The RCHARDIST[®]

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HORTICULTURE NEW ZEALAND

A persimmon perspective

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Team Food and Fibre sector

By Bernadine Guilleux : HortNZ deputy president

Tēnā Koutou Katoa

Barry asked me to put a few words together for this month's magazine. My immediate thought was the world is a busy place, and a noisy one at that. Who am I to add to the clutter?

That said, my personal approach is to gather and listen to as many views as I can, so that I am better placed to formulate an understanding of the world around me. Basic facts homework for anyone wishing to participate effectively within an advocacy organisation such as Horticulture New Zealand.

I recently had the unique opportunity to listen and gather as part of Te Hono Aotearoa, held in Waitangi, Kerikeri, in late June.

Te Hono is a partnership event between the leaders of New Zealand's food and fibre sector companies, iwi and government agencies. Conceived in 2012 by a New Zealander, Te Hono was devised to build the foundations of a winning team - shared vision, knowledge, and connections. This team was then the New Zealand primary sector, now known as the Food and Fibre sector.

New Zealand Trade & Enterprise (NZTE), the Ministry for Primary Industries (MPI), KPMG and the ASB Bank felt, and still feel so far, that it is an initiative worth supporting. Despite that, there are varied views on the legitimacy and worthiness of such an event, who attends, and why a humble sector like New Zealand's land-based industries should be pretentious enough to think this was a good idea in the first place.

Te Hono in te reo means to connect. It comes from a broader concept of Hono Tangata, Hono ki te ao. The English translation of this is strengthening relationships by linking to the land and connecting to the world. The purpose of Te Hono is to offer the shared experience of world-class thinking in a condensed, future-focused environment. As with anything, what you do

with your knowledge and experience is a democratic choice.

The world is moving at speed through unprecedented change and the virtual world is so much more real than we like to imagine. Many seem to believe that resisting change is the solution, that if we shout loud enough then the tsunami will stop, or that it will be smaller than all the scaremongers say it is going to be. From a pragmatic viewpoint one can agree, but

ultimately plan to get to the top of the hill just in case. If the tsunami of change ends up being a small tidal wave well great, at least we took the kids up the hill and enjoyed the trip.

Norman Borlaug was the brain behind the industrialised agriculture that we see on Netflix. His motivation to develop a strain of maize that could be grown in the impoverished countryside of Mexico was born from the emotion he felt seeing starvation firsthand. Today, there are people with the same motivation working on Food-as-Software that will also revolutionise food supply as we know it, providing the human population with adequate nutrition.

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Te Hono in te reo means to connect. It comes from a broader concept of Hono Tangata, Hono ki te ao

What is different today from when Borlaug was developing his maize is that there are simply more people on the planet, and a less stable natural environment. What is the same now as it was back then, is that humans look to technology to answer big challenges. The European Union has recently declared a review of their stance on geneediting (CrispR technology) after a European Commission report release stated such tools will help support agricultural sustainability. The EU recognises that to make such a position change, they will need extensive public consultation - lengthy and robust at that.

Some food scientists will say that regenerative agriculture is simply 'shining the horse and cart' whilst precision fermentation firmly takes over food production as we know it, and right underneath our noses.

As a marketer trained in social sciences, I would suggest that New Zealand has the type of global reputation to underpin a winning play at artisanal agriculture. Ultimately this is a food production system not to feed the masses, but to provide product options that consumers can select to help stabilise the planet's natural environment and be rewarded with a feel-good outcome. Tagged as 'regenerative', New Zealand can define what this means in our context. Whether one agrees with environmental regulation or not, marketers will say that if our country has high minimum standards, this helps us sell our basic products at a price that gives us the quality of life we wish for our country.

In summary, unless New Zealand agriculture is a net positive contributor to our natural environment, then its right to play becomes a whole lot harder to justify. This could be a complicated way of saying so let's just get on with addressing climate change and accept the publicprivate partnership offered that will help equip our organisations to ride the global tide towards new supply chains.

It is as simple - and as complex - as that.

This year, Te Hono saw a new generation of food producers come together by inviting a group from Future Food Aotearoa - a movement representing entrepreneurs who see food tech as New Zealand's future. How to convince the sturdy and humble backbone of New Zealand's economy that their future is an Avatar of what they know. The point that United States academics shared at Te Hono is that New Zealand can continue being humble, so long as we make sure we are acting for the good for the planet.

Another point made was to diversify risk by climbing the chain into higher valued, processed versions of current production. Global consumer research tells us that younger generations are consuming less and less raw fruit and vegetables and are not particularly interested in cooking. Therefore, our opportunity to reach consumers will be twofold – intermittently into their stomachs through the strength of our commodity supply relationships, but also into their hearts and minds through the high-value consumer products we dream up.

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Brand New Zealand – what is it worth?

For some time now, New Zealand has traded on the '100% pure' brand and status, largely promoted with incredible imagery from our tourism industry – a brilliant marketing campaign.

By Nadine Tunley : HortNZ chief executive

As food providers, we've built on that positioning to reach into the hearts and minds of global audiences. In turn, New Zealand has become well-recognised as a credible, safe food provider with key trading partners.

In 2012, the then government set a challenge to double export earnings via the Business Growth Agenda (BGA), a challenge the horticulture sector embraced. Horticulture New Zealand developed a strategy to double exports by 2023, Pipfruit New Zealand said it would double exports by 2022 and New Zealand Avocado secured a Primary Growth Partnership and set about to do the same.

Ten years on, many horticulture sector groups have more than doubled their exports, and in doing so, have considerably improved New Zealand's economic outcomes. Horticulture, as with many of our primary sector colleagues, is required to plan several years in advance for any potential expansion or contraction strategies - something imposed on us by mother nature and beyond our control. Using trees as an example, if an orchardist wants to plant new trees or vines, they need to order and pay for those trees two years ahead of when they plan to plant them. This is so nurseries can have the necessary stocks available,

bearing in mind that annually, there are about

1.5 million apple trees planted per annum at a commercial level, excluding garden centres and domestic use.

Working within these timeframes, growers are also required to budget for the capital to plant. This capital investment per hectare can range from about \$100,000 per ha to \$600,000 per ha, depending on licensing costs and the infrastructure used to grow the plants on. As you can see, planting

a 10-ha block in one variety can easily set a grower back \$1 to \$6 million.

Once the trees or vines are in the ground, it is a further three to five years before the plants will bear any meaningful volume of fruit. At best, an orchardist is counting on returns in five years' time, sometimes even



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eight. Legend, right? Making changes in this kind of environment is like trying to turn around an oil tanker in a hurry to avoid a storm.

Capital investment is required every step of the way. Therefore, if market conditions, consumer preferences, market access via trade agreements and or central or local government policies change, orchard entities are at risk of losing significant amounts of time and money.

This is one of the discussions we constantly have with policy makers, so they gain an understanding of the dedication and effort our growers apply, the timeframes they operate in, and how any new policy will affect growers and their operations.

Thinking intergenerationally

Growers have to think intergenerationally. They are forced to do so by the cycles and rhythms of the natural world. Growers accept change needs to occur with regard to freshwater, the environment and land use. They just need more realistic timeframes to adjust.

The situation the world is in with climate change has been building up over several decades. But not so long ago, the push was all about increasing productivity and yields per hectare. This was essentially a response to increased consumer demand, as both global and domestic population growth has increased exponentially. New Zealand needs to remain economically viable to be able to afford to implement necessary changes around the natural environment. By introducing too many changes at once, coupled with ongoing labour restrictions, we will reverse all of the horticultural successes of the past decade within the next two to three years.

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New Zealand needs to remain economically viable to be able to afford to implement necessary changes around the natural environment

Most at risk is the New Zealand brand, which we have spent so much time building, as well as the security of our own domestic food supply. Considerable amounts of effort over long time periods go into the food our growers produce. To circumvent that effort through relentless and unrealistic expectations will not achieve any of New Zealand's environmental or economic aims, let alone protect our valuable and prized New Zealand brand on the world stage.

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INDUSTRY WIDE ISSUES FOR INDUSTRY GOOD



Natural resources and environment

By Michelle Sands : HortNZ environment manager

Natural and Built Environments Act

The Natural and Built Environments Act (NBA) is part of the government's reform to replace the Resource Management Act (RMA) with three new Acts:

- National and Built Environments Act the primary replacement for the RMA.
- Strategic Planning Act coordination and integration through long-term spatial strategies. High-level and strategic.
- Climate Adaptation Act to address issues associated with managed retreat.

The NBA is being delivered in a two-stage select committee process:

- A Select Committee inquiry into an exposure draft of the NBA is the first, and current, stage. The Select Committee is seeking comments on the exposure draft.
- The second stage will be a standard legislative process (including the opportunity to submit) for the full Bill, along with the Strategic Planning Bill and Climate Adaptation Bill. Indications are that this process will begin in early 2022.
- The Bill is expected to be passed into law by the end of 2022.

The Parliamentary Paper explains the government's reform objectives. They are to better protect the natural environment, better enable development within biophysical limits, give effect to the principles of Te Tiriti o Waitangi, better prepare for climate change risks and natural hazard risks, and improve system efficacy and efficiency.

Horticulture New Zealand is developing a draft submission and consulting with growers. Key issues for the HortNZ submission include:

• The Bill has an emphasis on providing for more housing and infrastructure. We think the Act will result in more pressure on food production within growing areas close to urban centres. We are seeking that food, along with housing and water, is recognised in the Act as essential to human health.

- We support the recognition of highly productive land, and seek policy to enable its use for food production, as well as its protection from inappropriate subdivision.
- We support the emphasis on climate change adaptation and mitigation, and seek that legislation provides support and direction to encourage land use diversification.

Submissions on the draft Bill close 4 August 2021.

Freshwater Farm Plan Regulation

The government is introducing mandatory and enforceable freshwater modules of farm plans.

The new regulations will set out requirements for freshwater farm plans, and timeframes for when these plans are required to be implemented.

It is likely that the freshwater farm plan modules will need to include:

- A farm map identifying features such as waterways, high erosion-prone and discharge areas, and other risks to the health of water.
- A risk assessment across specific activities including irrigation and application of nutrients.
- A schedule of actions to manage identified features and address identified risks.

The government has released a discussion document. HortNZ will consult with growers and develop a submission.

Key issues that HortNZ's submission will likely include are that freshwater farm plans are aligned with existing GAP (Good Agricultural Practice) schemes and provide a streamlined approach for growers to track and demonstrate the good work they are doing to manage environmental effects. We are advocating for a system where the cost to growers is lower, and there is more certainty for growers about what they need to do, as well as more certainty for the community about the rate of improvement in water quality that can be expected.

Submissions on the Freshwater Farm Plan regulation discussion document close on 12 September 2021.



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HortNZ chief executive, Nadine Tunley, and Nelson Young Grower organiser, Richard Clarkson (right), presented Jonathan with his award at the evening awards dinner

2021 Nelson Young Grower Jonathan Bates backs horticulture careers

Winner of the 2021 Nelson Young Grower competition, Jonathan Bates, was planting and pruning before he left primary school, encouraged by his grandmother who instilled in him a passion for horticulture.

By Anne Hardie

Jonathan's progression up the horticulture career ladder occurred through opportunities that arose along the way rather than following a clear pathway, an area he says industry could work on.

"School leavers need a clear career progression pathway, so they know where they are going and the steps they need to take to get there," Jonathan says.



The 28-year-old grew up in cherry and stonefruit country around Alexandra, where he gained his first insight into orcharding, picking Golden Tatura peaches during one of the school's annual work days. Jonathan then "fell into a job" after doing summer work on a local orchard. The boss's father, Stuart McIntosh, tapped him on the shoulder,

showing him all he knew about grafting, which led to a longer-term job.

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"It made me see it as a career rather than just a job picking fruit," Jonathan says.

Stuart was designing his own cultivars at the time. The orchard included cherries, stonefruit and apples, which meant Jonathan "got to have a fiddle at everything." Eventually he got involved in a 100ha orchard development. It was on this site where he later married Sidonee in a ceremony where they turned off the irrigation 20 minutes before they exchanged vows.

When Covid-19 hit, Sidonee lost her job as a landscaper, and with few jobs on offer around Central Otago the couple needed to look for other opportunities. Jonathan found work with Birdhurst Ltd in Motueka where he has spent the past 10 months in what he thinks of as his "perfect job" as a block supervisor.

The role involves overseeing about 20 staff from apple harvest through to pruning and working the three-row sprayer which he describes as an "awesome machine" capable of covering 6ha in 45 minutes.

It's Jonathan's third time entering the regional Young Grower of the Year - twice in Central Otago where he came second and third, then winning this year's regional competition in Nelson.

"I was definitely planning on entering this year to meet people in the industry and learn region-specific aspects like the different soil structures. The soil can change five times across one block here.

"The speech was the hardest because I thoroughly despise public speaking, but it was good practice in front of 300 people." Jonathan spoke about how Covid-19 had impacted him personally as well as his work organisation. The pandemic prompted his move to Motueka and exacerbated the labour shortage for the industry, highlighting the need to attract people into careers rather than just part-time seasonal work.

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"The people are there but we can't seem to attract them. It's an issue we've had since before I was involved."

Being deemed essential workers during lockdown threw a positive light on the horticulture and agriculture sectors, something Jonathan hopes will help attract more people into the industry.

"It definitely helped those within the industry take pride in their roles," Jonathan says.

"Being called an essential worker changed how you thought about your job. You knew it was important, but no-one else gave us recognition for it. I hope it continues into the future."

He says accommodation will have to improve in the industry to attract more people. He and Sidonee have "amazing" accommodation which made moving to Motueka that much easier. It's part of the company's purpose-built facility for Recognised Seasonal Employment (RSE) Scheme workers and other staff, with a soccer field and a volleyball court that even has Golden Bay sand on its base. But not all orchards provide adequate accommodation, and he says there are seasonal workers living in cars or vans around the country.

"An orchard should be able to accommodate all its staff. If it doesn't pay for itself, you have to rethink what you are doing. If I couldn't get accommodation through work, I wouldn't have moved here."



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Record number of contestants for Gisborne Young Grower

By Andrew Bristol

The organisers of the Gisborne Young Grower of the Year competition had to turn contestants away, for the first time in the competition's history.

"While that's a great position for the competition to be in, it is also pretty disappointing for the hopeful contestants who missed out," says organiser, Scott Wilson, general manager at Kaiaponi Farms Ltd.

"But the logistics of the 10 competition modules dictate that we can only accommodate 10 contestants on the day. We did however, provide training exercises for potential 2022 contestants so they could gain some experience and have some fun."

On Thursday 8 July contestants had a cool start to the morning, but Gisborne turned on the sun and a blue sky with no wind for the rest of the day.

"The competition was close and came down to the speeches, which were given at the awards dinner that night," says Scott.

"Around 200 people attended the dinner at the Vineyard Restaurant. This was also a great opportunity for people from across the horticulture sector in Gisborne to catch up and celebrate the positivity of our young leaders in what has been a challenging 12 months."

The winner on the night was Jamie McIntyre, 25, an orchard hand at Illawarra Farms.

"What a day and I'm really stoked," said Jamie. "This is the best job you can have. I love what I do as growing is such a fantastic lifestyle choice. I am passionate about growing and want to share what happens on our orchards, so more people can have a slice of the lifestyle that we can all lead."



