NZKGI
NEW ZEALAND KIWIFRUIT GROWERS

Maturity Services Review

NZKGI 2025

Contents

1. Introduction

NZKGI has received feedback repeatedly from growers over the last 12 months with regards to the performance and subsequent cost of the Maturity Clearance Service (MCS).

Concerns are wide ranging, but the main topics are:

- Perception of inconsistent results between service providers.
- Inefficiency of too many service providers and the concern that this is a source of the price increases.
- Cost of testing and long-term cost increases.
- Performance measurement metrics applied by the contract holder (Zespri) to the service providers and the corresponding performance of said service providers.

This review will complete a full analysis into the performance of the MCS, including an examination of any discrepancies should they exist, while evaluating the overall effectiveness of the MCS business management, including its internal measurement and resourcing processes. There will be full analysis of the sampling costs, including recent increases, to inform a comprehensive understanding of the situation, and finally it will assess whether Zespri's management of the MCS is meeting the needs of growers, identifying areas for improvement.

A full data set was made available to NZKGI inclusive of auditing results and process, multiyear pricing models, sample integrity data inclusive of grower complaints as well as a full sample download from the MCS system including release service provider data release times.

The following topics are not within the scope of this report and therefore not reviewed.

- Maturity Metrics and Criteria.
- Individual service provider performance.
- Grower Behaviour and mitigation.
- Testing Strategies.
- Packhouse and Harvest impact(s).
- MCS software or enhancements.
- TZG and Taste commercials.
- Any possible future developments of the service or tools used such as non-destructive testing.

While decisions around cut off times are not in scope, a recommendation will be made if the facts support that sample data (or part) can be released earlier, as well as capturing any relevant feedback from the growing community in the process of producing this report.

2. Definitions

• MCS	Maturity Clearance Service, not the software platform but the service provided to growers.
• Lab	Any Zespri approved Maturity Clearance Service provider.
• Clearance event	The full 150-fruit sample for GA and a 90-fruit sample for all other varieties.
• Sample / Test	In the case of a GA clearance, service providers would consider a single maturity area testing event, or standard 150 fruit clearance to be two *samples*, being the 60-fruit and the 90-fruit. For simplicity and clarity and unless specified, a 'test' and 'sample' have been used interchangeably and considers for a GA clearance, the 60-fruit and 90-fruit to be two samples.
• MA	Maturity Area.
• NIR	Near-Infrared Reflectance technology.
• QMS	Quality Management System.
• GA	Gold3, no distinction between conventional and organic unless specified.
• HW	Hayward, no distinction between conventional and organic unless specified.
• RS	Red19.
• TZG	Taste Zespri Grade.
• DM	Dry Matter.

3. Executive Summary

Six providers are contracted for Zespri Maturity Services across seven sites. Northland, Nelson, Gisborne, and Hawkes Bay have dedicated sites. Auckland, Waikato, and Coromandel are serviced from the BoP sites.

The industry averages 40,190 samples per year over the last four years. Despite large submit volume swings between 2023 and 2024, testing volumes remain relatively stable, which sets the industry up well to handle future sampling requirements as volumes grow. While the BoP is the majority of sampling at approximately 81% of volume, there are pockets of strong growth in other regions which should be considered in future pricing and contract discussions. Despite these volumes, capacity remains fit for purpose to handle current and forecasted tray and sampling volume growth. With industry exceeding capacity at an individual provider level a handful of times in the last four years, outside of very short but sharp peaks, there remains plenty of capacity, and as such we invite Zespri to assess the efficiency of existing surplus capacity and examine the cost implications. There is sufficient capacity to handle an annual 3% growth in volume, even in high, average and low scenarios in the coming seasons.

There is a multi-faceted auditing program run by Zespri across four key audit areas. These are Inter-Lab Proficiency Testing to evaluate service provider performance against peer laboratories; the Audit Zespri (AZ) program which pairs a clearance sample against a duplicate pair to ensure results are consistent and reliable; externally provided and in-person independent audits measuring quality and compliance in the collections space; as well as annual Zespri Internal Quality Audits where the internal audit team conducts annual audits to evaluate service providers compliance with their quality management system. In addition to this is the contractual requirements to meet the ISO 17025 Standard from IANZ[1]. Each programme was identified as being largely fit for purpose, well organised, and executed. While each perform different functions, and considering overall outlier or concerning results showed steady improvements year to year, this report's recommendations will focus on this area, as there are opportunities for improvement that can enhance service provider performance and, in turn, benefit grower outcomes.

Result release times showed that in each year, most of the samples are delivered by the required cut-off time each day, being 90% by 9:00AM and 100% by 11:00AM. There are days where those cut-off times are missed. While the quantity of missed days is reducing

[1] International Accreditation New Zealand

every year, evidence suggests there is an opportunity to pull forward the release time by at least 30 minutes, potentially even an hour, but any earlier than that could be overly ambitious and could lead to inconsistent delivery. In committing to this however, growers need to have full clarity that there is still going to be a small quantity of days where this cut off time might be missed.

Sample Variability, specifically DM, showed that both the frequency and intensity of DM outliers was reducing every year. Zespri define DM outliers as any DM result that is more than 0.5 DM points higher or lower than the expected result (being determined by the combined samples model using the industry standard DM curve). We observed the count of actual outliers identified by season decreasing from the peak in 2022 of 619, to 204, or 0.7% of all clearance events. Testing quality was also reviewed with a focus on compromised samples, stop sampling events, grower disputes and complaints. Compromised samples are declining year on year, where the main issue remains individual sampler errors. That being said, grower errors still contribute to 11% of compromised samples. Sampler errors are mainly around incorrect fruit counts or sampling methods adopted but have noticed overall 63% drop versus 2022 to only 15 comprised samples due to sampler error. The remaining compromised samples are lab errors which are mainly equipment issues. Stop sampling events follow a similar trend with significant declines from 2021 where the main areas of concern remain long grass and spraying on orchard year to year.

Zespri provided both grower dispute and grower complaint data. There were only two formal disputes – or challenging of the charges - in 2024 (2022 and 2023 not able to be produced) where the integrity of the result was called into question. There were 22 formal complaints in 2024 (again data was not available in 2022 and 2023). 19% of the complaints were due to time on orchard and 38% of all complaints were for the result themselves with growers either feeling there was a disproportionate sample result falling beyond expectations or asking Zespri to review the outcomes due to for example “one piece of fruit holding it back”. Each complaint is investigated by Zespri, and only one was upheld due to a sampler acknowledging they accidentally walked out of bounds.

