SKILLS

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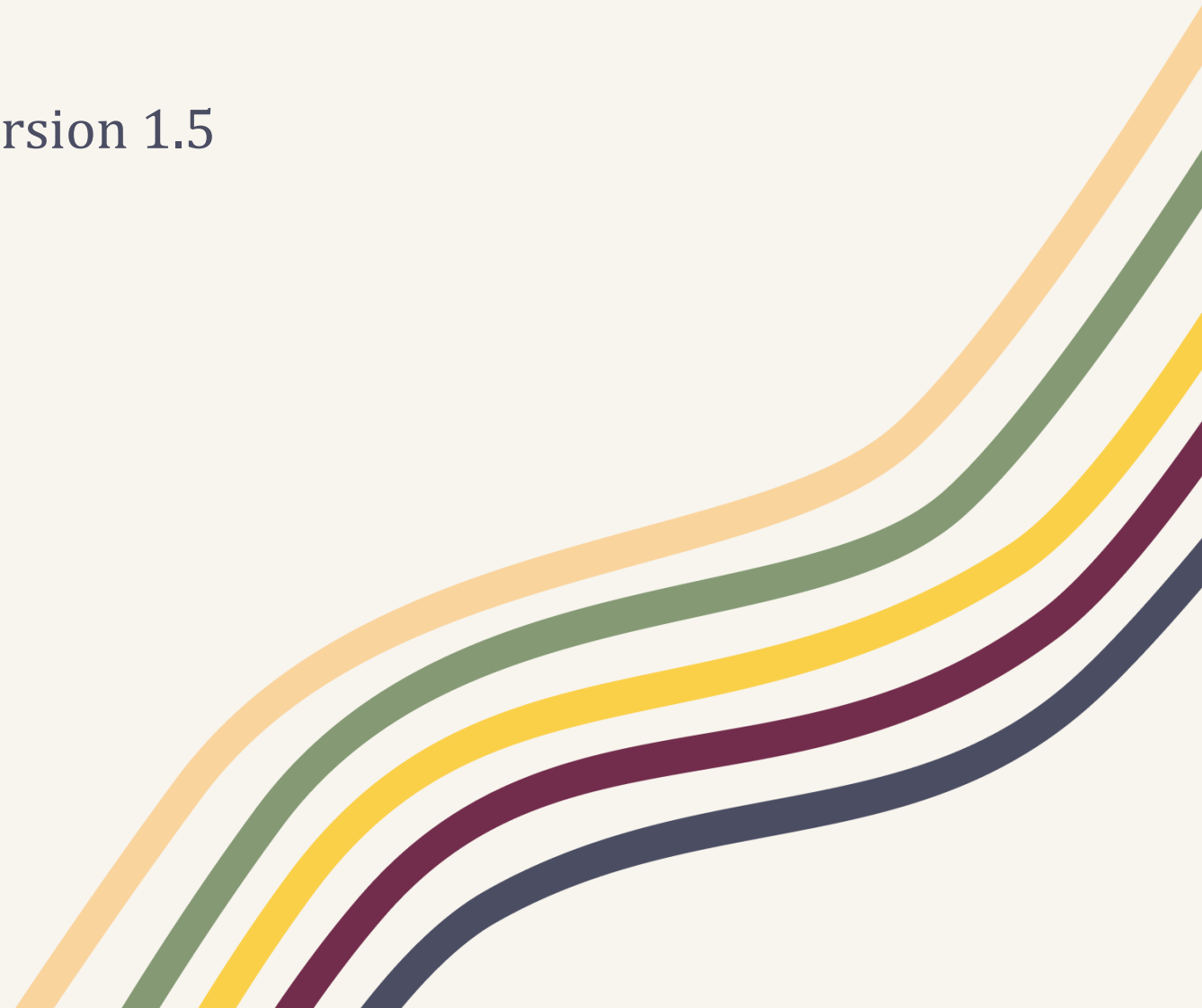
POST HARVEST ANALYSIS

Version 1.5



POST HARVEST ANALYSIS

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EXECUTIVE SUMMARY

The largest areas of horticultural production in New Zealand include:

- Kiwifruit: Bay of Plenty (11,290 hectares)
- Apples: Tasman-Nelson (2,210 hectares)
- Avocados: Northland (2,170 hectares) and Bay of Plenty (2,120 hectares)
- Summerfruit: Otago (1,442 hectares)

MPI forecasts record harvests for kiwifruit, with a 38% increase in green and a 24% increase in gold varieties, totalling approximately 180 million trays. This growth underscores the need for skilled supervisors in post-harvest operations, particularly as kiwifruit represents over 54% of New Zealand's fresh produce export revenue. Trevelyan's has expressed significant interest in post-harvest qualifications, identifying 15-20 potential participants annually.

Avocado exports have faced challenges due to adverse weather and market competition. Enhancing post-harvest processes is critical to improving export quality and operational efficiency. Substantial investments in avocado production in Northland, including the conversion of dairy farms and irrigation expansion, further highlight the need for skilled post-harvest professionals.

Apples contribute 19% of New Zealand's fresh produce export revenue, with Nelson as the second-largest production region. The sector requires skilled professionals to maintain its competitive edge in international markets.

The horticulture sector faces seasonal spikes in workforce demand, requiring thousands of additional employees for specific tasks. Job vacancy reviews indicate that most roles in the post-harvest sector do not require formal qualifications, offering low barriers to entry. Employees often gain experience on the job, with opportunities for career progression and greater responsibilities based on demonstrated potential and familiarity with business operations.

While qualifications are not mandatory, employers highly value them for career advancement and skill development. A senior staff member at Trevelyan's, emphasised the importance of higher-level qualifications in enhancing post-harvest operations. Similarly, a stakeholder from New Zealand Apples and Pears Inc., noted that understanding the broader supply chain improves employee performance, confidence, and adaptability.

The Primary Sector Workforce Dataset and Forecasting Working Group highlight that qualifications at levels 4 to 6 are becoming increasingly critical for roles involving management practices, sustainable land and water management, regulatory compliance, and workforce development. The industry faces retention challenges due to competition from other sectors, such as construction. Investing in employee professional development is a key strategy to mitigate these challenges.

Key skills identified for managerial and supervisory post-harvest roles include:

- Building effective teams
- Accountability
- Positive attitude
- Building trust
- Effective communication

A comprehensive understanding of the supply chain and modern technological advancements is essential, as post-harvest operations increasingly rely on advanced systems in packhouses. Stakeholders emphasized the growing importance of logistics, supply chain management, and export market expertise.

The EIT post-harvest programme is versatile and can be adapted to various food and fibre sectors, including kiwifruit, avocados, and other crops. Broad course aims and learning outcomes ensure applicability across diverse post-harvest roles. Stakeholders suggested enhancing the programme with:

- A buddy system pairing current and past learners
- Flexible scheduling aligned with crop post-harvest calendars
- Elective study options and expanded topics, such as transport and logistics, biosecurity, market access, technological innovations, and strategic development

Stakeholders favour a blended learning approach, combining online modules with in-person components. Practical learners benefit from tactile experiences, such as field trips, mentorship programs, and hands-on activities. Trevelyan's support online learning supplemented by block courses during off-peak seasons. Fully online programs without face-to-face interaction are considered unsuitable.

The horticulture sector's growth and evolving demands highlight the critical need for skilled and qualified post-harvest professionals. Tailored educational programmes, combined with strategic workforce development initiatives, will strengthen industry resilience, enhance employee retention, and ensure long-term sustainability.

PROJECT BRIEF

Project aim

The objective of this research is to outline the opportunities, and regional and crop requirements, for training within the New Zealand post-harvest space.

Scope

This report focuses on the post-harvest strand of the New Zealand Diploma in Horticulture Production (Level 5) with strands in Fruit Production, Indoor Crop Production, Nursery Production, Outdoor Crop Production, Post-Harvest, and Wine Growing.

Methodology

Between September and December 2024, desk-based research and stakeholder interviews were conducted to:

- Analyse the New Zealand post-harvest workforce labour market.
- Identify post-harvest skills gaps and training needs.
- Assess regional and crop-specific interest in the New Zealand Diploma (post-harvest strand) programme.
- Explore suitable programme delivery methods.
- Evaluate programme demand in horticultural sectors beyond apples.
- Review the content of the EIT programme and its suitability for application to the wider Food and Fibre sector.

Introduction

EIT, as the current sole programme provider of the post-harvest strand, is keen to ascertain if the programme could be transitioned to be offered online, potentially with block courses, to regions outside of Hawke's Bay and to a wider variety of crops.

Food and Fibre Centre of Vocational Excellence identified the need to support the sector's wider professional development through a project to ascertain workforce demand and workforce size in terms of post-harvest occupations and skillsets, including leadership and management.

NEW ZEALAND HORTICULTURE INDUSTRY

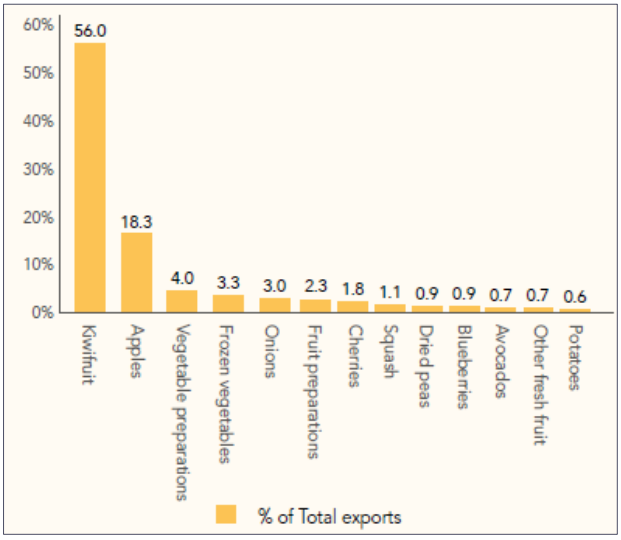
Exports

The Ministry for Primary Industries Situation and Outlook for Primary Industries report (MPI, 2024) states "Horticulture export revenue is expected to increase 1 percent to $7.1 billion in the year to 30 June 2024. Climatic conditions were favourable for most crops recovering from the impacts of the previous wet summers and cyclone damage. Kiwifruit, apples, cherries, and vegetables all saw production increases. This was countered by weak demand for wine due to high global inventories and a poor season for avocados. Harvests have been assisted by a good supply of seasonal labour with both Recognised Seasonal Employer scheme workers and backpackers available."

United Fresh (2024) reports that in 2023 kiwifruit made up just over 54% of New Zealand's fresh produce export revenue, followed by apples (19%) and fresh and produced vegetables (15%). MPI (2024) reports apples and pears and kiwifruit product revenue is set to grow in 2023/24.

As shown by Figure 1 below (United Fresh, 2024) kiwifruit is substantial as a percentage of exports when compared to avocados (0.7%) and cherries (1.8%).

Figure 1: Fruit and vegetable exports (1 July 2023 – 30 June 2024)



Source: United Fresh (2014)

Kiwifruit export revenue is forecast to increase 28 percent in the 2024/25 season (year to 31 March) to $3.3 billion following declines of 3 percent and 4 percent in the previous two seasons (MPI, 2024).