Horticentre



Winner of the 2021 Gisborne Young Grower of the Year competition, Jamie McIntyre

2 A record number of contestants competed in this year's Gisborne Young Grower competition, putting their horticultural skills and knowledge to the test

Jamie will represent the Gisborne growing community in the national Young Grower of the Year competition in Wellington on 22-23 September, where he and six other regional finalists will compete for their share of \$30,000 worth of prizes.

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Getting a better deal for growers

By Geoff Lewis

Making sure the little guys get a fair deal will be a key theme covered by New Zealand Food and Grocery Council chief executive Katherine Rich at this year's Horticulture New Zealand Conference.

The current supermarket scene is dominated by a 'duopoly' of two large companies - the Australian-owned Progressive Enterprises and the Foodstuffs cooperative which provides the vast majority of the grocery trade around New Zealand and importantly for those in horticulture, a large part of the fresh produce market.

However, growers of fresh produce can often become the casualties in the competition between these two large companies, Katherine says.

"New Zealand's supermarket duopoly is causing significant issues for suppliers and consumers. For suppliers, squeezed margins are resulting in under-investment, undersupply and reduced innovation. For consumers there is less choice, variety, innovation, price, and other non-price competition.

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For suppliers, squeezed margins are resulting in under-investment, undersupply and reduced innovation

"At the moment growers are caught between two supermarket chains where there is no competition on the supply side. There is the general feeling that growers are price-takers - they take what the big chains will give them."

Katherine Rich cited a strawberry grower she had recently talked to.

"He told me he was getting the same price he was 45 years ago."

She is awaiting the outcome of the Commerce Commission's Market Study, due out in the week before the conference, and hopes it will result in a Grocery Code of Conduct as is found in the United States, Canada and Australia.



Katherine Rich, New Zealand Food and Grocery Council chief executive

"The code works well in those markets, making sure smaller manufacturers and growers get a fair deal and improving transparency. We need to introduce a mandatory code which sets out how supermarkets deal with suppliers, payments, deductions, rebates and levies.



For consumers there is less choice, variety, innovation, price, and other non-price competition

Katherine says New Zealand's growers and grocery manufacturers are facing the perfect storm.

"We've had quite a few smaller producers sell out to bigger companies. If they can't make a profit and pass costs on it makes it difficult."

A variety of what had been New Zealand-based grocery manufacturing operations has disappeared over the past few decades.

"And these used to be major players in starting young people into these industries."

Katherine says the conference will give her the opportunity to talk to growers and farmers and congratulated HortNZ on its pro-active stance. ●

Katherine Rich is chair of Fairtrade Australia New Zealand, deputy chair of the Food Safety Advisory and Assurance Council, and a board member of the Health Promotion Agency.



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Jaspreet Bhatia - horticulture needs Kiwi students from the science, business and technology areas

New blood extends GoHort programme to Pukekohe

Newly appointed Pukekohe Career Progression Manager, Jaspreet Bhatia, says that while students may be attracted to conventional careers in areas such as IT and science, they shouldn't forget about the opportunities that horticulture offers.

By Glenys Christian

"Those other careers may sound exciting," Jaspreet says. "But don't forget growers are providing us with the necessities of life."

Jaspreet started work in mid-June as part of the extension of the national GoHort programme with support from the Ministry for Primary Industries (MPI). In 2020, the existing five career progression managers based in other parts of the country attracted 485 permanent workers to the industry and a further 256 horticultural apprentices – placing 1,077 individuals into training.

The GoHort network promotes horticulture as the career of choice for Kiwis. Jaspreet says the aim is to connect people to the industry, educate providers and government agencies. "We bridge the gap between education, training and employment," she says. "We help New Zealanders decide on the training that is right for them and work out their career progression pathway. We promote horticulture careers to New Zealanders by showcasing opportunities in our diverse and vibrant industry."

Jaspreet says it's not just about putting food on the table.

"There is a lack of awareness where people think that horticulture is just about growing food. We definitely need people who are good with science, business and technology too."

The GoHort website (www.gohort.co.nz) outlines different career options available, suggesting that students consider an agribusiness career if they are interested in supply chain

management, trade, marketing or international relations. This could see them working on international trade floors, marketing and selling premium, innovative new products and dealing with supply and logistics for fresh produce and by-products. Then there is the wide range of work undertaken by horticulture business professionals such as advisors, accountants, and developers, in providing services to orchardists. The website gives examples of expected salaries for different roles, and profiles a number of young people who have embarked on a career in horticulture. A range of jobs available around the country are also listed.

Jaspreet has over 10 years' experience in running her own food business. She immigrated from India in 2008 but after the Global Financial Crisis it was hard for her to find work.

"I always liked food and I wanted to do something creative," she says. "I learned on the go."

After a lot of research, she set up a business, Kati Grill, on Auckland's Karangahape Road selling popular Indian Street food - kati rolls, a roti with a curry filling. While the choice of location was largely due to Auckland University being nearby, she quickly found her regular customers included not just students. When the business needed an upgrade, she opened a second store in Mount Roskill in 2014, then an outdoor catering service in 2018, providing grazing-style Indian tapas that would appeal to millennials.

"I enjoyed the process of talking to people and getting to know their needs about hosting an event, which helped me to get better at my craft."

With roadworks affecting food traffic on Karangahape Road and Covid-19 forcing the cancellation of events, Jaspreet decided not to renew the lease and closed her business to spend some time with her children, aged 10 and four.

Now back in the food industry, Jaspreet is excited to be gaining more knowledge about its workings. "New Zealand's growing conditions are so good and the quality of produce so high - that's one of our biggest assets," she says.

In their multi-generational businesses, growers have become very resilient, providing



The GoHort website (www.gohort.co.nz)

consumers with food, no matter what. "But we need young growers because what do we do if we don't have them?"

Jaspreet is also the new secretary and administrator for the Pukekohe Vegetable Growers' Association (PVGA) which she believes will give her a better understanding of the needs and challenges of the area's growers.

Kylie Faulkner, the president of the PVGA, says Pukekohe growers were excited to see Jaspreet's appointment.



...we need young growers because what do we do if we don't have them?

"The PVGA has felt that we wanted to be able to do more in the careers space," Kylie says. "We've already got a good association with Pukekohe High School, but it's important to have someone who understands growers' needs and will take the hard yards out of identifying some of the career opportunities available."

Good statistics from other areas where career progression managers are placed are promising for the sector. It is hoped that Jaspreet will contribute to that trend.

Her role as PVGA secretary will work in harmony with her position as career progression manager, being exposed first-hand to growers' concerns – an advantage when it comes to attracting young people into roles they would best fit in the horticultural industry.



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On-farm biosecurity series: farm outputs

Your farm or orchard operation is likely to have a number of outputs such as produce and waste that leave your property.

BIOSECURITY FEATURE

By Anna Rathé : HortNZ biosecurity manager

The biosecurity measures you put in place on your property support biosecurity in your community and manage the risk to the wider industry. It is important to avoid spreading any known (or unknown) pests and diseases from your property to other properties via farm outputs. Being a responsible grower protects your reputation and your business. It's about paying it forward to protect other growers too.

Farm outputs should be included in your on-farm biosecurity plan. Contact your industry body to see if they have a crop specific template that you can use. If not, you can use the Horticulture New Zealand template available online. Some common farm output risk areas are explored below, along with risk reduction actions for you to consider.

Produce

Moving harvested fruit and vegetables off your property could present a biosecurity risk for the recipient if contaminated material is moved from one site to another. Remove any soil or adhering plant material from produce before it leaves the property. Keep an eye out for any signs of pests or disease and report them immediately if spotted. Try not to bring unsold produce back to your property as there is a risk of cross-contamination. If you do, store the produce separately to minimise the likelihood of transferring pests and pathogens.

Product packaging and containers

Product packaging and containers associated with harvest (bins, crates etc) can be sources of contamination and a breeding environment for pests and pathogens if not managed appropriately. Remove all soil and adhering plant material from packaging and containers before they leave the property.

Waste management

Farm and orchard waste can take many forms, each with a different level of biosecurity risk. Types of waste include gloves, booties, clothing, sample bags, disposable containers, plant material, growing media, harvest debris and reject fruit. There are a number of treatment and disposal options to select from depending on the type of waste, crop and pests of concern. Treatment and disposal examples include cleaning or soaking in bleach or disinfectant, burning, heat treatment, or containment in sealed bags for removal, transfer to deep burial sites by a recognised waste removal company, among others. Treatment and disposal options need to be selected carefully to ensure they are appropriate for the type of waste and level of potential biosecurity risk.

Disposal of material that is known to be contaminated with pests, pathogens or weeds needs to be undertaken

carefully to prevent spread on your property, or to neighbouring properties. Known infected plant material or growing media should be handled to minimise any material being lost to the environment during transport or disposal. Where fruit or plant material is moving from an area contaminated with a specific pest or disease to an uncontaminated area for disposal any movement controls set by the Ministry for Primary Industries (MPI), or your industry body, must be followed.

In conclusion

The above is not an exhaustive list. You should think about any additional outputs that leave your property and how to minimise any potential biosecurity risk that they may pose to others in your sector.

Remember, if you see anything unusual associated with your farm outputs do the right thing and report any suspect exotic pests or diseases via the MPI pest and disease hotline: **0800 80 99 66**.

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ACROSS THE SECTOR — ACROSS THE COUNTRY





One of Holyoak Orchard's employees, Samam Po



Waikato persimmon orchard to downsize

Persimmon grower Geoff Peach stands outside his packhouse at Holyoak Orchard. It is a clear cool winter's day. The sun is on his face. The sorting and packing equipment, so recently the scene of noise and bustle, is deserted and quiet.

By Geoff Lewis, photos by Trefor Ward

The product is gone, transported to a freight forwarder before being dispatched to eager customers in overseas markets.

However, this will be the last time this level of activity will be seen at Holyoak.

Geoff Peach is 73. As with many others, he was part of the band of enthusiastic young horticulturalists who 45 years ago, answered the government's call to diversify New Zealand's economy.

Geoff and his wife Leigh started in market gardening at Ohakune in the 1970s and early 1980s. Clearing a lot of land and doing the hard yards. It was their way of getting ahead and building up equity. Around 40 years ago they bought at Matangi, only a few minutes from Hamilton, and started an indoor plant nursery. Leigh did the growing and Geoff did the selling. He also worked as a fencing contractor and as an AB (artificial breeding) technician for Livestock Improvement while he developed the orchard.

Holyoak Orchard is one of New Zealand's smaller commercial persimmon growing operations. Classed as a smaller packhouse, Holyoak exports less than 20,000 trays each season. By comparison, a large packhouse in Gisborne packs out more than 200,000 trays in a season.



Geoff Peach grading the fruit

Holyoak persimmons are exported into high-quality niche markets in Thailand, Australia, Singapore, Malaysia and Vietnam.

As for much of the horticultural industry, the Covid-19 emergency arrived at an unfortunate time, when Holyoak was preparing to start the 2020 packing season. Lockdown was a challenge in a time of uncertainty, as new infection control protocols required the separation of staff in the packhouse, and labour had to be specially organised. The majority of product was refrigerated and seafreighted. With airfreight costs skyrocketing and freight space scarce, seafreight was the only option.

This season, with Covid-19 still raging across the world, labour shortages continue to be an issue for many growers. Holyoak Orchard was fortunate to have labour from last season return for this year's harvest, picking and packing.

The downsizing of Holyoak marks a significant milestone for persimmons in the Waikato.

"When we moved to the Waikato, horticultural field days would attract hundreds of people looking at orcharding including persimmons," says Geoff. "About 35 persimmon blocks were planted in the region. Holyoak is the last remaining export persimmon orchard in the Waikato today."

Geoff has been considering the future for a while now. Apart from the age factor, costs keep going up.

"This will be our last season as the orchard stands today. One option is to remove a large part of the orchard and reduce production to a level where additional staff will not need to be employed."

Holyoak Orchard's production is exported by fresh produce marketing company Cape Produce, which exports around 28,000kg of hothouse produce in 4kg trays to global markets.



Sally (Sal) Peach placing stickers on the fruit

Cape Produce managing director, Andrew Douglas, is also a third-generation Hawke's Bay apple grower.

"My job is to maximise the return to the grower," Andrew says. "This is achieved by working closely with our partners in the offshore markets, arranging marketing, freight and foreign exchange cover.

"The key to this is being able to work closely with the grower and understand their business. Being a grower myself helps immensely with this relationship and ultimately gives me the ability to deliver the best results possible. This information is imperative to ensure a successful shipping and marketing campaign with the customers."

Andrew says the export year to Thailand was good, despite challenges created by Covid-19.

"Historically, we have faced a few challenges with persimmons. They are seen as a traditional fruit and therefore are limited to traditional markets. However, Covid has allowed us to market the high Vitamin C and health value of the fruit and we have seen popularity gains and growing demand.

"It is more expensive to get produce to Thailand, but we have been able to maximise the return in a very challenging time for exports. We are getting good returns from the market, but these are eaten up by the significantly higher freight rates and costs across the board."

Thailand and Australia remain the key markets for New Zealand persimmons, but the industry is always looking for new markets and opportunities. Vietnam is becoming a major outlet providing premium returns for the hothouse fruit, particularly for early season fruit. At the same time, there has been good uptake in the New Zealand domestic market, promoted by a sustained marketing campaign, Andrew says.

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Winter pruning of kiwifruit is a highly skilled task which sets the orchard up for next season's harvest. (Photo Liam Butler, Fruition Horticulture assistant horticultural consultant)

Pruning courses helping to attract workers

Winter pruning is a crucial aspect of kiwifruit management, setting orchards up for the next season's harvest. But there is currently a shortage of skilled labour, which is why winter pruning taster courses have been established to attract staff.

Funded by the Ministry for Primary Industries (MPI) and facilitated by New Zealand Kiwifruit Growers Inc (NZKGI), the courses provide an introduction to the work and are followed by a five-day training for those keen to take it further.

Di Holloway, NZKGI education coordinator, says the courses have led to jobs for many who complete the five-day training, and are also serving as a pathway to other employment within the industry.

The programme began last year with MPI funding aimed at providing new opportunities for people displaced by the impact of Covid-19. The pandemic's effects continue to be felt this year, with fewer of the highly skilled seasonal workers who have traditionally carried out winter pruning, being able to enter the country.

By Elaine Fisher



The Whanganui course, co-ordinated by local growers Beth Lamb and Graham Wright, was attended by 30 people.

Horticulture in Te Puke, Tauranga, Whanganui

"There have recently been three quite big new plantings, mainly of green kiwifruit near Waverley and Waitōtara," says Beth.

and Pukekohe.

"We have proved we can successfully grow kiwifruit here, and anything we can do like the pruning course to help upskill workers is valuable," says Graham.

The couple, who own and lease a total of 12 ha of kiwifruit, made one of their orchards available for the taster course.

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How it's done - those taking part in a winter pruning taster course watch the experts at work. (Photo Liam Butler, Fruition Horticulture assistant horticultural consultant)

Di says winter pruning is a highly skilled job.

"It is such a crucial part of the industry, as the difference between a good prune and bad prune affects the crop for next season. There are also differences between how green and gold orchards are pruned."

Running the courses is part of NZKGI's labour attraction strategy and Di acknowledges that with current low unemployment figures, finding and retaining good staff is a challenge for the kiwifruit industry.