Zespri formally engage with service providers at a number of different touch points throughout the year, being a pre-season and post-season review, fortnightly operational catchups as well as annual pricing reviews (which may or may not include contract renewals). Each of these engagement points were reviewed and again we found them to be largely fit-for-purpose and productive, however again we will be making some recommendations about some of the subject matter that could improve outcomes for all stakeholders.

Finally, sampling costs and pricing was reviewed inclusive of the service provider costs to Zespri, the corresponding grower charges including reporting charges, and how these charges are comparing to other orchard growing costs. These were completed at a weighted average level to understand industry pricing trends, showing that service provider cost increases have averaged 10.7% and 10.2% in 2022 and 2023 respectively and declined 3.4% in 2024. Correspondingly, Grower Charges increased 8.8% and 6.5% in 2022 and 2023 respectively, while declining 3.5% in 2024. The reporting charge, both the weighted value and as a percentage of total grower charges has declined each year, in an inflationary environment.

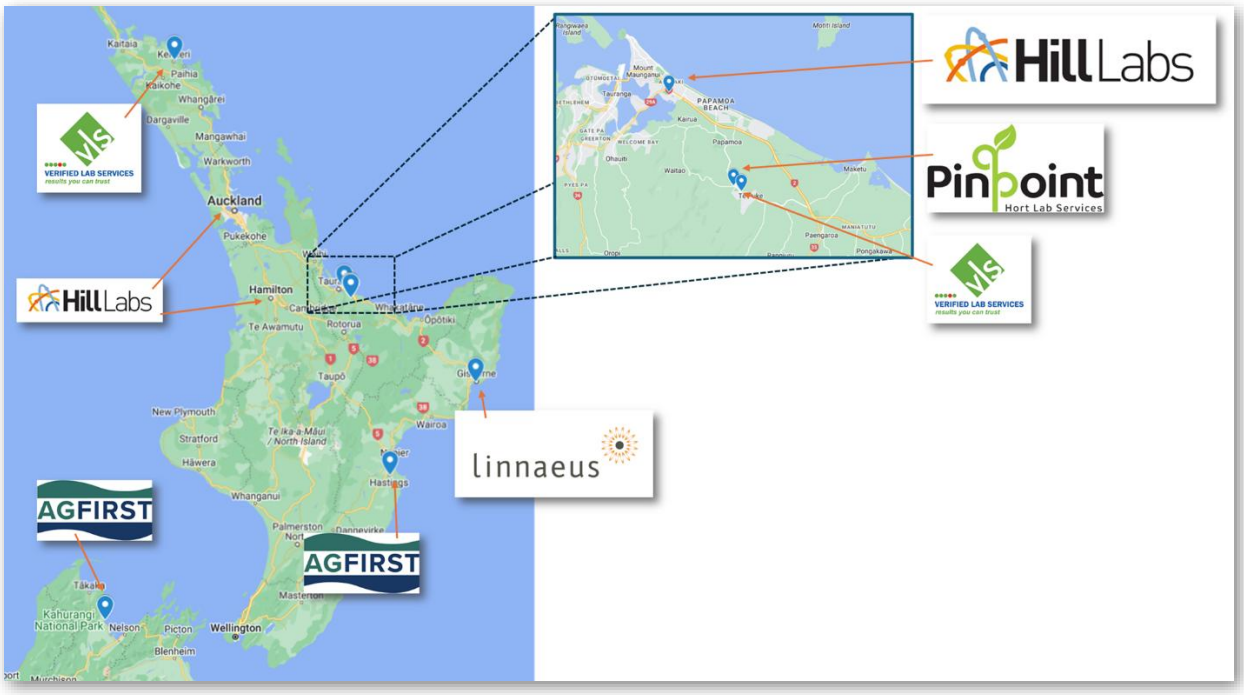
4. Service Overview

4.1. Service Providers Summary

Six providers are contracted for Zespri Maturity services across seven sites. Northland, Nelson, Gisborne, and Hawkes Bay have dedicated sites. Auckland, Waikato, and Coromandel are serviced from the Bay of Plenty (BoP). The service providers and regions serviced are:

- Hill Laboratories (Bay of Plenty, Waikato, Coromandel, Auckland)
- Agfirst Hawkes Bay (Hawkes Bay)
- Linnaeus (Gisborne)
- Pinpoint Laboratory Services (Bay of Plenty)
- Verified Lab Services (Northland)
- Agfirst Nelson (Nelson)
- Verified Lab Services (Bay of Plenty, Waikato, Coromandel)

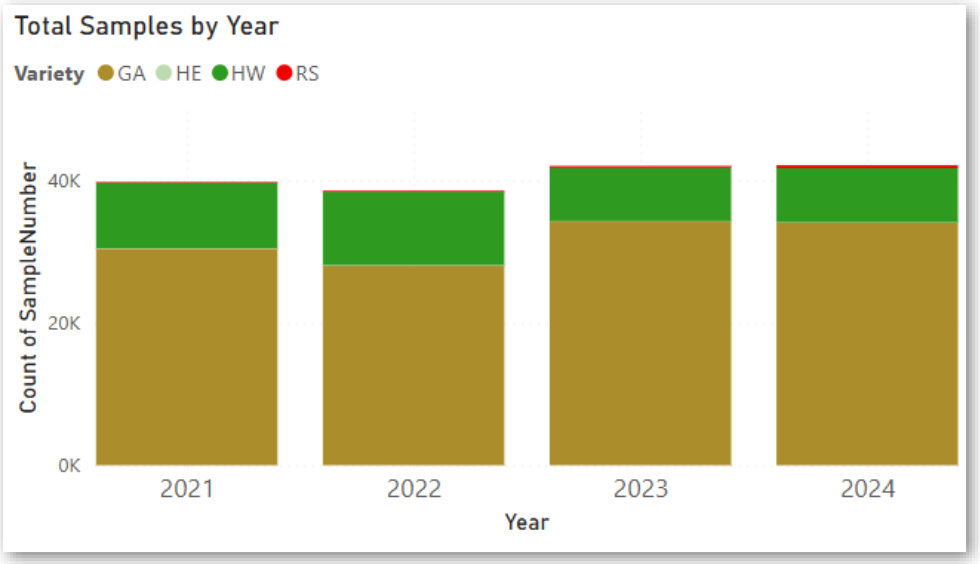
Image 1 – Service Provider Map



4.2. Sample Volume

The industry has averaged 40,190 samples per year over the last four years. There were 2,390 less GA samples in 2022, reflecting the impact of lowering the DM threshold, and while HW samples increased by 1,000, it was not enough to offset the overall industry decline.

