



WORLDWIDE  *fruit*

Environmental Sustainability Case Study

T&G Global - New Zealand



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Contents

1.	Context	2
2.	Summary	2
3.	About T&G Global	3
4.	Sustainability Strategy	4
4.1.	Sustainability-Linked Loan	5
4.2.	Strong Sustainability Ratings	5
5.	On-Farm Sustainability Initiatives	5
5.1.	Regenerative Horticulture	6
5.2.	Water	6
5.3.	Use of Agrochemicals	7
5.4.	Riparian Planting & Protecting Biodiversity	8
5.5.	2D Growing	8
6.	Sustainability in Post-Harvest Operations	9
7.	Climate Change Risk Adaptation and Mitigation	10
7.1.	Understanding Climate Risks and Opportunities	10
7.2.	Transitioning to a Low Carbon Future	11
7.3.	Adapting to a Changing Environment	14
8.	Minimizing Waste	14
9.	Conclusion	15



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1. Context

Worldwide Fruit Limited (WFL) is investing in environmental sustainability across its supply base. As part of their commitment, they are presenting a series of case studies from supplying farms. These case studies aim to raise awareness of the challenges that WFL's growers deal with on a daily basis, the solutions implemented to overcome these challenges, and the ongoing good management practices growers have implemented, as well as plans for improving sustainability into the future.

This case study presents T&G Global, which is based out of New Zealand. T&G owns 50% of WFL, providing them with rights to a number of pip fruit varieties, including Envy™ and JAZZ™. T&G is listed on the New Zealand Stock Exchange and its majority shareholder is BayWa Global Produce.



2. Summary

T&G Global is a New Zealand-based company that grows, markets, sells, trades and distributes fresh produce worldwide. It is well-known for its premium, high-quality apple brands, Envy™ and JAZZ™. T&G has the Māori value of guardianship and protection, Kaitiakitanga, deeply embedded within its frameworks. Therefore, this value is reflected in both their orchard and post-harvest operations. In the orchards, water use is monitored through telemetry and only irrigated when soil moisture levels drop below ideal growing parameters. T&G is actively involved in several industry-leading projects intending to improve knowledge and opportunities surrounding sustainability. For example, a regenerative horticulture partnership is seeing it research, develop and trial regenerative seed mix in orchards; A Lighter Touch explores the use of beneficial insects in T&G's tomato glasshouses; Smart & Sustainable strives to minimize the use of agrochemicals. T&G's new world-class packhouse has been designed not only to pack twice the volume of apples compared to their older facilities, but also to use water and electricity more efficiently. Significant efforts have been made toward transitioning to a low carbon footprint by committing to setting Science-Based Targets, installing thermal screens in glasshouses and partnering with New Zealand's first large-scale waste-to-bioenergy facility. The latter further eliminates potential waste from its Reporoa site going to landfills. T&G were also the first horticulture business in New Zealand to secure a sustainability-linked loan, demonstrating their commitment to embracing sustainable practices and meeting global consumer needs.

3. About T&G Global

T&G Global has grown over its 126-year history from a domestic New Zealand auction house for fresh produce to a global business, nourishing people in more than 60 countries. Today, the business employs over 1,600 people, rising to 3,000 people at the peak of the season. T&G has three core businesses:

T&G Fresh – is the Australasian business of T&G Global and has its own tomato, citrus and berry growing operations. In addition, it partners with over 600 independent growers to sell their fresh produce through its network of 11 regional market trading floors, directly to customers and to regional export markets. To augment local supply, T&G Fresh also imports fresh produce which cannot be grown locally, and to cover seasonal gaps in local production.



T&G Fresh in Auckland, New Zealand.



Apples – over many decades, T&G has built a global reputation for producing high-quality premium apples for global customers and consumers. Its two leading IP brands, Envy™ and JAZZ™, are grown under license across the world's prime apple-growing regions. In New Zealand, T&G has extensive owned growing operations and in addition, partners with a network of 104 independent growers in Hawke's Bay, Tairāwhiti Gisborne, Nelson and Otago, who grow a range of varieties, including Envy™, JAZZ™, Royal Gala, Pacific Queen™ and Pacific Rose™.