The kiwifruit industry's continued growth ensures a wide variety of employment opportunities at all levels

"There is not such a big disparity in payment between kiwifruit and other sectors. Skilled winter pruners can earn up to \$40 an hour but it takes time to come up to the guality and speed standards that requires. Di also believes more flexibility around working hours within the industry would help tap into an under-utilised labour force.

"Under-employment is a problem with some people not able to work the number of hours they would like. More flexible packhouse shifts for parents to work 9am to 3pm could encourage more people to work, and there are also high school students who could be employed for a couple of shifts a week."

Cooperating with other seasonal industries such as manuka honey, forestry, and mussel farming, could help provide more full-time employment and variety for workers keen to be involved in the primary sector.

"It is not only unskilled labour the industry needs. It is also crying out for people managers."

The kiwifruit industry's continued growth ensures a wide variety of employment opportunities at all levels, and Di says NZKGI is keen to engage with high schools to promote horticulture as an exciting and viable career for students.

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Heath Wilkins says there is a balance between technology, productivity and keeping people employed

Golden Bay Fruit looks to the future

Golden Bay Fruit could fully automate its state-of-the-art packhouse but continues to employ 60 staff because they are the "soul of the business".

By Anne Hardie

Heath Wilkins, managing director of the Motueka company, says the packhouse staff are mostly women, including Recognised Seasonal Employer (RSE) Scheme workers from the Pacific Islands, who would miss out on the benefits of working in New Zealand if the horticulture industry became fully automated.

His comments follow the government's push for horticulture to overcome labour shortages with technology. He points out the industry has already been working on technological improvements long before the labour shortages, but developments take time.

"We have only just got to the point where we are actually thinking about the ability of the technology we need in order to harvest that fruit. People have been working on this for a number of years, and the new policies are just increasing the time pressure. But the technology isn't there yet. Even if we worked day and night for the next five years, we would be very, very lucky to have a commercial prototype by then."

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...the industry has already been working on technological improvements long before the labour shortages, but developments take time

Golden Bay Fruit is working with a United Kingdom company on technology, which includes robotic picking, thinning and drones for harvesting. This season they will be exploring some of that technology in the orchard. Heath thinks the drones might be the future once the tree structure is robot ready. That's still years away, he says.

In the packhouse, the vertically integrated company, which involves three multi-generational families, uses Greefa technology, including robotics to sort and handle apples from their combined apple crop of more than 750 ha.

Before the packhouse was built in 2019 they ran two older packhouses, and four shifts with 60 people packing 280 bins per day. Today they still employ 60 people who pack the fruit into boxes at the end of the line. The difference is that those 60 people now have double the throughput per person on a ninehour shift.

Heath says they could take 40 people out of the packhouse and replace them with robotics, but they also want to keep people employed and take pride in doing that.

"We thought we had a good community story to tell our customers overseas. We were a company that had a nice balance between technology and productivity, and a social conscience by keeping people employed. "But we hear from the government that what we are employing is what they deem to be a low-value workforce that is reducing our productivity, keeping our wages low, damaging the economy, and that everyone should be able to upskill and become a computer technician or a robot engineer."

> He says it is unrealistic to expect everyone to upskill to the type of jobs that will come with technology, especially in a short period of time. Some won't be able to, others won't want to, and it is likely to take five to 10 years to bring the next generation through with those skills.

We want to give the women from the islands, and the community, the ability to work in a job they are well suited for, which pays an equal amount of money to what a man can earn out in the field

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Robotics could replace many of the packhouse staff, but people are important

In the orchard, the physicality of the job demands fit, young people, and more often than not, men, to prune and harvest. The RSE workers have excelled at that. Women from those same communities in the Pacific Islands - Samoa and Vanuatu - have been employed in the packhouse by Golden Bay Fruit for more than a decade.

"We want to give the women from the islands, and the community, the ability to work in a job they are well suited for, which pays an equal amount of money to what a man can earn out in the field. If we take those roles away and put robots there, those jobs are gone. We won't have the diversity in our business, the women from the Pacific Island villages won't be able to participate, and the balance of succeeding in their home countries will be significantly weighted toward the male worker. We don't see that as progress.

"We are being forced by the government to look at taking those people out and put more robots in our packhouse. Basically, discard those people.

"One of the greatest enjoyments in my business life is walking through the orchards and packhouse and seeing people who are happy and eager to see you and say hi to you. Building that culture up over a long period of time has been a true success for our business, and it's something we are reasonably proud of. It's definitely a partnershiptype scenario.

\$5,628 ORCHARDISTS MUST PAY \$5,628 PER OVERSEAS WORKER THEY BRING IN

One of the greatest enjoyments in my business life is walking through the orchards and packhouse and seeing people who are happy and eager to see you and say hi to you

"Without that? Well, you lose a bit of your soul, don't you?"

What Heath wants is leadership from the government - a pathway through unprecedented, difficult times. He wants the importance of RSE workers in

horticulture to be recognised, as well as the importance of those jobs for the workers and

their communities. And he wants the health response to Covid-19 to take that into account.

"The health response to date is unsustainable," he says. "The government needs to know the critical pinch points for all industries in the next 12 months or so and put things in place to help those industries. Otherwise, people will disappear from those industries."



The view from the control room

Family businesses in the horticulture industry are under severe pressure as they are more susceptible than the corporate structure to RSE shortages, he says. They are one of the unintended consequences of the government's policies.

He struggles to fathom how the government can have a travel bubble with Australia at a time it has Covid-19 in the country, yet no pathway to Covid-free Pacific Islands for RSE workers to come and go.

"No-one wants to export Covid-19 to the Pacific Islands. So, you put things in place that minimise that risk when those people need to go home in seven to 12 months. A) they are all vaccinated and B) they are guarantined here on-farm before they head home, or else there is a guarantine facility we work with in Samoa or other Pacific Islands, and we help fund that scenario."

Instead, orchardists are being forced to fund MIQ (Managed Isolation and Quarantine) in New Zealand to bring people in from non-Covid-19 countries at a sum

of \$5,628 per person excluding GST, according to the latest costings. Golden Bay Fruit has brought 35 people in through MIQ and has requested 150 more between now and next February. Many of the RSE workers working for the company have been in New Zealand for 15 months and are looking forward to going home in September. While they need to get home and see their families, Heath says those RSE workers also worry they won't be able to get back to New Zealand because of the restrictions.

...the only reason they managed to get through the season with such a shortage of labour was because of the massive Boxing Day hailstorm that destroyed half the crop



Golden Bay Fruit usually employs 400 RSE workers at the peak of the season, but this past season had about 200 due to the restrictions. He says the only reason they managed to get through the season with such a shortage of labour was because of the massive Boxing Day hailstorm that destroyed half the crop.

Because of the losses incurred this year, the company will have 80% of its next crop under hail cloth, up from 50% this year.

"I'm not going through another year like this one. It ruins your business. If you are a fully integrated business from growing through to packhouse, logistics and marketing, you don't just get hurt at the grower level. You get hurt right the way through the chain. We haven't been able to supply all of our customers with the volume of fruit needed, so they rightfully had to deal with our competitors this season. It will be a huge challenge to get them back next season when our volumes are back up again."

That fruit is the result of investment in new varieties and he says that is how New Zealand competes on the world stage because it can't compete in costs, due in good part to the lower wages in countries such as Chile and South Africa.



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Mike Smith and his dog Molly on the avocado orchard at Te Puna

Calibre of new leaders assures industry's future

Horticulture New Zealand's future is in good hands thanks to talented young people taking up leadership roles, says retiring Horticulture New Zealand board director Mike Smith.

By Elaine Fisher

"The calibre of people coming through the HortNZ Future Directors programme and the HortNZ Leadership Training programme is very heartening," says Mike who has stepped down after six years as a director.

"Succession planning is so important and bringing in people as associate directors or through the Future Directors programme is very valuable as it gives prospective directors a taste of what HortNZ is all about.

"As an example, new directors Kate Trufitt and Brydon Nisbet have been elected after being future directors, and recently Jamie Mountier has been appointed a future director to the board."

Mike can take some of the credit for encouraging new blood in leadership roles. Before being elected to the

board he was invited to be part of a working group to review the structure and constitution of HortNZ, including the length of time members could stay on its board.

"The outcome was that a director could not serve more than three terms of three years each without standing down. That has worked well in bringing

in new directors, and helped to open up opportunities for more diversity on the board by encouraging people to stand for an empty seat rather than against an incumbent."

Under those rules Mike could have stood for another term. Instead, he decided it was time to retire, and the calibre of those coming through was part of the reason. Putting himself forward for election to the board in 2015 was part of Mike's philosophy of giving back. "If you want to be part of an industry, I think it's important to give back because an industry doesn't work by itself. It needs people at all levels."

Despite holding several leadership roles within the kiwifruit industry, it was taking part in the HortNZ Leadership Training programme for emerging potential or current leaders in the fruit and vegetable industry, co-ordinated by Sue Pickering, which gave Mike the confidence to step up to a national leadership role and stand for election to the HortNZ board.

It's a pathway he strongly recommends to anyone with a desire to take on leadership roles. "Leadership is not for everybody but if you feel you have the skills to do it, there is a lot of support and training to get there," Mike says.

Serving on the HortNZ board has been enjoyable, challenging and a real eye opener for Mike, whose horticultural career has been almost exclusively involved in kiwifruit.

"The culture around the board table has been outstanding. In no small way due to having two very capable chairs, and board members both past and present who all have had the growers' best interests at heart.

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There are really good people doing some great work for the industry and their communities, offering local jobs and long-term employment. The opportunities for careers in horticulture are almost unlimited with more and more tech coming through

"I had not realised how diverse the industry is, nor the scale of some of the very big vegetable growing operations. There are really good people doing some great work for the industry and their communities, offering local jobs and long-term employment. The opportunities for careers in horticulture are almost unlimited with more and more tech coming through."

Since 2015 Mike has been a trustee for Agrecovery, the not-for-profit rural recycling initiative for collection and recycling of used chemical containers and other rural waste streams. It is a role he's very committed to.

"The government has just made farm plastic a priority for recycling, and it will be compulsory to have a recycling scheme, but as yet it is not compulsory to recycle. The problem is that with materials which are not easy to recycle such as silage wrap, currently farmers have to pay for a collection scheme. For some that extra expense can be hard to justify so it's easier to burn or bury it. However, the time is coming, including with farm environment plans, when that will no longer be possible. "Currently about 60% of recyclable plastic chemical containers purchased are recycled through Agrecovery, but that doesn't account for products which are held in stock or not yet used by farmers and growers. I think the best option to increase recycling on-farm is using the Agrecovery model where the cost of recycling or recovery is included in the purchase price."

While Mike has stood down from the HortNZ Board, he remains a member of the New Zealand Kiwifruit Growers Inc Forum, a position he has held since he joined as a Tauranga Growers and Green Growers Representative in 2004.

Among his portfolios is being on the committee for the Bay of Plenty Young Fruit Grower of the Year Competition through which he is a strong advocate for the development of young growers.

Mike grew up on a dairy farm at Welcome Bay near Tauranga and attended Tauranga Boys' College. His first full time job was as a laboratory technician at the then Te Puke Dairy Factory, followed by three years dairy farming in the Waikato while his wife Sharlene Darragh completed an accountancy degree at Waikato University.

Back in the Bay of Plenty, Mike worked for Wrightsons in Tauranga and Te Puke for 12 years. He and Sharlene bought their first kiwifruit orchard at Te Puna in 1987.



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"We then found another block of land at Plummers Point we wanted to buy, but at the time kiwifruit orchards were worth nothing, in fact the land was worth more without kiwifruit on it, so we converted the orchard to citrus in order to sell it."

The Plummers Point orchard was sold in 2000 when Sharlene began her own accountancy business and Mike took over management of his parents' kiwifruit orchard which was converted from dairying in 1980. Initially a green orchard, the 5.5ha block today grows gold and green.

In 2002, Mike became chair of the Green Growers Association, representing the views of growers of green kiwifruit, who at the time accounted for 70% of the industry's production.

"The association was formed when Zespri proposed a subsidy for growers of organic green kiwifruit, to be paid from the green growers' pool. Many growers felt that was not right and everyone should stand on their own two feet. In the end, Zespri decided to set up an organic pool."

The Green Growers Association was disbanded in 2017.

"It had, in effect, run out of purpose because things for green growers have improved and there is not much to complain about. Zespri has done well in selling green fruit, and orchard gate returns, especially for orchards with above average production, are good."

Last year gold kiwifruit export volumes overtook green for the first time in the industry's history.



You have to be an optimist in this industry, with the belief that next season will be better. My grandfather, who was a farmer, said in five years you should expect one very good year, one bad year and three somewhere in between

For ten seasons Mike carried out an important and unusual role for the kiwifruit industry – monitoring the storage temperatures and conditioning of export fruit travelling to market aboard refrigerated vessels.

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A regenerating wetland, converted back from grazing, is a feature of the new orchard which Mike takes pride in

"I did one or two trips a year and they were great experiences, working with people whose language I could hardly speak, but they were good guys who wanted to make sure I was happy and looked after. Sometimes the sea was rough and if it was too bad you didn't go into the hold. Mostly I enjoyed the trips, but sometimes said I'd never do it again - until the next time."

Mike says the issues facing horticulture are pretty much the same as they have always been. "The weather, access to land, labour, water, capital (although money seems to be flying in at the moment) and biosecurity are constant challenges."

Unexpected issues can arise which have significant impact on growers' incomes, including Covid-19 and the lack of labour due to border restrictions.

"What happened in Hawke's Bay with apples not being harvested this season was devastating and such a waste of fruit, income, and export earnings for New Zealand too."

But dealing with the unexpected is in fact an expected part of horticulture, as Mike has learned from 23 years of orcharding.

"You have to be an optimist in this industry, with the belief that next season will be better. My grandfather, who was a farmer, said in five years you should expect one very good year, one bad year and three somewhere in between."

Mike's next challenge is rejuvenating an established avocado orchard he and Sharlene have taken over just north of Tauranga where they plan to build a new home.



An artist's impression of the new \$40 million post-harvest kiwifruit complex

Staff involved in design of \$40 million complex

A \$40 million new kiwifruit post-harvest complex being built for DMS Progrowers in Te Puke could quite rightly be referred to as "the packhouse the people built," as the company's staff have had a major say in its design.

"We involved our staff from cleaners and caterers to forklift drivers, packers, logistics, office staff and the executive team, in the design," says DMS chief executive Derek Masters.

DMS met with both its teams from the existing Te Puke and Te Puna sites, set up a whiteboard and asked, "if there were no constraints, what kind of facility would you like?"

It was a bold move which DMS saw as an opportunity to tap into the knowledge of those who will work there.

By Elaine Fisher

"Health and safety were crucial factors in the design, and staff suggestions about safe and efficient traffic flow for forklifts, trucks, vehicles and people were taken on board. So too was the advice of the company's catering team, who pointed out that the new cafeteria should be big enough to allow for social distancing in the event of another pandemic such as Covid-19."

Consideration has also been given to facilities the cleaners need and how to keep people warm on the packing line in winter and cool in the summer. More than their input into the design, Derek says DMS also gave consideration to the aspirations of its staff when deciding to invest in the new 5400m² packhouse and four new coolstores at the Te Matai Road site.