Chart 1 – Total Samples by Year and Variety



There has been a slight increase year-on-year from 2022 on the number of samples completed. It is important to note that this has not been in line with the tray volume changes. 2023 had almost the same number of samples as 2024 despite a significant reduction in industry tray volume.

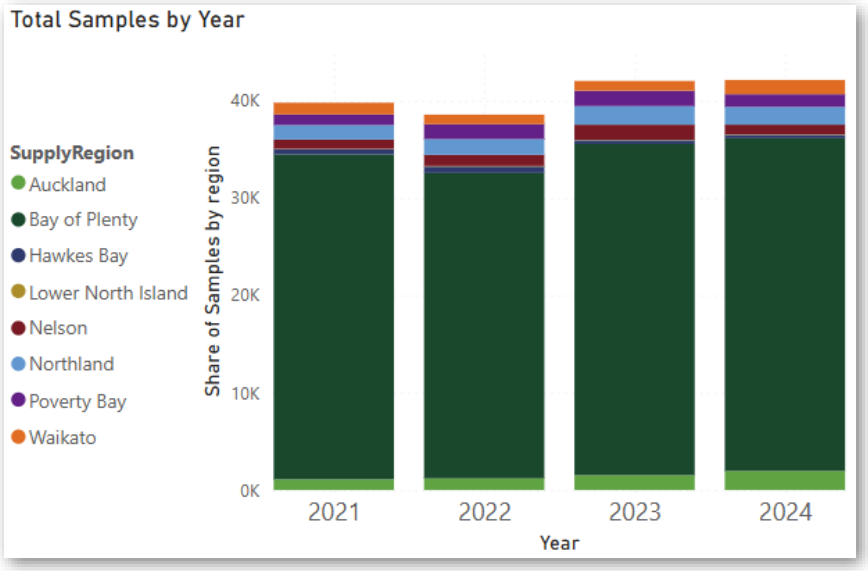
The key drivers of sample quantity includes not only the number of maturity areas and new properties each year and GA licence trends of previous seasons[2], but also the season's DM trends, which in turn influence the volume of re-testing required.

BoP consistently represents 81% of all sampling, which is in line with submit volume. The BoP also shows similar trends for industry with the 2022 drop then recovery. There

[2] Where a newly crafted GA maturity area can typically yield 5000 trays in year one, 10,000 in year two, then 15,000 trays in year three, but still be considered one maturity area.

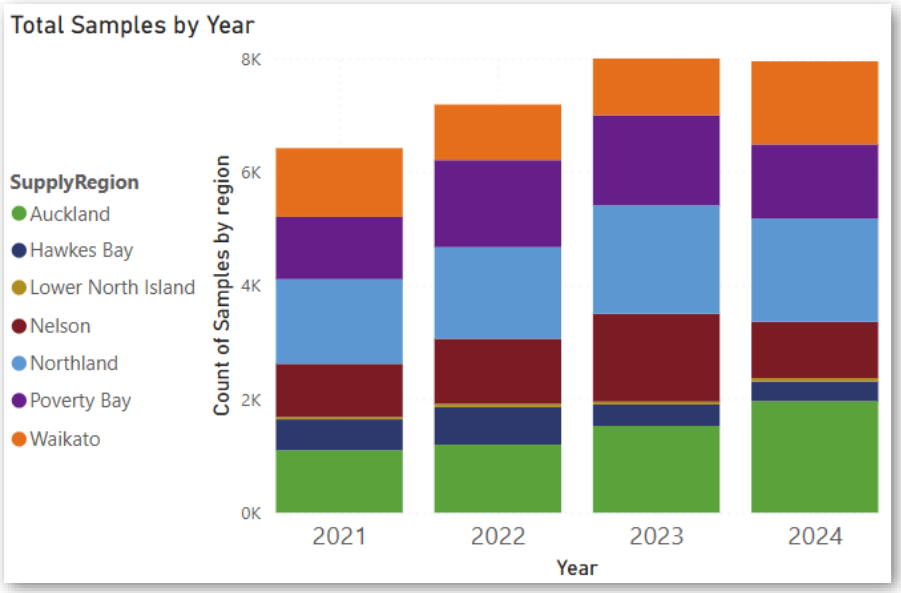
are some interesting trends happening in the other regions and it is prudent to remove the BoP from the data to have a more detailed view.

Chart 2 – Total Samples by Year by Region



Auckland sample quantities have grown 78%, largely in GA, and some RS. Waikato testing volume has experienced increases across each of GA, HW and RS. Waikato has had the largest growth of RS in 2024 outside of the BoP. Should both regions continue to grow sampling requirements, considering those regions are serviced by BoP-based service providers, a balanced approach should be taken to optimise costs while also leveraging potential economies of scale in the future.

Chart 3 – Total Samples by Year by Region (excluding BoP)



4.3. Capacity

Service providers have capacity to process 1350 samples per day[3].

It is important to note that the individual daily capacity is a maximum for an individual day only, and service providers also must make a rolling three and seven-day commitment to Zespri. These rolling capacity volumes are less than the daily capacity and this is to acknowledge the pressure placed on resources and labour over longer periods and to manage expectations.