VentureFruit® – With over a century of knowledge, T&G launched its VentureFruit® business in 2021 to provide independent variety management services to plant breeders and owners, growers and sales and marketing companies. VentureFruit®'s expertise and success in cultivar development and commercialisation services have been honed over the last 25 years and is demonstrated through strong consumer-orientated brands, including the JAZZ™, Envy™, Pacific Rose™ and Pacific Queen™ apple brands.





Kaitiakitanga reflects the Māori world view that people, the land and nature are intrinsically connected.

4. Sustainability Strategy

T&G's business strategy is focused on three strategic growth pillars: Grow great brands; Win in key global markets; and Lead New Zealand's fresh produce future. With the health of the land and the environment critical to its success, T&G has embraced **Kaitiakitanga** – a Māori value which means guardianship and protection. This is central to who T&G is and what it does – treating the land, people, produce, resources and communities with the greatest of respect and care, as guardians of their future.

T&G's Kaitiakitanga framework has three pillars: people, place and produce (see illustration below). It includes T&G's aspirations and targets, and how it contributes to 9 of 17 United Nations Sustainable Development Goals (as seen on the right).



Our Kaitiakitanga framework

 Our people	 Our place	 Our produce
<p>We're growing a safe, healthy and passionate team, where everyone is empowered to be their best and thrive.</p> <p>Aspirations</p> <ul style="list-style-type: none"> • Protect and grow • Fairness in our workplace 	<p>As kaitiaki, we're creating a healthier planet by protecting and nurturing our natural environment and using resources responsibly.</p> <p>Aspirations</p> <ul style="list-style-type: none"> • Climate action • Closing the loop • Lower impact, smarter growing 	<p>Our safe and sustainable produce value chain provides nutrition to our customers and consumers, and enhances livelihoods.</p> <p>Aspirations</p> <ul style="list-style-type: none"> • Safe food • Responsible partnerships • Healthy communities


4.1. Sustainability-Linked Loan

In June 2022, T&G was the first horticulture business in New Zealand to have secured a sustainability-linked loan. The three-year loan commits T&G to a science-based greenhouse gas emissions reduction target that aligns with limiting the global average temperature increase to 1.5°C above pre-industrial levels.

4.2. Strong Sustainability Ratings

T&G's sustainability performance and activities have contributed to the strong results BayWa AG received in 2022 in multiple ESG corporate ratings. These have included:

- MSCI ESG Ratings AA (2021: AA)
- ISS ESG Corporate Rating (Institutional Shareholder Services) Prime C+ (2021: C)
- CDP (climate) (Carbon Disclosure Project) B (2021: B)



T&G's Sustainability-Linked Loan and its ambitious targets demonstrates their commitment to embracing sustainable practices and meeting global consumer needs.

Photo by IRTA

5. On-Farm Sustainability Initiatives

As part of its Kaitiakitanga sustainability strategy, T&G pursues opportunities to lower its environmental footprint, improve its growing performance, and contribute to positive biodiversity impacts on the farm. Here are some highlights from several key focus areas.

5.1. Regenerative Horticulture

T&G is participating in a four-stage regenerative horticulture project with Zespri and Plant & Food Research. The project is being partially funded by the New Zealand Government's Ministry for Primary Industries (MPI). The goal of the project is to better understand regenerative farming practices and opportunities to uptake more sustainable agriculture methods.

In 2023, T&G planted a regenerative seed mix as part of this project, aiming to benefit soil quality, retain soil carbon and reduce mowing (as well as related emissions). Wood chips have also been sourced as a soil additive to mitigate soil compaction, increase aeration and improve the organic content of the soil.



T&G has planted a regenerative seed mix in their orchards as part of a regenerative horticulture project.

5.2. Water



Orchards are irrigated with close-to-the-soil, efficient sprinklers.

The irrigation water for its New Zealand apple orchards comes from bore sources, with full resource consent provided via the Regional Council. Telemetry units are mounted to the wellhead and report to the Council how much water is being used against T&G's allocations. T&G monitors local growing conditions via Fruition Horticulture and only irrigates when target soil moisture levels drop below ideal growing parameters.

