businesses to corporate entities like Freshmax, My Farm and T&G.

"We will be able to respond and supply what these businesses need," says Derek.

> **We can deliver a broad range of options including two-year-old rods, one-year grafted or twin leader**

Genesis is eyeing new growing areas too – one of these is Canterbury.

"We are talking to significant landowners in the Canterbury region who are looking at moving into apples."

Genesis won't just plant the trees but give continued technical support through the knowledge and expertise of Genesis national sales manager, Mike van Workum.

"Mike has an amazing knowledge and an incredible passion for growing; he knows how markets and growers operate," says Derek.

He also believes there is potential for cherry development in Hawke's Bay and other areas.

After 20 years in horticulture himself, first in nurseries then in kiwifruit, Derek says he knows how to grow a "really good" plant. The purchase of Pattullo's has given the business access to a much wider range of rootstocks such as the CG series.

Genesis Nurseries chief executive Derek Edwards

"We can deliver a broad range of options including two-year-old rods, one-year grafted or twin leader," he says.

Andy McGrath will continue to do what he does best, scouring the world for new varieties and bringing them into New Zealand, under his company GPVA (Global Plants Variety Administration). Genesis will have the sole propagation rights to any promising new material to come through this pipeline.

"Varieties introduced by GPVA have significantly changed the shape of fruit growing in New Zealand, with some of the exclusive varieties available from Genesis Nurseries

RSE staff in the nursery

including Gilmac, KORU®, Honeycrisp, Tarzi, Starletta® and Sweet Valentine®, NY Series Cherries plus many more," Derek says.

GPVA works closely with plant breeders in the selection, development and management of new varieties and will continue to work with Genesis Nurseries in future in introducing new varieties to the New Zealand fruit industry.

Kerry Sixtus from Pattullo's Nurseries was a founding shareholder of NZFTC, a private Intellectual Property Company initially formed by a group of New Zealand fruit tree nurserymen, growers and fruit marketers. Kerry was the Chairman of the NZFTC, which was established in 1996.

NZFTC is a member of Associated International Group of Nurseries (AIGN), an international group of nurserymen collectively working together for the benefit of each other. Key plant breeding programmes that NZFTC represent are Prevar (formerly known as HortResearch), Bradford Farms, Sunworld International, Star Fruits, Rutger's University and individual selections managed by AIGN and/or its members.

The investment by Genesis Private Equity (GPE), a small Ashburton group of 'angel' style investors, already have significant ties with agriculture and horticulture. Purchasing Pattullo's has led to them holding a 38% share in NZFTC, with 32% held by Market Gardeners Ltd (Christchurch) and the remaining shares held by one of the original shareholders, Paul Paynter.

GPE was established in 2015 to invest capital and governance expertise into small to medium-sized private companies identified as having significant growth potential.

Derek is excited for the future, with a great demand for New Zealand grown fruit in overseas markets. Dwarfing cherry rootstocks will bring great opportunities to set up more intensive growing systems.

> **Derek is excited for the future, with a great demand for New Zealand grown fruit in overseas markets**

"This fits in with challenges regarding labour, and health and safety," he says.

Genesis plans to invest in research, testing and commercialisation of new varieties through a programme to be run by Mike van Workum.

The company will have sites at Cambridge (cherries), Links Rd in Hawke's Bay (rootstock centre) and is looking at developing a South Island site. Both Pattullo's and McGrath had successfully developed innovative nurseries, each focused on different rootstocks and exclusive plant varieties.

"The combination of the two businesses will provide the industry with an exciting new opportunity to access the best new varieties to suit their requirements," Derek says.

Riwaka's Thomas Brothers – 160 years of growing

A cherry sits on top of every ice cream that is swirled and handed out to the long lines of customers at Thomas Brothers' cherry and real fruit ice cream shop in Riwaka.

By Anne Hardie

It is one of the few opportunities where you can taste cherry ice cream from fruit picked just along the road, at the orchard's 2.5ha cherry block.

Thomas Brothers – or Thomas Bros – are among the first in the country to pick cherries each year, slotting the harvest into their diversified business that employs 15 family members. It is a multigenerational business that traces its history in Tasman's Dehra Doon valley back to their forefathers who settled there in the early 1860s.

Mark Thomas is sixth generation in the business which has grown in the past 160 years to encompass 70ha of apples, 70ha of kiwifruit plus male kiwifruit blocks and a pollen mill, then the cherry on top which is the 2.5ha cherry orchard.

Mark is in charge of the day-to-day jobs on the orchards, while his cousin, James Thomas, is responsible for the cherry harvest which began in mid-November and will continue through to mid-January.

Cherries are a good money earner for the business and Mark says the harvest enables Thomas Bros to keep staff employed through the peak of summer so they are good to go for the apple harvest in February.

"We're quite a diverse business and we like to look at different avenues of income, so 16 years ago we decided to give cherries a go.

"There were a few hobby blocks around the place growing cherries so we knew they would grow here. It was also another way of retaining staff by offering work through the summer period.

"The cherries finish in mid-January and then we roll straight into pruning and that takes them through to the apple harvest."

Employee, Zara Fox, delivers the ice cream with a cherry on top

Thomas Brothers' cherry and real fruit ice cream shop

Up to 25 pickers – a mix of permanent and seasonal staff – are employed during the cherry harvest, with approximately ten more staff employed in the shop that sells real fruit ice cream and boxes of cherries. Through the peak holiday season, long lines of people queue for ice creams and cherries at the shop which Mark says is as a great alternative revenue stream.

> **"We're quite a diverse business and we like to look at different avenues of income, so 16 years ago we decided to give cherries a go**

In a typical year, the orchard produces ten tonnes of cherries per hectare and sells them for about $20/kg, making it a valuable crop. While the bulk of the crop is sold via the shop, Thomas Brothers also airfreight some to a customer in Auckland and another in Wellington, plus a small amount straight to the wholesale market. Once the tree-ripened cherries are picked, they have to reach the customer within a day or two because they can soften so quickly.

Mark says deciding when to pick is easy.

"The best way to do quality control is tasting them."

Nine cherry varieties spread harvest out, beginning with the early cropper Earlise and rolling over to a succession of other varieties through the short season including the public's favourite – a big, dark, full-of-flavour cherry called Samba. A mix of varieties, including Lapins, Sandra Rose, Skeena, Sweetheart, Rosann and Stella – which produces the bulk of the crop – are sold by the carton through the shop at Riwaka or used for the shop's real fruit ice creams.

A mix of berries from local growers provide other fresh fruit flavours for the ice cream, and gold kiwifruit from the Thomas Brothers' orchard adds a different taste for customers to sample. Regardless of flavour, every ice cream is served with a bright red cherry on top.

A cherry crop requires extensive protection in order for it to reach harvest. More so in the Thomas Brothers' orchard, as the Dehra Doon Valley experiences a higher amount of rainfall. Hail cloth, rain covers and bird netting totally enclose the blocks of cherries. Birds will determinedly peck holes in the netting, especially at the beginning of the season. Constant stitching is needed to keep them out as they can destroy large quantities of fruit with just one peck in each.

"They'll pick at the bird net until they make a hole," says Mark. "The earliest variety gets a really hard time from the birds."

Bird deterrents, which emit predator bird sounds, help but keeping the bird net secure is the only sure way of keeping the birds from the crop.

The rain cloth keeps the cherries dry and Mark says it has the added benefit of providing work under cover for the apple thinners and those in the kiwifruit blocks who would otherwise have days off work during rain.

In the 16 years since the cherries were planted and covered, they have replaced about half the rain

THE THOMAS BROTHERS HAVE A 2.5HA CHERRY ORCHARD

Cousins James (left) and Mark Thomas in the cherry orchard

covers. They had to do some major work on the blocks, thankfully covered by insurance, after Cyclone Gita swamped the cherry blocks in 2018. During the February storm, the nearby river broke its banks and flowed through the lower part of the orchard, leaving debris wrapped around structures and deep layers of sediment which buried the kiwifruit vines beside the cherries.

> **"The cherries finish in mid-January and then we roll straight into pruning**

The cherry crop was small last year due to poor flowering, so this year Mark says they have spent considerable time ensuring they achieve a good harvest. That has extended to tree training and using growth regulators for the first time to contain the growth of the trees so that fruiting sites are more condensed.

The result is "big ropes of fruit" that will provide a bumper crop for the carloads of customers calling into the shop on their way to the Abel Tasman National Park, Kaiteriteri or Golden Bay.

Most years, the growth regulators aren't needed because they are producing a crop just for local market and likewise, they don't worry about thinning the crop for fruit size because they can sell a range of sizes.