The Ministry of Foreign Affairs and Trade (MFAT) estimates that the NZ-EU Free Trade Agreement (FTA), which came into effect on May 1, 2024, will save the fresh produce export sector over $46 million annually. Of this, approximately $37 million will benefit the kiwifruit industry due to the elimination of the 8.8% tariff previously applied to kiwifruit exports (United Fresh, 2024).

The FTA with the UK and the EU provide new opportunities for diversification due to better market access. The EU is New Zealand's largest market for green kiwifruit and the second-largest market for gold kiwifruit, which should be improved by the NZ-EU FTA.

The NZ-UK FTA is also a win for New Zealand wine. The UK is New Zealand's second–largest export destination for wine, with exports valued at NZ$461 million in 2023. Wine exports have benefited from immediate tariff elimination and enhanced competitiveness of New Zealand wine in the UK market.

The Ministry of Primary Industries (MPI) is forecasting growth in New Zealand wine export revenue for the year to 30 June 2025, due to strong consumer demand (MPI, 2024).

Avocado export revenue was down 52 percent when compared with the previous season, falling to $37 million in the year to 31 March 2024 (MPI, 2024). This is the lowest export revenue the industry has generated in over a decade. The industry was still recovering from the lasting repercussions of the previous two seasons La Niña weather, which caused issues for both fruit quality and quantity.

This was exacerbated by reduced export demand from Australia, collapsing the value of the New Zealand avocados in the Australian market. Australia's domestic production volumes nearly trebled from the previous season. Australia is the main export destination for New Zealand avocados accounting for 59% of total volume exported.

MPI (2024) forecasted expected improvements in both weather and global market conditions should drive a more profitable season for avocado growers and exporters this season. New Zealand produces less than 2% of global production so in most markets is a very minor player.

Annual export volumes of apples are expected to increase gradually. Export revenue for apples is forecast to top $1 billion for the 2025 crop, subject to average to good climatic conditions in the main growing regions (MPI, 2024).

Exports for cherries are projected to increase by 3% to reach 3,930 tonnes by June 30, 2025 (MPI, 2024).

MPI (2024) provides actual horticulture export revenue for 2020 - 2023 and forecasted export revenue through 2028. Kiwifruit is forecasted to be 4,160 million in 2028 (2023 actual 2,544 million); wine is forecasted to be 2,720 million in 2028 (2023 actual 2,392 million); apples and pears are forecasted to be 1,280 million in 2028 (2023 actual 892 million); and 'other horticulture'[1] is forecasted to be 630 million in 2028 (2023 actual 501 million).

The largest percentage growth in export dollars from those categories is kiwifruit (63.52%), followed by pears and apples (43.50%). Figure 2 MPI (2024) provides revenue details.

[1] Other fresh fruits (including avocados, cherries, blueberries), frozen and processed fruits, fruit juices, nuts and ornamentals.

Figure 2: Horticulture export revenue 2020 – 2028 (year to 30 June) NZ$ million

	Actual				Forecast				
Product	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Kiwifruit	2,546	2,684	2,898	2,544	2,860	3,360	3,610	3,900	4,160
Wine	1,906	1,855	1,935	2,392	2,090	2,350	2,500	2,620	2,720
Apples and pears	883	823	865	892	970	1,040	1,100	1,170	1,280
Fresh* and processed** vegetables	701	629	622	737	730	770	860	900	910
Other horticulture***	505	588	494	501	470	510	570	590	630
Total export revenue	**6,541**	**6,579**	**6,815**	**7,066**	**7,110**	**8,020**	**8,630**	**9,180**	**9,700**
Year-on-year % change	**7%**	**1%**	**4%**	**4%**	**1%**	**13%**	**8%**	**6%**	**6%**

Source: MPI (2024)

Size of the market

GoHort (2021) reports that 60,000 people are employed in the New Zealand horticulture industry.

New Zealand has eight main horticulture regions. The unique regional weather conditions result in different crops growing better in some regions than others.

- Bay of Plenty, predominantly kiwifruit with 90% of the New Zealand export crop grown. Avocados and a wide range of citrus.
- Hawke's Bay, nectarines, peaches, plums, cherries, berries, onion, squash, apples, kiwifruit and grapes.
- Nelson is New Zealand's second-largest apple production region (PickNZ, n.d.-b). Grapes, kiwifruit, berry fruit, and vegetable production.
- Northland region, kiwifruit, citrus, avocados, wine grapes, and blueberries.
- Central Otago region, cherries, apricots, peaches, plums, and nectarines. Apples and grapes are also present.
- Gisborne region, citrus, corn, squash, grapes, tomatoes, apples, kiwifruit and persimmon. Horticulture is the largest and fastest-growing industry in Gisborne (PickNZ, n.d.-a).
- Marlborough region, grapes.
- Auckland and Waikato have a diverse range of horticulture and viticulture production, crops like asparagus, strawberries, kiwifruit, nashi pear, grapes and blueberries.

Table 1, adapted from 'Distribution of Fruit by Regional Councils' data on page 46 of the Fresh Facts 2024 report (United Fresh, 2024) shows the distribution of land planted for fruit production in the main horticulture regions of New Zealand, based on Statistics NZ 2022 data. Note, data on 'olives', 'other subtropical' and 'other fruits' categories present in the Fresh Facts 2024 report has been removed during the adaption for this report.

Table 1: Hectare area planted (2022)

	APPLES	KIWIFRUIT	SUMMERFRUIT	AVOCADOS	CITRUS	BERRYFRUIT
REGIONAL COUNCIL						
Northland	10	470	13	**2,170**	279	65
Auckland	S	730	18+S	600	72	137
Waikato	60	680	30	120	11	**399**
Bay of Plenty	120	**11,290**	11+S[2]	**2,120**	38	76
Gisborne	620	570	19	70	**1,119**	12
Hawke's Bay	**5,860**	130	467	40	24	115
Tasman-Nelson	**2,210**	440	43	10	8	224-S
Marlborough	20	S	35	0	0	3
Otago	380	S	**1,442**	S	1	30

The largest areas of land planted for specific fruit production are distributed as follows: Kiwifruit in the Bay of Plenty region, apples in Hawke's Bay and Tasman-Nelson, avocados in Northland and the Bay of Plenty, and summerfruit in the Otago region.

Northland has seen substantial investment in planting avocado trees over the last 5 – 10 years as dairy farms are converted, and irrigation projects open more land for orchard plantings. The significant growth in plantings was further enabled by the approval of the 2021 application by Far North landowners to extract water from the region's Aupouri aquifer.

Marlborough produces 70% of New Zealand wine production and is continuing to expand. Hawke's Bay is the second largest, at 12%. Table 2 shows the remainder of the wine production distribution by regional area (NZIER and Ministry for Primary Industries, 2022).

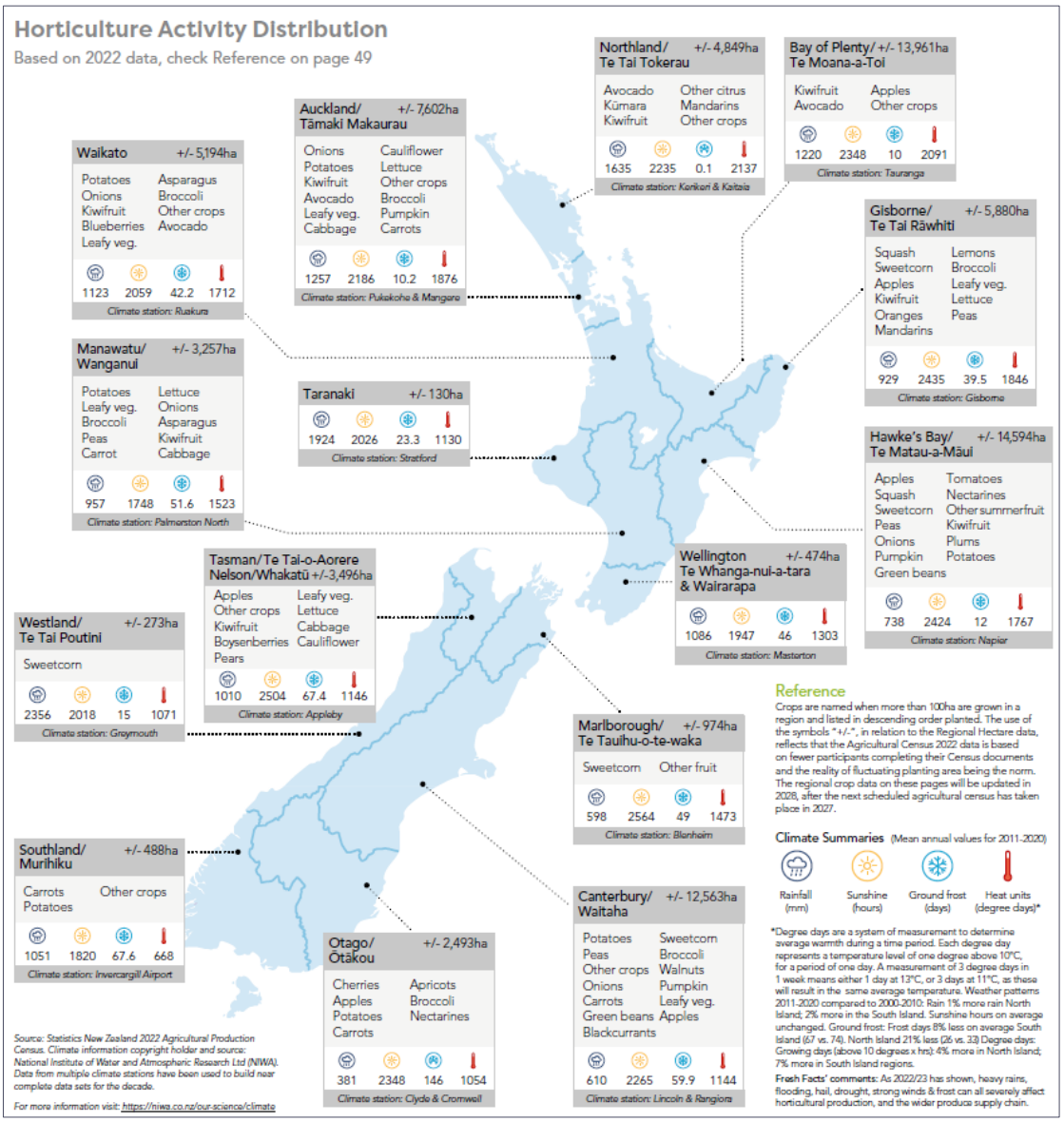
Table 2: Regional production of wine (hectares)

REGION	PERCENTAGE (%)
Northland	0.2%
Auckland	1%
Waikato/Bay of Plenty	0.05%
Gisborne	3%
Hawke's Bay	12%
Wairarapa	3%
Marlborough	70%
Nelson	3%
Canterbury	4%
Otago	5%

[2] S indicates that Statistics NZ have suppressed data.

A senior representative from Hawke's Bay Fruitgrowers Association (HBFA), reported that industry in the Hawke's Bay is facing significant cost pressures, and many growers are "just breaking even".