Efficient sprinklers that are close to the soil surface are used to deliver a measured amount of water appropriate for each soil type's absorption rate. Beyond promoting careful water management, this approach also ensures all farm nutrients are retained in the soil and not leached into neighbouring waterways.

With many of T&G's apple orchards having hail netting, the Company has anecdotally been using it to help reduce evaporative transpiration and the amount of water needed in the soil. Over the coming years, T&G will conduct further field validation to understand any expanded benefits of hail netting.

In terms of wider research and development in water management, T&G uses a network of Crompton sensors to monitor its apple trees and provide robust insights. Attached to the plant's trunks, the sensors enable a better understanding of stem water potential and linkages of water with fruit development and quality management.

5.3. Use of Agrochemicals

Conscious of biodiversity and in line with government regulations, T&G takes a targeted approach to on-farm chemicals to optimise any usage and is actively involved in exploring and piloting sustainable pest management practices.

T&G participates in the joint New Zealand Government and industry programme, A Lighter Touch, which explores biological control agents and biopesticides and how these can be sustainably integrated into crop production. T&G is piloting the use of beneficial insects as a form of crop protection in its tomato glasshouses and comparing the results achieved with market-accepted chemical controls.

Together with MPI and New Zealand Apples and Pears Inc, T&G is also involved in another programme, Smart & Sustainable. This programme strives to maintain the industry's unique global position and number one world ranking, by developing new solutions to managing pests and diseases without chemistry. The programme will adapt the industry to be able to meet changing agrochemical regulatory requirements, meeting both maximum residue level and high phytosanitary requirements simultaneously.

T&G also participates in the Apple Futures II programme, which support the development of new tools to control pests and diseases in apple and pear orchards across the country, along with the creation of new systems to remove insects during postharvest.

Collaboration in these programmes complements T&G's work with on-farm integrated pest management (IPM). In terms of its IPM work, T&G works with Fruition Horticulture to firstly trap and monitor for the likes of codling moth and leaf roller, and then only periodically spray when pests are found on apple orchard blocks throughout the season. Pheromone loops are also used on about 60% of apple production areas to further disrupt insect lifecycles and reduce spraying needs in high-pressure areas.

In terms of diseases, such as black spot and fire blight, T&G, together with New Zealand Apples & Pears Inc., monitors growing conditions across New Zealand to anticipate windows where the weather may increase the likelihood of disease spread, such as during rainy periods. Sprays are targeted and applied to apple orchard blocks with timings suitable to cover potential disease outbreak periods and delivered just in time to achieve maximum benefit with optimum application.

To ensure pests and diseases are managed without widespread impact, T&G does not use any broad-spectrum, untargeted chemicals in its operations.

5.4. Riparian Planting and Protecting Biodiversity

To promote biodiversity, T&G has pursued riparian planting on several of its apple orchards intending to improve native vegetation and species along waterways. Looking forward, this will be especially important as part of the recovery from Cyclone Gabrielle, to ensure riverbanks and other areas damaged by storms are repaired where possible.



T&G promotes biodiversity by planting native vegetation along riparian zones.

5.5. 2D Growing

Since 2018, T&G has progressively been replacing old orchards with innovative future-proofed 2D structure plantings – and all future developments will adopt this structure. In this growing system, which is best suited to apple varieties which produce fruit on spurs right along the length of the branch, branches are trained away from the trunk along the structure framework, allowing more light for ripening, easier maintenance and harvesting, and higher yields.



2D growing allows for semi-automated picking machines to easily move in orchards and provides a safer working environment for T&G's orchard teams.

T&G's preferred 2D structures allow for technologies such as the 12 semi-automated picking platforms it currently has in use, as well as specialised innovative equipment like its leaf defoliators. In addition, it supports new and/or in-development technologies, including unmanned automated sprayers, mowers, tractors and robotic harvesters. The technology in use today also provides a safer, more productive working environment for T&G's orchard teams.

T&G owns and leases 650 hectares of orchards in New Zealand (in addition to its independent growers' orchards). To date, it has converted 249 hectares into 2D structures.



T&G's new world-class packhouse has been designed with demanding sustainability standards to help conserve and protect New Zealand's natural resources.