Mark says they have no plans to expand the cherries because that would require a post-harvest facility for export and create more pressure at a time of year that's also busy gearing up for apples.

"Selling the bulk of the crop through the shop works so well now that there is no need to change the formula."

World Soil Day – organic carbon key to soil productivity

The United Nations Food and Agriculture Organisation (FAO) through its Global Soil Partnership has deemed the 5th of December to be World Soil Day.

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

This initiative is to raise awareness of the fragility of our productive soils upon which not just human, but all terrestrial life depends, and the importance of their preservation and enhancement through sustainable management practices for food production.

This year's theme is '*Halt soil salinisation, boost soil productivity*'.

Fortunately, in New Zealand our temperate climate with enough natural rainfall means we are not totally dependent on irrigation, and with relatively good soil organic matter levels, soil salinity is not yet a problem here.

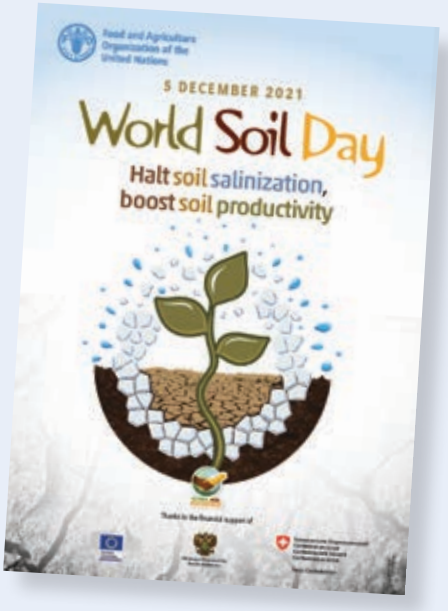
Increased salinity (build-up of salts) is making what was once a lot of productive land around the globe, unproductive. Large parts of the United States, Argentina, North Africa and the Middle East, former Russian Eastern block countries, the Indo-China region and small pockets of Southern Australia have salt levels so high that crops can no longer be grown in them.

Salt layers can build up from the use of irrigation water high in salt, causing sodification, but also high bicarbonate and carbonated water in semi-arid and arid regions can cause salinity problems. White crusting on the soil surface, or white spots and streaks in the soil profile, are indicative of salinity issues. Improving drainage, reducing compaction and adding large amounts of compost and other soil amendments high in organic matter, are vital in the reclamation of saline soils.

Last year, the United Nations World Soil Day theme was '*Keep soil alive, protect soil biodiversity*', to encourage people around the world to engage in proactively improving soil health. Soil health is often measured by the amount of organic matter in the soil, as this provides many 'soil ecosystem services' such as regulating the flow and quality of water, providing clean air, filtering pollutants and contaminants and supporting biodiversity. In general, soils with more organic carbon have a more stable structure through better aggregation, are less prone to run-off and erosion, have greater water infiltration and retention and increased biological activity and nutrient supply compared to similar soils with lower organic matter levels.

At last month's COP26 United Nations Climate Change conference in Glasgow, British soil scientists were able to present information on the importance of preserving and building up soil carbon as a contributing solution to mitigating climate change. Currently there is around 800 gigatonnes of CO_2 in the atmosphere, whereas the topsoils (up to one metre depth) currently hold approximately 1,500 gigatonnes of carbon, and the subsoil (one to three metre depth) holds a further 800 gigatonnes of carbon. All living plant matter above and below ground contains 700 gigatonnes of carbon, whereas the oceans contain a whopping 40,000 gigatonnes of inorganic carbon. One cause of concern is the potential uncontrolled escalation of global warming that could occur from the release of carbon held in the permafrost areas of northern Russia and Canada which are estimated to be as high as 1,000 gigatonnes. As the planet warms and these permafrost areas melt, some of this carbon will escape into the atmosphere as carbon dioxide through mineralisation of the organic matter and also as methane gas.

Carbon makes up approximately 58% of soil organic matter and this is a combination of dead and living organisms including plant roots, exudates, fungi, microbes, decaying plant materials and animal manure. With the cutting down of forests and development of agriculture worldwide through cultivation practices that have occurred for many decades and in some cases millennia, the soil organic matter levels in many countries are only a fraction of what they had previously been for thousands of years. On New Zealand's pastoral farms, the loss of soil carbon has been minimal except on peat soils, where carbon losses have been significantly



greater due to drainage and the resultant oxidising and mineralising of the organic materials peat is composed of.

Under cropping and intensive horticulture, carbon losses have been and continue to be greater due to cultivation and fallowing practices. Degraded soils have the greatest potential to sequester carbon from the atmosphere, but this process takes a long time and can quickly be reversed and degrade through rapid carbon losses though cultivation. Carbon has the ability to form bonds with other essential elements such as nitrogen, phosphorus and sulphur to create large complex molecules. These bonds trap energy as a source of fuel for micro-organisms.

To help circumvent the loss of soil carbon, management practices such as strip tillage, minimum tillage or zero tillage, rather than fully inverting the soil, results in less oxidisation of soil carbon. Using green manure cover crops, such as lupins or winter ryegrasses, between commercial crops to minimise fallowing losses and also add additional plant material to the soil, is another tool. Adding compost and other organic waste amendments such as animal manures and vermicast type materials will also help in developing a soil's resilience to adverse climatic events and any potential build-up of soil salinity.

> **Degraded soils have the greatest potential to sequester carbon from the atmosphere**

With our current Emissions Trading Scheme and the rapid lift in international carbon prices driven by carbon trading schemes, planting vast swathes of our productive New Zealand soils in rapid carbon sequestering pine trees is unlikely to have any net benefit to global CO_2 emissions. We are among the most carbon efficient producers of food in the world and any global shortage of these foods will only be produced elsewhere using more greenhouse gases in the process. COP26 strategists will hopefully realise the error of some of their policies and ideas which have been decided upon in previous conferences.

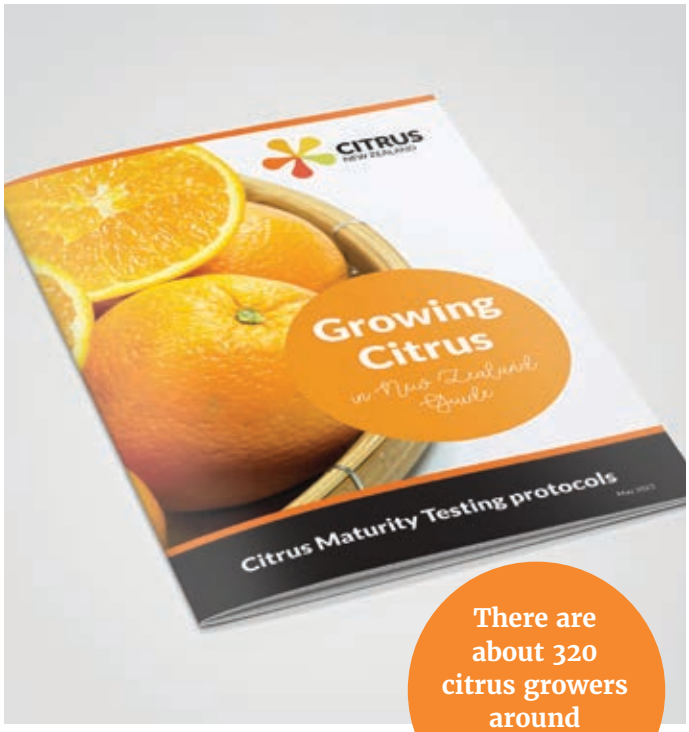
A better solution to my way of thinking is for us to aim to become even more carbon and energy efficient, not resting on our laurels, and keep doing what we have always done – while looking at improving our already world leading innovativeness.

Planting our good productive soils into exotic trees is a total waste of resource, even though the temporary economics of carbon trading make it extremely attractive to do so. Our climate and soils are too valuable for this, and future generations will likely have to swallow a bitter pill as a consequence. Such loss of food producing soils to carbon farming here in New Zealand should be a consideration on this World Soil Day. ●

New citrus growing guide gets set to land for Christmas

Work is well underway to create a new guide for citrus growers to replace the Growing Citrus in New Zealand *guide which has served the industry for 20 years.*

By Geoff Lewis



There are about 320 citrus growers around New Zealand

The two-year task of creating a contemporary guide is in the hands of the Citrus NZ Research Committee, composed of Matt Carter, Keith Pyle, Wayne Hall and Sally Anderson and co-funded by Citrus NZ and the NZ Fruitgrowers' Charitable Trust.

A launch was planned for the Citrus NZ national conference in September, then November, and now hopefully in March 2022, barring any further disruptions from Covid-19.