United Fresh (2024) produced the infographic below in their Fresh Facts 2024 (page 49). It provides a detailed overview of the distribution of horticulture activity across New Zealand based on 2022 data.



Source: United Fresh (2024)

Main horticulture products

Kiwifruit

MPI (2024) reports the forecast for this season is a 38 percent increase in green and 24 percent increase in gold harvests. These figures would place kiwifruit production at a record of around 180 million trays.

Record crop volumes are expected to test the industry's capacity for picking and handling fruit. However, growers are optimistic that supply chain issues encountered during the 2022/23 season have been resolved.

Apples and Pears

MPI (2024) reports "the regional distribution of apple and pear orchards is: Hawke's Bay (64%), Tasman (23%), Otago (4%), Gisborne (4%), and dispersed across the rest of New Zealand (4%). The Canterbury region will increase in importance as climate change consequences become a reality".

The recovery of orchards affected by Cyclone Gabrielle in the Hawke's Bay and Gisborne Tairāwhiti regions has exceeded expectations. Growers have adapted effectively to challenges, ensuring better-than-anticipated outcomes.

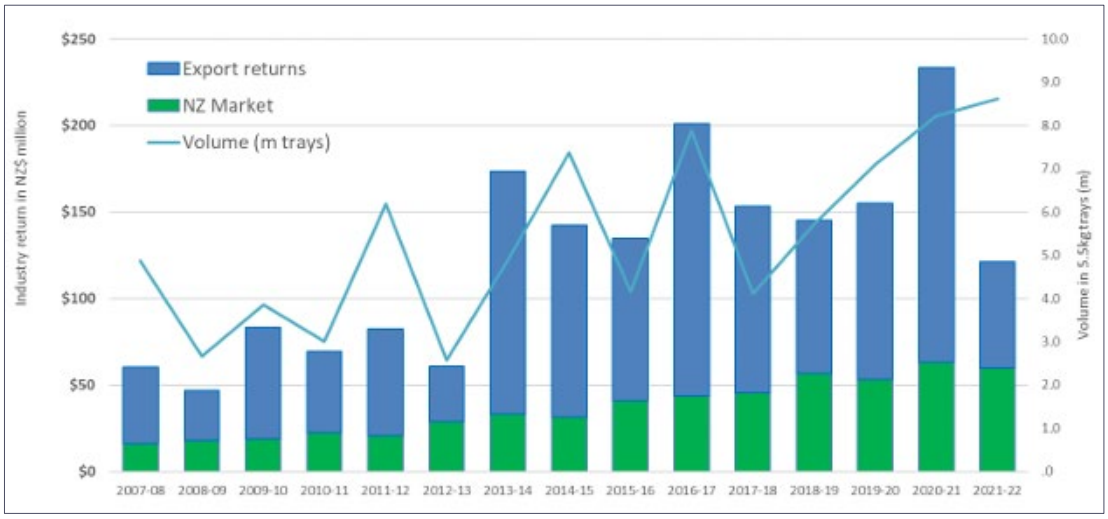
To address rising production and post-harvest costs alongside static market returns, growers have streamlined plantings. Those with sufficient capital are replanting and investing in new, robot-compatible plantings of intellectual property (IP)-protected varieties, aiming to enhance efficiency and future profitability.

Avocados

The avocado industry expanded to become an important sector in Northland and remains a significant sector in the Bay of Plenty. It has more than 4,400 producing hectares with new investment into larger, more intensively planted orchards, mostly conversions from dairy farms. There is diversity across the 1,600 growers, from very large to very small orchards (New Zealand Horticulture Export Authority, n.d.).

Figure 3 from the New Zealand Avocado (n.d.) report shows the industry value from the 2007-08 season through to the 2021-22 season. The value peaked in 2020-21, the value of export of avocados from New Zealand was NZ$170m. The total value of the industry including the domestic market was NZ$234m. The 2021-22 season was impacted by Covid19, avocado export value fell 63 percent to $62 million.

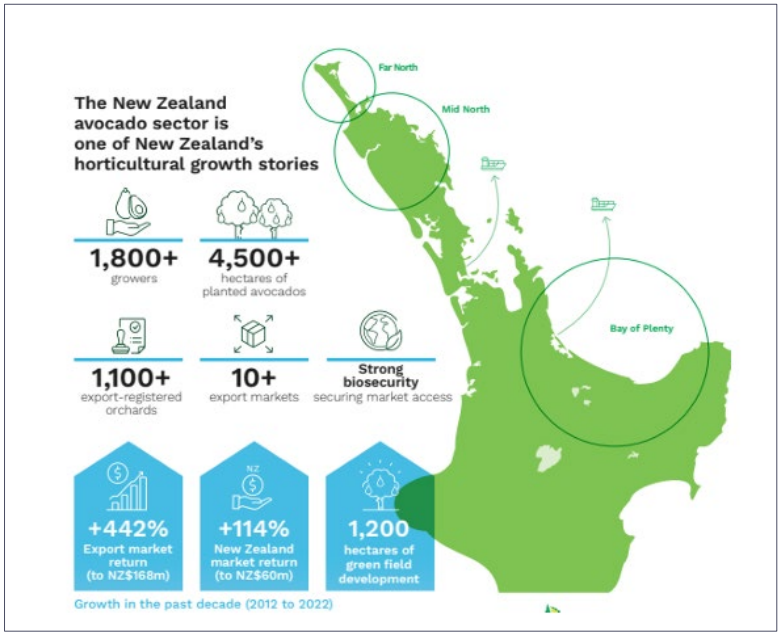
Figure 3: Value and volume of the New Zealand Avocado sector from 2007 to 2022



Source: New Zealand Avocado (n.d.)

MPI (2024) expects the recent favourable pollination period to help return crop quality and quantity to normal levels, and subsequently stronger orchard gate returns for growers. Freight costs and shipping times beginning to return to preCOVID-19 levels. The avocado industry is forecast to bounce back from several challenging seasons.

Figure 4: New Zealand Avocado Sector



Source: New Zealand Avocado (n.d.).

Wine (Grapes)

The Ministry for Primary Industries (MPI, 2024) reports that demand for Sauvignon Blanc, which accounts for nearly 90% of New Zealand's wine export volume, is expected to remain robust. This growth aligns with a continued global shift in consumer preferences from red wine to white wine.

The recently implemented NZ-EU FTA is projected to provide significant benefits to the wine industry, including an estimated $5.5 million in annual tariff savings. These cost reductions will enhance competitiveness in the European market.

Cherries

MPI (2024) reports that the outlook for New Zealand's cherry industry is positive. New large-scale corporate orchards are starting to yield, and the sector is adopting new technologies to enhance productivity.

THE WORKFORCE

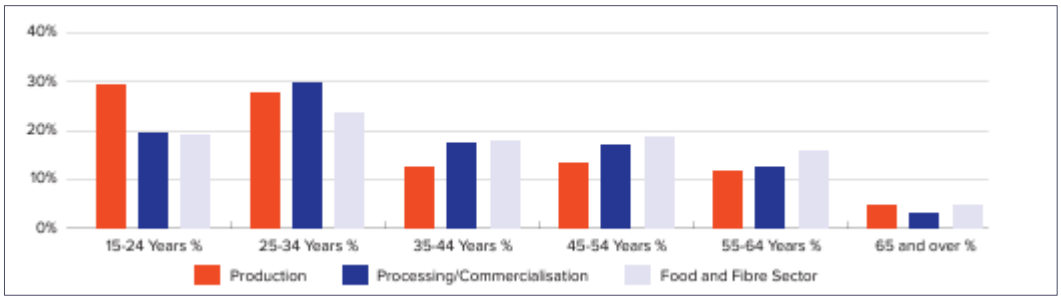
The horticulture sector experiences brief periods of high demand for seasonal workers, during which thousands of additional employees are needed to perform specific tasks.

There are many job roles within the horticulture sector with low barriers to entry where people can start working while they gain experience and qualifications. Employers will promote past season employees into roles of greater responsibility as those employees have shown potential and have knowledge of how a particular part of the business operates. DMS Progrowers (2024) provide an example of this.

> Aaron has grown up within the local agricultural and horticultural industries working his way through most areas of the orchard and pack house. Aaron has gained an extensive understanding of the industry from the growing, harvesting, packing, and cool chain, right through to loadout and into the marketplace. Aaron was successfully appointed Site Manager of our Te Puna Packhouse in early 2017 and most recently in 2020 moved into a Post Harvest Operations Manager role (DMS Progrowers, 2024).

Figure 5 shows the age profile of the horticulture workforce for production, processing/commercialisation and the food and fibre sector. The post-harvest workforce is part of the processing/commercialisation category, the most common age profile, 30%, is between 25 – 34 years. Fifty per cent of the horticulture processing/commercialisation workforce was under the age of 35 at the time of the report (Primary Sector Workforce Dataset and Forecasting Working Group, n.d.).

Figure 5: Age profiles of the horticulture workforce



Source: Primary Sector Workforce Dataset and Forecasting Working Group (n.d.)

Primary Sector Workforce Dataset and Forecasting Working Group (n.d.) report that "Qualifications at levels 4 to 6 are increasingly seen as important for roles supporting good management practices associated with increasing productivity, improving sustainable land and water management, and managing people, along with supporting people that have responsibility for compliance with regulations." In 2019, the horticulture sector reported 24 percent of processing/commercialisation workers held qualifications at levels 7 to 10.

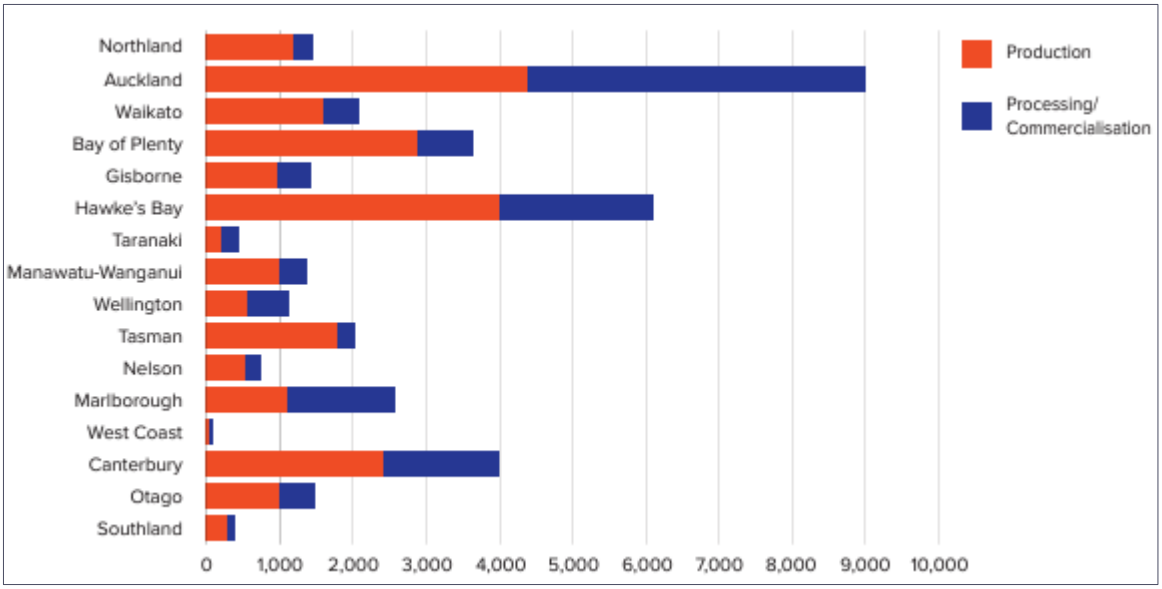
HBFA report the industry is experiencing difficulty with worker retention due to competition from other sectors like construction. Other current workforce issues include:

- Declining engagement from younger workers/school leavers
- Noticeable decline in skill levels among new entrants
- Lower productivity rates among newer workers compared to historical norms.