"Even though DMS could remain profitable with its two current postharvest facilities, as kiwifruit volumes grow, we would lose market share. When it was put to the DMS board that we should consider building a new complex, Craig Greenlees and Paul Jones (co-founders of DMS) asked what did the staff think?



DMS chief executive Derek Masters

"I said surveys showed staff wanted to be part of a progressive, growing company. Our staff are highly motivated and are very proud of what we have achieved over the last 10 years.

"I believe if they saw the industry growing but DMS was not growing with it, we would have a less motivated staff who might look for something bigger and better. I firmly believe that by us taking this journey to grow, we will retain good people who are excited to be part of this new project and the future growth aspirations of DMS."

That new project includes a state-ofthe-art MAF Roda camera grading packing line from France, capable of handling 6.5 million trays of fruit, four additional coolstores with a static capacity of 1.5m trays, automated shuttle racking technology used in the other coolstores on site and a temperature and humidity-controlled bin store which will jointly feed both the old packhouse and the new one.

The new grader will add to the 6 million tray packing capacity of the existing Te Matai facility and the eight million trays packed at Te Puna, giving DMS the capacity to pack 20 million trays a season from 2022 onwards. The company packed 14 million trays this season.

Three million dollars of the \$40 million investment will be used to replace the existing grading tables with the same latest technology at the Te Puna site which handles both kiwifruit and avocados.

"The industry is producing a significant amount of kiwifruit - estimated at 178 million trays this year - and this is only going to increase as more greenfield developments and gold conversions come on stream. In the next few years demand for gold kiwifruit worldwide will continue to rise and so DMS wants to grow its share of that anticipated industry growth," says Derek.

In order to expand at Te Matai Road, DMS purchased the neighbouring 7.5 ha green and gold orchard owned by Don and Claire Heslop and had it rezoned for post-harvest activity.

Derek says 5.5 ha of the land is flat, making it ideal for construction. "The land slopes down at the rear of the property through bush, to the Waiāri Stream which will be used as the water supply for Papamoa East. It is also an area of importance to local iwi." Resource consents for the new post-harvest complex include strict stormwater and sewerage constraints to protect the stream's water quality and the area's cultural significance.

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...surveys showed staff wanted to be part of a progressive, growing company. Our staff are highly motivated and are very proud of what we have achieved over the last 10 years

Western Bay of Plenty District Council Mayor Garry Webber says the investment by DMS is a vote of confidence in Te Puke, Te Puna, the region and the industry. "Re-zoning the land is reflective of our council's recognition that the kiwifruit industry is critically important to our district. I am proud that council has shown it is flexible and did not put roadblocks in the way, enabling this development to go ahead."

The new facility will provide more employment, which is also crucial, he says. "With increased technology in state-of-the-art packhouses and coolstores built by people like DMS comes improved product quality and diverse employment opportunities for staff.

"However, much employment remains seasonal and as a council we need to help cater for those peaks and troughs, including through enabling the establishment of on-site accommodation."

While the new MAF Roda grader has the latest technology, Derek says extensive automation will not be a feature of the complex. "We are not early adopters of automation, but followers, watching to see what does and doesn't work in our industry."

Fully automated packhouses are, in Derek's view, a long way off. "Staff are still a vital part of the packing process and while automation may take out some labour, if insufficient numbers of people are working on the packing line, automation can't operate at full capacity."

It's estimated that the new DMS facility will create work for up to 100 additional seasonal employees, but Derek admits attracting enough staff is an ongoing problem which all in the industry share.

"This season has been particularly hard, especially with the reduced numbers of Recognised Seasonal Employer (RSE) Scheme workers because of Covid-19 restrictions." Collectively the industry needs to find ways of addressing labour issues, he says.

Te Puke businesses and contractors will be used for the majority of the expansion project. "It's important to look after your own. We strongly believe in keeping things local and supporting the businesses that are based in Te Puke." DMS is the first post-harvest company since 2018 to build a completely new packhouse in the Bay of Plenty, as the region continues to produce recordbreaking kiwifruit crops.

"Packhouses around the Bay are already working 24 hours a day, seven days a week, during the limited gold harvest window. Next year when we have this additional packhouse, we'll certainly be able to provide more packing slots and help a lot more growers. This \$40 million development will also give confidence to our existing DMS growers that we will have capacity to look after their future growth as well."

Staff are still a vital part of the packing process

Work on the new complex began in July, with the goal of having the packhouse fully enclosed when the MAF Roda grader arrives in November. The entire project is due for completion in time for the start of the packing season in March next year.

The packhouse, designed to cater for high fruit volumes during the three to four weeks at the peak of the gold kiwifruit harvest, will operate in total around 12 weeks of the year.

"This is a huge investment for just a few weeks. For the rest of the year, it will sit idle. However, the benefits of making that investment and continuing to grow with the industry, outweigh the risks of not doing so," says Derek.

Established in 1989 by Craig Greenlees and Paul Jones, DMS manages more than 100 orchards and has 150 full-time staff, employing another 600 plus seasonal contractors and workers in Te Puna and Te Puke. DMS is a member of the G4 Kiwifruit Group, which provides 32% of Zespri's Class One crop. ●





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NZKGI Labour Coordinator Gavin Stagg distributing copies of NZKGI's Little Green and Gold book to an accommodation provider

NZKGI Labour Attraction Strategy helps kiwifruit industry complete record harvest

A focused three-year strategy to attract and recruit seasonal labour has paid dividends for New Zealand Kiwifruit Growers Incorporated (NZKGI).

Supplied

NZKGI has invested strongly in a structured Labour Attraction Strategy (LAS) in the years following the 2018 harvest which kicked off with a shortage of around 1,250 workers, says labour coordinator Gavin Stagg.

A focus on developing and implementing new ways to attract workers both here and overseas averted a similar shortage in 2019, says Gavin.

"We also prepared well for 2020, even when Covid-19 deprived the industry of a significant overseas element of workers. Then this year we pivoted again, working with the Ministry for Primary Industries (MPI) and the Ministry of Social Development (MSD) to find Kiwi workers. As a result, so far we have been able to avoid any significant failure to harvest our crop – and the industry has delivered bumper totals of fruit."

Gavin says the core component of the LAS has been to ensure the industry provides the best information on the roles available, pay rates and conditions, and develops strong channels to get the information to potential workers.

"That involved establishing an expanded social media
presence through a special Facebook page, Kiwifruit Jobs NZ, developing robust collateral material like our 14-page workers guide, the *Little Green and Gold Book*, working closely with traditional media on what we were doing, and reaching out to groups in the community, and initially overseas, to alert them to the great jobs we have available.

"The government definitely has a role to play in supporting the industry to find workers, and the recent initiatives with MSD and MPI have been a boon, but ultimately the LAS is a NZKGI-led initiative. We needed to work hard ourselves to get the message out there that we had good work available and correct any misconceptions about the industry."

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We needed to work hard ourselves to get the message out there that we had good work available and correct any misconceptions about the industry

Gavin says the closure of New Zealand's borders due to Covid-19 meant a reduction in the potential workforce of around 25% for this year's harvest.

"We had to turn even more inward to make up the shortfall from Kiwis, so a lot more effort went into promoting the roles to unemployed New Zealanders, students and seniors."

In the first year of the LAS, international workers – working holiday visa-holders and backpackers – were a prime target, both on social media and via promotion of a video featuring German and Czech orchard workers. "We also strongly featured the beautiful scenery and leisure activities in our kiwifruit-growing regions, which was an important factor in their decision whether to work in the industry.

"But after that it was just a case of showing the work opportunities, the 'family' and team environment we strive for in our orchards, and the definite longer-term career options, answering any questions about the work, and making it as easy as possible to apply for jobs.

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"With the first outbreak of the pandemic in 2020, we also saw a win-win in reaching out to industries badly hit by Covid-19 - such as tourism, airlines and hospitality - and offering them work until their sectors recovered." 25% REDUCTION IN THE POTENTIAL WORKFORCE DUE TO CLOSED BORDERS

Gavin says NZKGI has already evaluated the 2021 season and planning for the 2022 LAS will begin in late July.

"We're anticipating restrictions on overseas workers coming in to continue, so will be looking hard at how we can make it work for Kiwis to work with us.

"That's about having the best information available, but also about strengthening the relationships and communications we have with the community, so people see what we are offering and don't see any obstacles to getting involved."

The 2022 LAS will become a component of NZKGI's wider strategy to reduce the seasonal labour shortage. Other components will include a strong focus on absenteeism, strengthening partnerships with stakeholders and further utilisation of NZKGI's quantitative knowledge of seasonal labour.



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Fertiliser price increases

Like a number of internationally traded commodity products, international fertiliser prices have skyrocketed in recent months.

By Robin Boom

Both Ballance Agri-Nutrients and Ravensdown announced significant price increases almost across the board in nitrogen, phosphorus, potassium, and sulphur (NPKS) products at the end of June.

International nitrogen products have gone up almost 70% compared to a year ago; ammonium phosphate products have gone up 80% and triple superphosphate (Triple Super) has almost doubled in price. The lifts from both co-ops on these have been cushioned somewhat by their inventories, but it is expected these increases will continue across products in the foreseeable future if current trends continue. Demand, Covid-19, shipping issues and the closure of some factories, are just some factors contributing to the increase.

🚯 Urea

China exported 13.8 million metric tonnes of urea back in 2015, but poor margins and the closing of inefficient urea plants resulted in a decline to just 2.8 million metric tonnes exported in 2018. At the end of 2020 there was a large increase in demand for urea from India, with extra crops planted due to good monsoon rains and the Indian government's Minimum Support Price schemes. The result was a single tender for an extra 2.2 million metric tonnes of urea. Prices for natural gas in Europe, and coal in China, lifted at the same time, making production of urea more expensive.

🚯 Ammonium

On the back of these increases, prices for sulphate of ammonia and ammonium nitrate products have also climbed. Ammonium phosphate products, such as Di Ammonium Phosphate (DAP) and Mono Ammonium Phosphate (MAP), have experienced an even greater price increase, not only because of the increase in nitrogen demand, but due to the almost doubling of the international price of triple superphosphate since last spring. The increased demand for ammonium phosphate products has come from Brazil and Australia after the drought broke last year, resulting in extra crops being planted.

🚯 Potassium

Conversely, international potassium prices have remained relatively stable for quite some time. This is expected to change given the recent, politically driven sanctions against Belarus state-owned potassium supplier Belaruskali which supplies approximately 20% of the world's potassium fertiliser. Ravensdown is now sourcing its potassium from Canada, and political

tensions between the European Union and Belarus over air flying space - and demand from other main sources such as Russia and Canada - has resulted in a recent spike in international potassium prices.

🚯 Freight

Shipping costs have also climbed. Covid-19 has disrupted the timely supply of imported product and continues to be a major headache for both importers and exporters. Pre-Covid, a shipping container out of China cost approximately \$500 to get to New Zealand. Current prices are often over \$3,000. For smaller fertiliser importers like Dickie Direct and Marsden AGRI, product which was ordered to arrive this autumn has taken up to three months longer due to ships being held in ports or having taken more indirect routes - going to other countries where product is off-loaded then later picked up or shipped by another company.

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Covid-19 has disrupted the timely supply of imported product and continues to be a major headache for both importers and exporters

\delta Rock phosphate

Rock phosphate prices have not climbed as much as imported, manufactured, phosphate products. The price of locally manufactured superphosphate has increased less than DAP and Triple Super. The table below shows the tonnage prices for standard NPKS fertiliser product sold by Ballance Agri-Nutrients in July 2020 compared to July 2021.

Product	July 2020	July 2021
Urea	\$568	\$799
DAP	\$751	\$1,055
Triple Super	\$690	\$867
Muriate of Potash	\$660	\$790
Ammonium Sulphate	\$399	\$499
Sulphur Gain Pure	\$550	\$700
Super Ten	\$295	\$339

The increase in fertiliser cost reinforces the importance of being judicious in what needs to be applied to the soil for this season's crops. Rather than just a standard annual application of the usual product, conduct a soil test to assess the current nutrient status of your soil. Then only apply those elements which are low. If for example, it is phosphorus, find out if there are cheaper phosphorus options than what you may have traditionally applied. It may be more cost effective to use locally manufactured superphosphate products as opposed to imported, high analysis fertilisers. Prices of some private importers should also be considered. There are at least two companies selling Triple Super into the upper North Island - \$200/tonne cheaper than the two big co-ops, and sulphur that is \$150/tonne cheaper.

Another benefit of completing soil tests to find out what the current nutrient status of the soil is, is the environmental benefits - in that excess nutrients are not leached out or lost through surface run-off. In the case of nitrogen, losses not only from leaching, but also from volatilisation should be considered, so timing and method of application are important considerations. It is important to know what the nitrogen demand is for the crop grown, as applying a certain amount of fertiliser annually may be excess to the plant's demand - which is not only harmful to the soil and environment, but also to the bank balance.



The increase in fertiliser cost reinforces the importance of being judicious in what needs to be applied to the soil for this season's crops

Other considerations are waste products such as chicken manure, pig manure, goat or horse manure, composts, and industrial waste products such as whey. These may work out to be considerably cheaper nutrient options to conventional fertilisers if they can be sourced locally and while food safety remains paramount.



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Keith Pyle is one of this country's foremost citrus experts

Citrus benefits from Keith's encyclopaedic knowledge

Keith Pyle is supposed to be retired, but the man who is one of the country's foremost citrus experts, is still in demand for his encyclopaedic scientific knowledge and technical skills, built on decades of growing citrus trees in Southern Africa and New Zealand.

By Elaine Fisher

Keith has a degree in agriculture with entomology, plant pathology and plant protection as the focus and is a longstanding member of the Citrus New Zealand (CNZ) research committee.

In the 23 years since he emigrated to New Zealand, Keith has made a significant contribution to the New Zealand citrus industry - both through his work with CNZ and as a consultant to individual growers, says Sally Anderson, CNZ research manager.

"Keith has been involved in helping the industry improve its growing practices and our growers have benefited from his extensive and in-depth knowledge. He is very generous with his time and knowledge, and his ongoing input into the CNZ research programme is invaluable."

Sally says Keith has a knack of diving deep into the research and drawing out the parts most relevant to growers. He has also increased her own understanding of the industry.

"When I first joined Market Access Solutionz and took over the Citrus New Zealand Research Programme 10 years ago, I had little knowledge of the citrus industry. I am very grateful to have had Keith as an advisor."

Keith grew up near Johannesburg in South Africa and was educated at Natal University. His first job was in Rhodesia

(now Zimbabwe), researching cotton pest problems. In 1974, Keith took a position on an estate north of Harare owned by the Anglo-American corporation.

"The citrus orchard was initially 1,300 ha, but we reduced that to 750 ha and grew fresh fruit and produced juice mainly for the local market," says Keith. "There were 40 ha of West Indian limes - and despite the international sanctions against the country at the time, we exported lime juice to the United Kingdom for Rose's Lime Juice."

Keith and his wife Madeline moved to Swaziland (now Eswatini) in 1981, where Keith managed a property with 800 ha of citrus, 4,000 ha of sugarcane and a 25,000-ha cattle and game ranch.

In 1998 when Keith and Madeline immigrated to New Zealand, the couple bought a two-hectare citrus orchard near Katikati and Keith quickly became involved in this country's citrus industry. In 2015 they sold the orchard, settling on a lifestyle block north of Katikati with an extensive garden, but just a few citrus trees.