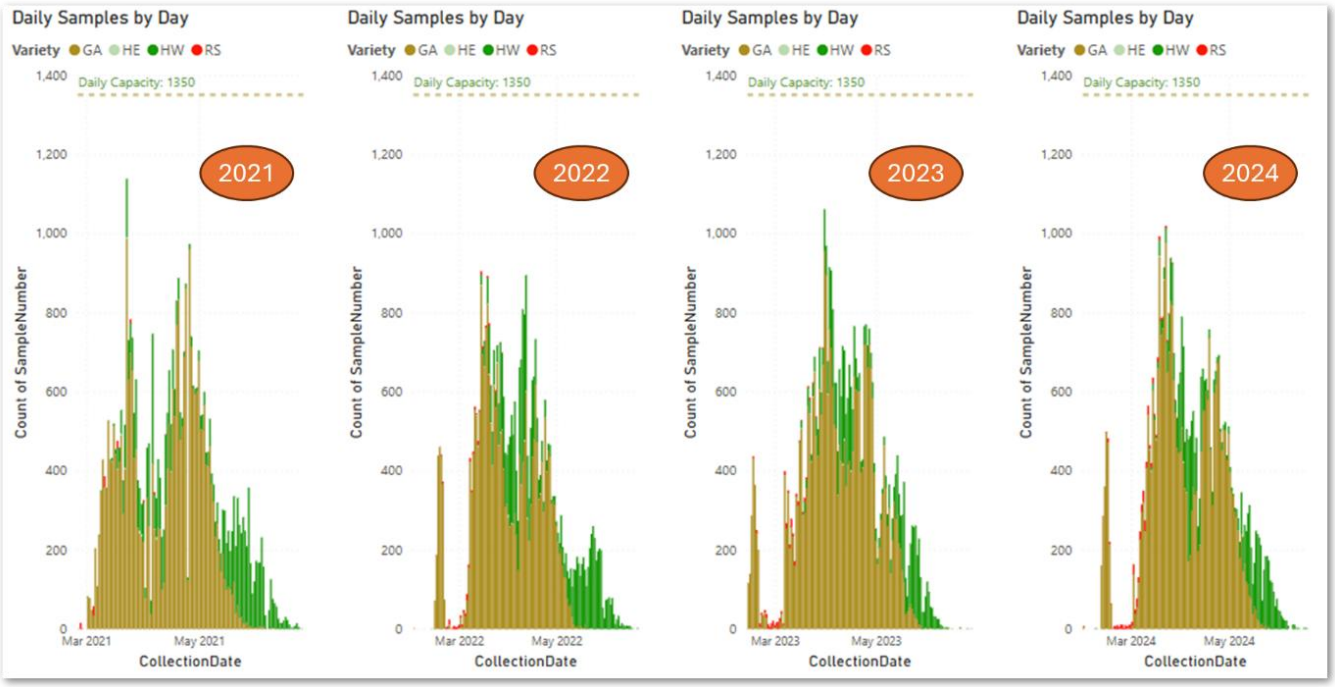
As seen in chart 4 below, and due to the bell curve nature of kiwifruit harvests and therefore sampling volume, when looking at the entire season it appears the current capacity available to growers exceeds present needs. While at no time in the last four years has capacity been reached at a national level, desktop analysis confirms there were four days over the last four years where an *individual* service provider had its capacity breached. These days were across three service providers with one service

[3] There is an additional 55 samples worth of capacity in collecting across the industry. This report will default to the testing capacity due to all service providers collecting and therefore testing their own samples, rendering the additional capacity redundant for
analysis purposes.

provider in the BoP, where this volume could easily have been absorbed by the other service providers if required.

As both charts 4 and 5 below show, there is a large underutilisation of resources outside of peak days. Not unlike the challenges experienced in a packhouse, asset and labour utilisation needs to be able to handle the peak days when it is most needed therefore it is prudent to measure capacity against the peak sampling volume day(s) in any one season (and seasonal trends). This ensures, not unlike a packhouse mantra, growers fruit is able to be tested when they want it to be.

Chart 4 –Samples by Day for the last four years against daily capacity



At peak, 78% of capacity is being utilised nationally, an average of 84% capacity being utilised in the BoP (with a 2021 peak of 92%) and all regions today remain fit-for-purpose and have capacity to handle the peak days and forecasted growth (see 3.4. Forecasted Volume below). Focusing on the BoP, on paper the largest peak day experienced over the last four years still had 8% of capacity remaining. If this capacity is reduced in any way, either after a long stretch of service providers being at capacity, any unforeseen labour or equipment issues, or more dramatically one less service provider, there are a number of days in three of the last four seasons where sampling requirements could not have been met.

Chart 5 –Samples by Day for the last four years against daily capacity (BoP only)

Outside the BoP, the trends are very consistent with all the regions having adequate daily capacity over the last four years. Only two service providers had their capacity exceeded one day over the last four years.

At a national level, and assuming an average daily peak of +/- 1050 samples, capacity utilisation reaches 78% on any given day. While this capacity is expected to remain sufficient for a number of years yet and considering an estimated 4% annual growth rate in tray volume[4], we must also consider regional variations, such as Auckland and Waikato's increasing testing volumes. Considering this, it is essential to question the cost of maintaining excess capacity, essentially 'volume insurance,' and explore whether the industry would benefit reviewing capacity to match changing demand and improve overall efficiency.

For balance, we assume that many of the operating expenses required to run a maturity service are proportionate to the weekly volume, there is limited amount of capital

[4] Zespri 10-year forecast, Mark Edgecombe.

investment required to manage upcoming capacity, and labour requirements also proportional to volume.

4.4. Forecasted Volume

There is a weak relationship between tray volume and samples required.

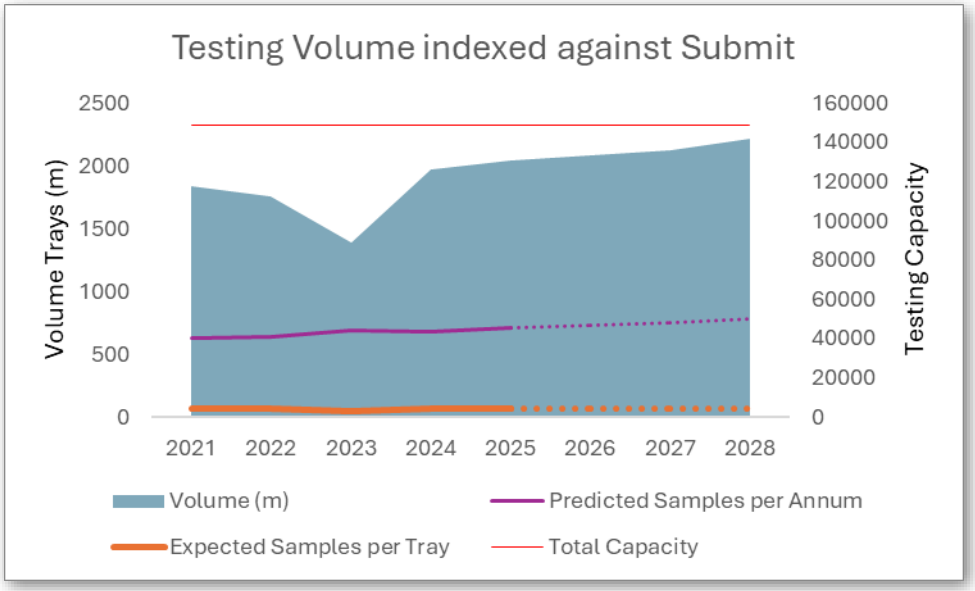
2024 delivered +/- 60 million more trays in volume from the previous year, while sample volume was static. While this makes producing a long-term forecast challenging, given increased volumes are known variables and future commercial settings or DM conditions are not, an attempt can be made using volume as a leading indicator of sampling requirements.