HBFA has concerns about the workforce demographics and engagement of younger age groups.

The largest workforces for processing/commercialism workers in horticulture are located in the Auckland and Hawke's Bay regions.

Figure 6: Regional distribution of the horticulture workforce (year ending March 2019)



Source: Primary Sector Workforce Dataset and Forecasting Working Group (n.d.)

Labour market

MPI (2024) reports the labour market is showing signs of easing making it easier for employers to fill worker shortages. In the March 2024 quarter, the unemployment rate increased to 4.3 percent, an increase of 0.9 percent over the previous 12 months.

The food and fibre sector employs approximately 360,000 people in a wide range of roles requiring a diverse range of skills (MPI, 2024). The majority, over 90 percent, are New Zealand citizens or residents. The remainder are temporary migrants.

An increase in net migration to New Zealand supports the cooling of the labour market. There was an annual net migration gain of 111,100 in the year to 31 March 2024 (MPI, 2024).

Accredited Employer Work Visa

Changes to the Accredited Employer Work Visa (AEWV), New Zealand's main visa for hiring migrant labour, came into effect on 7th April 2024. MPI (2024) reports these changes could affect the food and fibre sector. The AEWV is designed to attract high-skilled, highly remunerated staff but has been used to hire low-skilled workers as well. It will take time for the impacts of these changes to affect the food and fibre sector.

Kiwifruit

NZIER and Ministry for Primary Industries (2022) provide the following information on the post-harvest workforce estimations. A high proportion of the post-harvest workforce workers are managed part-year and are approximately 88 percent of total roles. The packhouse also has more manager-level roles than semi-autonomous roles, with manager-level roles associated with specialist responsibilities in the packhouse.

Table 3: Kiwifruit core processing/manufacturing role and skill level estimates (packhouse) (2021)

Roles	Managers	Semi-autonomous	Managed
Skill composition	**55%**	**30%**	**15%**
Supervisors	151		
EDI Supervisor/Team Leader	23		
Line Manager	91		
Coolstore Manager	32		
Grower Liaison Manager	31		
Grader Supervisor/Team Leader	31		
EDI Manager	27		
Operations/Site Manager	25		
Quality Manager	24		
Auditor	23		
Production Manager	22		
Grower Support/Harvest Coordination	21		
Inventory Manager	21		
Quality Supervisor	21		
Mechanical Engineer	21		
Lab Manager	16		
Packaging Manager	14		
Supply Manager	13		
Technical Manager	12		
Lab Supervisor	12		
Chief Engineer/Maintenance	12		
Electrical Engineer	10		
Grounds Supervisor	10		
EDI Admin/Data		55	
Assistant Quality Manager		47	
Grower Liaison Rep		46	
EAN Team Member		34	
Maintenance		27	
Quality Controller		100	
Logistics/Shipping/Loadout Team Leader		17	
Forklift Supervisor		17	
Lab Technician		16	
Logistics/Shipping/Loadout Team Member			35
Forklift Operator			105
Cleaner			19
Truck Driver			17
Skill Composition (Part year)			**100%**
Part year (between 11,000 and 13,000)			12,000

Source: NZIER and Ministry for Primary Industries (2022)

Table 4 shows business support roles. NZIER separated the business support from post-harvest operations to illustrate the roles required in aspects of post-harvest operations. The largest group is the semi-autonomous group, which is almost half of all business support functions, these workers are all employed within the packhouse.

Table 4: Kiwifruit business support role and skill level estimates (packhouse) (2021)

Roles	Manager	Semi-autonomous	Managed
Skill composition	**19%**	**47%**	**34%**
Information Technology Manager	13		
HSE/Compliance Manager	10		
HR Manager	10		
RSE Manager	9		
Commercial Manager	9		
Payroll Manager	9		
Communications Manager	9		
Admin/Information Systems Team Member		28	
HR Advisor/HR Coordinator/Recruitment		27	
Information Technology Developer		23	
Financial Controller/Company Accountant		19	
Accounts Administrator		18	
RSE Administration/Pastoral Care		16	
Business Analyst (Grower Payments)		13	
Sustainability Coordinator		13	
Communications Coordinator		13	
Helpdesk			22
Receptionist			13
Admin Support (HR & H&S)			44
Administration			44

Source: NZIER and Ministry for Primary Industries (2022)

Apples and Pears

NZIER and Ministry for Primary Industries (2022) provide the following information on the post-harvest workforce estimations. They state that the New Zealand Apples and Pears calculator and interviews with New Zealand Apples and Pears staff helped to inform the estimations. The full-year workforce is made up of semi-autonomous workers and managers. Part-year, managed roles make up the rest of the workforce and represent approximately 87 percent of the workforce.

Table 5: Apple and pear post-harvest role and skill level estimates

Roles	Managers	Semi-autonomous	Managed
Skill composition	**23%**	**77%**	
Permanent Roles			
General Manager	19		
Inventory Manager	19		
HR Manager	19		
Post-harvest Manager	19		
Finance Manager	19		
IT Manager	19		
Systems Manager	19		
Chief Engineer	19		
Packhouse Manager	19		
Coolstore Manager	19		
Quality Manager	19		
Engineers		19	
Shift Manager		39	
Yard Supervisor		39	
Coolstore Supervisor		39	
Technician		78	
Packaging Supervisor		39	
Packing Supervisor		78	
Export Dispatch		117	
Quality Officer		78	
Lab Technician		78	
Admin		78	
Skill Composition Packhouse			**100%**
Packhouse roles (part year)			
Forklifts (Packhouse)			195
Machine Operators			273
Forklifts (Coolstore)			273
QC's			312
Carton Makers			156
Packers			2,027
Stackers			312
Graders			390
Extra Graders			2,000

Provider: New Zealand Apples and Pears.
Data source New Zealand Apples and Pears calculator

Source: NZIER and Ministry for Primary Industries (2022)

Avocados

NZIER and Ministry for Primary Industries (2022) report that avocado orchards require a stable workforce. Avocados are usually harvested twice a year; fruit does not ripen until picked which allows for greater harvesting flexibility, leaving fruit on trees until the workforce can be scheduled to harvest at each orchard. This flexibility flows through to post-harvest, allowing for more even processing of fruit throughout the season. The domestic market occurs all year round and the export market occurs between the end of July and January. Consequently, workers can be employed for much longer periods.

Table 6: Avocado production role and skill level estimates (2020)

Roles	Managers	Semi-autonomous	Managed
Skill composition	**80%**	**10%**	**10%**
Owner/manager	1,800		
Permanent Workers		219	219
Part year workers			3,000
Packhouse			
Technical Expertise			
Exporting			

Source: NZIER and Ministry for Primary Industries (2022)

Wine (Grapes)

NZIER and Ministry for Primary Industries (2022) report that they understand the approximate total number of workers, but estimating the roles and skill levels accurately is difficult. Table 7 below provides the estimates. Note the data contains both Viticulture and Winemaking, as they are closely linked industries. Viticulture is defined as vineyards that are mainly engaged in growing table or wine grapes.

Table 7: Viticulture and winemaking: role and skill level estimates (2020)

Roles	Managers	Semi-autonomous	Managed
Skill Composition	**18%**	**40%**	**42%**
Permanent roles			
Management (these include)	756		
GM			
Finance			
General Admin (these include)	176	1,232	853
Administration			
Planning			
HR			
Technical			
Marketing/Sales			
Hospitality			
Packaging			
PR			
Production (these include)	328	1,568	2,087
Distribution			
Viticulture/Purchasing			
Logistics/bottling/transport			
Quality control/Lab			
Wine Cellar			
Winemaking			
Part year (managed roles)			
Summer Staff			2,800
Wine production			1,300
Winter pruning & maintenance			4,300

Source: NZIER and Ministry for Primary Industries (2022)

Cherries

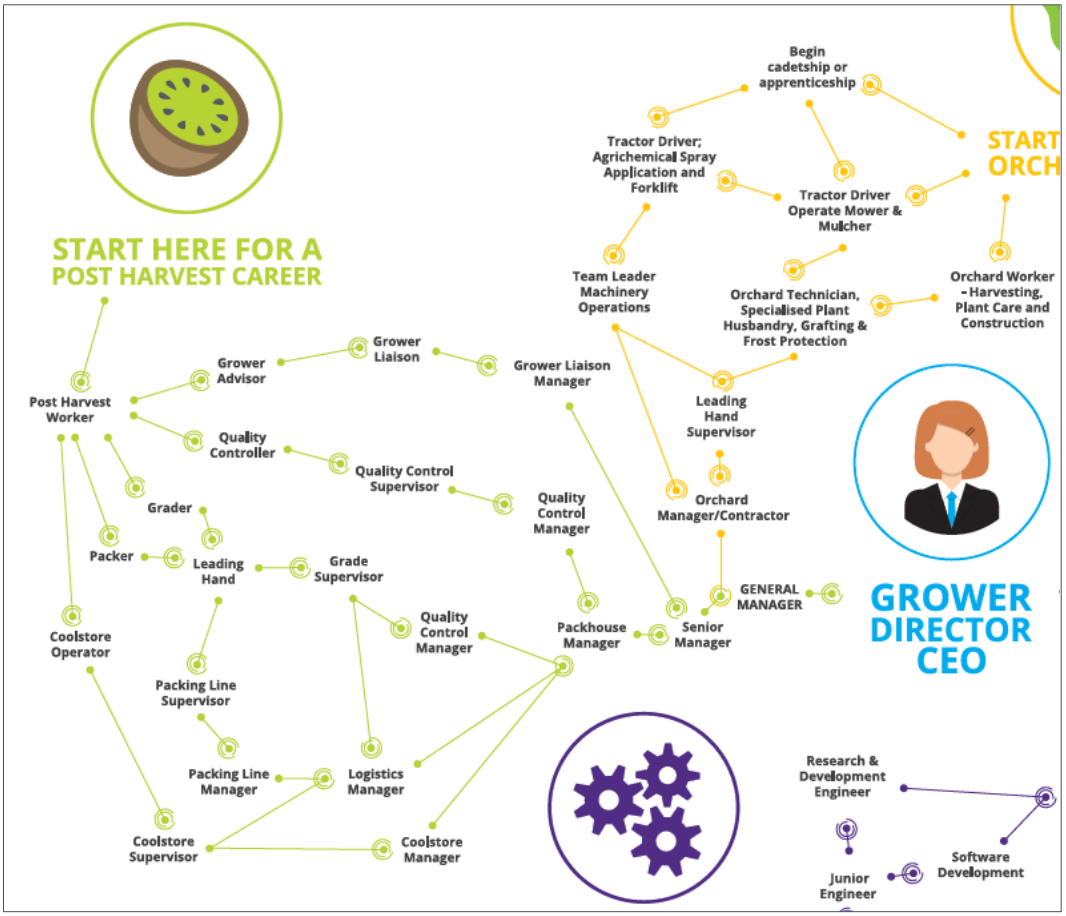
According to MPI (2024), the labour supply during the past season has been highly favourable for the cherry industry, with employers encountering no challenges in recruiting seasonal workers. The return of international working holiday visa holders has been particularly beneficial.