Matt Carter is a Citrus NZ board member. He is also a Gisborne grower of navel and Valencia oranges. He says, in producing the new guide, consideration was given to an electronic online form but many growers were more comfortable with the familiar paper-based format.

While the 2001 edition had been produced as a book, the new guide has been designed as a series of modules which are available online through the Citrus NZ website. The series of modules allows for updates and new material to be included as it becomes available. A print format will also be available to growers, which can be inserted into a folder for ease of use.

Pests and diseases will not be covered in the new guide as these are catered for under Integrated Pest Management (IPM) on the Citrus NZ website, which also allows for online postings of urgent updates.

Citrus NZ research manager, Sally Anderson, says the modular publication covers all aspects of growing citrus. Modules that are available now to growers include irrigation, picking and harvest protocols, citrus maturity, frost management and pruning.

Sally noted that more modules are planned for release over the next ten months including varieties and rootstocks, topworking, citrus nutrition, irrigation, frost management, crop volume estimation, thinning, growth regulators and weed control.

At the end of the project, the citrus industry will have a completely revised and refreshed set of resources that growers can use to complement their own growing practises.

There are about 320 citrus growers around New Zealand, with the foremost growing areas in Northland and Gisborne. At one time citrus was popular in the western Bay of Plenty but has been largely displaced by kiwifruit and avocados in that region. Citrus NZ executive manager Rebecca Fisher says citrus production is valued at about $60 million in the domestic market with about $12 million going to export.

All Citrus NZ growers and members can access the growing guideline by logging into the member portal at **www.citrus.co.nz**. If you do not know your login details please email: **info@citrus.co.nz**

20,000 Kiwi kids enjoy 'virtual adventure'

It's been a tough year for Kiwi kids but 20,000 tamariki are about to take the trip of a lifetime thanks to the 2021 Zespri Young and Healthy Virtual Adventure.

Supplied

Since its inception, the initiative has encouraged more than 80,000 school children and their families to eat better, move the body more and lead environmentally conscious lives.

This year's Virtual Adventure, which ran from 1 to 26 November, took classes across Aotearoa on a journey through a virtual world that encouraged them to exercise, eat extra fruit and vegetables, drink more water and reduce the amount of leisure time they spend on screens.

Young and Healthy Trust founder Kim Harvey says the team were determined to deliver an amazing programme for kids and their families despite the Covid-19 pandemic.

"It has again been a really challenging period for parents with the disruptions caused by Covid-19," says Kim. "Every year we see fantastic results with teachers, parents and the kids themselves telling us they have more energy, can focus better in class and feel better, so we really wanted to make it work."

The programme's use of technology meant children could still participate even if they weren't physically back at school. Classes taking part in the Virtual Adventure worked as a team to travel across the world and met sporting heroes along the way – ASICS Ambassadors Ardie Savea, Ameliaranne Ekenasio, Kane Williamson and Samantha Charlton – who shared facts about local history and geography, as well as personal health tips.

"The programme has been perfected for the digital generation, with each child designing a unique avatar which they'll see interacting with their classmates and the sports stars at every stop," says Kim.

"Better still, every real-world healthy choice, like moving their body, eating a piece of fruit or drinking water, comes with the instant reward of digital points to add to their class total."

While online learning might feel like the new normal for some, Kim says teachers nationwide have been fantastic, with many working extra hard to deliver the adventure for their classes this year.

"Our health approach needs to change," says Kim. "With our health system being put under pressure we need to focus on teaching kids healthy habits as this is the best defence against poor mental and physical health in the future.

"Research has shown that the first 10 years of a child's life lay the crucial foundations for lifelong attitudes and habits. It's important we find fun and engaging ways to teach kids how small daily actions can have a massive impact on how we feel."

Support from Zespri, ASICS and The Young and Healthy Trust has meant that participation in the Virtual Adventure and the resources and support provided to teachers, remains completely free.

Zespri chief executive Dan Mathieson says the kiwifruit industry is proud to help 20,000 kids and families involved in this year's programme.

"We're really proud to support the Zespri Young and Healthy Virtual adventure as we know it brings positive benefits to the lives of thousands of New Zealanders, helping ensure happier, healthy young people and communities," Dan says.

"We've seen first-hand how investing in the well-being of our people and communities helps them thrive, and we know this year's adventure will have a huge impact on kids – whether they are back at school or joining in from home."

Labour, labour, labour – preparing for 2022

New Zealand's horticultural sector survived last year's Covid-19 lockdowns, but this season has added stress through labour shortages, changing consumer habits and the costs of exporting.

By Geoff Lewis

The Recognised Seasonal Employer (RSE) scheme enables the horticulture and viticulture industries to recruit workers from the Pacific Islands for seasonal work, when there are not enough New Zealand workers.

However, the government retained the 14,400-worker cap for 2020–21, due to the impact of Covid-19 on employment, economic conditions and international travel. This has been compounded by a gradual loss of foreign backpackers on working holidays.

Waikato-based Strawberry Fields owner, Darien McFadden, says labour was a big issue in early November and he is still a long way from full production and already short-staffed.

"A lot of growers are going to walk away from blocks," says Darien. "I usually have 30 to 40 staff but this year I've got five with another 13 or so regulars coming back. The big loss is 20 to 30 people on working holiday visas who usually just rock up. We have record low unemployment. WINZ (Work and Income New Zealand) refers people, but we're lucky to get any that turn-up."

PickMee Fresh director, John Altham, says the labour market is tight, the biggest shortage being in foreign holiday visa workers. The leading apple and stonefruit producer is hoping to get the same number of RSE workers they had in 2019 – as promised by the government.

"We usually use about 30 to 40 backpackers, but they have been slowly going home," says John. "Unemployment is very low. The Ministry of Social Development (MSD) did a survey asking how many people were interested in working in horticulture and 80% said they weren't interested. A lot still think it's low wages and long hours, but there is good money to be made."

PickMee, with a 120ha orchard in the Waikato and 350ha in Hawke's Bay, usually employs 112 RSE workers with 70 needed by late November and another 50 in February. The company's production season begins with peaches, nectarines and plums in December and moves into apples in February.

Brent Wilcox, director with Pukekohe and Waikato onion and potato growers A.S. Wilcox and Sons Ltd, says the earlier part of the season had been favourable but the labour market had tightened up in the last six months as had the difficulties and costs of shipping export onions.

> **"...this season will be short due to border closures which have resulted in the industry facing a critical situation with seasonal labour**

"We got through last season quite well but I'm anxious looking forward to the coming crop. We need skilled [machinery] operators and we employ full-time crews when we reach the season's peak. Many skilled operators come from offshore as there are very few available locally."

'Pinch points' will arrive from November through to Christmas and then with the start of the onion season which requires workers from January to March.

Wilcox says the company is lucky to have good regional teams and many of its administrative staff have been working from home due to Covid disruptions.

The kiwifruit industry has successfully reached the end of its 2020 harvest and packing season with a record crop now headed for overseas markets – if not already there.

New Zealand Kiwifruit Growers Inc. (NZKGI) represents 2,813 growers on 13,334 producing hectares across New Zealand.

NZKGI chief executive, Colin Bond, says this season will be short due to border closures which have resulted in the industry facing a critical situation with seasonal labour.

"A very wet and long season slowed and disrupted the harvest," Colin says. "But the sector coped with the labour crisis well – through a combination of good practice and good fortune.

A survey showed 80% of people aren't interested in working in horticulture

There is a perception that it's low wages and long hours, but there is good money

"The continued border closures mean Working Holiday Visa (WHV) holder numbers were down significantly and RSE worker numbers were limited – meaning an even heavier reliance on Kiwis filling the roles this season.

"We continued our labour attraction strategies using a range of media and social media programmes. We were bolstered this year by the support from MSD and the Ministry for Primary Industries, which worked hard to get unemployed Kiwis into the industry.

"We see kiwifruit, along with the other horticultural crops, needing certainty of labour supply, and one way we can encourage this is by supporting employment of a workforce that can be on the orchards almost year round."

Bond says the labour shortage issue urgently needs solutions to create certainty, and RSE workers from the Pacific Islands are critical for the near future.

Pukekohe Vegetable Growers Association president and director of broccoli and lettuce growers D&J Sutherland Ltd, Kylie Faulkner, says the ongoing lockdowns had become taxing for growers and labour.

"Everything costs more and takes longer," she says. "Capacity-wise, some growers have decided to cut back. Nobody likes being stopped by the police. It's hard to employ people, even interviews have to be done outdoors. We've got the new saliva tests but it takes three days to get the results."

The effects on growers differ depending on their crops, and whether they are selling into the local market or exporting. Shipping had become "diabolical" as with perishable products no one could take the risk of booking shipping space to find the vessels didn't turn up on time, Kylie says.