Keith continues to play an important role for Citrus New Zealand, working closely with research manager Sally Anderson and grower representatives Matt Carter and Wayne Hall.



Keith is an advocate of pruning citrus trees to open them up to light and to allow better application of sprays

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Damage to leaves caused by the citrus flower moth

His most recent projects have included updating the citrus manual he helped to write in 2001.

"I am still in the process of updating parts of that," Keith says. "I have written the irrigation and frost protection chapters and am now engaged in writing pruning guidelines.



Keith's ongoing input into the CNZ research programme is invaluable

"When I came to New Zealand, not a lot of pruning was done and some of the trees were overcrowded. In 2003, I got an expert to come from Australia to hold pruning field days and now all growers see the need to prune, which gives better spray penetration for pest and disease control, improves air circulation, and brings light into the canopy for improved fruit size and quality."

Keith will later be working on a chapter on the physiological disorders of citrus, and another on planning and developing new orchards.

From 2003 to 2005 Keith led a Sustainable Farming Fund project in cooperation with what was then HortResearch, to introduce integrated pest management to the industry and write a IPM manual for growers.

"Together with Matt Carter, it was revised last year and now it is all online. A few things have changed since we first wrote it. Chemicals have changed and there are new pest management practices for the Australian citrus whitefly and lemon flower moth which needed updating."

Another pest Keith hopes New Zealand growers never have to deal with is citrus greening Huanglongbing, also known as HLB.

"If it became established here it would decimate the industry," says Keith. "It is in Florida, California and Texas and millions of dollars have been spent to try to control it. There is no way citrus growers here could do the same."

Since 2009 the United States Department of Agriculture has invested more than \$400 million to address citrus greening which is also affecting citrus growers in Brazil, Central America and in Asia, where it originated. Citrus New Zealand is working closely with Biosecurity NZ and the Ministry for Primary Industries under a Government Industry Agreement (GIA) on guidelines to recognise the disease and its vector and implement control and containment measures should it arrive.

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HLB is considered to be the most serious insect-vectored bacterial disease of citrus

"I hope we can keep it out. HLB is considered to be the most serious insect-vectored bacterial disease of citrus. The big concern is if someone smuggles in infected plants as happened in Australia in 2019. The threat to



New Zealand comes not only from the potential for illegal importation of infected citrus budwood, but also from *Murraya paniculata* or orange jasmine - a garden plant commonly available in New Zealand.

"This plant can serve as a host for the vector *Diaphorina citri* and as a host for the HLB disease. Also of course, citrus is widespread in gardens here where the disease and vector could easily get established."

Citrus greening is transmitted in nature by the Asian citrus psyllid *Diaphorina citri* and the African citrus psyllid *Trioza erytreae*. *D. citri* was discovered in southern Florida in 1998, and the HLB disease in 2005. Both have become established throughout citrus-producing areas of Florida where orange acreage and yield have decreased by 26% and 42% respectively.

Alongside his work for CNZ, Keith was the citrus consultant for the late Tony Gibbs since 2001, and now consults

for his family, who own a 33-ha citrus orchard near Matakana and are developing another 14 ha of citrus and a large avocado orchard near Tapora in Northland.

Although he no longer has his own orchard, Keith's interest in citrus has not diminished.

"I do like to be kept busy and the work is stimulating. I feel I want to give back to the industry because I have received a lot from it."









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Daughter in law, Lynley, is fully involved in all aspects of the business

Voyles persimmons an icon of Matangi

Lovers of persimmons in the Waikato are increasingly turning to small growers like Ian and Darienne Voyle.

By Geoff Lewis, photos by Trefor Ward

In a prescient purchase, the couple bought 10 acres at Matangi near Hamilton back in the late 1980s - right next door to the now historic Matangi dairy factory.

At the time, Darienne was working for Plant & Food Research as a technician and the block had been planted out in five acres of persimmons by one of its previous owners - a chap who had also worked for Plant & Food Research. The remainder is in olives, mandarins and feijoas.

Persimmons are native to China, Northeast India and Northern Indo-China. The mild, sweet, flavoured fruit has



been cultivated in China for more than 2,000 years, later being introduced to California and Southern Europe in the 19th century. For the Voyles, growing persimmons has been a learning experience.

"When we bought the place, the trees were only a few metres high," Darienne says. "We had thought of training them on wires but decided to let them grow into freestanding trees."

The Voyles dabbled in export but decided supplying the local market was the way to go.

"We did spray for a couple of years but decided to go spray-free. We are not officially organic, and we still use conventional fertiliser. When we bought the place, we thought persimmons would need a pollinator, but it turns out pollinated fruit creates huge pips," says Darienne.



WE GET A LOT OF FAMILIES AND BUS-LOADS OF PEOPLE TURNING UP FROM AUCKLAND The trees like a cool winter and the weather over the 2020-21 season was generally good.

"But you couldn't design a worse climate for persimmons than the Waikato, humid in summer, and all the bugs," says Ian. "The fruit have smooth skins and all the blemishes show up. Heavy frosts can damage the fruit. But

in 30 years, we have only had one complete failure. So far, we've been treated really well."

Pruning is done in early spring; new shoots arrive in October and flowers around November. The fruit sets and develops and the harvest is short and sweet - beginning in mid-May, it's all done by the end of the month - about 20 tonnes worth in the average year. Today the Voyles' orchard is run as a 'pick your own' enterprise.



The Voyles dabbled in export but decided supplying the local market was the way to go

"We get a lot of families and bus-loads of people turning up from Auckland, probably 80 to 90 percent Chinese and other Asian peoples and Pacific islanders - lots of families."

But the Voyles did not buy the property because it was an orchard. They bought it because of where it was – adjacent to the local shops, garage, and school, and now in the centre of a growing lifestyle block area linked to Hamilton city services.

"It's an orchard I've been subsidising for 30 years. But it's not a bad hobby and it pays its way and the rates," Ian says. ●





Ian Voyle says despite the region's humid climate, their persimmon orchard has produced good fruit for 30 years

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Tam Cole-Holt discovered a love for horticulture while working on an organic farm in England

Horticulture career of choice for Zimbabwean refugee

Resilience and positivity are among the personality traits which make for a good horticulturalist. A grower in Motueka has exercised these traits more than most, and not just in her horticultural career.

By Elaine Fisher

Tam Cole-Holt, now assistant block manager pipfruit for Birdhurst Ltd, arrived in New Zealand with her family in 2000 as a refugee from Zimbabwe's brutal regime.

"My family was given just two weeks to leave the country and arrived at the airport with two suitcases each and \$US500 between us. I was 16," Tam says.

"New Zealand and Canada were the only countries who cared about what was happening in Zimbabwe, and said if you can get to us, we will help you. We were supported when we arrived with transport, accommodation and to get on our feet by a group set up to assist refugees from Zimbabwe. It was challenging but coming to New Zealand was the best thing we could have done."

Tam's aunt and uncle back in Zimbabwe had been the printers for the Movement for Democratic Change -

Tsvangirai (MDC-T) the opposition party to the ruling Zimbabwe African National Union - Patriotic Front (ZANU-PF) party.

"When ZANU-PF found out about that, they targeted our family. Given all the murders and disappearances which were happening at the time, we had no option but to leave."

Tam still speaks fondly of the bounty of the land of her birth.

"It is a beautiful country with so many natural resources including wonderful soil and climate. You can grow just about anything there. It was a prosperous country but unfortunately it did go downhill from the late 1970s when the independence war started. Today unemployment is at 90% which is hard to wrap your head around. It is not a place you would want to be."



Starting over in a new country was not easy but Tam was determined to make the most of the opportunities. That included the chance to travel to Europe for two years, which is where she discovered a passion for horticulture.

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My family was given just two weeks to leave the country

"I was looking for work when a friend got me a job on an organic vegetable farm near Canterbury in England. Until then, for me food was bought from the supermarket, and I didn't think much about how it was grown or where it came from. I was fascinated to see how relatively easy it was to grow food, even in England's climate, so when I returned to New Zealand, I wanted to grow whatever I could."

Tam developed a large home vegetable garden, experimenting with different crops, even those she didn't like to eat.

"I learnt to save seeds too and discovered so many different aspects of horticulture that fascinated me. I knew I wanted to work with plants, no matter if they were amenity plants, vegetables or fruit trees, if it was a plant, I could grow and manipulate to its maximum potential that was what I wanted to do."

She looked for work in horticulture and enrolled for the National Certificate in Horticulture Level 3 through the Nelson Marlborough Institute of Technology.

"Being self-driven to learn and gain qualifications aided me towards securing a job, and later an apprenticeship in high-tech glasshouse vegetable production. During this time, I finished my Level 3 and Level 4. Upon completion of my apprenticeship, I moved to the outdoor vegetable division to gain further skills, while undertaking my Level 4 Advanced. "I was then accepted into the Horticulture New Zealand Leadership Programme 2019 to further develop my leadership skills and gain valuable knowledge on how to drive my career while constantly promoting horticulture. Through networking on the programme, I was offered my current position which has aided further growth and progression of my career."

> Tam is a strong advocate for the Horticulture New Zealand Leadership Programme. "It offers a fantastic opportunity for anyone in the industry. You do not have to be in senior management to apply. It is such a valuable course for those in the horticultural sector to grow personally and find stepping stones to progress your career. It benefits the whole industry.

"The programme represents the biggest change in my horticultural career as it taught me a lot about myself. I learnt to lead myself

before leading others. If I stop learning, growing, and aspiring to be better, I cannot expect the same from my staff, so I really do strive to lead by example and encourage others to achieve their maximum potential."

True to that philosophy, Tam is continuing to study, working towards a Diploma in Horticulture from Lincoln University, alongside her full-time job with Birdhurst. The role involves working under a block manager for one of the many blocks which make up Birdhurst's roughly 250 ha apple orchards.

"Individual blocks have different requirements and timeframes for management because of different soil types, tree varieties and rootstock, so each block has a designated manager who knows the ways to manage the trees for the best production.

"My role includes supervising pruning, thinning, harvesting and undertaking spraying of the orchards, amongst many other tasks."

The resilience and positivity Tam demonstrates through her refugee experience are strengths which no doubt helped





Pictured here with her team, Tam is assistant block manager of pipfruit for Birdhurst Ltd of Motueka

her cope with the devastation of last Boxing Day's hailstorm in the Tasman district.

"Effectively we lost 50% of the apples in less than 25 minutes. We had spent a whole year preparing for the harvest. Everything you do from the end of the previous harvest is working towards the next one.

"It was very hard, and not just for the business owners but for everyone involved. It can have a negative mental impact and was quite challenging. It felt like all our hard work had come to nothing. It was quite a scary couple of weeks for the region after the hailstorm. However, Birdhurst as a business is very supportive, and we came together and carried on."

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I really do strive to lead by example and encourage others to achieve their maximum potential

It was not an easy time. Covid-19 related border restrictions meant fewer seasonal workers were available to help with the apple harvest."

Even with less fruit to pick we did not have enough staff, but we still managed to get all our fruit harvested."

This was the first season Tam had managed a team and she is proud that her group of 18 pickers harvested 2,450 bins of apples. Tam believes more flexibility in the workplace could help overcome the shortage of skilled labour in New Zealand that has been highlighted by the pandemic.

"I would love to see more horticultural businesses adapt a flexible approach regarding school-hour requirements for women. There is a wealth of ability, knowledge and passion that is lost or stifled because of the perception that the only way to succeed or progress in horticulture is through the 50+ hour working week. Let us work smarter, not harder."

Tam is the secretary for Grow NZ Women, a local group in the Tasman region that promotes and supports women at all levels of horticulture, providing workshops, tours, mentoring and networking to the local community. Tam is also the president for the Motueka Toastmasters club which enables members to gain skills and confidence in public speaking as well as leadership skills through undertaking different roles within the club.

Tam knew virtually nothing about New Zealand when she left Zimbabwe; now when she is not working, studying, or volunteering, she loves discovering its great outdoors by hiking and continues to explore New Zealand with every chance she gets. ●



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Mike and Bruno Simpson with bare-rooted trees in the nursery

Waimea Nurseries celebrate 50 years of success

Mike Simpson remembers loading trucks with trees for Woolworths stores when he was the sole permanent employee for his parents' fledgling Waimea Nurseries business.

By Anne Hardie

Decades on and Waimea Nurseries now employs 100 permanent staff, 110 seasonal workers at peak season and is set to celebrate its 50th anniversary.

The family's involvement in horticulture dates back to a previous family tree nursery - the Simpson Bros Nursery that existed before Mike's parents, Doug and Georgi, created Waimea Nurseries in 1971 so Doug could focus on his passion for fruit trees.

Today the nursery is run by Mike, his wife Angela Donaldson, and their son Bruno, who oversees the sales, finance, administration and varietal management components of the company. Although the nursery is perhaps best known for the commercial fruit trees it produces for orchards, it is also a leading producer of fruit, nut, and ornamental trees - supplying some 300 garden retailers nationwide.

Fruit trees for lifestyle blocks were the bread and butter of the business until the early 1980s when the family bought rootstocks from the former New Zealand Fruitgrowers Federation Nursery. That created the basis for the commercial pipfruit side of the business. Mike says the major turning point was when they led the

importation of Pajam[®]2 (Cepiland) – an M-9 clone and patented rootstock that came out of France – working with Andy McGrath on the importation of CG202 from Cornell University. The rootstocks held the promise of better-quality fruit, higher yields and lower labour requirements. Mike says they represented the beginning of modern orcharding in New Zealand. Variety licensing overseas became an important string to the nursery's bow which lifted it onto the international platform with a network of licencees. As a member of the International New Varieties Network, he says they were able to turn up anywhere around the world and talk with credibility about licensing and new varieties.

Establishment of an on-site quarantine facility for new varieties of pipfruit and stonefruit marked another milestone for the nursery. Up until then, there was just a handful of apple varieties imported each year by the Department of Scientific and Industrial Research (DSIR) which was obviously limiting. The quarantine facility changed the focus to finding a variety that was not only new, but a good one.

A separate company, Waimea Variety Management, was set up specifically for managing the selection of varieties coming into the country which were then tested and evaluated for the New Zealand market. Waimea now has a sizeable footprint in varieties and has exclusively managed global sales of varieties such as the Lady in Red apple and the Taylor's Gold pear. Mike says they have been fortunate to have had the opportunity to manage some great New Zealand mutations around the world, including Aztec Fuji. That variety has been planted extensively in the United States and Europe for the past 15 years, but funnily enough not in New Zealand where growers chose Candy instead.

The nursery's exponential growth over the years has not been without hurdles. When the apple industry peaked in 2009, the nursery was in expansion mode and selling 600,000 trees a year. Two years later that had dropped to 150,000 trees as the industry contracted. Since deregulation, the dynamics of the nursery has changed and instead of growing trees on spec and averaging sales of 300 trees to about 600 clients, it moved to forward contracts for about 50 clients with average orders of 20,000 to 30,000 trees, and in many cases more than 100,000.

The nursery took another leap forward in 2020 with the purchase of a tissue-culture laboratory in Hawke's Bay to speed up the development of apple rootstocks. The former Plant Propagation Laboratories has been rebranded as Waimea Plant Laboratories Ltd and will continue with its previous product range – but with a focus on introducing Geneva series rootstocks into tissue culture production. It will also extend the product range to crops such as blueberries, strawberries and hops.

The goal is to become New Zealand's leading tissue culture laboratory, says Bruno.



