

Kiwifruit News

Trevelyan's News » 2 	Industry Update » 3 	Organic Insights » 3 	Technical Info » 5 	General News » 8 
Red19 Packing Site Development 	Maturity Sample Pricing Maturity Clearance System Is Live	Let's Talk About Worms 	Weather Update The Importance Of Being Observant Crop Protection and more...	Upcoming Events Zespri Grower Roadshows

Light On Our Toes

James Trevelyan
– Managing Director

Some days it is hard to get my son off the couch, so when he shows an interest in an activity, I am always keen to support him.

Pre-Christmas he became interested in volleyball. Great, I thought. However, I could not find any volleyballs in New Zealand. I am sure I am not alone in this and that we have all had similar experiences with imported goods. In the last two weeks we are seeing pre-export issues onshore. Containers we export avocados in now come from Auckland as there are none from the Mount.

Globally, supply chains are still very much disrupted with a lot of the refrigerated containers needed for the upcoming horticulture season still

sitting offshore. Zespri has indicated it will be switching some markets from containers to refrigerated vessels to pick up the shortfall. I believe there will be a disruptive flow of empty containers this year. That has been one of the factors in us deciding to build more cool storage.

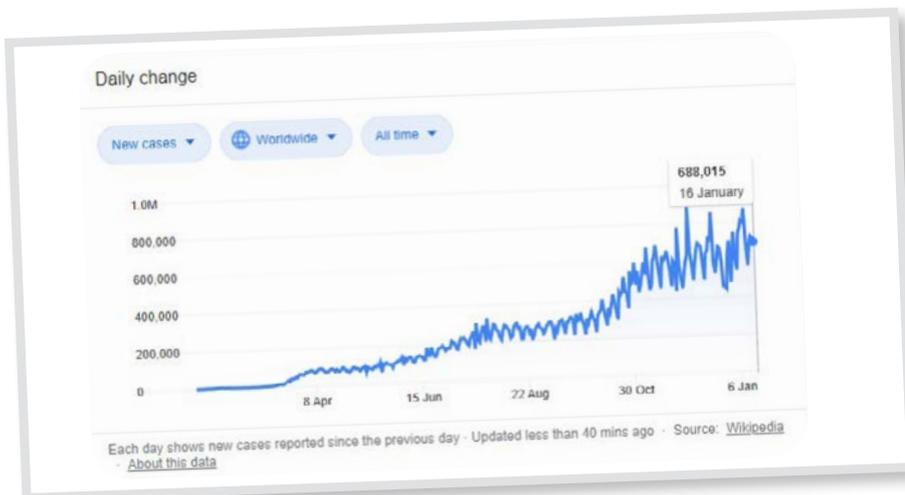
As shown in the graph, the volume of reported COVID-19 cases continues to rise globally. This explains the increased number of positive cases arriving at the New Zealand border. With little chance of offshore labour being allowed into New Zealand



Volleyball on the Green at Trevelyan's.

(bar the limited RSE offering and the Rarotonga bubble), we need to be more innovative in the way we source labour. We have employed a lot of different strategies this year and we are pleased with the response we have had to date. If we are short on labour, this will impact on our productive capacity in the packhouse. To mitigate this, we have purchased extra bins and built two extra drying tents so harvest capacity isn't affected if we have a staff shortage. However, I am under no illusion, it will not be a normal year. In addition, I expect the minimum wage to turn into the living wage.

We will need to stay light on our toes, stay off the couch and look for a path to the new normal.



Operations Update

Phil Allison – Information Systems Manager



Red19 Packing

This season Trevelyan's will be packing a small volume of Red19 from trial orchards.

This is the last season where only fruit from trial orchards will be harvested – in 2022 the first fruit from commercial crops will be harvested. Each grower will pack with their chosen facility that season.

The total volume we expect to pack is around 40,000 trays. It will be very early in the harvest season before the packhouse gets busy with Gold3 KiwiStart packing.

Site Development

New Coolstore

A new coolstore is currently being built. Once completed, this will take the static capacity at Trevelyan's to 10.3 million trays.

The build is going well with the concrete floor being poured last week. This project is on schedule to be completed around mid-April.