Of all the lessons to be learned from Covid-19, the reliance of New Zealand's horticulture industry on foreign labour and the distended logistics at the far end of the Earth, are the foremost. It has also highlighted the need for innovative long-term industry and labour development policies if we wish to continue surging production in existing and new product lines. ●

Hauiti Berries ahead of the pack

Spring gave its last, nasty gasp in the first week of November, with a storm that brought lashing rain and gusting gales to the Gisborne area.

By Kristine Walsh

It was rough, with days of the same to come. A state of emergency was declared, trees littered the road leading to Tolaga Bay and power poles leaned like drunkards from the land that had moved beneath them.

That wouldn't usually worry Hauiti Berries operations manager, Steve Phelps. Though delicate, his berries are under a network of tunnel houses, so the harvest is not weather dependent.

But this week his team were dealing with a 'major weather event' that had invaded even the closed-confines of the tunnel houses.

"We're good, but we're not God," says Steve, referencing the 300 millimetres of water that swept through his tunnel houses. "We're just going to have to suck it up and make sure we continue to get good fruit off in the coming weeks."

That resilience is a good indicator of how Hauiti Berries has, in just three years, grown from one hectare of cropping to four, with the resulting harvest estimated to reach nearly 45,000 kilograms this December – up from 500 kilograms in their first year of picking (2019) and double that by the end of 2022.

That's even with the November flood resulting in a loss of around 4,000 kilograms. It's a big win for an organisation operating in a small East Coast region, 50 kilometres north of Gisborne and with a population of just over 800.

Known by the locals as Uawa-nui-a-Ruamatua – Uawa, for short – Tolaga Bay is the turangawaewae of Te Aitanga-a-Hauiti, an iwi within the wider reach of Ngāti Porou, that has become known for its focus on science and the arts.

Just days after the November flood waters swept through their tunnel houses, the Hauiti Berries team, led by orchard supervisor, Luke Scragg (left), operations manager Steve Phelps (centre), and assistant orchard supervisor, Keaton Kereopa, have already caught up with the harvest programme that would taper off in December

Hauiti Berries LP is a joint venture between Hauiti Incorporation and Ngāti Porou Holding Company (the investment arm of Te Runanganui o Ngāti Porou), with Miro on board to offer technological expertise and BerryCo the licensed holder and sales and marketing company.

It is located on Hauiti Inc's own Titirangi Station where, in its former use for maize or grazing, shareholders could expect to see a return of some $2000 to $3000 per hectare.

Hauiti's blueberries have a projected return of around $100,000 a hectare but Hauiti Inc chair, Wayne Amaru, says it is about more than just returns for shareholders. As well as being focused on Māori self-determination, the iwi always had a sharp eye out for opportunities to create jobs on the coast, where employment was limited.

The operation's growth, from one hectare of tunnel houses in 2019 to four by 2020, has all happened under the guidance of Steve Phelps, a man who started his career as a builder and eventually became Head of School for Primary Industries at Gisborne's Eastern Institute of Technology.

While proud of the employment opportunities created for students, Steve says he was frustrated with the lack of job security for his staff. So, when Hauiti Berries put the call out for a new leader, he thought he would have a crack.

The job incorporates both his main skill bases. When he started in June 2018, his primary role was getting the first tunnel house planned, consented and built; with work on infrastructure (including water, power, roading and land levelling) starting in September. The construction of windbreak and one hectare of tunnel house (covering 9,000 bushes) launched in January 2019.

By September, work had begun on building a further three hectares of five-metre-high tunnel houses, all enclosed with windbreak and bird netting to protect the April 2020 plantings of a further 11,000 bushes.

Steve's role as operations manager was also well underway, his responsibility being to manage the health of the orchard with the help of a computer system that monitors nutrient requirements and water, which are sourced from a combination of spring water and catchment from the tunnel houses.

With each bush in a 30-litre pot, Hauiti grows the fat, juicy Eureka berries so beloved by the market, and plans to plant 1,500 of the more vigorous variety, Eureka Sunrise.

That is an early-season fruit, but even with its existing plantings, Hauiti is one of the first to market, picking high-quality berries in early July, nine weeks earlier than in the 2020 harvest.

"That's where the dollars are," says Steve. "It was great to be just one of two orchards in the country growing Eureka to be picking that early."

That achievement was a result of a mix of factors, from maturing bushes to early pruning and nutrient practises.

And while it gets pretty hot for pickers under cover – over 40 degrees on warm days – the bushes love it and produce good growth right through until April.

Hauiti Berries is shooting for production of well over 25 tonnes per hectare and as each bush needs to be picked up to ten times over the course of a harvest, it is a labour-intensive business.

Those pickers are largely sourced from the local community. Steve says, that was the point.

"The aim was always to create an environment where locals could have as much work as possible for as much of the year as possible. The ongoing challenge is in making sure we have enough hands over those peak periods," he says.

"But with about 70 staff on the books, we've pretty much tapped the local market. So, on big weeks during our October/November peak, we get contractors to come up from Gisborne."

Additional tasks like pruning and weeding gives some staff work for up to seven months of the year and there will soon be more: Hauiti Inc has recently bought a nearby farm with 18 ha of citrus on it.

"That offers complementary cropping to provide work when it is down-time for the blueberries," Steve says.

"That diversification feeds the aim of having successful working orchards that keep as many people in meaningful work as possible, for as long as possible. That's the kaupapa."

Hauiti Inc is one of seven Māori Incorporations that have 80% to 90% common shareholders within the tribal rohe of Te Aitanga-a-Hauiti Iwi, stretching from Gisborne to Tokomaru Bay.

It is joint owner of Hauiti Berries, which grows four hectares of blueberries in tunnel houses located on an iwi-owned station just out of Tolaga Bay.

Licensing, sales and marketing of Hauiti fruit is taken care of by the Freshmax-owned BerryCo, which expects the now $44 million export industry to more than double by 2026.

Export the key to industry growth

In its 2020 report for the Ministry of Business, Innovation and Employment (MBIE), research company Coriolis said blueberries had emerged as a high-growth sector for New Zealand "that has grown on the back of growing global demand for this small, healthy fruit".

The report, *Opportunities in the New Zealand Blueberry Industry*, says the NZ Department of Agriculture introduced blueberries to New Zealand from the United States in 1950 to provide a suitable crop on the acid peatlands of Waikato, which remain the centre of blueberry production today.

In the 1970s, improved varieties were imported from the United States and since then, further introductions have occurred with fruit breeders – at Plant & Food Research and elsewhere – developing improved varieties with superior characteristics.

"At the same time, global demand for blueberries is growing driven by clear research on their great taste, their health-giving properties and their status as one of a handful of 'superfruit' known to consumers," says the report.

Coriolis says New Zealand now has a large and vibrant blueberry industry with 2020 figures showing 640 hectares (and growing) of fruit creating $62 million in total industry revenue – including $39m in exports.

The Bay of Plenty, Hawke's Bay and Waikato are the primary growing regions, with firm growth and investment in Northland and the South Island.

The researchers believe export growth in the industry could be driven by opportunities to grow production, improve supply chains, develop better marketing and create value-added products.

Consolidation to fewer growers running bigger operations had already led to strong increases in average tonnes produced per grower, they said, feeding markets for fresh, frozen and further processed fruit.

While the domestic market was stable, Coriolis believed the real opportunity for growth lay in exports, where New Zealand growers were currently "big in small markets and small in big markets".

They identified continued opportunities for growth in Australia, where New Zealand is effectively the only blueberry supplier currently able to penetrate Australian biosecurity, as well as select East and Southeast Asian markets.

Chile and Peru are New Zealand growers' main competition, the latter having grown rapidly over the past decade to become the largest blueberry exporter in the world.

"To date, New Zealand has achieved success primarily in the domestic market and in Australia, both markets insulated from global pressures by biosecurity," Coriolis says. "If growth is to continue, the New Zealand blueberry industry needs to transition from this 'Walled Garden' into the fast-growing but more competitive markets of East and Southeast Asia."

AVO UPDATE

Northland avocado study gets underway

By Jen Scoular : NZ Avocado chief executive

NZ Avocado is undertaking a study to understand the opportunity for avocados in Northland.

Over 1,000 hectares have been planted in avocados over the past five years, mostly conversions from dairy, with tree nurseries still foreseeing good orders going out over the next few years.

The project seeks to understand how industry growth can be supported in Northland, from labour requirements to schooling for those in the industry, to logistics and coolstore facilities, to transport for packing and shipping avocados.