Post-Harvest Labour Market Analysis

Post-harvest handling is a critical time in fresh crop production. Correct handling and storage protect the freshness and quality of the produce. Primary ITO (n.d.) states talented people are needed to operate the over 250 postharvest facilities in New Zealand.

Figure 7 (NZKGI, n.d.) (adapted from original illustration to focus on post-harvest career options) shows the wide range of career opportunities available within the horticulture industry. Progression to jobs of greater responsibility and skill requirements are common in post-harvest. This can be applied to different organisations too.

Figure 7: Horticulture Career Pathways Illustration



Source: NZKGI (n.d.)

The qualification states graduates of the New Zealand Diploma in Horticulture Production (Level 5) with a strand in post-harvest may be employed as a Production Manager; a Cool Store Manager; a Packhouse Technician; and a Logistics Manager.

Job profile – Production Manager

Production managers organise and control the production process in a factory. They ensure that products are made to the right specifications and are ready on time and within budget. Alternative titles include Production Planner, Technical Manager and Quality Manager (Careers.govt.nz, 2024).

Annual salaries for production managers vary depending on skills and experience (Lawson Williams Consulting Group, 2023).

- One to two years of experience usually earn $80,000 to $95,000.
- Three to six years of experience usually earn $90,000 to $120,00.
- Over seven years of experience can earn $115,000 to $150,000.

Skills and knowledge needed in the role:

- Financial and budgeting skills.
- Skill in analysing information and figures.
- Knowledge of employment relations laws.

Personal requirements

- Friendly and patient.
- Organised and good at planning.
- Good at making decisions and solving problems.
- Excellent at communicating.
- Good at leading people.
- Able to work well under pressure, and deal with conflict.

Production managers may progress into general management roles or take up similar positions in other industries. They may also specialise in a role such as:

- Production supervisor, managing teams in factories or manufacturing workplaces.
- Quality manager, ensuring products meet relevant quality standards, setting up quality assessment systems, and improving product quality.
- Technical manager, responsible for checking, maintaining and upgrading technology in production workplaces. Careers.govt.nz (2024) report that to specialise as a technical manager, a tertiary qualification in an area relevant to the industry worked in is preferred.

Job profile – Logistics Manager

GoHort (2021) states supply chain and logistics managers earn between $65,000 – $90,000 per annum.

Supply chain managers direct the design, development and implementation of warehouse distribution. They arrange the smooth movement of goods from the supplier to the customer including storage, distribution and logistics (Opportunity Grows Here, n.d.).

Main employers

The main employers of post-harvest workers in New Zealand's horticulture industry are packhouses and processing facilities. These businesses handle tasks such as sorting, grading, packing, and processing fruit and vegetables after they are harvested. Major companies in this sector often include large-scale operations in regions like the Bay of Plenty for kiwifruit, Hawke's Bay for apples, and other horticulture hubs.

Examples of large-scale post-harvest organizations specializing in Hawke's Bay (apples) include 'Mr Apple' the largest integrated grower, packer, and marketer of apples in New Zealand, managing extensive post-harvest operations in the region, including packing and storage for both its orchards and external growers. Also, T&G Global, which recently launched a state-of-the-art packhouse in Hawke's Bay, is designed to process over 125,000 tonnes of apples annually, doubling its current capacity.

Several large-scale post-harvest organizations specialize in cherries, particularly in the Central Otago region. Key players include 45 South Cherries, a significant exporter and packhouse operation known for high-quality cherry handling and export practices. Also, CentralPac, based in Cromwell, focuses on advanced grading, packing, and exporting cherries, emphasizing precision and quality standards.

Main employers in the post-harvest operations for kiwifruit are concentrated in the Bay of Plenty, the largest kiwifruit-growing area. These include EastPack Limited, Seeka Limited, Apata Group Limited, DMS Progrowers Limited and Trevelyan's Pack and Cool Limited.

Notable organizations supporting avocado post-harvest operations include AVOCO, a major exporter, and regional packhouses in the Bay of Plenty (DMS Progrowers Limited and Trevelyan's) and Northland (King Avocado), which are the primary avocado-producing regions in New Zealand.

Online job vacancy data

Seek

A search of Seek on 14th November 2024 for 'Production Manager'; 'Coolstore Manager'; 'Packhouse Technician'; and 'Logistics Manager' positions within Farming, Animals & Conservation/Horticulture found 31 vacancies.

Table 8 lists vacancies deemed relevant to a post-harvest graduate. NB: Any entry-level harvester and packer, on-orchard and lab testing vacancies have not been included. Only one vacancy, at a higher level than the others, required a horticultural qualification, all other post-harvest roles preferred experience.

Table 8: Seek post-harvest vacancies

JOB TITLE	STATUS	COMPANY	REGION	CROP TYPE	QUALIFICATION
Regional Operations Manager	Full time	Seeka Limited	Kerikeri	Kiwifruit	Horticultural qualification or general degree preferred
Operations/ Packhouse Manager	Full time	Not listed (recruitment agency)	Tauranga	Not listed	
Onion Packhouse Operations Manager	Full time	Apatu Farms	Hawke's Bay	Onion	
Operations Support Lead	Full time	Rockit Global Limited	Hawke's Bay	Apples	
Apple Production Assistant Manager	Full time	Wai-West Horticulture	Tasman	Apples	
Independent Quality Controller – Cherry Packhouse	Full time (seasonal)	Hortinvest Management	Tarras	Cherry	
Horticultural Trainee	Full time	Hortinvest Management	Tarras	Cherry and Apricot	
Operations Manager	Full time	Asplundh	Invercargill	Vegetation management solutions	

Trade Me

A search of Trade Me Jobs on 15th November 2024 for 'Production Manager'; 'Coolstore Manager'; 'Packhouse Technician'; and 'Logistics Manager' positions within Farming, Animals & Conservation/Horticulture found seven vacancies.

Table 9 lists vacancies deemed relevant to a post-harvest graduate.

Table 9: Trade me post-harvest vacancies

	STATUS	COMPANY	REGION	CROP TYPE	QUALIFICATION
JOB TITLE					
Regional Operations Manager	Full time	Seeka Limited	Kerikeri	Kiwifruit	Horticultural qualification or general degree preferred
Packhouse Manager	Full time	Not listed (recruitment agency)	Tauranga	Kiwifruit	
Site Team Leaders	Permanent	Mankirat Enterprises Limited	Bay of Plenty		Level 4 qualification Horticulture
Onion Packhouse Operations Manager	Full time	Apatu Farms	Hawke's Bay	Onion	
Dayshift Production Supervisor	Permanent	Rockit Global Limited	Hawke's Bay	Apples	
Gatehouse Team Leader	Full time permanent	Rockit Global Limited	Hawke's Bay		
Apple Production Assistant Manager	Full time	Wai-West Horticulture	Tasman	Apples	

PickNZ

A search of PickNZ Job Board on 15th November 2024 for post-harvest positions found ten vacancies (see Table 10).

PickNZ is a horticulture industry initiative, spearheaded by Horticulture New Zealand, to promote seasonal work in fruit and vegetable industries. It serves as an information source and free job board for New Zealand's horticulture and wine industries. Any employer in the fruit and vegetable industry can register and use the site.

Table 10: PickNZ post-harvest vacancies

	STATUS	COMPANY	REGION	CROP TYPE	QUALIFICATION
JOB TITLE					
Cherry Grading/Packing	Full time (seasonal)	Central Organics Limited	Central Otago	Stonefruit (including Cherries)	
Packhouse positions	Fixed term and full time	Heartland Fruit	Richmond	Stonefruit (including Cherries)	
Packing Line Supervisor	Full time (seasonal)	Mt Erin	Hawke's Bay	Stonefruit (including Cherries)	
Stacking Area Supervisor	Full time (seasonal)	Mt Erin	Hawke's Bay	Stonefruit (including Cherries)	
Quality Control	Full time (seasonal)	Mt Erin	Hawke's Bay	Stonefruit (including Cherries)	
Cherry Packhouse Staff	Full time (seasonal)	Pure Pac	Cromwell	Cherries	
Quality Controller Position	Fixed term and full time	Wratten Orchards Limited	Lower Moutere	Apples Pears	
Quality Control	Full time (seasonal)	45 South Management Limited	Cromwell	Cherries	
Packhouse Team Leader	Full time (seasonal)	Central Orchard Management Limited	Cromwell	Cherries	
Quality Control	Full time (seasonal)	Central Orchard Management Limited	Cromwell	Cherries	

Seasonal impact on data

Note job data in the three job searches undertaken will be skewed by the fact that research was undertaken in November, not all organisations are advertising for roles for their crops at this time of year. Generally, organisations begin advertising three to six months in advance of the season for supervisory roles.

Key skills needed

Trevelyn's, a large Te Puke kiwifruit and avocado organisation, held internal workshops recently with over 100 leaders. A workshop discussion on the top skills wanted in employees in managerial or supervisory roles concluded the following skills:

- Building effective teams
- Accountability
- Positive attitude
- Building trust
- Effective communication

Of key importance is the individual having a good understanding of the whole supply chain. Workshop attendees placed a strong emphasis on this knowledge. A Trevelyn's stakeholder, commented, "Our departments or divisions are very tunnel vision... it would be really cool if people understand the whole process... and how decisions they make or don't make impact other departments".

HBFA report technology and skills are a growing factor in post-harvest with modern packhouses using advanced technology. For example, equipment which takes '83 pictures' during processing. HBFA feel there is a growing importance for understanding logistics, supply chain management, and export markets.

Training

Qualification

New Zealand Diploma in Horticulture Production (Level 5) with strands in Fruit Production, Indoor Crop Production, Nursery Production, Outdoor Crop Production, Post-Harvest, and Wine Growing (120 credits). The purpose states: "This qualification is intended for people who have significant operational experience in the horticulture industry, or who are capable of transferring their prior skills and knowledge in a specific horticulture production operation. It recognises the skills and knowledge of individuals who can manage horticulture production operations. Graduates will be able to work autonomously and may be managing others. The qualification includes strands that recognise the distinct skills and knowledge for specific horticulture production sectors." (NZQA, 2024).

Graduates in the Post-Harvest strand will be able to:

- Apply knowledge of leadership and relationship management to engage with team members and clients using a range of effective interpersonal skills relevant to a horticulture sector.
- Plan and manage post-harvest operations to achieve production goals.
- Plan and manage post-harvest quality standards to achieve production goals.