Low Humidity Tents

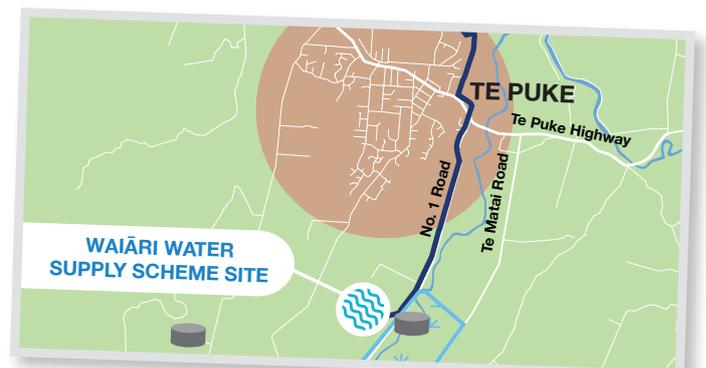
Following the success of bin storing Gold3 last season, we will do this again in 2021. With the increased crop, the amount of bin store will increase to around 13,000 bins. To get this fruit packed in a timely manner (the aim is to pack all bin store fruit within 18 days), two additional low humidity tents are being built. These are going into packhouses three and four, with packhouse two already having a tent from last season.



Existing low humidity tent in packhouse two.

Land Purchase

Trevelyan's have purchased some land immediately to the south of the existing site. This is land that was owned by Tauranga City Council as part of the Waiāri water scheme. Now building of the scheme is nearing completion, the amount of land the council needs is reducing. This land purchase is enough to keep development on a single site well into the future.



Waiāri pipeline route as outlined in Tauranga City Council brochure.

Industry Update »



Organic Insights »



Industry Update

Phil Allison – Information Systems Manager

Fruit Group	Hayward KiwiStart	Hayward Mainpack	Gold3 KiwiStart	Gold3 Mainpack	Green14 Mainpack
Waihi	\$392	\$407	\$653	\$669	\$432
Waikato	\$422	\$436	\$706	\$722	\$462
Bay of Plenty	\$357	\$371	\$589	\$607	\$404
Opotiki	\$372	\$386	\$606	\$624	\$419
Gisborne	\$383	\$386	\$583	\$611	\$442
Hawke's Bay	\$310	\$337	\$536	\$568	\$375

Maturity Sample Pricing

There has been an increase in the price of clearance maturity samples this season. The reason, as noted on the Zespri website, is to cover the development costs of new providers to the industry.

Presumably, that means prices will decrease again once those development costs have been covered. The prices for each region are shown in the above table.

Maturity Clearance System Is Live

The Zespri Maturity Clearance System (MCS) is now live. Growers can log into the system using their Zespri Canopy login.

Access is either through the Canopy or via the site directly at <https://msc.zespri.com>. If accessing directly, you will need to login using your Canopy username and password. If accessing through the Canopy, you will already be logged in.

Let's Talk About Worms

Nicola Roderick – Grower Liaison / Organic Manager

The earthworm lovingly tends to your soil – reducing the impacts of compaction, recycling nutrients, mixing organic matter into the soil profile, and leaving behind a trail of tasty vermacast.

With a renewed emphasis on soil health, how can we look beyond the earthworm and the huge role it plays in this area? These top workers are renowned for conditioning soil. In fact, a soil without worms isn't much of a soil at all. It often has a layer of slowly decomposing material at the surface, and a poor structure within. S. Stockdill and D. Cossens showed well-established earthworms, decomposing and incorporating dead material and dung into the soil, can help increase pastoral production by 20-30%.

A key component of a worm's existence is converting minerals to those forms that are more readily available for plant uptake. This ensures more efficient use of environmentally-available and imported mineral inputs on an orchard. Vermacast can typically contain five times more nitrogen, seven times more phosphorous, 10 times more potassium, three times more magnesium and one and a half times more calcium than soil.

High on the list of accolades for the worm is their ability to improve soil structure through creating tunnels and pores which allow nutrients to flow, the soil's water-holding capacity to increase, soil compaction to diminish, and enabling better plant root penetration. In fact, according to soil scientist Dr Charles Merfield, a healthy soil should look like a sponge.