Acknowledging the need to ensure sustainable growth, the study will look at water requirements and availability, the ability to spray agrichemicals using helicopters, and the positive impact jobs and career options might have on regional New Zealand. It is not just about avocados. We will certainly share the resulting report with other sectors, with an expectation that if avocados thrive, other sectors and the communities there will as well.

As the industry body, we understand the landscape and know many of the orchardists or commercial entities planting, as many need to become a member of the NZ Avocado Growers Association before they purchase clonal avocado trees.

We have received support from the Ministry for Primary Industries (MPI) for the study and have now held three online workshops with growers and stakeholders to look ahead, hear growers' views on the opportunities and challenges of supporting industry growth, and discuss ideas on solutions to those challenges.

Holding strategic workshops online is certainly more difficult than face to face, but when the participants are happy to share their knowledge, their questions and their expertise, it makes for some excellent conversation. It also provides the opportunity to hear from new and long-time growers on the same call, hear about technologies that could be adopted from apples or summerfruit to use on avocados, and to hear about the basic cost structure under which those investing in new developments operate.

The feedback participants provide will help to further inform the study. We certainly appreciate the collaborative way the participants share that information. We have such a diverse range of growers, owning nearly 1,700 orchards, ranging from 0.1ha to 200 hectares, with yields from under 5 tonnes per hectare to 50 tonnes per hectare. NZ Avocado expects to receive the report by March 2022.

> **"A big thank you to the avocado growers, packers, marketers, retailers and service providers who are adapting, innovating and doing everything they can to find solutions to the frequent challenges of this season**

This year has been a very challenging season for the avocado industry. A big thank you to the avocado growers, packers, marketers, retailers and service providers who are adapting, innovating and doing everything they can to find solutions to the frequent challenges of this season.

The upcoming holiday period will be a busy time for avocados too, with export harvest volumes and shipping peaking in December and January each year.

We wish all growers a successful harvest and a safe and happy festive season. ●

KIWIFRUIT UPDATE

Hydrogen cyanamide an important tool for kiwifruit growers

The Environmental Protection Authority (EPA) is currently reassessing hydrogen cyanamide for approval for use in New Zealand.

Hydrogen cyanamide is an important tool for many kiwifruit growers and is used under strict conditions once a year, in late winter (July to early September), when the vines are dormant. The spray helps to produce greater yields of quality fruit which ripen at the same time, making it easier to harvest.

> **“ ... removing hydrogen cyanamide could result in a loss of between $233 and $300 million in grower returns**

The New Zealand Kiwifruit Growers Incorporation (NZKGI) commissioned an NZ Institute of Economic Research Inc (NZIER) report on the economic impact, assessing the costs and benefits of withdrawing hydrogen cyanamide from the New Zealand market. NZIER found that removing hydrogen cyanamide could result in a loss of between $233 and $300 million in grower returns, plus another negative impact of $100 million on other associated industries.

What is hydrogen cyanamide?

Hydrogen cyanamide is a flower-inducing dormancy-breaking compound used on dormant vines. It is critical for kiwifruit production where it is used in late winter primarily to compensate for inadequate winter chill. Hydrogen cyanamide is also used to condense flowering, promote uniform budbreak and reduce unwanted lateral flowers even in regions which don't need to compensate for lack of winter chill. The synchronised flowering it promotes means pollination and fruit maturity is also synchronised which gives efficiencies in labour, as orchards can be strip-picked.

What is the EPA proposing?

The EPA has recommended that hydrogen cyanamide be banned and phased out over a five-year period and tighter controls be introduced during the phase-out period. These include:

- Introduction of buffer zones
- Update of hazard classifications
- Restriction of application rate to 25ai/ha
- Update to labelling and packaging
- Restriction of application period.

Keeping communities safe

The industry has done a lot of work over the years to develop best practice spray technology guidelines and has developed compulsory measures for all growers and spray contractors to mitigate risk. All growers and spray contractors are certified to the internationally recognised best practice standards benchmarked against GLOBALG.A.P. Examples of risk mitigations include:

- Using AI (air inclusion) 1 nozzles (making the spray droplets bigger and heavier to reduce the risk of drift)
- Adding drift reducing additive
- Spraying in the right conditions
- Spray plans are in place and risk areas on orchards are identified
- Neighbours are notified and signs are in place.

> **“ The industry has done a lot of work over the years to develop best practice spray technology guidelines**

The kiwifruit industry has for many years voluntarily operated a national public service to provide information and receive feedback from the public on kiwifruit growing operations – including spray activity, noise (bird scarers or fans) and labour compliance. The service informs compliance activities for Zespri GLOBALG.A.P.

Each year, NZKGI and Zespri run a community awareness programme with a number of initiatives, including:

- Presence at community markets
- Dedicated Zespri resource in Northland
- Spray contractor meetings
- Updated complaint recording system and procedures
- Regular meetings with regional councils
- Updated *Spray Safety* brochure provided to all growers via *Kiwiflier* and to all addresses in Kerikeri and rural addresses in Bay of Plenty.

What's next?

NZKGI has engaged experts to provide an independent assessment of the human health and environmental risks that the EPA has identified. This work is due back by the end of February. Therefore, NZKGI has asked for an extension to 6 April 2022. NZKGI will be making a submission on behalf of kiwifruit growers and is encouraging growers to make their own independent submission.

> **"NZKGI has engaged experts to provide an independent assessment of the human health and environmental risks that the EPA has identified. This work is due back by the end of February**

Current information, including updates on deadlines regarding the EPA reassessment, is available on the NZKGI website. This includes information on NZKGI's submission as well as a template for growers to make their own submission: www.nzkgi.org.nz.

Forecasts by Zespri suggest the NZ kiwifruit crop will increase over the next 10 years from 177 million trays (or around 600,000 tonnes) in this current 2020/21 season to 190 million trays to 2027 season (note that a tray = 3.6kg).

The kiwifruit industry is horticulture's largest fresh export.

2,800
growers

13,000
hectares of producing orchards

10,000
permanent employees

up to **25,000**
jobs during the peak season

$2.1 billion
The industry is a major contributor to regional New Zealand, returning $2.1 billion directly to rural communities in 2020/21.

3.3 ha
The average green orchard is 3.3 hectares in size and the average gold orchard is 3.3 hectares.

7,146 ha + 6,189 ha
The NZ kiwifruit industry comprises around 7,146 hectares producing Green (conventional and organic), 6,189 hectares producing Gold3 (conventional and organic).

$12.46 per tray
Growers earn significantly more growing Gold3 than they do growing Green, with Gold3 per-tray returns at $12.46 and Green returns at $7.51 per tray in 2019/20.

SUMMERFRUIT UPDATE

Summerfruit primed and ready for the 2021–22 season

By Richard Mills : Summerfruit NZ market support

Hawke's Bay weather

We've had enough of the rain and overcast conditions thanks very much.

The rainfall totals seem to have varied around the district with the coastal areas copping a bit more – there were lingering puddles out near Red Bridge that were not so visible further inland, and hail damage in the early fruiting areas. We are hoping this won't affect the overall amount of fruit for sale too much. Not nice for those who are dealing with it, but okay for the overall production. Harvest was underway mid-November and we will wait to see how good the brown rot control was. Now some good temperatures and sunshine are needed to harden the exterior of the fruit and get the sugar levels up.

> **"Now some good temperatures and sunshine are needed to harden the exterior of the fruit and get the sugar levels up**

Growing degree days (GDD) in Bay View, for example, are pretty good – better than average in fact. As of 8 November, 345 units have been accumulated, but this is behind last season's exceptional accumulation. This is confirmed by growers suggesting that harvest will be five to seven days behind last season, at least for the early harvested fruit. Stations that we access are a little above or a little below average, so nothing too different to the five-year average.

The following table is a good illustration of why Bay View grows the early fruit. For cherry growers, the Marlborough comparison of GDD is 207 from trees that flowered at the same time as Hawke's Bay – excluding Bay View.

Weather station	GDD (1/09 to 8/11)
Bay View	345
Twyford	233
Pakowhai	241
Lawn Road	204
Ruahapia	208
Havelock North	196
Longlands	251
Te Aute	236

Central Otago weather

Growing degree days as at early November, are showing a steep pitch of the curve, i.e. there is a lot of heat being accumulated.

Cromwell is on 144 units, which is now on par with last season and the 2017 season. Clyde is the same as last season on 131 units, and the Rockview site is now the highest it has been in the last five seasons on 158 units. Roxburgh on 127 units is only mid-pack in the five-year comparison, but is showing the same acceleration in accumulation as the other Central Otago sites.

A couple of growers are anticipating 30-plus-degree days soon and remembering back to the 2017 hot season. By the time of publication, it may have all changed, but at this point it's all good.