6. Sustainability in Post-Harvest Operations

T&G's apples are packed through a network of owned and third-party post-harvest facilities. T&G owns its Hawke's Bay facilities, leases its Nelson facility, and works with independent operators across Tairāwhiti Gisborne, Hawke's Bay, Nelson and Central Otago. T&G also provides guidelines for third-party post-harvest facilities outlining key performance and sustainability criteria that need to be met.

In 2023, T&G commissioned one of the largest apple packhouses in the southern hemisphere following three years of research, planning and trials. Based in Whakatu, in Hawke's Bay, costing close to \$100 million, the facility is world-class in terms of its automation technology, enabling the site to increase volumes, lift productivity and ensure its fruit arrives in global markets in excellent condition.

The first phase of the commissioning has seen the installation of the first of two 100-metre packing lines. The second 100-metre line will be installed in the coming seasons as apple volumes increase. Once both phases are complete, the facility will be able to pack more than 125 million kilograms of apples per season (more than 300,000 bins of apples) - twice the volume of apples T&G packed in its former packhouses.

The new world-class Whakatu packhouse has been designed with demanding sustainability standards to conserve natural resources. The water used to transfer fruit from bins to the packing line (sourced from an on-site, Regional Council consented bore) is split into three water bodies. As fruit moves through the process, each body of water has a different level of cleanliness during production. T&G has the ability each week to cycle the water from one area to the next, thereby prolonging its use. As the water begins

to gradually accumulate debris, T&G releases a portion of it for treatment before subsequent discharge into the wastewater system. Effectively, T&G is getting a longer life from the water it uses each week by recycling a portion of it.

The Whakatu packhouse also has 1,200,000 litre water tanks, enabling it to absorb large downpours and thereby remove this volume of water from flowing immediately into the public stormwater system. This allows T&G to meter the water out, reducing the impact on the stormwater system and the local rivers, and enabling it to be used for watering onsite trees and firefighting (should the need arise). In addition, the packhouse's filtration system allows for reduced water use from its own bore, with final discharges being drinking quality standards.



LEFT: Interior of packhouse showing one of the 100 metre packing lines. RIGHT: Soft fruit robotic apple packers sort and place apples into trays in the same direction and uniform position.

7. Climate Change Risk Adaptation & Mitigation

Adverse weather events, including the Nelson hailstorm in late 2020, heavy rain in Hawke's Bay in 2022 and Cyclone Gabrielle in mid-February 2023, reinforce the importance of the work T&G continues to do to better understand and adapt to the risks and opportunities which climate change presents.

7.1. Understanding Climate Risks and Opportunities

In 2022, T&G undertook an assessment to establish a complete list of climate-related risks and opportunities. This identified the top five physical and transitional risks (as noted in Table 1), and associated risk rating which classified them on a scale from no impact through to low, medium and high.

Table 1: The top 5 physical and transitional climate-related risks and associated risk ratings for New Zealand.

Top 5 physical risks			
	Headline risk statement	Hazard	2022 risk rating (observed data)
1	Increased crop damage from extreme acute weather events	Acute weather events	High
2	Inability for existing practices to maintain the required crop yields and quality	Chronic warming	High
3	Reduced resilience of T&G's growing strategies	Chronic & acute weather events	High
4	Increased water stress and lack of water security for operations	Water stress, water security	High
5	Growing regions become increasingly unsuitable due to sea level rise	Sea level rise, salt intrusion, inundation	No impact
Top 5 transitional risks			
	Headline risk statement	Hazard	2022 risk rating (observed data)
1	Increased cost of carbon for T&G and independent growers	Cost of carbon	High
2	Increased financial viability strain on operations and assets/investments	Cost of transition	Medium
3	An increase in the administrative responsibilities of T&G and associated costs of compliance	Policy and regulation	Medium
4	Loss of competitive advantage	Technology	Low
5	Increase in carbon taxes and/or reduced capacity of the current methods of transport	Less efficient transport options	No impact

In 2023, T&G built further on this work with a deeper assessment of climate-related risks and opportunities and undertook analysis across different degrees of warming and future time horizons of 10 years, 20 years and 50 years. These risks are now woven into the company's risk register.