An additional benefit provided by the earthworm is the proven increase in microbial populations, diversity and activity as the worms disperse the population throughout the profile. These soil superstars can also help reduce plant pathogens through digestion of fungal spores.

Nearly 200 species of worm have been identified in New Zealand which have been categorised into three main types by the way they interact within the soil profile. Epigeic worms live in the topsoil and litter layer, feeding on decaying organic matter. These worms need moisture to thrive as they don't live in burrows. Endogeic earthworms move through all layers of the upper soil, consuming soil and creating complex horizontal burrows. Anecic (subsoil) earthworms help greatly with soil mixing as they take organic matter from the surface down into their deep, vertical, burrows below. The most common worm in New Zealand kiwifruit soils is the introduced epigeic grey worm (*Aporrectodea caliginosa*) characterised by its saddle-like segment.



Common earthworm *Allolobophora caliginosa*

A good way to determine what's going on in a soil is to grab a spade and dig. Different areas of your property are likely to yield varying levels of worms. A reliable count should involve 15-10 spade samples, 150-200mm deep. Late winter and early spring should harbour the most reliable results. Around the headlands and natural shelter areas, populations will be stronger due to higher levels of organic matter being returned to the land from shelter trimmings and mown sward. Conversely, if you have a dense orchard canopy and associated die-back of sward, then the levels under the vine may be relatively low. Currently there is no guidance around the ideal number of earthworms in New Zealand soil. However, studies have shown below our pasture there are generally 500-1000 per m². Interestingly that means the weight of earthworms below a pasture is similar to the weight of the cattle supported above ground. However, the numbers in agriculturally-cropped soils are fewer than 20 per m². In organic kiwifruit orchards, an ARGOS (Agriculture Research Group on Sustainability) study found an average density of earthworms over two years of study in Gold, Green and Green organic kiwifruit orchards was about 130 per m².

If you find your orchard lacking worms, the common worm (*Aporrectodea caliginosa*) can be reintroduced under the canopy from around the headlands or other nearby suitable

fertile paddocks. Spade-fills of sod can be placed, one per bay, grass side down. A prior application of 0.25kg lime at each site will help as calcium is important for earthworm establishment. Maintaining an orchard sward and applying compost regularly will also help ensure re-establishment is successful.

Earthworms are great indicator species as they are very sensitive to changes in conditions, signalling to you any potential problems in the soil. During summer you may be disappointed by the lack of numbers, but unless you irrigate, the worms may have gone in search of moisture and coolness. To deal with dryness and heat, the worms have a few survival mechanisms, depending on their species. Some worms will have either burrowed lower into dormancy to wait for the rain or left their eggs behind ready to hatch when conditions suit. Another factor that may concern the mighty worm is their sensitivity to a variety of chemicals, including copper. Excess levels can accumulate in the topsoil layers, as once it is there it doesn't tend to break down. Fortunately, the studies done on kiwifruit orchards to date has the levels, in general, sitting below the eco-toxic level of 100 mgCu/kg. On the occasional orchard that sat above that level the impact on soil microbiology seemed negligible. However, increasing organic matter in the soil to raise carbon and nitrogen levels can help negate the impact of copper in the soil. The report put out by Plus Group - Zespri Project GP1909 in 2019 did mention more work needed to be done in this area to measure how copper levels are tracking and if the figure of 100mgCu/kg needed reviewing. Low pH is also unfavourable to worms but around 5.8-6.5 is ideal.

Let's face it, for their size, work ethic and productivity, earthworms may be the cheapest labour force you will ever find on an orchard. And if you are short of them, there are companies that now supply worms to worm-poor soils.