The methodology used in this report to predict testing volume was to take total volume in trays and divide it by total samples of that year, creating an average tests completed per submit tray. Taking an average of the last four years to predict the next four years, dividing the number of tests per tray by total forecasted submit gives a predicted volume of tests per annum.

2021 example

- Volume (trays) 183,973,000
- Samples 40,446
- Samples per tray 4,548
- *Total annual capacity* *1,350 per day, over 110 days*

Chart 6 – Testing volume indexed against submit trays.



As seen in chart 6 above, and as is clear in section 3.3 of this report, industry has plenty of maximum capacity (both in the peaks and the nature of the supply bell curve), with projections for 2028 showing 148,000 samples worth of capacity but only reaching a maximum 50,000 samples per annum. Therefore, capacity modelling must be done at a peak day requirement.

The methodology used in this report for this is as follows:

1. Identify the peak packing day in each year for the last four years.
2. Identify the peak sampling day in each year (the assumption being that one would follow the other, but these may not be 100% aligned by *packing day -2* in a typical request sample > result > pick 48-hour model).
3. Calculate trays per sample (total trays / total samples). The average of the last four years is the forecast.
4. Add the forecast volume growth per year. *This assumes peak week volume growth follows total industry volume growth.*
5. Calculate peak sample volume (total tray volume / average samples per tray).

Chart 7 – Testing volume at peak against peak days forecast.

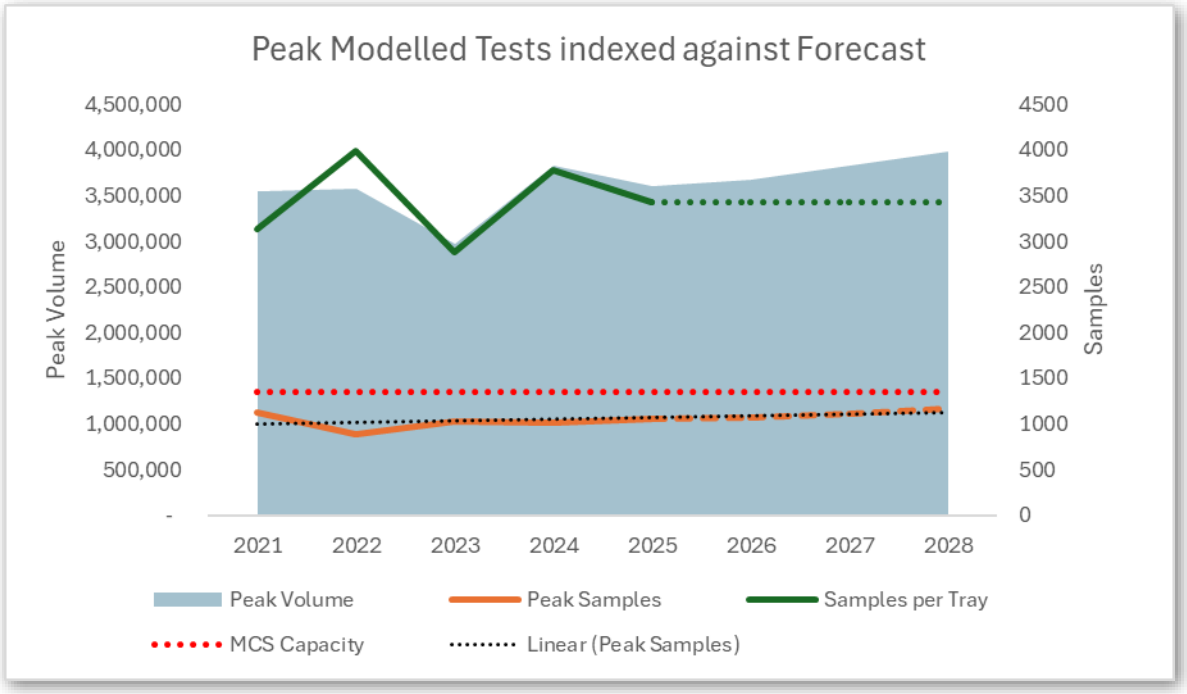


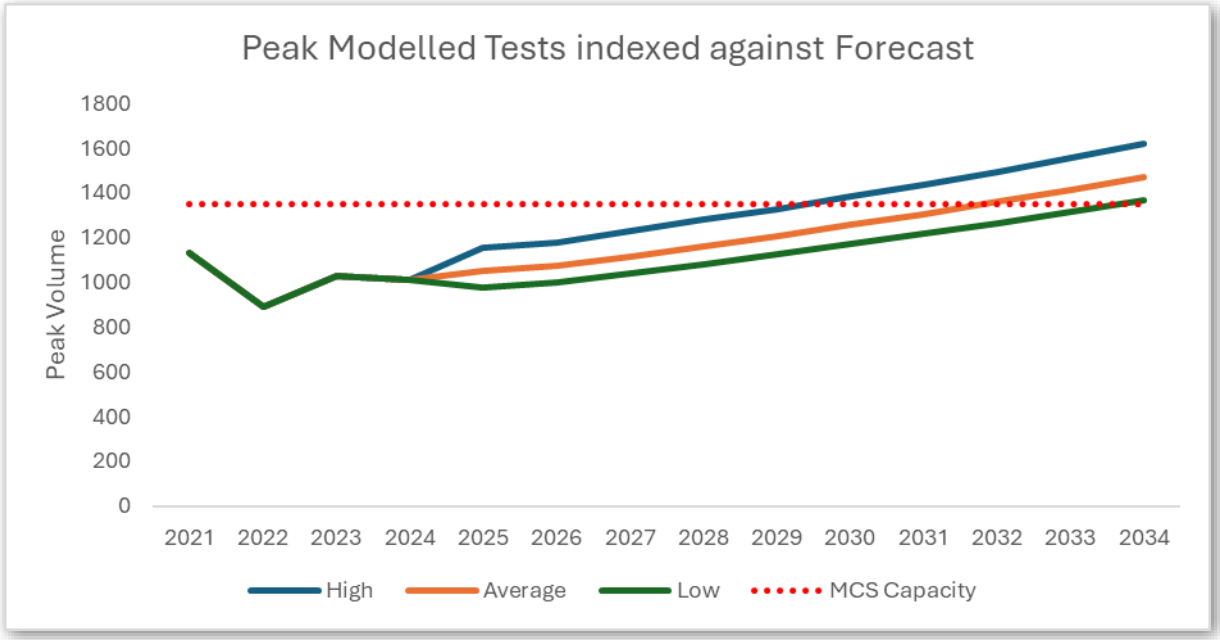
Table 1 – Testing volume at peak against peak days forecast (table supporting the above chart)

	2021	2022	2023	2024	2025	2026	2027	2028
Peak volume (mil.)	3,548	3,573	2,970	3,831	3,604	3,681	3,833	3,986
Samples per tray	3,134	3,997	2,884	3,781	3,430	3,430	3,430	3,430
Capacity	1350	1350	1350	1350	1350	1350	1350	1350
Peak samples	1,132	894	1,030	1,013	1050	1073	1117	1162

As seen by the MCS capacity line in chart 7, the industry is easily fit for purpose out to 2028 and beyond. In fact, using the same methodology as reported and assuming a 4% tray (and therefore peak) volume increase year on year, service providers can handle peak capacity until at least 2032.