"The lab is about making us more responsive to changes in rootstocks and rising to meet the market needs. It also gives us a physical presence in Hawke's Bay which is the biggest apple region in the country."

As a third generation Simpson in Waimea Nurseries, Bruno says the next step is automation and labour assistance to resolve the ongoing labour shortage in a very manual job, plus improving environmental outcomes.

Waimea Nurseries is heading towards containerisation of plants with a 10-year transition period to move from bare-rooted trees that are manually lifted in winter. Once they have containerisation – in environmentally acceptable packaging – they can take the next step to automation.

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NURSERIES



Waimea Nurseries staff tending to young apple trees



Mike and Bruno are in a transition period from bare-rooted trees to containerisation

"It reduces our physical footprint and allows us to mechanise for a wider labour force by eliminating some of the back-breaking work involved with the business," Bruno explains. "The big thing is it allows us to be more responsive and we can scale up or down and use it for other crops."

The nursery is investing in an on-site facility to plant large-scale containerisation, using biodegradable paper. Ongoing trials will fine-tune the system. The nursery uses Danish Ellepots - a sustainable seedling propagation solution that uses paper certified by the Forestry Stewardship Council to create substrate pots. Waimea Nurseries bought Ellepot machinery to make the pots locally. The paper that is used is still being refined to achieve a product that is 100% biodegradable. The end result for a grower will be a little tub of potting mix growing a tree ready for planting. At this stage, the pots are only being used within the nursery, but the plan is to have growers trialling them by late 2022.

The potted trees transplant well, meaning growers can avoid transplanting shock.

"It is a more flexible way of planting at different times and the pots are easier for growers to handle," says Bruno. It also allows the nursery to stabilise tree prices because it will be able to stabilise labour costs.

The trees take up more room than bare-rooted trees in a truck, will need to be kept hydrated as opposed to being stored in a coolstore and will require being planted in ground that is already set up with irrigation. Bruno says

Waimea wants to work with growers to trial and improve the concepts, then resolve any issues before further expansion.

Transitioning the nursery to containerisation is aimed at reducing the nursery's demand not just for labour, but also land and water. For a company that grows trees on some 20 sites around the Waimea Plains, totalling 300ha, land and water availability is crucial. Two thirds of that land is leased and traditionally, the nursery has been able to secure two-year leases. Dwindling land availability and increased demand means they now need multi-year leases - which requires rotating with cover crops to avoid fumigation. Crops such as sunflowers are now a common sight around the plains once the nursery has lifted its fruit trees.

Water used to be free, but the new Waimea Community Dam being built will cost the company more than \$100,000 a year. The family business has already paid just over \$5,000 per hectare to secure water rights - with a flexible mechanism for leased land. They bought a significant surplus of shares, as did many landowners, to get the project up and running and Mike doesn't begrudge a cent of it.

"We are way better off with this dam because it has created confidence and productivity in this area. Without surety of water, we would probably have to be somewhere else."

The dam is expected to be completed by the middle of next year. It will ensure business as usual for the nursery as it tackles the next phase of containerisation and automation. ●

AVO UPDATE



Making connections

By Jen Scoular : NZ Avocado chief executive



While attending the New Zealand Merino conference in Christchurch recently, I didn't expect to be in a room of 450 people, mostly farmers, who were some of the most inspiring lovers of New Zealand wool I have ever heard.

NZ Merino hosts this conference annually. I was invited as part of the Te Hono alumni - a primary industry initiative seeking to establish linkages between our amazing country, the products it produces, and the creation of value and stories to enhance the sales of those products offshore.

As we head into what will be a very challenging season, I needed the aspiration, the opportunity to look at things differently, the chance to share our challenges with others and to hear how others are facing their challenges. We heard from the author of *Belonging: The Ancient Code of Togetherness*, Owen Eastwood, who has written a wonderful book about whakapapa and leveraging your identity to create strong teams. New Zealanders have such amazing pride in being Kiwi; we identify with so many aspects of the very essence of being a New Zealander. There is automatically a connection between us, we 'belong' in the same team, and that belonging strengthens what we do in that team.

Across the avocado industry we are a diverse team, but we have a game plan, a strategy and hundreds of years of combined experience amongst us. We are facing an unprecedented season, but rather than think of the negatives, we need to take some comfort from that experience, the connections we have, and the assets we have built up over the years. It is impossible for our exporters to visit their customers at the present time, but they have nonetheless built some of those relationships over a long time, and the connections they have made are assets as we face the tough times.

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I really enjoyed hearing about other sectors. Whether it is those that are similar to avocados - like kiwifruit or apples and pears - or sectors very different from ours - like the wool sector. How inspiring to hear some of the initiatives that have strengthened the wool industry. We heard from the founder and chief executive of Allbirds - I hope readers have all tried their shoes, which are the most comfortable shoes in the world. We heard from the chief executive of VF Corporation - the owners of clothing brands Ice Breaker and Vans. They love the story behind New Zealand wool, the provenance, the passion of the farmers looking after their farms and their sheep for future generations. That story resonates, and their well-told story supports the similar story we tell in our export markets - the power of New Zealand, the significance of our connections, and the amazing products that New Zealand produces.



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SUMMERFRUIT UPDATE





New Summerfruit NZ chairman Roger Brownlie at home with his cherries on his Bay View orchard

Brownlie brings collaborative approach to Summerfruit

Newly elected Summerfruit NZ chairman, Roger Brownlie, plans to bring a collaborative approach to the role.

By Rose Mannering

Elected at the Summerfruit NZ annual meeting in June, Roger is a third generation fruitgrower at Bay View, just north of the city of Napier.

He is excited for the future of the summerfruit industry and is looking forward to representing the broad base of members, from larger corporate operators to small local market suppliers. "We want to establish better lines of communication with growers, and to work collaboratively across the sector to benefit everyone," he says.

Labour is the immediate challenge for the industry. With borders shut and a shortage of backpackers and Pacific Island workers, the industry is focused on employing more New Zealanders to take on seasonal roles.

The industry will need to have a renewed look at future growth, and how that will fit into the world post pandemic.

He is particularly passionate about the environmental footprint of summerfruit growing.

"We need to work towards regenerative horticulture but taking a pragmatic approach. We need sensible solutions for the industry to slowly migrate to," Roger says.

Viability will be the key factor for summerfruit growers.

"We need to keep doing what we are doing, but only better."

Roger completed a Diploma in Horticulture at Massey University, before being called back to the family property.

In between, he worked in market gardens in Bay View before becoming a groundsman for the Napier City Council. When his father announced he was selling the home orchard, the three sons came home and took a share each. Roger and his wife Anna started farming in their

own right in the early 1990s. They've survived hail, market downturns, and several restructures of their business.

The duo started out growing grapes and kiwifruit, but poor prices and inconsistent soil properties for the kiwifruit led them to change the mix - later growing summerfruit and apples on their property known as 'The Orchard.' It was a logical progression from growing apricots for the local market in their very early season production area, to starting a roadside stall.

Fifteen years ago, Roger and Anna started The Orchard Store on the main road at Bay View and changed their growing mix to cater for the needs of the store.

They packed all their own summerfruit and had a stall at the Hastings Farmers' Market as well. At the market Roger was shoulder tapped by fellow summerfruit grower Derek Barnes to join the Summerfruit NZ Board 12 years ago.

When the pandemic arrived early last year, the Brownlies decided to call time on their orchard store, selling the business and leasing the shop out. Uncertainty over labour supply was one of the main reasons for the change.

"Now the shop has gone, I didn't realise how much time it took up," he says.

Upon becoming a board member of Summerfruit NZ, Roger was influenced by Central Otago grower Tim Jones who was using the Upright Fruiting Offshoots (UFO) growing system. "I liked the system, there are a lot more trees per hectare and theoretically we can double the tonnage," he says.

Consequently, over the last eight years Roger's focus has been on adopting new growing systems such as Twin Leader and UFO, first with apples then later with apricots and cherries. He handed the design of his new Envy planting over to the late John Wilton (Agfirst) at the time the new production systems were evolving from Plant & Food Research.

He admits this goal has not been reached yet, but he is hoping this is going to be the year.

The intensive Future Orchard Planting Systems (FOPS) present a much more manageable orchard set-up that he feels comfortable tending in his retirement years. There is a bigger focus on summer pruning, and he admits there is not a lot to do in the orchard in the winter.

His involvement with Summerfruit NZ has covered several portfolios, including local market, then research and development, then vice chair before being elected to the chair. Roger has loved his time on the board and finds it inspiring checking out the growing systems and methods used in Central Otago and Hawke's Bay.

He is happy to have Trudi Webb as the vice chair, with north and south summerfruit growing areas both represented at the top of the organisation.

Roger says he is not afraid of making hard decisions and looks forward to leading the industry through the current tough climate and towards better times in the future.

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KIWIFRUIT UPDATE



Proposal to retain NZKGI's value to growers by increasing its levy

Supplied

New Zealand Kiwifruit Growers Incorporated (NZKGI) has grown substantially in recent years, resulting in an increased output in the organisations' value for growers.

For NZKGI's 2021 Annual General Meeting, a motion is proposed to change the organisation's levy from 1 cent per tray of kiwifruit exported outside New Zealand (excluding Australia) to 1.1 cent, an increase of a tenth of one cent.

The resolution stems from a unanimous decision made at the March 2021 Forum meeting in recognition that NZKGI's activities should be maintained, and that this was not possible within the current levy rate. NZKGI's Commodity Levy has funded the organisation since 2012. At the last levy renewal referendum in February 2017, growers voted to set a maximum levy rate of 1.5 cents per tray, which the proposed 1.1 cent falls within.

With the proposed levy, NZKGI intends to continue to operate as it has done for the past five years with activities in each of the six portfolios. Continuing NZKGI's current outputs is not feasible with the current resourcing. Key points to this are:

- Two staff are currently co-funded by government. This means that the output of the organisation would decrease if these positions were no longer funded by government and NZKGI did not have the resource to fund them.
- Current staff are working beyond capacity and this is not sustainable.
- The organisation is going through a transition period with the changeover of chief executives.

What follows is an overview of the value the organisation's six portfolios have delivered to growers in recent years. We also encourage you to visit the Organisation page of the NZKGI website, where NZKGI has published detailed information on the value of the organisation for growers: www.nzkgi.org.nz.

NZKGI delivers results for growers

NZKGI's work is split into six portfolios, each of which have their own focus. Here are just some of the highlights of NZKGI's work from recent years. ORTIGITIES Attracting seasonal full-time workers to the industry NZKGI continues to work with industry stakeholders to attract potential employees to the kiwifruit industry.

The 2018 seasonal labour shortage led NZKGI's Labour portfolio to develop a Labour Attraction Strategy for the 2019 harvest. The strategy provided initiatives and information to attract New Zealanders and those on Working Holiday Visas to the industry.

The strategy was refined and extended for the 2020 and 2021 harvests, with the latter requiring 23,000 seasonal workers to pick and pack. The most recent campaign gained 10 million impressions across all communication mediums, leading to 11,490 people visiting NZKGI's seasonal jobs page to gain more information on working in the industry.

As part of the strategy to attract potential employees to the industry, NZKGI's Education portfolio offered one-day winter pruning courses in 2020 and 2021 with funding from the Ministry for Primary Industries to help develop skilled labour. Some participants also had the opportunity to join an intensive five-day course to gain skills which would make them more attractive to employers.

Another highlight where NZKGI fosters careers into the kiwifruit industry is through NZKGI's *Kiwifruit Book*. Launched in 2015, the book provides teachers of horticulture (and even agriculture) with a resource that shares every aspect of the kiwifruit industry, including statistics, event updates, hot topics, on-orchard management practices and sustainability. Each year 200 copies are distributed to schools and a digital version is available on the NZKGI website.

Industry communication

NZKGI's Communication portfolio has been widely recognised for its success over the past year, winning the Gold Award for *Special Project or Short-Term Campaign* from the Public Relations Institute of New Zealand. NZKGI was also the winner of the *Primary Sector Communications Award* at the 2020 Ravensdown Agricultural Communicator of the Year Awards for industry communication throughout Covid-19 lockdowns. Two highlights of the portfolio are communications with growers, for example, through the *Weekly Update* newsletter, circulated to more than 3,000 growers, as well as media relations which has led to NZKGI being featured in more than 100 publications annually.

🛞 Local and national advocacy

NZKGI's Industry Stability portfolio focuses on strengthening relationships with central government Ministers and officials who have a direct impact on the industry. Frequent discussions are held with stakeholders such as the Minister of Immigration, Kris Faafoi.

Local and central government policies are being developed at a rapid pace. Since 2019, NZKGI's External Relations portfolio has made over 50 submissions.

An example of work conducted in this area has been policy to protect and enhance water resources for our people, environment, community and the kiwifruit industry. In 2019, NZKGI's External Relations portfolio took the lead in the creation of an industry-wide Water Strategy in collaboration with growers, Zespri, Māori Kiwifruit Growers Inc. and Horticulture New Zealand.

NZKGI has also advocated for regional grower issues such as rural rate increases, with the organisation taking legal proceedings against Gisborne District Council's decision to include the licence in rating valuations for gold kiwifruit orchards. In a separate court case, NZKGI successfully removed barriers to seasonal accommodation in legal proceedings against Western Bay of Plenty District Council in the Tauranga District Court.

🛞 Monitoring of Zespri

NZKGI's Performance and Supply portfolio closely monitors Zespri on aspects such as market performance, forecasting and grower payments. This included an independent audit of the Zespri administered Growers' Pool in 2017. As a result, improvements were implemented, and NZKGI has initiated a follow-up audit this year.

Following the successful Kiwifruit Industry Strategy Project (KISP) Referendum in March 2015, a Margin Implementation Working Group was established to focus on achieving simplicity, transparency and a fair allocation of costs between Zespri and the New Zealand Growers' Pools. This was reviewed by an expert commissioned by NZKGI and resulted in a new, enduring funding model to calculate Zespri's margin and utilisation of the loyalty payment.

😳 International advocacy

NZKGI also builds relationships with growers in other kiwifruit producing countries by attending the International Kiwifruit Organisation (IKO), where discussions take place around global supply, fruit production, crisis response, and NZKGI's commitment to the Single Point of Entry.

Ensuring value for growers

In 2016, portfolio leaders, subcommittees and executive committee members were assigned to help address the objectives in the Strategic Plan. Several roles have also been created since 2016 to ensure NZKGI is equipped to drive change.



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NZKGI's Weekly Update newsletter containing current need-to-know information for growers and stakeholders is distributed each Friday. Subscribe to the newsletter here: www.nzkgi.org.nz





THE LATEST INNOVATIONS AND IMPROVEMENTS





Reducing variability in apple tree productivity

What are the opportunities to reduce variability in apple tree productivity through targeted (sub-block) water and nutrient application?

By Mike Nelson, Greg Dryden, Anna Weeks & Chris Hosie : Fruition Horticulture, Nelson, and Dr Ken Breen & Rob Diack : The New Zealand Institute for Plant & Food Research Limited.

This project investigated variability among apple trees in an orchard block with varying soil textures, to correlate tree variability with soil texture and consider if variable fertiliser and irrigation applications were warranted.