References:

Preparation for Conversion to Organic Kiwifruit Production from a Soil Fertility Perspective, Actions to Take Before Conversion Begins – Peter Mulligan Horticultural Consultant Ltd.
Accumulation of Copper in Soil – Orchard Soils, Plus Group – Zespri Project GP1909, 2019.
Nutri-Tech Solutions – Microbe Management Course Notes.
<https://canopy.zespri.com/EN/industry/pubs/kiwitech/Documents/OB8.pdf>



Technical Information

Gordon Skipage – Kiwifruit Technical Manager



	Period rainfall for harvest years 2020/21 - 2016/17					
Rainfall period (month)	Rainfall (mm) 2021	Rainfall (mm) 2020	Rainfall (mm) 2019	Rainfall (mm) 2018	Rainfall (mm) 2017	5-year ave rainfall (mm)
1 Nov to 20 Jan	355	257	537	287	252	404
1 Jan to 20 Jan	42	10	17	200	62	66

Figure 1. Comparing period rainfall data (Plant and Food, Te Puke weather station)

Weather Update

NIWA's updated Seasonal Climate Outlook for January to March 2021 (www.niwa.co.nz/Science/Climate/Publications/SeasonalClimateOutlook) continues to predict a continuation of the La Nina weather pattern, bringing higher than normal temperatures and average to above-average levels of rain.

It seems these rain events will come in the form of periodic heavy rainfall events followed by extended dry spells.

Looking at the summer rainfall data to date (1st November - 20th January as shown in Figure 1), this year's rainfall for Te Puke appears higher than what has been experienced in the past five years (with the exception of 2019). Rainfall received since January 1st shows that this year has been wetter through this period when compared to the previous two (drought) years. Remember the 2019 data is skewed by an extremely wet autumn/early summer period.

Despite reasonable summer rainfall, NIWA's soil moisture map indicates that kiwifruit growing regions around the Western BOP are 20-30% drier than normal, while the Eastern BOP show wetter than normal soil conditions.

The Importance Of Being Observant

As a grower, it is easy to become complacent in the orchard – many of the tasks we undertake

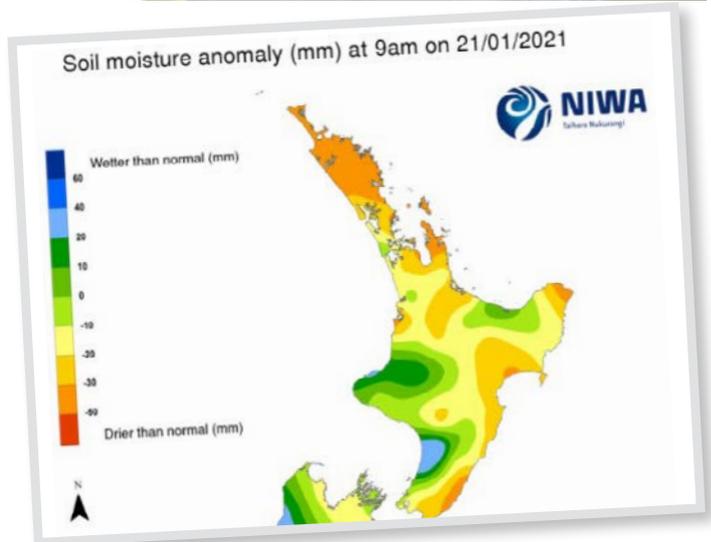


Figure 2. NIWA soil moisture anomaly map (21/01/2021).

are the same tasks performed in previous years and many orchard managers adopt a routine-based approach to management.

In my opinion there is no substitute for spending time in the orchard walking rows, observing vine condition, and looking at the ground. For example, an indication of soil moisture can be determined by digging a hole – it's not as precise as using water probes but it's better than taking a guess on soil moisture.

This month I've been part of a team investigating unusual symptoms identified on Gold3 vines by an astute and inquisitive orchard manager. During winter, the orchard manager observed that some vines had fewer replacement canes, and the scions above the graft were lumpy and sometimes spongy with splits in the leader. Some vines also had rots associated with the graft union area of the trunk, but the area around the trunk base did not show any symptoms.

As unhealthy vines are not unusual in kiwifruit orchards (often kiwifruit vines can survive surprisingly well despite such infections), the orchard manager "cleaned-up" the affected vines by removing any dead/dying wood and continued with his winter work.

As spring and summer progressed, it became clear to him that all was not well with these vines. They identified additional vines in the orchard (over 10% of the total area) that showed similar symptoms. By January it was clear that current and future production will be impacted.