Furthermore, a low, medium, and high peak testing volume scenario shows that even with peak volume increasing faster than expected, industry is comfortably fit for purpose until 2029 at least. Based on history, we acknowledge that this scenario is unlikely.

Chart 8 – Peak Modelled tests, high, low, and average scenarios



Should testing volumes fail to increase at the forecast rate (which we acknowledge is ambitious), we summarise that the industry's sampling capacity is likely to remain sufficient and existing infrastructure can accommodate demand without significant strain.

5. Service Provider Performance Measurement

5.1. Testing Audit Program

The Zespri auditing program ensures the standards of quality and compliance in service provider testing and sampling. The program covers four key audit areas:

1. Inter-Lab Proficiency Testing to evaluate service provider performance against peer laboratories.
2. Duplicate Testing on the same MA and day to ensure results are consistent and reliable.
3. In-person observations measuring quality and compliance by independent auditors.
4. Zespri Internal Quality Audits where the internal audit team conducts annual audits to evaluate service providers compliance with their quality management system.

The below summarises each audit area and the results.

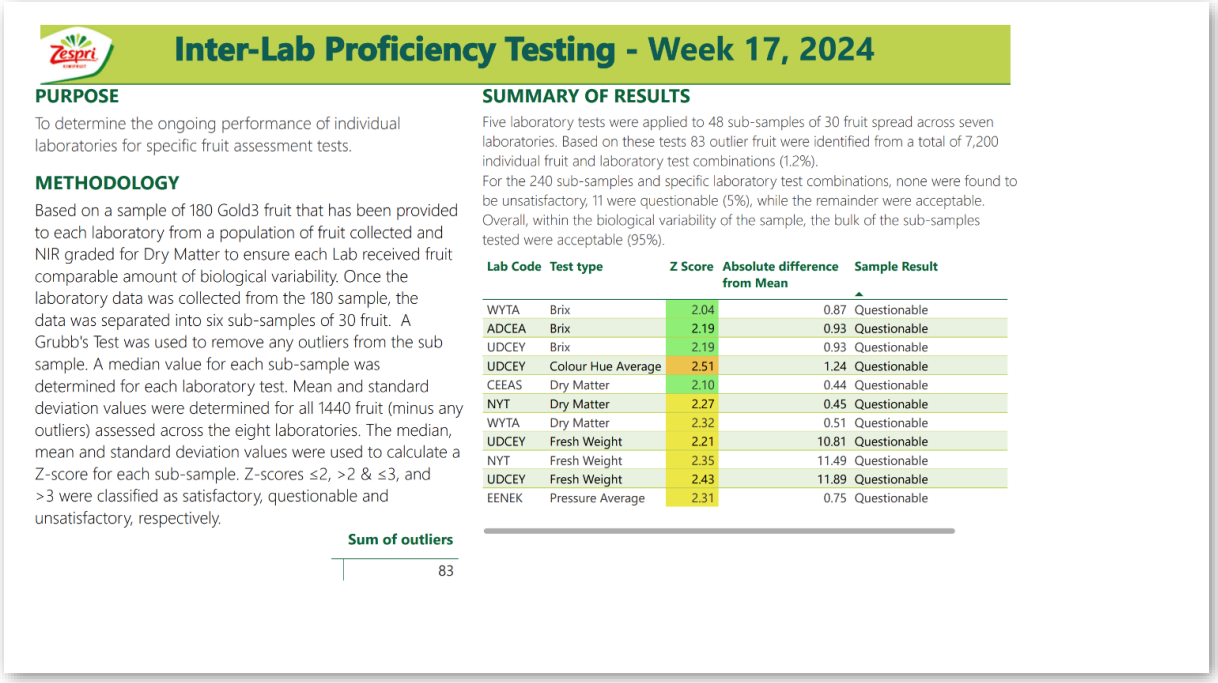
5.1.1. Inter-lab proficiency

The inter-lab proficiency testing program[5] runs across every week of harvest for GA, from week 10 until approximately week 20. The goal is to monitor the ongoing performance of individual service providers across each of the maturity tests (brix, colour, DM, fresh weight, and pressure average) against their peers.

The process begins with the Control Lab (Start-a-Fresh) segregating fruit into comparable sub samples of biological variability using fresh weight and NIR. Samples are delivered (with x-Sense tags for temperature management) and once completed, data is separated into sub samples to run through a statistical Grubbs test to remove outliers. Using the median for each sub-sample, the result is then compared to the individual service provider results. Zespri then apply a score to determine if the results are ‘satisfactory’, ‘questionable’ or ‘unsatisfactory’. These results are summarised, blind coded and sent out to the service providers weekly. Service providers are aware of their own blind code.

[5] The Inter-lab testing for MCS providers only. There is a pan-industry proficiency test in week 9, where packhouse labs are invited to join.

Image 2 – Inter-Lab Proficiency Testing Example, page 1



Inter-Lab Proficiency Testing - Week 17, 2024

PURPOSE

To determine the ongoing performance of individual laboratories for specific fruit assessment tests.

METHODOLOGY

Based on a sample of 180 Gold3 fruit that has been provided to each laboratory from a population of fruit collected and NIR graded for Dry Matter to ensure each Lab received fruit comparable amount of biological variability. Once the laboratory data was collected from the 180 sample, the data was separated into six sub-samples of 30 fruit. A Grubb's Test was used to remove any outliers from the sub sample. A median value for each sub-sample was determined for each laboratory test. Mean and standard deviation values were determined for all 1440 fruit (minus any outliers) assessed across the eight laboratories. The median, mean and standard deviation values were used to calculate a Z-score for each sub-sample. Z-scores ≤2, >2 & ≤3, and >3 were classified as satisfactory, questionable and unsatisfactory, respectively.