Hawke's Bay crop load

In addition to the hail damage, a few blocks of summerfruit have been removed since last season including peaches, nectarines and especially plums, lowering the overall crop volume. Apricots seem relatively stable in planted area and this season there will be a few more cherry blocks producing fruit.

The cherry crop load might be lower than growers had hoped, at least a bit patchy. Apricots seem to be pretty much up to the expected volume, as with peaches and nectarines. Hand thinning in a number of cases has been quick, which all bodes well for size and possibly quality.

Central Otago crop load

As in Hawke's Bay, crop loads in Central Otago are almost at expected levels or mostly so, across all five crops. Cherries have the odd, slightly lighter crop occasionally, possibly due to the flowering period and local weather at that time, but this is pretty much business as usual. It would be an unusual season where every branch on every orchard across apricot, cherries, nectarines, peaches and plums, was at full noise. In a year where labour supply will again be difficult, that may be a slight blessing.

> **"It would be an unusual season where every branch on every orchard across apricot, cherries, nectarines, peaches and plums, was at full noise**

Conclusion

At this early stage, stonefruit supply is underway. Volumes will be good, although Hawke's Bay needs more sunshine, as does Central Otago, to really benefit the supply and volume.

A developing La Niña weather forecast will be worth keeping a watch on in Hawke's Bay, as will the rate of heat accumulation in Central Otago.

The reports on labour availability to date have mostly been adequate, but not oversupplied. As the 2021–22 season progresses, the horticultural sector will keep working to attract enough harvest staff.

In summary:

- There should be enough fruit to supply the market, but not at levels that are over the top. Size has the potential to be good.
- Marlborough local market cherries also have moderate crop loads, with similar bloom and GDD. They could be in the market at the same time as Heretaunga Plains crops.
- Plum supply and demand will be more closely matched than the previous two years.
- Ideally the non-supermarket retailers in Auckland will be up and selling from 10 November, as this is where a part of the Hawke's Bay crop is sold, as well as a good portion of the tag 2 supply.
- Central Otago at this stage seems to be telling a similar story to Hawke's Bay, but it is still very early days. ●

TECHNICAL

THE LATEST INNOVATIONS AND IMPROVEMENTS

Apple growing systems

Page 66

Calcium management in apple orchards

Most orchardists are aware that good calcium levels in their fruit is important.

By Dean Rainham : AgFirst horticultural consultant, Hawke's Bay

Figure **1** *Bitter pit in apples*

Calcium is important for cell wall integrity. Without sufficient calcium, cells become leaky, more prone to disease and can collapse and die. Fruit with adequate calcium status improves the longevity of storage after picking.

The incidence of bitter pit and blotch is associated with low fruit calcium status (Figure **1**) and it usually expresses in storage. There are several factors that increase the risk of calcium related problems in apple fruit, it is never just about one risk factor. Understanding calcium movement and distribution in the tree and what influences this allows for better management to mitigate the risk of both bitter pit and blotch incidence. This article outlines calcium physiology in the tree, discusses the risk factors and poses some practical management responses.

Calcium availability & uptake

First and foremost, it is important to have enough calcium in the soil. A soil test will identify this. Calcium needs to occupy at least 65% of the soil base exchange sites. Maintaining the pH (acidity/alkalinity) between 6.5 and 6.8 will ensure the calcium in the soil is in a plant available form.

Calcium must come into the soil solution and then in contact with the root surface for plant uptake to occur. When plants transpire water flows to the root surface and calcium is transported in this mass flow. Good water management is therefore vital to achieve good calcium status into the tree. Trees under water stress may also suffer from a shortfall in calcium. Conversely, if there is a sustained period of too much water, anaerobic soil conditions can develop which will severely reduce root function and therefore calcium uptake is compromised.

Ensuring good nutritional balance with other competing cations (positively charged ions) such as potassium and magnesium in the soil is important. High amounts of these competing cations, especially potassium, will reduce calcium uptake. Calcium, being a cation, cannot exist alone in soil solution without an anion (negatively charged ion) such as phosphate, nitrate and sulphate. These anions must also be balanced in the soil.

Calcium is primarily taken up by newly developed roots. Thus it is important to maintain a soil environment that sustains a healthy root system and promotes new root growth especially in the spring. Good drainage, nutrient and water management along with organic matter, encourages a healthy and thriving soil ecosystem. Be careful with the overuse of chemicals which lowers biodiversity in the rootzone, impacting on root growth and nutrient availability.

Calcium movement and partitioning

Calcium is translocated through the plant in the transpiration stream via the xylem vessels (Fergusson et. al.). Calcium will therefore be deposited to plant organs that have the strongest demand for water; this is principally the leaves. New developing leaves with high transpiration rates are the strongest sink for calcium. The demand for calcium by the leaves is over 75 times more than the fruit (Fergusson et .al). Excessively vigorous trees are usually the primary reason for low fruit calcium levels and increased risk that bitter pit or blotch is expressed in post-harvest storage.

Water flow and therefore calcium movement to the developing fruit is a little more complex. During early fruit development the surface to volume ratio of the fruit is high. This is favourable for maintaining the transpiration stream

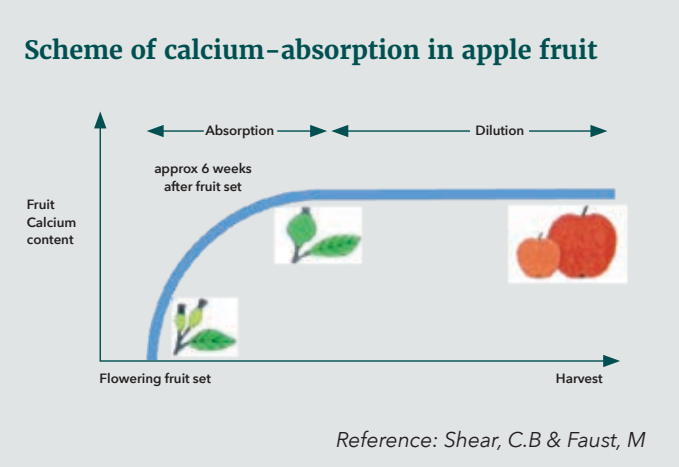


Figure **2** *Schematic diagram of calcium absorption in apple fruits*

and so water moves readily into the fruitlets taking with it calcium. Also during this early fruit development period the outermost layer of the young fruitlet skin has little waxy cuticle. This makes it more permeable to water movement. So, the first six weeks following fruit set is the crucial window in which calcium moves into the fruit. Figure **2** shows the flow of calcium accumulation into the fruit after full bloom. The calcium absorption phase is approximately six weeks after fruit set. Then the concentration levels off and can slightly decline as fruit enlarges through to harvest. This is because there is a dilution effect as the total fruit calcium is now spread over a larger volume of fruit.

Unlike other nutrients such as potassium and nitrogen, calcium does not move in the phloem and so will not re-distribute from the leaves to the fruit (Fergusson et. al.). Therefore, the only way now to get more calcium into the fruit is by regular applications of calcium sprayed directly onto the fruit.

Boron effect

Fruits with higher seed numbers accumulate more calcium (Table 1). Pollination is therefore important. Boron is required for pollen tube formation. If there are inadequate levels of boron, pollination is incomplete which means less seed numbers and in worst cases distorted fruit. Trees are best treated with an immediately post-harvest boron spray and/or a pre-flower boron spray.

Table 1. Seed numbers per fruit in relation to fruit diameter and calcium concentration (Bramlage et.al. (1990))

Seed numbers (per fruit)	Fruit diameter (mm)	Fruit calcium (ppm)
0 - 1	67	174
2 - 3	70	208
4 - 5	71	215
>5	72	223

Risk Factors

It is usually never just one risk factor you need to manage. The perfect storm for pit and blotch is the alignment of all risk factors. However, pit and blotch management can be complex because just one risk factor if not sufficiently mitigated could be the one that will tip the fruit into pit or blotch disorders. Management therefore is about having a proactive plan to mitigate all risk factors.

Table 2 outlines some key risk factors and possible responses or management tools available to mitigate these risks. Low crop load leads to larger fruit and more tree vigour. Larger fruit means a greater dilution of calcium. Crop variation within block and within row, as well as excessive vigour, block history, hot and dry climates are all key risks that need to be managed. Tools such as pruning, crop load management, varying chemical thinning, the use of Regalis®, water management (soil moisture monitoring), root pruning, nutrient management (soil and leaf test monitoring) and calcium sprays allow a grower to proactively manage these risks.