7.2. Transitioning to a Low Carbon Future

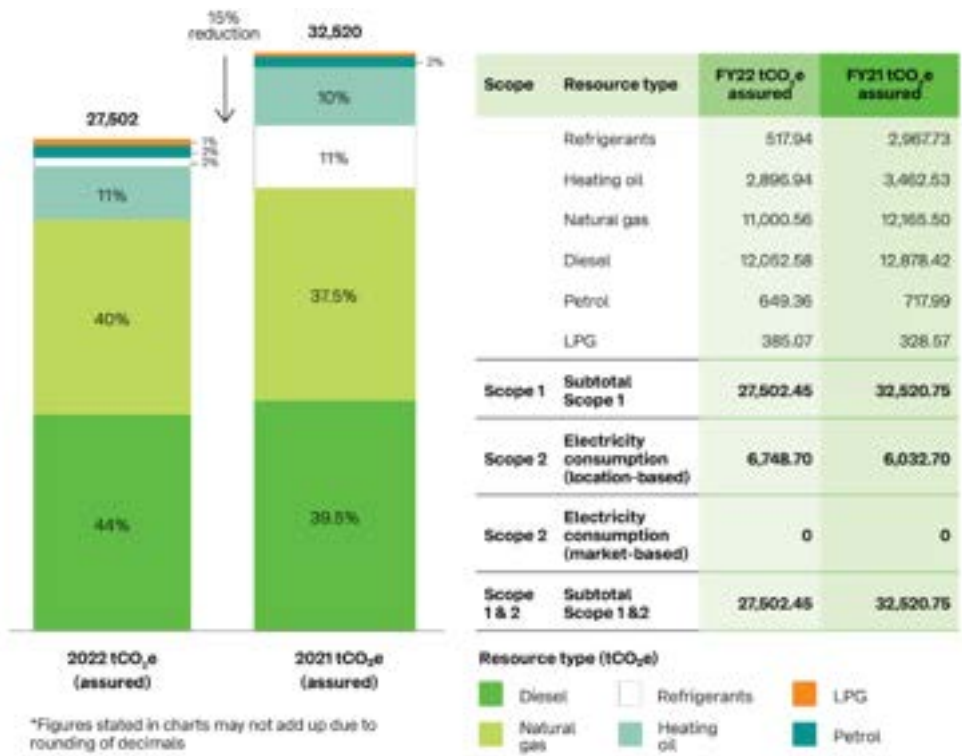
In line with the climate strategy of T&G's parent company, BayWa AG, its current target is to reduce scope 1 and 2 GHG emissions by 22% by 2025, against a 2017* baseline. And then longer term, achieve carbon neutral operations by 2030.

T&G have also committed to setting Science-Based Targets (SBTs) from a 2021 baseline. This will provide a clear path to reduce GHG emissions in line with the Paris Agreement to limit warming to 1.5°C.

*T&G Global is updating its GHG baseline to be 2021 figures, however, T&G's targets which are set in-line with their ultimate parent company, BayWa AG, still reference the original 2017 base year.

In terms of T&G's scope 1 emissions, the Company achieved a 15% reduction in 2022, bringing it to 27,502 tCO₂e/year. This was achieved in part through a combination of reduced refrigerant consumption, reduced natural gas usage following the closure of a glasshouse, and reduced heating oil requirements in one of its glasshouses given a warmer winter in 2022.

In terms of its scope 2 emissions, while 80-85% of New Zealand's grid is generated from renewable energy sources, T&G has purchased 100% renewables via renewable energy credits (RECs) (from Meridian Energy in New Zealand and through BayWa AG using a broker agency) since 2021. This purchase eliminates emissions in scope 2 under the market-based approach.



T&G's progress in transitioning to a lower carbon footprint from 2021.

In terms of its scope 3 emissions, T&G will begin to engage with its suppliers from 2024 onwards.

From a wider energy efficiency perspective, T&G's new Hawke's Bay packhouse installed extensive sensors which ensure the equipment only runs when required, thereby reducing electricity usage. For example, rollers on T&G's previous packing lines ran continually whereas in its new facility, they sense when there is an issue or no cartons on the packing line, and the line automatically stops until it needs to become operational again.