Figure 3. Unusual lumpy nodes above the graft. Figure 4. Rot observed on trunk below the graft.

While the affected vines are currently holding good numbers, there is very limited replacement cane growing for next year. As a result, it is likely that the 2022 harvest will be impacted, and until quality replacement cane can be regenerated, crops past 2022 are also likely to be affected.

A call to KVH initiated a visit from Linda Peacock (KVH Industry Liaison & Technical Specialist) who spent time evaluating the symptoms and assessing the impact of the diseased vines. Linda is an expert in “unusual symptoms” and some of the symptoms observed are unlike other symptoms she has seen. Constantly swapping between her “grower hat” and “biosecurity hat”, Linda worked with the grower to understand the issue with an aim to answer two fundamental questions:

1. What is the cause of the issue?
2. How to manage the issue?

Trying to answer question one, plant tissue samples were taken from the vines (and sent to an MPI laboratory for analysis) to determine what organisms were present. An invasive process, this will hopefully help determine what the infection is, where it started and if it is moving within the vine.

Answering question one will help answer question two, determining a course of action on how to manage the issue. At the time of writing this article, we don't have the lab results back but hopefully it's a simple fix using a combination of cultural, chemical and/or biological tools – but consideration is also given to the possibility of production losses. If survival of the vine is not guaranteed, or production of the vine is permanently impacted, it may be prudent to re-graft or replant now to ensure long-term productivity across the block is maintained.

The purpose of this article is not to highlight the fact the plant is sick, rather it is a story of observation and action to limit the impact on production and profit. Unhealthy vines cannot be identified if you do not make the effort to spend time in the orchard walking the rows and observing what is going on around you. Even then, it takes courage and effort to act when you observe something different. Experts like Linda are only a phone call away and are happy to help.

We often refer to kiwifruit as “weeds” that are “hard to kill” – and as such often expect them to deliver record crops despite a high stress environment (due to pest, disease, drought, girdles, nutritional deficits etc). As observed in this instance, production is already being affected, with the medium/long-term prognosis not yet known. Caring for your vines will not only ensure the health and production of the orchard, but also ensure the financial viability of your investment.

Start today by taking a walk and quietly observing what you see.

Lifting Those Low Hanging Fruit

Now is the time to start checking fruit heights in the orchard, tying up any fruit hanging less than 1.5 metres from the ground. Fruit hanging lower than this can make contact with sprayers, tractors, bins etc around harvest time which results in flesh damage.

Fresh damage (occurring just prior to harvest) is difficult to grade out at packing and often turns into a rot once packed, resulting in increased fruit loss during the storage season.

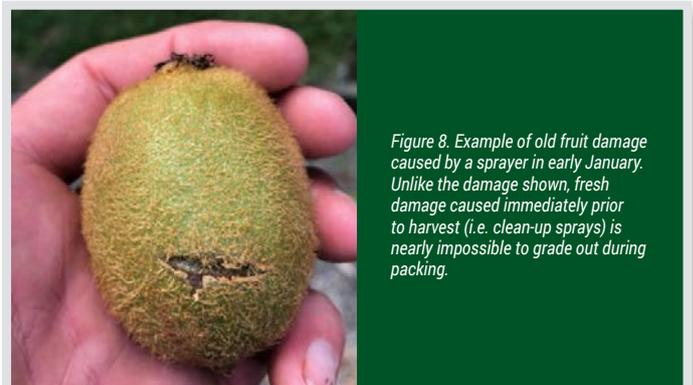


Figure 8. Example of old fruit damage caused by a sprayer in early January. Unlike the damage shown, fresh damage caused immediately prior to harvest (i.e. clean-up sprays) is nearly impossible to grade out during packing.

Crop Protection

We have now entered Zespri's formal monitoring period for leafroller and scale meaning that any sprays for these pests require formal monitoring results entered into the Zespri Spray Diary.

Applications of any foliar sprays (i.e. copper, oil, foliar fertilisers) should be carefully considered due to the chances of staining fruit and must be applied in good drying conditions.