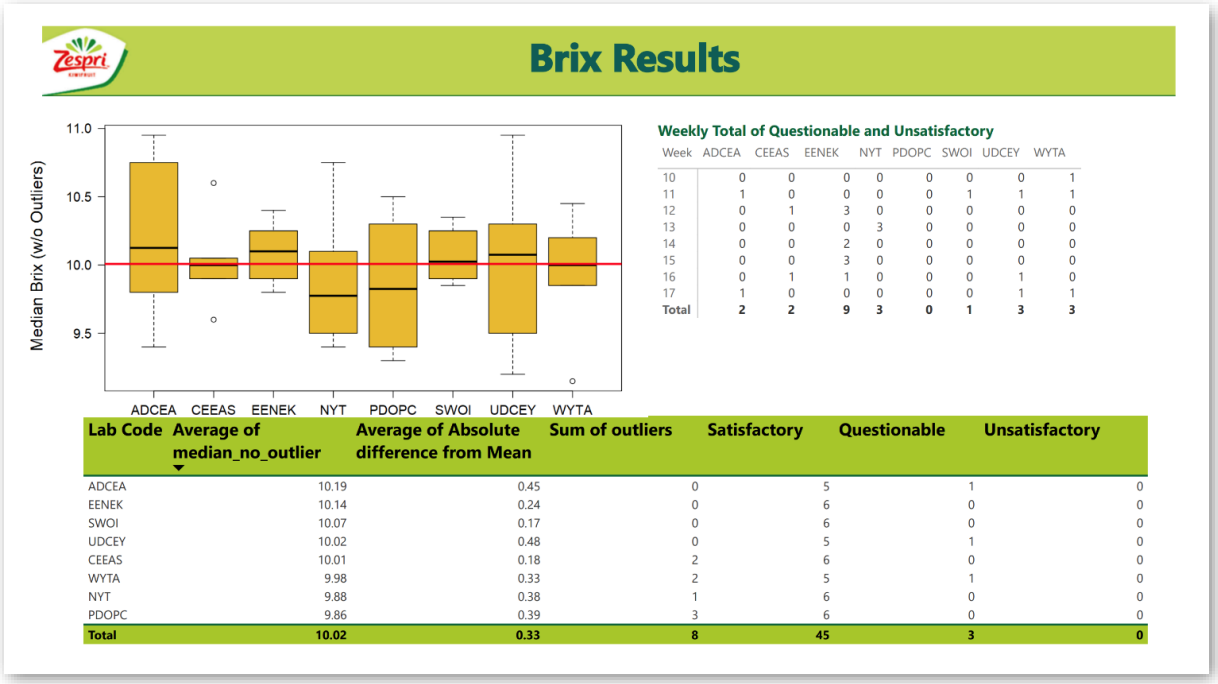
Sum of outliers
83

SUMMARY OF RESULTS

Five laboratory tests were applied to 48 sub-samples of 30 fruit spread across seven laboratories. Based on these tests 83 outlier fruit were identified from a total of 7,200 individual fruit and laboratory test combinations (1.2%).
For the 240 sub-samples and specific laboratory test combinations, none were found to be unsatisfactory, 11 were questionable (5%), while the remainder were acceptable. Overall, within the biological variability of the sample, the bulk of the sub-samples tested were acceptable (95%).

Lab Code	Test type	Z Score	Absolute difference from Mean	Sample Result
WYTA	Brix	2.04	0.87	Questionable
ADCEA	Brix	2.19	0.93	Questionable
UDCEY	Brix	2.19	0.93	Questionable
UDCEY	Colour Hue Average	2.51	1.24	Questionable
CEEAS	Dry Matter	2.10	0.44	Questionable
NYT	Dry Matter	2.27	0.45	Questionable
WYTA	Dry Matter	2.32	0.51	Questionable
UDCEY	Fresh Weight	2.21	10.81	Questionable
NYT	Fresh Weight	2.35	11.49	Questionable
UDCEY	Fresh Weight	2.43	11.89	Questionable
EENEK	Pressure Average	2.31	0.75	Questionable

Image 3 – Inter-Lab Proficiency Testing Example, page 2



Brix Results

Weekly Total of Questionable and Unsatisfactory

Week	ADCEA	CEEAS	EENEK	NYT	PDOPC	SWOI	UDCEY	WYTA
10	0	0	0	0	0	0	0	1
11	1	0	0	0	0	1	1	1
12	0	1	3	0	0	0	0	0
13	0	0	0	3	0	0	0	0
14	0	0	2	0	0	0	0	0
15	0	0	3	0	0	0	0	0
16	0	1	1	0	0	0	1	0
17	1	0	0	0	0	0	1	1
Total	**2**	**2**	**9**	**3**	**0**	**1**	**3**	**3**

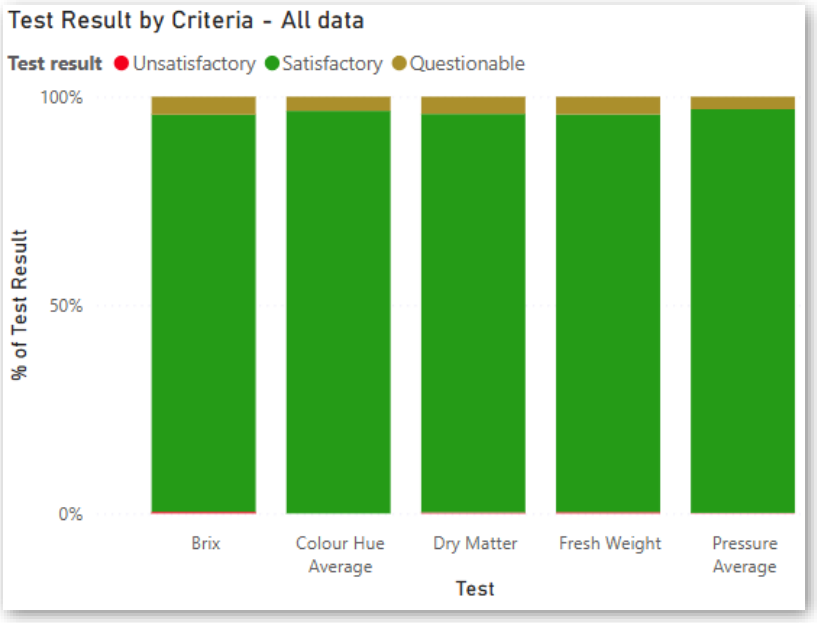
Lab Code	Average of median_no_outlier	Average of Absolute difference from Mean	Sum of outliers	Satisfactory	Questionable	Unsatisfactory
ADCEA	10.19	0.45	0	5	1	0
EENEK	10.14	0.24	0	6	0	0
SWOI	10.07	0.17	0	6	0	0
UDCEY	10.02	0.48	0	5	1	0
CEEAS	10.01	0.18	2	6	0	0
WYTA	9.98	0.33	2	5	1	0
NYT	9.88	0.38	1	6	0	0
PDOPC	9.86	0.39	3	6	0	0
Total	**10.02**	**0.33**	**8**	**45**	**3**	**0**

To determine whether a sample result is satisfactory, questionable, or unsatisfactory, Zespri use the median, mean and standard deviation values to calculate a Z-score[6] for each sub-sample. Z-scores are ≤2 (satisfactory), >2 & ≤3 (questionable), and >3 (unsatisfactory). The Fruit Performance team review the results and send to the MCS Manager for review.