Table 2. Bitter pit and blotch risk factors and possible management responses

Risk factor	Response
Low crop load	• Moderate prune • Apply Regalis® early • Moderate chemical thinning • Supervision of hand thinners
Crop load variation	• Vary chemical thinning • Identify and segregate the harvest • Apply more foliar calcium more frequently
Vigour	• Higher crop load • Less irrigation early • Avoid N inputs in spring • Apply more foliar calcium more frequently • Apply Regalis® • Root prune – vigour control plus promotes new roots which absorb more calcium
History of low fruit calcium	• All of the above
Dry hot climate	• Continue with spraying foliar calcium • Apply more foliar calcium more frequently • Apply with higher water volume • Apply with buffer • Regular irrigation, avoid stress

Nutrition imbalance	• Soil test and address pH, Ca, Mg & K balance • Avoid fertiliser applications during flowering and the crucial six-week period post fruit set • Maintain good water management – avoid water stress or overwatering • Avoid excessive N use in the spring • Leaf test to monitor nutrient balance – make adjustments • Maintain regular foliar calcium programme

Regalis® is a plant growth regulator. Its active ingredient is prohexadione-calcium. Regalis® is a trademark of BASF.

Calcium Sprays

Once the fruit has entered the cell enlargement phase of growth (approximately 6 weeks after fruit set), the only means to increase fruit calcium status is to apply calcium sprays directly to the fruit. Regular applications are important to top up the cells with calcium as they expand.

The key points for calcium spraying are:

- Aim for at least 25 kg Ca/ha for pit sensitive varieties.
- Split into 18 – 20 sprays over the season. Frequent applications are key, target every seven days.
- Make sure each application uses the full recommended rates.
- Keep the programme going regularly right up to just before harvest. Late calcium applications are just as important as early applications.
- Every calcium application is important as it tops fruit cell calcium levels up as they expand.
- Apply to get best absorption, higher water volume sprays are better.
- Use buffered formulations especially in hot climates.

Summary

Post-harvest storage disorders, bitter pit and blotch are linked to low fruit calcium status. By understanding calcium availability, uptake and movement in the tree, growers can identify key risk factors for pit and blotch incidence. Nutrient imbalances and excessive vigour are important factors; however, it is never just one risk factor that needs managing. A coordinated and timely response is required to proactively manage and mitigate the incidence of these disorders.

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Shear C.B. & Faust M. (1970) "Calcium Transport in Apple Trees." Plant Physiology June: 45. Crop Research Division Ag Research Service, US Department of Ag, Beltsville, Maryland. Bramalage, W.J., Weis, S.A., and Greene, D. (1990), Hort Science 25: 351–353.

Canterbury soils drying out

By Georgina Griffiths : Meteorologist, MetService

Soil moisture deficits (SMD) in Canterbury typically start dropping rapidly through October and November, due to the drying spring westerlies.

This year was no exception, although modest rain at the time of writing in South Canterbury has briefly put the brakes on this decline. Ashburton recorded 20mm of rainfall in mid-November, while Rangiora recorded just 7mm over the same period.

As of 15 November, a 'snapshot' of estimated soil moisture (fig. 1a) highlights how Hurunui and the Kaikoura coast, as well as Nelson, Blenheim, and central Hawke's Bay, are showing significant soil moisture deficits. The definition of 'significant' soil moisture deficit is more than 110mm of deficit. These maps are useful to compile a national picture of where it is dry and where it is not.

A zoomed-in version of the same map (fig. 1b) shows some of the detail available in the 4km resolution SMD estimates at the time. However, estimates are estimates, so always 'ground truth' the soil state-of-play for yourself.

Figures 2 and 3 tell an interesting story about just how hard 2021 has been for Canterbury farmers. The plots show the unusually prolonged drought during summer and through autumn of 2021. Soils remained extremely dry until the end of May, when extreme flooding in Canterbury on 31 May caused widespread damage.

New Zealand really breaks a drought savagely, doesn't it?

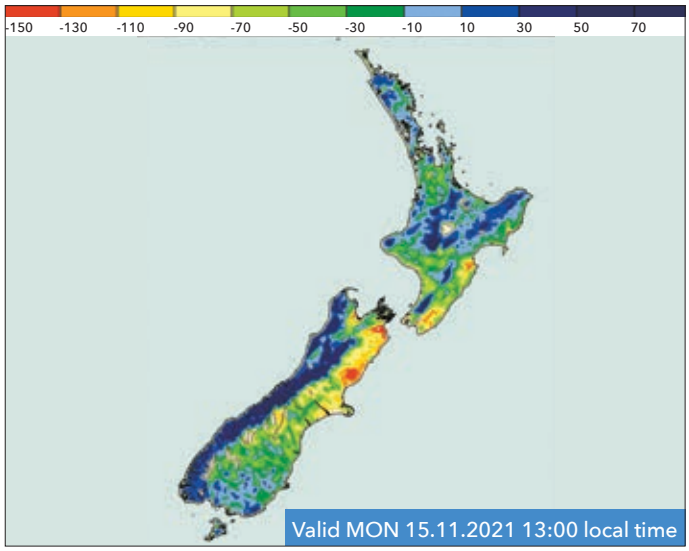

Figure 1a: *A national 'snapshot' of soil moisture deficit (SMD), shown in mm of deficit (orange, yellow, green colours) and mm of surplus (blue colours), from mid-November. (The snapshot is estimated as at 1pm, 15 November 2021). This is an estimated SMD based on 4 km resolution weather modelling, based on estimated daily rainfall (mm), outgoing daily potential evapotranspiration (PET, mm), and a fixed soil available water capacity of 150 mm. 'Significant soil moisture deficit' is defined as more than 110mm of deficit, and 'severe soil moisture deficit' is defined as more than 130mm of deficit.*

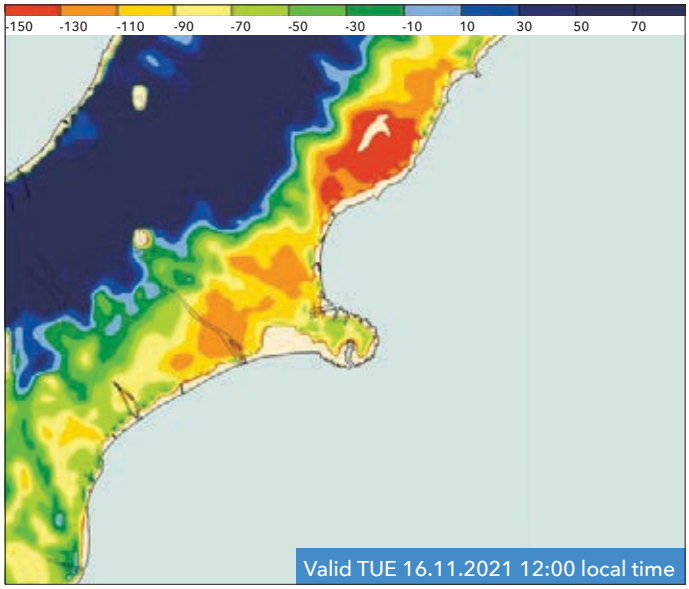

Figure 1b: *A zoomed-in 'snapshot' of soil moisture deficit (SMD) across Canterbury, exactly as described in Figure 1a.*

The rapid change in soil moisture levels at both Rangiora and Ashburton during the first half of November also caught my eye (figures 2 and 3). By mid-November, soil moisture deficits had accelerated higher than five of the six years shown, and were comparable to 2017 at the same time of year. The year 2021 sure has been a rollercoaster for Canterbury!

With La Niña forecast for the coming summer and the associated risk of higher-than-usual pressures over the South Island, there is a very real likelihood that this weather rollercoaster is not yet over for the region.

As always, you should keep up to date with the MetService long-range forecast at **http://metservice.com/rural/monthly-outlook**, or ask us questions on the MetService Facebook or Twitter feeds.