In Hawke's Bay and Tasman, most apple production occurs on soils that have formed from alluvial (river movement) deposits. These soils range from clays to sand to gravels from a wide range of parent material, even within a defined soil type. Orchard blocks are usually laid out with only surface features in mind – roads, drains, boundaries, and little thought is given to soil features unless they are to be critically detrimental. As a result, orchard blocks can have considerable variation in soil composition and texture running through them, while a uniform management strategy is applied to them. Soil texture has a major influence on how much water a soil can hold and make available to plants over time. Soil texture also influences the amount of nutrient that can be temporarily stored for plant use, particularly the cations e.g., potassium, calcium and magnesium. It is well documented that soils with light texture (larger spaces between particles) need smaller amounts of nutrient and water, applied more often, compared with heavier textured soils. Current industry practice is that orchards are generally managed at a block level without regard to soil texture variation within them. There is no accounting for the considerable variation in tree requirements due to variability in soil texture. As world leaders in the move to higher production levels, New Zealand orchardists have become better at solving the more obvious yield limiting factors at a block level. However, improving yield and

quality further will require understanding and reducing subblock tree level variation. In addition, block-level irrigation and fertilisation can be wasteful of resources - some plants are oversupplied while others are undersupplied, and can also result in pollution of aquifers and waterways.

Reducing between-tree variation also has the potential to achieve more even fruit maturity and quality, which is also important for the economics of mechanisation and postharvest outturn.

The block selected for this study was 23 ha of Scilate' (Envy[™]) on 'M9' rootstock planted in 2010. Running through the block were four soil types having different soil textures. Three soil types were selected for the study – Hau stony sandy loam, Riwaka medium sandy loam and a heavier Riwaka silt loam - to give a range of soil textures.





Within each of three soil types 20 plots of 62 m^2 each were selected.

On each of the three soil types, 20 plots were selected randomly, with each plot made up of 21 adjacent trees (1 bay X 3 rows).

Soil moisture levels were monitored using Sentek continuous monitoring probes (capacitance sensors) to 90cm on one site, on each soil type.

On each plot measurements were made of trunk crosssectional area (TCA) which is a reasonable indicator of total tree biomass in blocks of this age, with variations in size an indicator of historical variation within a block. Soil samples were taken for chemical analysis and soil texture determination. Unfortunately, due to hail damage, recording fruit yield and size was not viable, so instead branches were measured to determine branch cross-sectional area (BCA) as an indicator of potential fruit production.

Normalized Difference Vegetation Index (NDVI) mapping was used to measure tree vitality. NDVI mapping uses satellite (or drone) imagery to measure near-infrared light reflectance. It can provide an accurate indication of the presence of chlorophyll, which with accurate interpretation, correlates with plant health and vigour. This can then be displayed graphically with colours, or each pixel can be given a numerical value. An image was obtained by satellite later in the season, on 9 February, when it was considered trees would be under some stress (Fig 2).



Figure ² Image of Normalised Difference Vegetation Index (NDVI) variation within each of the soil type areas. Yellow through to red has a lower NDVI index value showing lower chlorophyll levels which may indicate stress or reduced vigor, with green through to blue showing a larger index value and high chlorophyll levels which indicate more active photosynthesis and less stress

An electromagnetic (EM) soil survey was also conducted over the study areas (Fig 3). This involves using a magnetic field to measure soil conductivity. Coarse soil texture such as sand has a low conductivity compared with a soil having a higher proportion of clay, which has a high conductivity, and a silt soil having a medium conductivity. Measurements were taken at two depths (0.4m and 1.2-1.4m) and mean values for each plot were derived from a 3m radius from the plot centre



Figure 3 Image of Electromagnetic survey mapping of each soil type at the 1.2 to 1.4 metre depth. The smaller the electrical conductivity (EC) value the coarser the base material. Red brown and yellows would be prograding gravels (red indicates bigger gravels, yellow smaller), the light green likely sands, and the darker greens sandy to silty

RESULTS

Soil Texture

All three soil types consisted mostly of sand and silt components with very little clay found in any of the plots. This left the proportion of sand to silt as the main influence on soil texture. The greater proportion of sand in a sample makes a lighter texture soil with less water holding capacity and less ability to retain nutrients. Although there were observed differences in the sand fraction among soils as was shown in the chemical analysis, variability among samples was as large or larger than variability among soils. However, as would be expected the Riwaka silt loam generally had less proportion of sand particles and was of a heavier texture.



Figure 4 Mean percentage of sand (as an indicator of texture) by soil type. Influence of soil type on size of tree (mean trunk cross-sectional area in cm²)



Figure 5 Influence of soil type on size of tree (mean trunk crosssectional area in cm²)

Tree Growth

Tree biomass was significantly less for trees grown on the Hau stony sandy loam, with a mean TCA of 27 cm², compared with 41 cm² and 39 cm² for the Riwaka medium sandy loam and the Riwaka silt loam respectively. Trees on the Hau stony sandy loam also had smaller branches, with a mean BCA of 2.5 cm², compared with 3.3 cm² and 2.7 cm² for the Riwaka medium sandy loam and the Riwaka silt loam respectively (see images a and b).



a Trees on Hau stony sandy loam, b Trees on Riwaka silt loam

Electromagnetic Survey

The electromagnetic (EM) survey did not detect differences in localised soil textures, within a soil type, that may explain soil texture (percentage of sand, determined in the 15cm core sampling).



Figure 6 Mean percentage sand of a plot compared to shallow (1.4m) EM value

Production

Production levels for the 2018-2020 seasons are given in Figure 7. Over three seasons, production on the light textured Hau stony sandy loam was higher at 280 t/ha compared with 234 t/ha and 207 t/ha on the other two soil types that had much greater biomass in trunk and branches.



Figure **7** Production levels in t/ha from blocks within each of the soil types

NDVI

NDVI images taken on 9 February strongly correlated (R^2 0.79) to tree trunk cross-sectional area. Plants with a high NVDI value in February had developed larger trunks over time.



Figure 8 Relationship of tree biomass (TCA) and NDVI values taken on 9/2/2021

Discussion

Growers aim to apply water and nutrients at levels that are sufficient to support plant and fruit growth and development. The rates of nutrient applied are dependent on soil test results, previous seasons' leaf tissue test results and plant performance at a whole block level, and do not take into account within block variability. Consequently, there will be areas of oversupply of nutrient, particularly as growers prefer to avoid undersupply.

...soil tests showed that nutrition was generally not limiting at either a block or sub-block (plot) level

In this research, soil tests showed that nutrition was generally not limiting at either a block or sub-block (plot) level. However, for example, the soil test survey of 10 plots per soil type indicated that there was significant variation in phosphate levels in both the Riwaka medium sandy soil and the Riwaka silt loam soil, while the Hau stony sandy loam had low variability. This suggests that there is opportunity to reduce inputs by a more targeted, sub-block application of phosphorus. Similar opportunities may be available with other elements such as potassium. However, this could not be determined or correlated to any of the variables measured such as soil texture, so would depend on more cost-effective soil chemical analysis processes than what is currently available.

TECHNICAL

In the case of irrigation, seasonal traces of soil moisture content showed that soil moisture was not limiting at block level, and there was strong indication that irrigation frequency and/or volume could be reduced in both the Hau stony sandy loam and Riwaka medium sandy loam soils. However, with only a single monitoring station per block, we were unable to interpret this at a plot level. Given that results showed greater variability in texture among plots than among soils, opportunities may exist to save inputs through more targeted application at subblock level, but because measurement of soil moisture at a plot level was outside of the scope of this work, this should be included in a subsequent study. A more intensive project measuring NDVI scores throughout the season may be warranted and yield more insight into tree performance in relation to soil texture/soil moisture dynamics.

66

Given the wide variation in soil texture as measured by percentage of sand, there may also be opportunity to improve productivity by managing inputs at a sub-block level

Interpretation of the NDVI data was limited because overhead satellite frequency and cloud cover restricted the number of successful images received. The strong $(R^2 = 0.79)$ positive correlation between NDVI and tree biomass may not so much show that trees with lower biomass were less healthy or under stress, but that those trees were less vigorous. And that this one snapshot in time reflected tree biomass that had accumulated since planting. High vigour and dark green leaves in the mid to late-season, at the stage that the NDVI imagery was taken, is usually an indicator of excess vigour. In trees with excess vigour, post-harvest fruit quality is reduced, and high leaf area may cause shading, reducing marketable yield through reduced fruit colour. Examination of the trees across the plots suggested the smaller trees (by TCA and BCA) with lower NDVI scores observed in the Hau stony sandy loam soil were likely to be better performing trees; an observation supported by yield data. This also suggests that there is opportunity to improve productivity by reducing inputs at a block level. Given the wide variation in soil texture as measured by percentage of sand, there may also be opportunity to improve productivity by managing inputs at a sub-block level.

The large differences in tree biomass could not be explained by soil texture either through the sample fraction method or the EM survey, despite the wide differences in soil texture within and among the soil types. It is possible that the tendency of growers to liberally supply inputs so as to avoid

Soil texture has a major influence on how much water a soil can hold and make available to plants over time

to liberally supply inputs so as to avoid areas of deficiency may have clouded this relationship.

In conclusion, we could not confidently link soil type or texture and tree growth or productivity. This may be because orchard management tended to oversupply inputs to avoid areas of deficiency that might cause reduced productivity. A number of factors investigated at both the block and sub-block (plot) level supported this view. Consequently, the original concept of supplying a secondary irrigation line to mitigate soil texture-based moisture deficiencies is unlikely to have any positive effect on productivity under the current management practices. However, if management objectives were to shift towards minimising inputs, a situation easily conceivable under improved ecological sustainability targets, application of nutrition or irrigation at a sub-block level, possibly based on soil texture, may become feasible and desirable.

Potential Future Research

- Investigate NDVI values within and among seasons to understand their relationship with tree growth and yield.
- 2 Explore the use of soil moisture deficit management using NDVI in conjunction with soil moisture monitoring.
- 3 Further explore the reasons for tree variability. ullet

Funded by the Rural Professionals Fund - Our Land and Water National Science Challenge.



We wish to thank the following for their support of this project: Kono Horticulture for allowing access to their property and production records for this study; Carl Sladen, Complete Water Solutions, Motueka, for irrigation costings; Lachie Grant, LandVision, for EM mapping; Our Land and Water for funding this project.





Forest Lodge Orchard's AGI Frost Fan in the foreground and the western fan in the background

The future of frost fighting

It's the modern-era question – fossil fuels or electric futures?

By Heather Woods

Under crisp, Central Otago skies, co-owner Mike Casey and the team at Forest Lodge Orchard are on a mission an electric mission. With a blank canvas, they've chosen electricity as their power-of-choice with the goal of farming without fossil fuels.

Chris Kay, marketing manager at New Zealand Frost Fans, whose diesel-fuelled fans are making a noise in the crop management arena, explains the superior blade design and premium monitoring technology that sets them apart.

The science of frost

There are different types of frost including radiation frost and advection frost (the kind that comes from a polar blast). Radiation frosts are the most common type in New Zealand and Australia, characterised by clear, calm conditions with a temperature inversion and temperatures greater than 0°C during the day. And they can devastate entire crops and orchards if not managed in the right way. The sun warms the ground during the day, then after sunset the ground radiates that heat back out. As that heat rises above crop height, the colder, heavier air above moves in underneath, causing bud and flower damage.

Frost fans like the FrostBoss and those from South Africabased AGI Frost Fans, pull the warmer air back down into the crops. And while there are no guarantees, it's a great insurance policy for your crops, with one fan covering six to nine hectares.

Crops that have an overhead canopy netting, like kiwifruit, benefit from around 5.5-hectare coverage. The benefits don't stop at crop protection either, with vineyard and orchard owners seeing a reduction in overhead costs and crop management risk. Frost fans cost less than using helicopters, and with automatic start/stop at pre-set temperatures there is no need to make judgement calls on when you will actually need them. Many growers have moved to using frost fans instead of water sprinklers, which use large volumes of water, at considerable cost. There is also a risk of sprinklers freezing, and the mud created makes orchard maintenance and access harder.

A focus on renewable farming

In winter when trees are dormant, frost isn't a huge deal. But when you're in the stonefruit business bud burst in spring can be a challenging time, as frost can damage and burn off the buds.

Forest Lodge Orchard, specialist cherry growers, are expecting their first harvest next year. They've set their operation up with renewable farming in mind. They are the first Kiwi business to import fully electric frost fans from AGI, and Mike Casey is excited by the value it adds to their operation.

Traditional frost fans have a six-metre diameter, but Mike prefers the four-metre diameter and faster spin from his AGI Frost Fan. It also has a different noise profile - sounding more like a propeller plane, or a constant white noise - than the "swoosh swoosh" of a helicopter. Maintenance is a breeze, and it's cheap. Plus, a service lane isn't required so Mike has been able to plant more trees than if he went with a diesel option. He says they simply run cables from the fans to their switchboard removing the operational aspect of filling tanks, and the potential for diesel spills affecting the orchard.

When asked what his 'Plan B' is for a power outage, Mike isn't too fussed. Frost is typically overnight when there are not usually scheduled outages, and the weather conditions required for frost mean it is unlikely a storm that could cause damage to poles and cables would occur. And with only 150 to 200 frost hours (roughly) a year, the chances are slim. Mike is however, planning to look for insurance against power cuts, because you can't insure against frost specifically.

He hopes other growers will see the benefits – for their farms and for the planet – of going electric and do their own research via the EECA (Energy Efficiency & Conservation Authority) for available grants to get them started.

The plus side of uniform wind and data

Chris Kay says that what makes the FrostBoss Frost Fan so special is its cleverly designed propeller blade. From the centre to the tip, it has constant dynamic pitch right through the blade, making the entire blade length from hub to tip produce a uniform wind momentum. This optimises the coverage area at an efficient low engine speed of 1750 to 1800rpm at which the maximum torque of the engine is generated. As a result, the blades are more environmentally friendly as they don't burn as much fuel. They also have lower noise emissions while still getting huge coverage across crops. Bonus features that set the FrostBoss apart are fuel security, with no separate tanks and external hoses, and engine cabinets designed to be rodent and bird proof. So you can say goodbye to chewed-up cables and nests creating a fire risk.

The remote monitoring option, known as FrostSmart, enables growers to access real-time monitoring of fans around the world, together with text alarms and historical data and graphs on temperature, run-hours and machine performance. The hardware required for FrostSmart



One of the many types of frost fans available on the market, the FrostBoss

monitoring is now included as standard with all FrostBoss machines, which incorporate automatic start/stop and wireless radio temperature probes. That means no additional hardware costs, only an annual monitoring fee to access the customer-specific data for your fans. Frost fan monitoring is now the norm for the majority of FrostBoss customers, who can access their specific data from a smart phone, or any other internet connected device.



The benefits don't stop at crop protection either, with vineyard and orchard owners seeing a reduction in overhead costs and crop management risk

NZ Frost Fans offer an end-to-end service including site visits for mapping and layouts, organising council consents (if required), installation, upgrades and servicing including 24/7 emergency repairs.

Innovating for a sustainable and efficient future

For Forest Lodge Orchard, electric frost fans are just the next step in their grand plan. They already run electricity for golf carts, irrigation, and will soon have the first electric tractor in New Zealand. It takes them one step closer to growing food without needing to burn fossil fuels. Chris believes consumers will be willing to pay a little more for something that is socially and environmentally responsible. There are demonstration grants available, so interested growers can jump on board.