Managing Scale On Gold3

Zespri advocates a 1% “summer mineral oil” application to Gold3 if scale levels exceed the KiwiGreen threshold of 4%.

Trial work completed by Plant and Food over the past three

years supports the application of 1% mineral oil on Gold3 in the second or third week of February to manage scale populations in the Bay of Plenty (Using summer oils safely – Cathy McKenna et al - Kiwifruit Journal Dec 2019/Jan 2020). The trial data suggests that if mineral oil is applied correctly within this window, the risk of skin damage, premature fruit drop and/or spongy fruit is minimal - but it is important that the spray window, product rate and ideal spray conditions (i.e. good drying conditions) are adhered to.

Further trials reported at Zespri 2020 Pest Day (Scale control in summer – Cathy McKenna et al) confirmed the results from the earlier trials and highlighted a further benefit. Scale crawlers (not killed by the oil application) tended not to settle on the fruit once it had been sprayed, further reducing the numbers of scale found on fruit at packing.

In my opinion, spraying oil on Gold3 in February is NOT WITHOUT RISK. I recommend that if you choose to spray oil, you should be well-informed of the benefits and potential risks. Review the articles listed above, along with Zespri's "Need to Know" document entitled "Spraying Oil on Gold3 in Summer", and watch Zespri OPC's webinar entitled "Monitoring & responding to scale in summer" available on the Zespri Canopy (Cathy's presentation starts at the 20 minute mark) – both are available on the Zespri Canopy.

Passionvine Hopper (PVH)

Adult PVH are now amongst the vines and if left unchecked, may result in sooty mould on your fruit. At this time of the year, there are two basic approaches to managing sooty mould issues:

1. Target the pest (PVH)

- Pyrethrum based sprays
 - o Pyganic, ZETaPY and Pylon are the only PVH spray options supported with a label claim that Zespri allows at this time of year – applications should be made to affected areas at dusk or dawn, spraying the inner rows first and working outwards towards the shelter belt (this technique pushes PVH out towards the shelter).
 - o Using an adjuvant such as Wetcit (conventional growers) or OroBoost (organic growers) may improve efficacy.
 - o Follow label rates – refer to the Trevelyan's Summer 2020/2021 Spray Guide for more information or talk with your merchant.
- KiwiGuard
 - o The manufacturers of KiwiGuard claim it contains a "bitting agent" – basically the insect doesn't like the taste and moves on. While I've not seen any data to suggest it works (it does not have a label claim), some growers tell me they see a noticeable difference in PVH and cicada levels in the orchard after it is used.
 - o KiwiGuard contains boron that could result in phytotoxicity if boron levels are already elevated in the vine – refer to your leaf tests (if you have them) to determine if this could be an issue for you.

- o KiwiGuard is listed in Zespri's Allowed Other Compound (AOC) list and may be used through until 35 days before harvest.

2. Target sooty mould

- PVH excrete a sugary substance known as honeydew that acts as a food source for sooty mould.
- TripleX is the only product on the market with an ACVM label claim for sooty mould prevention - feedback is that it can be effective if 2-3 sprays are applied as part of a programme (i.e. it's not a "one-off" spray).
- It works by aggressively colonising the foliage, flowers and fruit with the *Bacillus amyloliquefaciens* Bs1b microbe which competes with sooty mould for honeydew as a food source.
- Spray at 2-3 week intervals onto the fruit and foliage from early January to late March – if you haven't already started it's too late!
- For maximum effect TripleX must be applied with a superspreader such as HyWett or DuWett.
- Follow label rates – refer to the Trevelyan's Summer 2020/2021 Spray Guide for more information or talk with your merchant.

Thrips

Generally regarded as a market access pest for Gold3 and Hayward, thrips have the potential to be a significant production pest in red varieties. Recent work completed by Cathy McKenna (Plant and Food Research) confirms that cryptomeria shelter is a key source of thrips with dispersal from the shelter into the orchard occurring from January through until April, with thrip numbers in orchard peaking in April.

If cryptomeria shelter is trimmed this summer, it has been shown that the thrip population increases significantly in the outside rows as they look for a new home. If shelter belt trimming is scheduled, applying a pyrethrum spray (i.e. ZETaPY/Pylon/Pyganic) to the outside rows 24-48 hours after trimming has proven to be extremely effective at managing this population.