Graduates of the Post-Harvest strand may be employed as production managers, coolstore managers, packhouse technicians and logistics managers.

Barriers to study

There are no qualification entry requirements, however training providers may set specific criteria for entry into their programme. For example, EIT learners must hold the following before enrolling.

- A minimum of NCEA L2; or
- Successful completion of a Level 3 certificate or above, preferably in the Primary Industries subject area; or
- For applicants 20 years or older without any of the above academic criteria, evidence of relevant knowledge and experience, and the ability to undertake tertiary study at diploma level is required. In this case, the applicant will be required to participate in an enrolment interview to verify the evidence.

Competitors

A search of NZQF for qualifications containing 'Harvest' under the New Zealand Standard Classification of Education (NZSCED) fields of 'Agriculture, Environmental and Related Studies; Horticulture and Viticulture' found one Level 3, one Level 4, and one Level 5 qualification listed (NZQA, 2024a).

- New Zealand Certificate in Horticulture (Level 3) with strands in Amenity, Arboriculture, Cemetery, Fruit Production, Garden Centre, Indoor Crop Production, Landscape Construction, Nursery Production, Outdoor Crop Production, Post-Harvest, Sports Turf, and Wine Growing.
- New Zealand Certificate in Horticulture Production (Level 4) with strands in Fruit Production, Indoor Crop Production, Nursery Production, Outdoor Crop Production, Post-Harvest, and Wine Growing.
- New Zealand Diploma in Horticulture Production (Level 5) with strands in Fruit Production, Indoor Crop Production, Nursery Production, Outdoor Crop Production, Post-Harvest, and Wine Growing

The New Zealand Diploma in Horticulture Production (Level 5) with a strand in Post-Harvest is the only Level 5 qualification available in New Zealand. EIT is the only tertiary education provider offering the Post-Harvest strand (NZQA, 2024). As such EIT has no direct competitors in programme delivery, market entry would be relatively easy for other providers. EIT delivers their programme part-time over 2 – 4 years, with one intake per annum (July). The programme primarily targets students from the apple industry and local packing operations in Hawke's Bay.

NZQA has given programme approval for other strands of the New Zealand Diploma in Horticulture Production (Level 5). Table 11 lists training providers and their delivery information. No training provider delivers strands in Indoor Crop Production or Outdoor Crop Production.

Table 11: TEOs delivering New Zealand Diploma in Horticulture Production (Level 5) (any strand)

	STRAND	DELIVERY MODE	LOCATION	LENGTH	IN-TAKES
PROVIDER					
Otago Polytechnic	Fruit Production Wine Growing	Online with block courses	Work-based	Part-time 2 – 4 years	Flexible
Franklin Institute of Agri-Technology	Nursery Production	Campus-based (20 hours per week)	Pukekohe	Full time, 1 year	January, April, July, October
NMIT	Wine Growing	One day per fortnight in class plus online tutorials	Marlborough	Part-time 2 years	January, April, July, October
EIT	Post-Harvest	Campus-based	Hawke's Bay	Part-time 2 – 4 years	July

Manukau Institute of Technology (MIT), Primary ITO and Toi Ohomai are listed by NZQA as accredited to deliver the qualification, but it does not appear on their website as a current programme offering. Otago Polytechnic, NMIT, EIT, MIT, Primary ITO and Toi Ohomai all currently operate under Te Pūkenga – New Zealand Institute of Skills and Technology, a national network for New Zealand's 25 polytechnics and industry training organisations. It is currently in the process of disestablishment following the change in direction in the December 2023 Letter of Expectations from the Tertiary Education and Skills Minister.

Vocational education in practice

Three out of the four accredited training providers (Table 11), regardless of the strand offered, also require learners to be employed to enrol in the programme. Having learners employed and working in the industry enables them to draw on in-work processes at assessment time. This is vocational education in practice, learning is relevant and more engaging when learners can use real work experiences to address assessment tasks.

Stakeholders agree that the preferred delivery mode for any qualification involving workplace input needs to work around the frantic season. Online learning with block courses during quieter times is most desirable.

Adaptability of EIT post-harvest programme

This section discusses the NZQA approved programme, delivered by EIT in Hawke's Bay, which leads to the award of the New Zealand Diploma in Horticulture Production (Level 5) with a strand in post-harvest.

Delivery format

EIT delivers four courses in one year and the other four the following year, eight in total across the programme. Learners can sign onto any course offered that year; there is no set sequence for completing courses to achieve the programme. Learners have four years to complete the programme. It is delivered in conjunction with Primary ITO.

Figure 8 details courses offered in 2025 and 2026.

Figure 8: EIT 2025 and 2026 course delivery (New Zealand Diploma in Horticulture Production) post-harvest strand

Course No.	Brief Description	NZQA Level	No. of Credits	Year Offered
HP5.04	The Safe Horticultural Business	5	15	2025
PH5.01	Quality Requirements and Post-harvest Physiology and Storage	5	15	2025
PH5.02	Quality Audit and Inventory Management	5	15	2025
PH5.03	Post-harvest Quality Control Plan	5	15	2025
HP5.03	Labour Management	5	15	2026
HP5.05	Leadership Qualities	5	15	2026
PH5.04	Efficiency Planning and Management of Plant and Machinery	5	15	2026
PH5.05	Develop a Post-harvest Operational Plan	5	15	2026

Classes are delivered on-campus at EIT, Hawke's Bay, between the end of July and mid-December annually, learners are required to attend classes two days per week. In addition to class attendance, they are required to complete assessment work both on the job and on their own time.

The classes are delivered during those months as this is the quiet time for the apple packers, EIT's target market. EIT states that subjects are timetabled to align with the post-harvest calendar so learners can relate activities in the classroom with tasks they are completing as part of their job role.

Programme structure

EIT delivers the New Zealand Diploma in Horticulture Production (Post Harvest strand) over eight compulsory 15-credit courses. The aims, learning outcomes and content for the courses are below.

All eight courses are at Level 5. None of the courses have prerequisites or co-requisites, this provides excellent flexibility with delivery and means that a learner could complete the courses in any order.

All learners should be working in industry or have access to an appropriate workplace for the equivalent of at least one day a week.

The Safe Horticultural Business	
This course aims to develop the knowledge and skills to sustainably manage the day to day operations and business risks of a primary industry organisation.	
Learning outcome 1	Interpret and apply requirements and regulations applicable to a safe and sustainable primary industry organisation.
Learning outcome 2	Meet legislative requirements to achieve goals of a sustainable horticultural business.
Course content	• Risk management • Health and safety law • Employment law • Consumer guarantees Act • Fair trading Act • Sale of goods Act • Fertiliser Act • Property law • Trade marks intellectual property • Plant variety rights • Codes of practice • Inland revenue compliance • HSNO • Environmental risk management authority • Eurepgap compliance • Global gap • Agrichemical usage • HASAP

Quality Requirements and Post-Harvest Physiology and Storage	
This course aims to allow students to develop the knowledge and skills related to understanding of quality requirements and postharvest storage and physiology of a horticultural product.	
Learning outcome 1	Interpret quality requirements and standards for a horticulture product
Learning outcome 2	Demonstrate understanding of post-harvest physiology and storage
Learning outcome 3	Apply customer and/or market quality requirements and standards to a horticultural product
Course content	• Customer and/or market quality requirements • Supply chain and regulatory requirements • Key components of a quality control system • Best practice • Audit requirements of a quality control system and the implications for non-compliance • The stages of crop growth and physiological changes • Crop physiology under post-harvest storage conditions • Physiological changes that occur during premature fruit loss • Factors that affect crop quality and storage life in a storage facility.

Labour Management	
This course aims to develop the knowledge and skills to effectively and sustainably manage and lead a team in a primary industry operation.	
Learning outcome 1	Plan job analysis, staff recruitment, selection processes, induction and performance management strategies.
Learning outcome 2	Outline employment agreements, obligations and responsibilities including termination rights and responsibilities.
Learning outcome 3	Plan and manage sustainable work allocation and workflow in a primary industry organisation.
Course content	• human resource planning • job analysis and design • recruitment and selection • legislation and employment obligations • performance management training and development • management leadership, communication and culture • conflict management and disciplinary processes • health and safety • human resource procedures and best practice • resourcing staff for seasonality

Quality Audit and Inventory Management	
This course aims to allow students to develop the knowledge and skills related to managing a quality audit process and inventory management system in a horticultural processing operation.	
Learning outcome 1	Manage a quality audit process in a primary products food processing operation
Learning outcome 2	Manage an inventory management system to minimise wastage & loss
Course content	• Roles and responsibilities in an audit • Information and resources needed for an audit • Audit participation • Information gathering • Records review • Compliance observation • Audit reporting and communication of results • Corrective action

Post-Harvest Quality Control Plan	
This course aims to develop the knowledge and skills to develop a quality control plan for a horticultural operation.	
Learning outcome 1	Develop a post-harvest quality control plan including its management, implementation and review process.
Learning outcome 2	Examine the quality requirements of the market and/or the customer and how to meet those standards.
Course content	• Quality goals and standards for a horticulture product • Implementing a quality control plan • Quality control plan review

Develop a Post-Harvest Operational Plan	
This course aims to allow students to develop the knowledge and skills related to developing a post-harvest plan for a horticultural operation.	
Learning outcome 1	Develop a post-harvest operation plan for a given crop.
Learning outcome 2	Develop an implementation procedure for the operational plan.
Learning outcome 3	Develop a review procedure for the operational plan and identify opportunities for improvement.
Course content	• post-harvest standards • post-harvest procedures • regulatory compliance requirements • post-harvest operational plan implementation • post-harvest operational plan review • making recommendations • continuous improvement

Leadership Qualities	
This course aims to develop the knowledge and skills to effectively and sustainably manage and lead a team in a primary industry organisation.	
Learning outcome 1	Coach and Mentor team members to develop a positive and sustainable workplace culture.
Learning outcome 2	Use appropriate communication strategies and leadership styles to achieve workplace goals.
Learning outcome 3	Identify effective decision making and problem-solving skills to manage and lead teams.
Course content	• effective communications • problem solving • goal setting • decision making • motivation • leadership styles and qualities • coaching and mentoring • stakeholder relations • effective teamwork • workplace culture • change management • conflict management

Efficiency Planning and Management of Plant and Machinery	
This course aims to allow students to develop the knowledge and skills related to efficiency planning and the use of plant and machinery in a horticultural operation.	
Learning outcome 1	Develop a plan to optimise efficiency of a post-harvest system, its management, implementation and review.
Learning outcome 2	Manage plant, machinery and/or equipment maintenance in a horticulture operation.
Learning outcome 3	Produce a justification for the purchase and install of a piece of Plant, machinery or equipment to improve efficiency.
Course content	• post-harvest operational area systems • post-harvest operational area procedures • continuous improvement methods and tools • plans to increase efficiency • capital expenditure decision making • seasonal operational requirements of plant, machinery and equipment • maintenance schedules and cleaning procedures • training requirements for plant, machinery and equipment

Assessment

More than half of the programme assessment (65%) is based on the learner submitting an evidence portfolio, drawing on the learners 'in-work' processes. Four of the courses are 100% assessed by evidence portfolio.