NZ Frost Fans run a tight ship. But like any successful business they are constantly innovating to develop further efficiencies and reduction in noise emissions. Their service trucks are equipped with oil extraction and transfer pumps for efficient and environmentally friendly engine and gearbox oil changes and their recycling programme includes used oil. Their five-year strategy includes the construction of a new composite blade factory, to ready the company for further global growth.



One of the grafted trees in February 2013. Tamarillos grafted onto woolly nightshade produce a smaller tree, but a heavier crop of larger fruit for the area of canopy

The key to saving the tamarillo industry?

The tamarillo industry has struggled to come to terms with the Tomato Potato Psyllid (TPP), a vector of the devastating bacterium Candidatus Liberibacter solanacearum, since its introduction in 2009.

By Ray Paterson, with contributions by Stan Walker

The first two years following the incursion saw a drop in national production from 900 tonnes of tamarillos in 2008 to 270 tonnes. Grower numbers also fell from approximately 200 to 35.

While production levels rose with controls, such as effectively designed insecticides targeting TPP, it soon became apparent that this was not completely effective at eliminating the psyllid, as it was not always possible to time the applications.

Persevering growers are still reporting significant loses and have to be ready with replacement trees to fill in the gaps left by those infected with the psyllid. All this has added to the operational costs and is the reason why annual production has not recovered to any degree, remaining at around 400 tonnes. After losing 90% of the 12,000 trees in my Awanui orchard in 2010, I was amazed to find that another orchard, planted 10 kilometres to the north of Waiharara in 2000, showed less than 1% infection. At the time, the owner Stan Walker, was recovering from a heart valve replacement and had not been able to tend to his orchard of 1,000 trees. Woolly nightshade growing around the edge as shelter had begun to spread through his tamarillo trees.

Seeing no sign of Liberibacter disease in woolly nightshade anywhere in Northland, this observation led me to graft 6,000 tamarillo seedlings onto woolly nightshade rootstock between October and November 2011, to see if immunity could be obtained in this manner. The first year looked promising, but the second year it became apparent that the grafted trees showed no greater resistance than



The graft union of tamarillo onto woolly nightshade rootstock



A block of the grafted trees in November 2012, 12 months after tamarillo seedlings were grafted onto the woolly nightshade rootstock



Taken in January 2013, this shows the woolly nightshade from the rootstock making a full recovery after the diseased tamarillo was cut out. The tamarillo regrowth alongside has the symptoms of Liberibacter and did not recover

the non-grafted ones. Once again, I faced the task of cutting out the infected trees.

By cutting off the infected trees at the graft union, I noted that the remaining woolly nightshade rootstock regrew, initially showing signs of Liberibacter, stunted growth and small leaves, but in a few weeks, they outgrew this and made a full recovery. So what was the unknown factor making these trees immune to the disease?

Further north in Pukenui, Northtam Orchards newly planted by Robert Morris and Eric Wagenerwith limited spraying also enjoyed a similar immunity from Liberibacter with less than 5% of the trees showing infection. What other options were there to investigate? Both this orchard and Stan Walker's orchard near Waiharara are isolated from most other solanaceous crops. A leaf analysis however, showed another possibility. The area is rich in white silica sand – most visitors on the way to Cape Reinga would have seen the spectacular white dunes at Parengarenga – and with Northtam Orchards showing twice the silicon content as mine and four times that of the older orchard at Waiharara, perhaps silicon is the answer.

The silicon levels in my orchard, consisting mostly of peat, were boosted by the ground application of sodium metasilicate and potassium silicate applied as a spray. The tamarillo uptake of silicon is slow, taking one year to reach the level of the orchard at Pukenui, and two years to double again to reach that of Stan's Waiharara orchard. Whilst it appeared good at the start, the trees soon began to show little improvement in the infection rate, although the resistance to powdery mildew improved dramatically.

Another member of the solanaceous family, the cape gooseberry, is extremely susceptible to Liberibacter, but thrives in the Waiharara orchard through its climbing habit and ability to root from any node. The cape gooseberries were often harvested and sold at the Kaitaia Saturday markets along with tag two tamarillos. Naturally, for tamarillo growers any possibility of overcoming Liberibacter is of extreme interest. An old school friend recently drew my attention to the news that the citrus industry in the United States is set to make real progress in combating Citrus Greening disease, also known as Huanglongbing (HLB) utilising a peptide found in the Australian finger lime, that has a natural tolerance to the bacteria. It is hoped these peptides could be used to make a spray, applied three or four times a year, to effectively eliminate this problem. Citrus Greening, a severe plant disease spread by the Asian Citrus Psyllid, has wreaked havoc in the United States and many other countries, but fortunately is not found in New Zealand.



...any possibility of overcoming Liberibacter is of extreme interest

University of California Riverside (UCR) geneticist Hailing Jin who discovered the cure for Citrus Greening after a five-year search says, "It is much safer to use this natural plant product on agricultural crops than other synthetic chemicals." The treatment effectively kills the bacterium with the naturally occurring molecule, an antimicrobial peptide that can be sprayed on crops.

Could a similar answer be found in *Solanum mauritianum*? I have witnessed TPP and their nymphs on woolly nightshade that came away from the rootstock. It is glaringly obvious of its total immunity to the disease. Could this hold the key to saving the tamarillo industry and bring benefits to other solanaceous crops?

Robyn Wickenden, secretary of the New Zealand Tamarillo Growers Association, has been in contact with Plant & Food Research who are well underway exploring the literature about peptides and following the research into the cure for Citrus Greening. ●

Looking after seasonal workers in the time of Covid–19

New Zealand relies on seasonal workers to help its crucial agricultural sector thrive. Following many challenges as a result of the pandemic and border closures, seasonal workers are now returning to our shores to bolster the labour supply shortage.

It is estimated that between now and March 2022, up to 2,500 workers from Vanuatu, Samoa and the Solomon Islands will arrive in New Zealand as part of the Recognised Seasonal Employer programme. These workers will provide critical support to the fruit, vegetable and grape-growing industries.

For those embarking on the journey to New Zealand, it doesn't come without risk. It is essential that seasonal workers are insured for their period of stay in New Zealand, to cover potential medical or travel issues that might arise.

Allianz Partners and Mercer Marsh Benefits have developed Seasonsafe to protect seasonal workers coming to New Zealand by providing medical and travel insurance. Seasonsafe now offers selected cover for epidemic and pandemic diseases*, including Covid-19.

... it's important employers ensure their workers have insurance

Mercer Marsh Benefits Business Development Manager, Mark Taylor, says the policy has been designed with seasonal workers in mind. "When creating the policy, we considered the specific needs of seasonal workers and benefits that would be relevant to this group, such as emergency dental treatment. With this in mind, we recently updated the policy to include selected cover for epidemic and pandemic diseases such as Covid-19," he says.

Allianz Partners New Zealand Chief Executive Officer Kevin Blyth says it's important employers ensure their workers have insurance in place during their time living and working in New Zealand in the wake of Covid-19.

"All workplaces have a role to play in looking after employees and minimising the risk of Covid-19



Up to 2,500 seasonal workers are expected to arrive in New Zealand between now and March 2022

transmission - this is no different for seasonal workers. Seasonsafe can provide assurance to both employers and seasonal workers that cover is in place should seasonal workers contract Covid-19 during their time working in New Zealand," says Blyth.

Seasonsafe is part of InsurancesafeNZ, a portfolio managed by Allianz Partners and Mercer Marsh Benefits. Seasonal workers who hold a current Recognised Seasonal Employer Limited Visa are eligible for this policy.

Those interested in making Seasonsafe available to employees should contact Mark Taylor, Mercer Marsh Benefits Development Manager mark.taylor@mercermarshbenefits.com.

*As with any insurance, terms, conditions, limits, sub-limits and exclusions apply. To require cover for pre-existing medical condition(s), a medical risk assessment form must be completed as stated in the Policy Wording.



Streamlined spray manual on the way

The latest edition of the Novachem New Zealand Agrichemical Manual is available in August, and new editor Peter Holden says while 18 months may not seem a long time between publications, much has changed in the industry since the last one was published.

And he's not just talking about new products, although there are plenty of those.

And he's not just talking about new products, although there are plenty of those.

"The 2022 manual features the addition of 40 completely new proprietary registered agrichemicals and 50 new generic registered products. At the same time, 80 agrichemical products have been discontinued.



"The notable trend is the withdrawal of older chemistry that presented a high risk to users and the environment, being replaced by more target specific products, which are much safer to use and present a low risk of environmental harm."

Meanwhile regulations relating to agrichemical use and handling have also changed since the last manual, he points out.



From the start, one of his big priorities was to keep the manual from getting too physically big while still including all the information it's renowned for, and he's happy to say the new one is smaller than its predecessor.

Part of that is down to taking a lot of the common mandatory information out of each label, and placing that in one separate, collective advisory section.

"These are the topics that apply to many if not all agrichemicals, for example, regulations around PPE (personal protective equipment), storage, managing spills, container disposal, decontamination and clean down, and so forth."

The result is that each label listing in the new edition contains only content that is highly product specific, minus pieces of script that previously were repeated for every product.

"The supplementary information is still there for anyone who requires it, it's just been given its own separate section. In many ways it will be easier to refer to those topics in this new format."

MRL (Maximum Residue Level) references on labels have been removed as these can and do change over time. The Ministry for Primary Industries (MPI) maintains an up-to-date database online for these, he says.

New HSNO (Hazardous Substances and New Organisms) classifications have been included alongside old ones in the advisory section of the manual.

While a large number of people continue to enjoy having a hard copy of the *Novachem New Zealand Agrichemical Manual*, subscription to the online version has the additional benefit of providing product updates as they occur as well as being able to directly link to labels, safety information and further technical information from product suppliers.

For more detail visit www.novachem.co.nz

Global trends in food production impact growers

Growers are facing a global expectation to provide traceability for their food production processes, following a fruit or vegetable from planting right through to the end consumer.

Terms such as traceability and provenance are now familiar in the horticultural industry, and these new expectations have resulted in increased complexity.

Milton Munro, PGG Wrightson's Technical Manager, is aware of the current situation faced by growers and how increasing regulation will continue to affect them in the future.

"Consumers want to feel confident that the food they're eating is safe, healthy and has been grown sustainably. We are seeing increased complexity and compliance requirements within the supply chain as consumers demand greater transparency," explains Milton.

Global consumer trends and regulations impact the use of crop protection products in New Zealand. Keeping abreast of these changes is an enormous task, which is why the team at Fruitfed Supplies supports growers by keeping up to date with the latest regulatory changes and evaluating how these changes will affect the industry in the coming years.

"We have close relationships with relevant government agencies, such as the Ministry for Primary Industries, and industry bodies, so when legislation and regulations are enforced, we are alerted.

"From there, we consider the ramifications of these changes for our growers and put recommendations in place," says Milton.

The Fruitfed Supplies Research and Development (R&D) team assesses products for their efficacy and suitability for use within a crop, while also ensuring regulatory requirements are met. Along with its R&D product trials, Fruitfed Supplies conducts supply chain audits of its suppliers. With the majority of these agrichemicals sourced from large, international companies, their well established and auditable supply chains provide a good level of traceability.



Purpose-built software can help growers manage the increasing complexities of food production to meet global requirements

Milton notes that more environmentally compatible products now dominate product development decisions at most international agrichemical companies.

"The number one determinant of whether a product moves from screening to initial development is no longer efficacy or profitability, it is the product's environmental compatibility."

Fruitfed Supplies Technical Horticultural Representatives make use of crop guides and plans created by the Fruitfed Supplies technical team. These guides help growers determine the most appropriate product to use and the timing of its application to ensure the crop meets export requirements.

So how can growers meet the increased regulatory requirements associated with traceability expectations?

"By using purpose-built software to assist with the complexity of food production, using it to capture and store data that is then translated into auditable information to make informed decisions," Milton advises. "These decisions are then fed into the supply chain for consumers to see."

With food production needing to rise to meet the nutritional needs of up to ten billion people by 2050,¹ New Zealand's ability to adapt to increased digitalisation of production systems will provide an opportunity for increased productivity and profitability.

Fruitfed Supplies

Visit **fruitfedsupplies.co.nz** to find out more about Fruitfed Supplies' range of products and services, or to find a store near you.

Fruitfed Supplies is a trading division of PGG Wrightson Ltd (PGW). PGW and the writer do not warrant the information's accuracy, quality, outcome or fitness for any purpose.

¹ Ministry of Business, Innovation and Employment (2021). Agritech Industry Transformation Plan. https://www.mbie.govt.nz/ dmsdocument/11572-growing-innovative-industries-in-new-zealand-agritech-industry-transformation-plan-july-2020-pdf.

Integrating Biostimulants into avocado orchard management

Just Avocados orchardists are being advised by technical manager, Erica Faber, to use BioStart's biological range to ensure they have optimal biology in their orchards.

"I see less fungal and pest pressure, a more balanced tree and better overall health as a result of using their biological programme", says Erica. She recommends Mycorrcin for good soil biology, Foliacin for foliar biofilm health, Digester for decomposing and recycling prunings, and Terracin for resilience against root disease.

When Erica arrived in New Zealand five years ago and noticed this country was using a largely agri-chemical approach to avocado tree health, she saw an opportunity to incorporate a biological alternative to improve orchard health and productivity.

A qualified horticulturist with 20 years' experience, Erica specialised in avocados in 2002. In her current role she supports growers to implement programmes that give their trees the conditions and good health to sustainably produce quality fruit and consistent yields year-in and year-out.

While Erica had been previously using an integrated biological approach in South Africa, she was very careful in her introduction of biological products into New Zealand. She is emphatic that biological products need to come from reputable companies and to be reliably scientifically trialled.

BioStart is a New Zealand company whose biological range has been developed over 27 years using naturally occurring indigenous microbes, and their products have now been extensively trialled with growers.

Erica's approach to orchard management for top results is to encourage good soil biology, lift organic matter, ensure foliar health and use new pruning techniques that balance flowering and foliage.

An overriding piece of advice she has for orchardists is to pay detailed attention to every aspect of their trees. "The more intuitive growers get with their orchard, the more they understand and can read the trees, and then the better they can manipulate their own programmes for good results."

Erica says BioStart's soil biostimulant Mycorrcin "kicks off a microbial process that develops earlier and greater root mass so trees can glean more nutrients, which leads to faster establishment, better health and more consistent fruit production."



Erica Faber and the Biostart team, Dr Jerome Demmer and Phil Carter, at a Just Avocados orchard management workshop

Her management practices ensure fast orchard establishment, good yield and quality, which has reduced biennial bearing, further indicating that the trees are in optimal health.

Mycorrcin is based on fermentation extracts from the beneficial bacteria Pseudomonas putida, and works by activating specific beneficial soil microbes which speed up the plant's root growth and establishment, leading to greater nutrient uptake.

The BioStart decomposition enhancer Digester activates microbes in the soil to break down litter and mulch faster. Nutrients and organic matter are recycled back into the soil, improving nutrition and soil structure.

BioStart's foliar biostimulant Foliacin activates the microbes on plant foliage to lift photosynthesis by helping with green leaf retention, leading to greater photosynthesis and growth.

Terracin contains the bacteria Bacillus amyloliquefaciens BS 1b which rebalances or resets soils, providing resilience against root disease.

For more information visit **biostart.co.nz**

Erica Faber is an independent technical consultant providing consulting to services to Just Avocados.



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