Wheat Bug

Wheat bug is occasionally found on packed kiwifruit and while it does not cause any damage, it is a significant quarantine pest for some markets such as the USA and China.

Typically 3-4mm in length, wheat bug is found in the weeds growing in or around your loadout pad and move into bins during the harvest process. To best manage this pest, spray your loadout pads with herbicide now (or remove weeds by hand), therefore eliminating their host plants but allowing them time to move away from the load pad. Spraying weeds with herbicide close to harvest forces the bug into fruit bins (and onto fruit) as they seek a new habitat.

Colin's Chatter

Colin Olesen – TGL Chair



Onward and Upward

Wow, I know Trevelyan's had a good 2020 storage year but I am still eating sound green kiwifruit picked off our orchard last year and stored ever since in the drinks' fridge in our garage. It must have been a vintage year or at least the remaining kiwifruit are vintage!

This eating delight was tempered during the holidays as we watched on two occasions, just 50 minutes apart, as hail descended from the sky onto our Te Puke orchard. While the back lawn was white, the hail was small and round enough to bounce off the vine leaves and fall to the ground without any damage. Knowing the hail that had occurred in Motueka a week or two earlier was a sad and sorry sight, we breathed a sigh of relief when our hail was short in length of time and size. It confirms the prudence that your TGL directors showed in deciding to take up that extra hail insurance cover on top of the Zespri cover that is in place. This base cover has been claim-maximised already for this year.

Your directors gave notice a couple of years back that the pool split for Gold would ultimately move to 50/50. This decision was deferred while storage of the Gold variety was enhanced to a level that ensured the risks were minimised. That point has now been reached, in your directors' opinion, so for both Gold conventional and Gold organic the 2021 pool splits have moved from 40% direct and 60% pooled to 50/50 which is the same as the Hayward Green conventional and organic pool splits. Such a move enhances the rewards to those growers whose fruit stores well. At TGL we have a strong focus for both reward and penalties falling where they are due as we believe that encourages good orchard practice and improvements.

Kaspar Beech completed his term as an Associate Director in December 2020. Thank you Kaspar for your contribution to the TGL director discussions. We trust you have gained a good knowledge of how our part of the industry operates.

We had excellent applicants for the Associate Director position for the 2021 calendar year, such that it was agreed to appoint two. They are Joga Singh and Heather Hawkey. We look forward to Joga and Heather's participation at our director meetings.

Colin Olesen - Chair

Upcoming Events

The next round of Zespri Grower Roadshows will be held around the country at the start of March.

WAIKATO

Monday 1st March, 9am – 11am
Mighty River Domain, Karapiro Room,
601 Maungatautari Road, Cambridge

HAWKE'S BAY

Wednesday 3rd March, 9am – 11am
The Crown Hotel, Cnr Bridge Street and
Hardinge Road, Ahuriri, Napier

GISBORNE

Wednesday 3rd March, 4pm – 6pm
Bushmere Arms Hotel
673 Matawai Road, Waerengahika

OPOTIKI

Thursday 4th March, 10am – 12pm
Opotiki Golf Club
14 Fromow Road, Opotiki

EDGE CUMBE

Thursday 4th March, 2pm – 4pm
Matata Rugby Club
12 Division Street, Matata

TE PUKE

Friday 5th March, 10am – 12pm
The Orchard Church
20 MacLoughlin Drive, Te Puke

KATIKATI

Friday 5th March, 2pm – 4pm
Katikati Rugby Club, Moore Park,
Fairview Road, Katikati

TAURANGA

Monday 8th March, 6pm – 8pm
Zespri Office, 400 Maunganui Road,
Mount Maunganui

DISCLAIMER: The information contained in this document is given in good faith, but because in providing this report it has been necessary, in some circumstances, to rely on the information provided by others and a number of future factors, this may influence the result. Accordingly, Trevelyan's Pack and Cool Ltd and their employees do not accept any liability should any grower or other party incur any loss having relied on information given in this document.

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