An evidence portfolio is a collection of documents and artefacts compiled by learners to demonstrate their knowledge, skills, and competencies in relation to specific learning outcomes or industry standards. This form of assessment typically includes written tasks, photographs, examples of work, industry documentation, attestations from supervisors or peers, and reflective pieces. Using an evidence portfolio as an assessment method provides several advantages:

- Practical application: It allows learners to showcase their abilities in a real-world context, bridging the gap between theoretical knowledge and practical application.
- Personalised learning: Learners can tailor their portfolios to reflect their individual experiences, strengths, and areas of expertise.
- Continuous learning: The process of compiling a portfolio encourages ongoing reflection and self-assessment, which are essential skills for professional growth.
- Career preparation: Portfolios often serve as a record of professional achievements, which can be valuable for job applications and career progression.
- Fair assessment: This method accommodates diverse learning styles and provides a comprehensive view of a learner's capabilities beyond traditional exams or tests.

By enabling learners to provide evidence of their competence in varied and meaningful ways, the evidence portfolio is an effective and inclusive assessment tool.

Learners have until June of the following year to complete and submit their assessments. This is a long time and while it allows the learner plenty of opportunity to collate evidence towards assessment, the extended deadline could be demotivating for some learners. The lack of urgency to apply new knowledge at the time of learning is missing.

Adaptability

The content of the EIT post-harvest programme is suitable for application to the wider food and fibre sector including potential adaptions for a range of other crop industries, for instance, kiwifruit and avocados. The course aims and learning outcomes are broad enough to include application in a post-harvest job role for any New Zealand crop.

Course delivery can be scheduled to align with quieter times for different crops, aligning with that crop's post-harvest calendar. The timing for training delivery and assessment is critical for uptake and success.

Evidence portfolio assessments are easily adaptable to the learner's job role (regardless of crop and regional location).

Moving the programme to online delivery, EIT feels they will be able to re-model the programme and learners would have time to work on their assignments to fit their busy packing seasons.

Any adaptation must consider that participants are typically practical learners, requiring a design model that meets their needs. Vocational learning is acquired through real-life experience—learning by doing rather than through reading, listening, or watching. By practising relevant skills in action, learners gain the experience and knowledge needed to perform tasks and demonstrate competence in their roles.

Adapting the programme to delivery in new markets presents an opportunity to update the current structure and courses, for example:

- Moving from an “everything is compulsory” model to a structure that contains a foundation of core compulsory courses encompassing the essentials required by all learners; then elective options which suit the learner's interests, employer's needs and job opportunities.
- Adding new courses to broaden the range of post-harvest topics.
- Rewriting current assessments to ensure the requirements are flexible enough to be applied in multiple contexts (i.e. different crops, regions, seasons etc.).
- Consolidating ‘Develop a Post Harvest Operational Plan’ and ‘Post-Harvest Quality Control Plan’ into a single ‘business planning for success’ course.
- Adding higher-level research project courses (Level 6 or 7) to allow a learner to conduct an in-depth project for their employer.
- Adding a ‘special topic’ course to deliver content on the latest trends in post-harvest, e.g. new technology.

Stakeholder suggestions for new course topics include:

- Transport and logistics
- Biosecurity and phytosanitary
- Market Access
- Research project
- Technological innovations
- Strategic development

Stakeholder Engagement

Key stakeholder interviews

This section summarises key findings from interviews held with stakeholders at the following organisations: Trevelyan's, HBFA, and New Zealand Apples and Pears Inc.

Trevelyan's

Located in Te Puke (Bay of Plenty) Trevelyan's is New Zealand's largest single-site kiwifruit and avocado packhouse. Trevelyan's operations handle kiwifruit and avocados and employ around 1,200 seasonal workers. The management roles include packhouse managers, site managers, production managers, and coolstore managers. Managerial job progression tends to happen internally.

Interest in enrolling

The organisation has a strong interest in enrolling employees into the post-harvest qualification, stating "Absolutely there is interest". Trevelyn's estimates they have 15 - 20 potential participants, depending on their learning aspirations. Twelve current packhouse managers were identified as suitable for enrolling.

Trevelyn's views the qualification as valuable for their post-harvest operations, "I think there's absolute value in drawing a higher level qualification for post-harvest."

Current training and development

Trevelyan's has employees who have completed Level 3 Fruit Production apprenticeships through Primary ITO, some of these employees started the Level 4 programme but did not complete it. Most managers work their way up through on-the-job experience. There is one shipping/inventory manager currently doing postgrad studies toward an MBA.

Delivery preferences

The best time for Trevelyan's employees to undertake tertiary studies is from mid-September to the end of the year, as "there is a sort of quieter period". The busy season is from late February to the end of June, this period is referred to as the "frantic season". Trevelyan's are supportive of online learning with block courses during the quiet periods. "That would be fantastic".

New Zealand Apples and Pears

New Zealand Apples and Pears Inc., represents the vision, provides the voice for the Aotearoa New Zealand apple and pear industry and enables members to prosper. Initially, a growers-only organisation, it has extended its membership to include packers, cool store operators, marketers and associates such as horticultural suppliers and consultants.

The stakeholder interviewed has firsthand experience of New Zealand Diploma in Horticulture Post-Harvest strand graduates in the workplace. They advocate the EIT programme, stating "We need to ensure this course is available for the future to encourage extended learning for the next generation and ensure employees are ready to take on new challenges in the horticulture sector."

They believe there is not enough support from the industry for employees to gain qualifications. The qualification needs to be something to "strive for" not just an activity to fill the gap in the off-season. Marketing focused on graduate success stories is missing.

Skills and knowledge

It was reported that the programme gave employees an appreciation of the entire business, expanding their awareness wider than the area they worked within. If post-harvest employees understand what others do, it improves their performance and open-mindedness with their role in the process.

The stakeholder witnessed employees grow in confidence and their ability to take on new challenges. The learners gain an understanding of plant physiology and the impact that cooling has on produce – both when done correctly and incorrectly.

Value of the qualification

"When I saw people with this diploma, I wanted them on my team because it showed motivation, stickability and the want to further themselves. A tertiary qualification is favourable because it allows for specialisation into an area of interest."

Current training and development

More consideration of the different roles that exist now and specific skills such as technical/machine operator in the packhouses could be added to the programme. Other additional programme content suggestion include:

- Specific learning on operating AI, NIR, Apple washers etc.
- Biosecurity
- Market Access
- Research & Development

Future delivery needs to consider that many software applications are used daily both in the packhouse and orchard and ways to connect this through the entire production system. From using drones for spraying, pest and disease monitoring, water storage and use, size, colour and quality monitoring etc.

A barrier for employees to study is time and juggling work pressures. The amount of time required outside of the classroom needs to be clear from the start for both learners and employers. Having a buddy system connecting current learners with past learners might assist with learning. The learner's manager needs to be included at enrolment time so they understand the time commitment and can tailor support to suit.

There could be benefits in a pre-requisite paper to gauge the level each learner is currently at, leading to an individual support plan.

Delivery preferences

The format of the post-harvest programme needed to be varied. An online delivery option would encourage and enable learners outside of the Hawke's Bay area to study at EIT. However, the learners are practical so any online offering would need to include a mixture of online learning, zoom/team meetings and mentors/coaches at the regions. Field trips need to continue as these events provide tactile learning and understanding.

"A refresh and engaging with the businesses themselves (possibly a survey) would provide further insights" and collaboration by EIT with other education providers would only enhance the offerings of this qualification.

Hawke's Bay Growers Association

HBFA is a not-for-profit organisation, working on behalf of its members to ensure the region's horticulture industry remains a dynamic, progressive and accessible sector. It is the country's largest fruit-growing organisation, funded through an annual membership fee. HBFA represents the pipfruit, summerfruit, and kiwifruit sectors, working closely with sector organisations; PipfruitNZ, SummerfruitNZ, KGI, and Horticulture New Zealand.

Supporting and driving awareness of career pathways in horticulture is a key focus for the HBFA. "By fostering an industry culture where innovation, talent and education are valued, will help drive a vibrant, progressive and skilled workforce that will support current and future leaders" (Hawke's Bay Growers Association, n.d.).

Training and development

Hawke's Bay Fruitgrowers' Charitable Trust, in conjunction with the Horticentre Trust, is providing funding towards three horticulture scholarships, one is available for students studying towards a Diploma in Horticulture. The funding aims to encourage individuals domiciled in Hawke's Bay and employed in the industry, to undertake further education or training in horticulture subjects relevant to pipfruit, summerfruit and kiwifruit.

HBFA feel organisations currently place value on experience over qualifications. Hands-on mentoring for employees is important, especially for early-stage roles.

A current industry challenge is corporate entities compared to independent growers show marked differences in their ability to support training and development.

HBFA indicated there is support for training initiatives but emphasised the need for flexible delivery models that account for seasonal pressures and the different capacities of corporate versus independent operations.

Career progression

Traditionally managers have worked their way up through the industry "very long and slow process". HBFA is seeing a generational shift where newer managers may only stay 2 - 3 years before moving to different industries. Recruitment is a mix of internal promotions and some "corporate brands" bringing in external hires.

The growing complexity in areas like logistics and cool storage requires new knowledge, and roles are becoming more demanding with "high expectations".

Delivery preferences

Online learning creates easier access to tertiary study and qualification, however learning via an online delivery method presents learner engagement challenges. In particular concerns regarding attention span. The timing for training is critical for uptake and success. The best period for learner engagement is the end of the year (during dormancy). February to May was described as "very challenging". June is less difficult and July potentially workable.

“The timing of any block courses would be crucial for success”.

Learner voice

This section summarises key findings from feedback from graduates of the EIT NZ Diploma in Horticulture Production (Post-Harvest) (Level 5).

Graduates found significant value in completing the post-harvest programme. Notably, the assessments related to the industry encouraged them to engage in in-depth thought processes concerning their jobs. They reported that their studies broadened their understanding of their roles and increased their knowledge of the organization as a whole. One remarked, “I covered areas that I wouldn't have been able to learn about in my role, and it allowed me to explore more about my company, its operational methods, and how I can better support them from my position.”

The programme facilitated personal development and provided insights into the various elements involved in running a business within the horticulture industry. Although the learning topics are primarily focused on horticulture, students expressed that the skills they acquired are transferable to other fields.

One participant stated, “It has opened my horizons to the entire horticultural supply chain. It has allowed me to grow and establish strong relationships not only within my company but also throughout the horticultural industry itself.”

There is a consensus among graduates that their studies have improved their chances of securing higher-level positions within other companies and industries. They recommend this programme to colleagues looking to advance their knowledge, experience, connections, and skills for advancement into higher roles.

One graduate stated their experience with the New Zealand Diploma in Horticulture Production (Level 5) Post-Harvest strand was “incredibly positive”. They preferred delivery in person within the classroom environment as it enabled them to give 100% of their attention to it. When studying online learning (during Covid) they found themselves doing other work while on the Zoom learning sessions. Stating “I did not participate as often as I would usually.”