Rangiora Soil Moisture Deficit

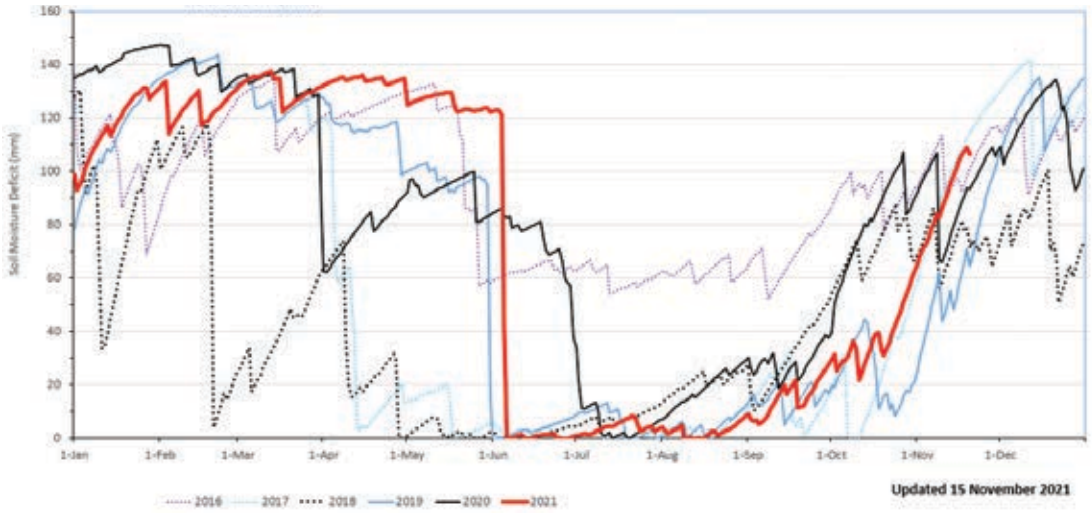

Figure 2: *Rangiora soil moisture deficit (SMD), shown in mm of deficit, for the last six years (2016 to 2021-so-far). SMD is calculated based on incoming daily rainfall (mm), outgoing daily potential evapotranspiration (PET, mm), and a fixed available water capacity of 150 mm. (This is the amount of water in a theoretical soil 'reservoir' that plants could utilise). Soil moisture deficit in Rangiora in 2021 remained in 'extreme' soil moisture deficit (more than 130mm of deficit) through most of summer and all of autumn, until the extreme Canterbury floods on 31 May shot soils straight to run-off (saturation) for winter and early spring. Since mid-October, soil moisture levels have started to drop quickly again.*

Ashburton Soil Moisture Deficit

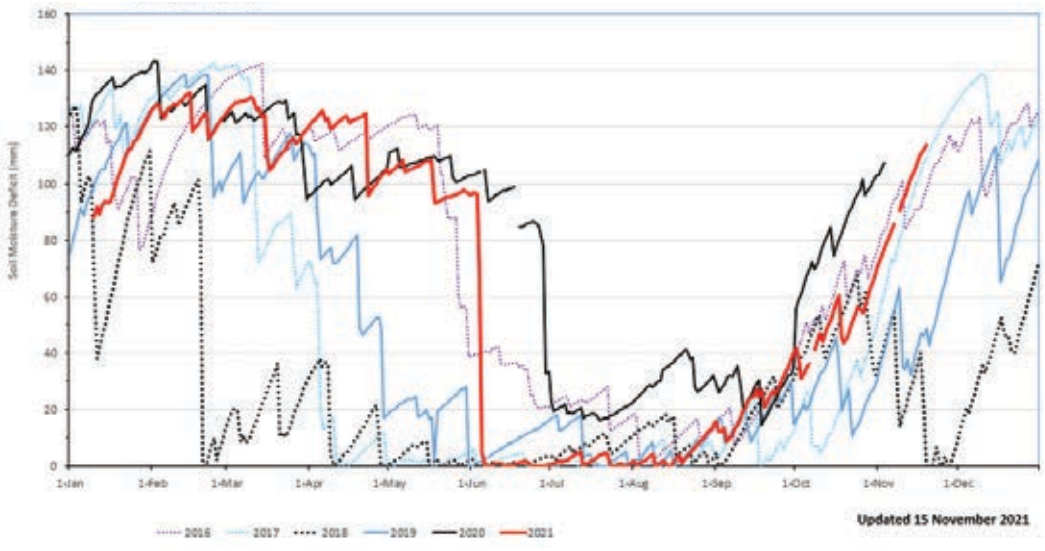

Figure 3: *Ashburton soil moisture deficit (SMD).*

2-D growing systems prove their worth

Fourteen years since the first commercial 2-D orchards were planted, AgFirst director, Craig Hornblow, says they can provide long-term growing benefits.

By Rose Mannering

There is not one iteration of a 2-D system, it is a constantly moving target, Craig says. However, he believes a simple, narrow row produces the greatest accessibility and is the most productive.

Due to the high capital expenditure, with a development cost of $200,000 a hectare, it is important to consider the longevity of the block. Investment analysis has been carried out for 15 years but most orchards at a reasonable row spacing and in good condition, can be grafted to another variety, or even worked over three or four times.

"A development cost of $200,000 a hectare can stretch to a 30-year horizon," Craig says.

Careful thought needs to go into the structure and risk.

Hail insurance has got to the point where it is almost unaffordable, and Craig believes hail netting will be a big part of the future.

Ground conditions become an important consideration, with more frequent machinery passes and high technology equipment for picking or scanning the canopy.

Longevity of rootstock is also critical. There are now two or three rootstocks soon to be available that will offer a whole range of benefits going into the future.

"Be wary of ones that grow strongly early but then stall and behave much worse than M9 – the current industry standard," Craig says.

Disease and pest resistant qualities will also be important for future orchard developments.

The oldest 2-D systems are now 14 years old and every variety in commercial production has been tried on this system. Most varieties can be adapted to a 2-D system, the most difficult to date has been Pink Lady.

The objective metrics are to fill the wires. Current systems now vary between six and eight wires.

"It becomes a matter of micro-managing every fruiting window to deliver the desired number of fruits," says Craig.

The narrower the 2-D system, the better. It should be no wider than 35 – 40 cm mid-season, and narrower rows allow light to penetrate through the whole canopy.

"You need to be able to see through three to five rows mid-season."

Another way to judge whether the level of light penetration is good is to lay Extenday – a type of reflective cloth – then see if there is a 50% shading pattern on the cloth (or measured light of 800µmols).

"It is all about managing windows and getting texture into the canopy to allow light transmission," says Craig. "This will give you excellent consistent fruit quality."

Leaf blowing can be used to manage late season light transmission in the canopy.

Craig says picking platform sales have been "massive" in the past twelve or so months, representing a big capital investment for individual orcharding operators. Narrow rows maximise the benefit of picking platforms.

The narrower the 2-D system, the better. It should be no wider than 35 – 40 cm mid-season, and narrower rows allow light to penetrate through the whole canopy

Labour demand in growing pipfruit is one of the biggest considerations and equates to one person per hectare. At peak demand at the end of season, this may increase to three people per hectare. If a picker needs to climb 1.5-metres up a ladder to pick the tops of the trees and there is a planting density of 2,000 trees per hectare, this is equivalent to climbing 3,500 metres. Putting this in climbers' terms, that is the equivalent to climbing Mt Everest.

"One bin weighs 400 kg," says Craig. "If a worker picks four bins a day, that is 1,600 kg a day. In a five-day week, one worker picks 8,000 kg, and in a 12-week season that is 96,000kg."

Mobile picking platforms produce a smaller efficiency gain of 20% for experienced pickers, but for inexperienced pickers the gain is closer to 40%.

2-D growing systems mean chemical thinning can be eliminated due to the ease of thinning mechanically. Truly robotic picking systems are some time away, Craig says.

Productivity of different growing systems within the 2-D footprint indicates the V-system can produce higher yield.

PRODUCTIVITY 2-D system & V-system

	2-D Single leader	V-System
Fruiting Wood	33km	42km
Yield 2.7kg/m	90 tonnes/ha	113 tonnes/ha
Yield 3.0 kg/m	100 tonnes/ha	126 tonnes/ha

Mature 2-D systems are yielding between 83 and 125 tonnes, and consistency through the canopy is a big plus. Pink Lady has proved to be the most challenging to grow on a 2-D system.

Hoddys Fruit Co Ltd general manager, Andrew Kininmonth, says extensive use of the 2-D growing system on his orchards has been driven by a desire to produce high quality fruit which delivers a consistent eating experience.

Trees tend to be less biennial and produce more spur wood. For staff working on platforms, it is straightforward to teach the rules making each task easier.

"We spend a lot of time during the winter doing detailed pruning, which makes the rest of the year easier," he says.

Practical learnings from the 2-D system for commercial growing include having longer rows. Andrew believes 100-metre rows are too short and in future he plans to lay conduit down the rows in preparation for electric vehicle (EV) platforms that may need charging during the day.

One bin weighs 400 kg ... If a worker picks four bins a day, that is 1,600 kg a day. In a five-day week, one worker picks 8,000 kg, and in a 12-week season that is 96,000kg

A fragmented approach to the development of machinery and systems to use in 2-D growing systems is seen as a barrier to progress. Co-founder of Hortworx, Rob Elstone, says the industry needs to work out how to collaborate so design effort is not wasted.

"Do we develop a machine that goes down narrow rows [to fit the Future Orchard Planting Systems (FOPS) developed by Plant & Food Research]? We don't want to develop what you don't want," he says.

It is exciting times for technology development in pipfruit but a mindset change is needed so that different growing groups can work together. ●

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