T&G is actively working to reduce the carbon footprint of its glasshouse operations.

Adjacent to its Reporoa tomato glasshouse, and built on T&G land, is New Zealand's first large-scale food waste-to-bioenergy facility (which is owned and managed by Ecogas). The facility is capable of turning 75,000 tonnes of inedible food waste, which is being collected throughout the North Island of New Zealand, into renewable energy, biofertilizer and renewable carbon dioxide. The facility uses anaerobic digestion and once fully in production, is expected to produce hot water and carbon dioxide which T&G intends to use in its Reporoa glasshouse – thereby providing an important step in decarbonising T&G's glasshouse heating sources.



Source: <https://www.ecogas.co.nz/reporoa>



New Zealand's first large-scale food-waste bioenergy facility.

T&G is also currently installing thermal screens to improve the energy performance of its Geraghty glasshouse in Tūākau, New Zealand. With 2022 carbon emissions over 5,000 tCO₂e/year, the thermal screens are expected to reduce carbon emissions by 29% from the site. This equates to a 6% reduction in T&G's 2022 carbon footprint of 27,502 tCO₂e. Once operational, T&G will explore the potential of further screen installations.



Thermal screens are being installed at the Geraghty glasshouse in Tūākau, New Zealand to improve its energy performance.

7.4. Adapting to a Changing Environment

Connecting with its other climate efforts around mitigation, carbon reductions and risk management, T&G is adapting to its changing environment. As part of this, its VentureFruit® business is moving at pace to commercialise new apple and pear varieties for increasingly hot and warming climates. The Hot Climate Partnership is an international breeding programme focused on the long-term sustainability of apple and pear production given changes caused by global warming and the continued and growing demand for high-quality, healthy food choices. VentureFruit® joined as the strategic commercialisation partner in February 2019.



In 2023, VentureFruit® celebrated the successful launch of the world's first hot climate apple variety Tutti™ at Fruit Logistica in Berlin. Innovative varieties like these have been well received by growers and enable food producers to continue to grow high-quality apples and pears in changing climatic conditions and regions.

Adaptation pathway

In 2024, T&G will develop adaptation plans to further shape its resilience to climate change. Already within its growing operations, some preliminary adaptation measures have been undertaken to minimise sunburn and hail (such as netting), and frost (such as fans), which will be built on in future years. Once completed, growing-related aspects of T&G's adaptation work will be shared with its independent growers to support their learning and adaptation with their own businesses.

8. Minimizing Waste

Waste minimisation, and especially waste diversion of edible produce, is a significant area of focus for T&G. In partnering with the New Zealand Food Network (NZFN), T&G has diverted approximately 924 tonnes of edible produce in 2023 to families in need across the country. The Company has sent a further 7,900 tonnes of off-spec fruit for juicing, further eliminating potential waste to landfill. Finally, sliced fruit from T&G's quality and assurance testing processes, which cannot be juiced, is sent to feed livestock.

Beyond edible produce diversion, there are many other waste initiatives underway at T&G's apple packhouse. Cardboard is now baled on-site and sold for making fibre trays. All label-backing paper is rewound and collected to go back to a recycling station. Plastics are separated and sent to relevant channels for recycling. Additionally, T&G's team is working on options for green waste and for smaller items, such as hair nets and gloves.

9. Conclusion

T&G Global's Kaitiakitanga strategy is visible across all aspect of their operations. It is reflected in their prioritisation of regenerative horticultural practices, efficient water management and integrated pest management to support biodiversity within their orchards. They have designed and built post-harvest facilities that help to conserve and protect New Zealand's natural resources, even though it can handle increased volumes of produce. Edible surplus food is diverted to New Zealanders in-need, and tomato vines will be turned into renewable energy, biofertilizer and renewable carbon dioxide. A sustainability-linked loan was secured, and the Company has undertaken detailed climate-related risks and opportunities assessments, is actively reducing its GHG emissions and setting robust targets. T&G has already made significant progress in reaching set targets and aims to further shape their adaptation plans to climate change.



Resources:

All photos, unless otherwise indicated, were acquired from T&G Global, or sourced from T&G news articles at www.tandg.global/news/