One graduate suggested that pairing learners with extensive horticultural industry knowledge with those who lack such knowledge could be beneficial. While this approach might help the less experienced learners, it could unfairly burden the more knowledgeable ones. A better solution would be to ensure that all learners have access to a dedicated workplace mentor.

Time was mentioned as a barrier to study. Participants noted that finding time for most tasks is challenging in this industry, and allocating additional time for studying and completing assignments presents an even greater difficulty.

Graduates highlighted the value of the programme in providing diverse opportunities, with a strong emphasis on networking. One shared, "This programme opens you up to so many different opportunities, especially networking! I have met amazing people and now have friends in the industry that I would never have connected with otherwise."

The programme was also praised for offering a comprehensive insight into various departments across the supply chain, which students found highly beneficial. Another remarked, "The course provides an in-depth understanding of the different stages in the supply chain, and I always see value in that." The feedback reflects the programme's role in fostering industry connections and broadening learner's understanding of the sector.

In late 2019 EIT held a student focus group at the Hastings Learning Centre, key takeaways about the programme include:

- The content is industry-related and relevant to their job roles.
- The study workload was generally manageable.

Food and Fibre Centre of Vocational Excellence: Addendum to Post-Harvest Report

Executive Summary

This addendum to the Post-Harvest Workforce Analysis Report (January 2025) examines how well New Zealand's post-harvest workforce is prepared to engage with emerging technologies and identifies opportunities to improve training and development pathways. It supports the Food and Fibre Centre of Vocational Excellence's (FFCoVE) vision of a skilled, tech-confident, and future-ready sector.

The horticulture industry is rapidly adopting advanced technologies such as artificial intelligence (AI), robotics, Internet of Things (IoT), and data analytics to improve efficiency and reduce reliance on manual labour. While many businesses, particularly larger corporates, have invested in both technology and training, smaller and independent operators often struggle to access affordable, consistent, and industry-aligned training.

Current training provision combines formal qualifications, vendor-led instruction, and on-the-job learning. However, gaps remain in delivering role-specific, hands-on, and standardised programmes that align with the increasingly sophisticated technologies used in modern packhouses and cool stores.

Key findings include:

- Uneven training delivery: Larger businesses achieve better outcomes due to access to vendor support and internal expertise, while smaller operators lack resources and support mechanisms.
- Need for standardised, targeted training: Current qualifications do not fully address emerging technologies or specific operational roles.
- Importance of hands-on learning: Practical, field-based learning remains critical for engaging the workforce.
- Critical role of partnerships: Collaboration between industry, providers, and regional communities enhances training relevance and impact.

To address these challenges, the addendum recommends:

- Updating curricula to include automation, AI, robotics, and digital systems.
- Expanding hands-on, workplace-based learning opportunities, including mentorship and field demonstrations.
- Strengthening partnerships between employers, providers, and regional stakeholders to co-design and deliver training.
- Improving accessibility through broader funding, regional delivery, and culturally inclusive approaches.

By implementing these measures, New Zealand's post-harvest sector can build a resilient, skilled, and innovative workforce equipped to thrive in an increasingly technology-driven environment.

Background

The initial post-harvest analysis report (January 2025) outlined the opportunities and regional and crop requirements for training within the New Zealand post-harvest space.

This addendum examines how well New Zealand's post-harvest workforce is equipped to utilise emerging technologies and what improvements could be made, supporting FFCoVE's ambition to build a tech-confident and future-ready sector.

There is growing recognition within the horticulture sector that post-harvest careers require individuals who can navigate increasingly sophisticated technical systems while also understanding market demands. To meet this need, workforce development pathways must reflect both technological proficiency and commercial insight.

Initial findings and challenges

The initial report highlighted workforce challenges in the horticulture sector. Seasonal surges in demand require thousands of additional employees, with most post-harvest roles having low entry barriers and on-the-job skill development. While formal qualifications are not mandatory, they are valued for career growth and skill advancement.

To address industry needs, the EIT post-harvest programme offers adaptable training across food and fibre sectors. Stakeholders interviewed for this report recommended further enhancements, particularly in training for technology use within post-harvest operations.

Role of technology in post-harvest production

Technology plays a critical role in post-harvest production, grading produce for quality and defects, packing by size, and labelling products for market delivery. These systems are continuously evolving. From advanced grading cameras to near-infrared technology that detect internal defects, modern packing systems are highly automated and increasingly sophisticated.

As a result, packhouse roles are becoming more skilled and less reliant on unskilled labour. In high-tech facilities, robots frequently handle palletisation and product movement. Automated packing lines are increasingly adopted in response to labour shortages and the drive for greater efficiency.

Technology providers typically deliver on-site training for packhouse staff, reflecting a partnership approach to implementation. As one Hawke's Bay packhouse noted:

> 'Staff were meticulously trained and confident to use the machines accurately from day one.'

Cool storage facilities are also becoming more automated. One of New Zealand's largest post-harvest operations runs a fully robotic, five-high cool store, stacking pallets up to 14 metres high.

These advances highlight the need for structured technical training. Currently, most training is delivered informally on the job or by the technology suppliers as part of system installation. While this is practical and tailored, it often lacks consistency and formal recognition. There is growing demand across the sector for more standardised and industry-recognised training frameworks to ensure staff can confidently and safely operate advanced systems while also building long-term technical capability.

Current technology training

Technology training in the post-harvest sector combines formal qualifications, vendor-led instruction, and on-the-job learning. Stakeholders noted that technology training is uneven, with larger corporations offering more comprehensive training than smaller operators, who often struggle to resource both technology adoption and staff development.

NZQCF programmes provide foundational knowledge but lack specific modules on advanced technologies such as AI systems, NIR scanners, grading machines, and digital software. As a result, learning happens informally or directly from equipment suppliers, which can be inconsistent.

Hands-on, practical experiences like field trips and on-site demonstrations remain critical for engaging the largely practical workforce. Government initiatives, including Apprenticeship Boost, Mana in Mahi, R&D funding, and industry training organisation (ITO) frameworks, help reduce the financial burden on employers and build long-term capability.

However, small and medium-sized enterprises (SMEs) often face challenges in funding both new technology and the training required to use it effectively. Without additional support, these businesses risk being left behind in the shift towards automation and digitisation.

Industry examples:

AI-Powered Safety Technology - Bay of Plenty
A large packhouse implemented AI-powered pedestrian detection systems on forklifts to enhance workplace safety. Structured, on-site training ensured staff could confidently operate and monitor the new technology. While effective, the substantial investment remains a barrier for smaller businesses.

Labour Management Tools - Hawke's Bay
A grower adopted the 'ABCgrower' system to improve how it records labour hours and on-orchard costs. This digital solution reduced errors, streamlined payroll, and improved staff confidence through in-house training, but required dedicated time and support to implement effectively.

These examples highlight the need for more coordinated, accessible training support across the sector to ensure businesses of all sizes can confidently adopt and benefit from technology.

Muka Tangata, the Food and Fibre Workforce Development Council, recognises the critical need for workers with strong technical and digital skills to operate and maintain advanced technologies within the post-harvest sector. Their workforce development plans for horticulture and food processing explicitly include competencies related to automation, robotics, and digital systems widely used in packhouses and cool stores. To address this, Muka Tangata supports the development of modular training programmes and micro-credentials that provide targeted upskilling opportunities in areas such as machinery operation, automation technology, and health and safety systems specific to post-harvest environments.

Working closely with Te Pūkenga Work-Based Learning (which incorporates Primary ITO) and other training providers, Muka Tangata ensures vocational qualifications and apprenticeship frameworks evolve to reflect the sector's increasing reliance on sophisticated technology. This approach not only equips workers with relevant skills but also promotes safer and more efficient post-harvest operations as automation and digitalisation become standard industry practice.

Effectiveness of technology training

When delivered well, technology training clearly improves workers' confidence, performance, and ability to innovate. A Level 5 graduate reported that their training enabled them to research and evaluate new machinery, justify its implementation, and introduce improvements, demonstrating the value of structured learning.

A senior tutor observed that effective training also develops broader industry understanding, enabling staff to manage complex automated systems and adapt flexibly across roles. Training is most effective when it combines specific technical skills with a holistic view of operations.

Collaboration between industry and training providers further enhances effectiveness. When employers actively engage in training design and delivery, providing access to current equipment, software, and expertise, workers gain relevant, hands-on experience that reflects real workplace challenges.

Field-based, experiential learning remains highly effective, particularly for practical workers who benefit from live demonstrations and direct exposure.

However, effectiveness is uneven across the sector. Larger, well-resourced businesses achieve better outcomes thanks to vendor support and internal expertise, while smaller operators often lack the capacity to deliver equivalent training.

Support needed by industry

Despite progress, businesses, especially smaller and independent operators, still face challenges keeping pace with technological change and training needs. Stakeholders highlighted key barriers that limit participation in and effectiveness of training:

- **Access and affordability:** Smaller operators often lack the resources to purchase advanced technology or release staff for training.
- **Standardised credentials:** There is a need for more visible and accessible industry-aligned qualifications, such as apprenticeships and micro-credentials.
- **Time constraints:** Online and self-directed programmes are valuable but require staff to have dedicated time or meaningful incentives to engage fully.
- **Extension services:** Greater provision of regional field days, extension officers, and technology demonstrations would reduce hesitation and improve adoption.

Providing targeted support in these areas would ensure that all businesses, regardless of size, can equip their staff to succeed in an increasingly advanced post-harvest environment.

Recommendations

Stakeholders identified opportunities to improve the way technology training is designed and delivered:

- **Broaden and modernise curricula:** Embed content on automation, AI, robotics, sensors, and digital traceability into NZQCF qualifications; develop modular short courses aligned with seasonal work cycles.
- **Enhance hands-on delivery:** Expand block courses and workshops; offer mentorship opportunities with experienced operators; support field trials and demonstrations to build confidence.
- **Strengthen industry–provider partnerships:** Formalise co-designed curricula; create
- cross-industry training networks; pilot workplace-based assessments; ensure content reflects workplace realities.
- **Expand access and inclusion**: Broaden funding eligibility; ensure regional training coverage; collaborate with Māori and Pasifika communities to embed tikanga Māori and culturally aligned approaches.

These combined measures will help create a skilled, confident workforce ready to operate and innovate with the advanced technologies shaping the future of post-harvest production.

Conclusion

New Zealand's post-harvest sector is rapidly adopting technologies such as AI, robotics, IoT, and data analytics to drive efficiency and reduce reliance on manual labour. Currently, most training occurs through vendor support, apprenticeships, and digital programmes. However, there remains a clear need for more structured, accessible, and industry-aligned training, including time-release funding and on-site support, to ensure all workers can effectively engage with these advancements.

The findings and recommendations outlined in this addendum highlight the importance of coordinated, practical technology training, underpinned by strong partnerships between industry and training providers. Such collaboration is essential to equip the workforce with the skills and confidence needed to succeed in an increasingly automated and digitally driven sector.

By enhancing curricula, delivering workplace-focused training, fostering robust industry–provider partnerships, and embedding culturally inclusive approaches, New Zealand's post-harvest industry is well-positioned to build a capable, resilient, and future-ready technology workforce, ensuring the sector continues to thrive in a fast-evolving landscape.

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