Over the last three years, 96% of results were satisfactory or within allowable limits; 3.8% were questionable. Only 0.22% of samples were unsatisfactory.

Across each of the testing criteria these results showed similar percentages of satisfactory, questionable, and unsatisfactory, with no maturity test type standing out. This is a testament to the results and individual service providers but also showing that the control lab is effectively segregating fruit.

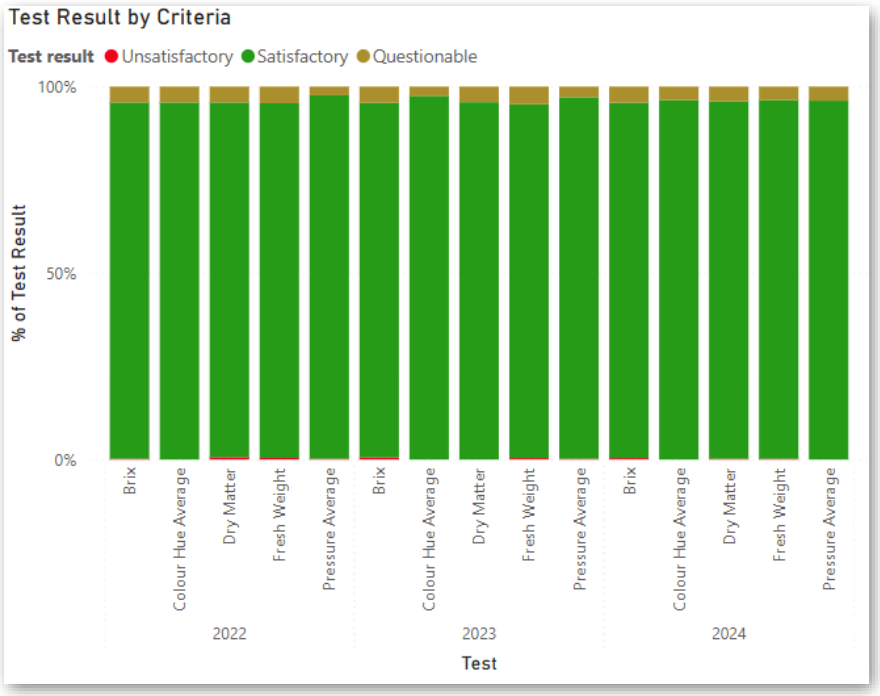
Chart 9 – Proficiency Test Result by Criteria, 2022 to 2024



[6] Formula: (Batch Median – Inter-laboratory Mean) / Inter-laboratory Standard Deviation

When viewing the data at year by test type by audit result level, again the results are very consistent with no apparent outliers.

Chart 10 - Test Result by Criteria by Year



5.1.1.1. Questionable Results

Chart 10 above shows questionable results contribute less than 4% of the total proficiency testing. Questionable results have increased slightly (92 to 102) over the last three years. The lab-to-lab results remain variable with arguably only one service provider having a multi-year concern (see lab code SWOI above), averaging 20% of all questionable tests over the last three years. No other service providers show any great concern.

Analysing the same data over multiple years by ISO week, it is evident that there is no clear pattern emerging between any service provider, with each having a small number of questionable results each year due to natural variability in kiwifruit.

Chart 11 – Questionable Results

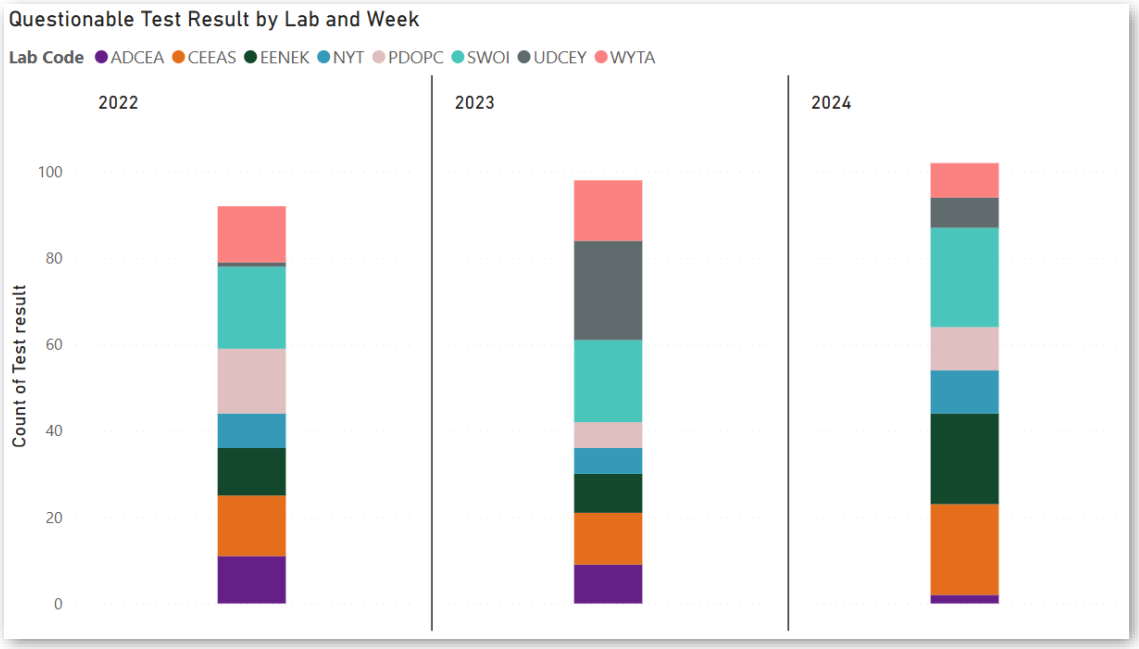
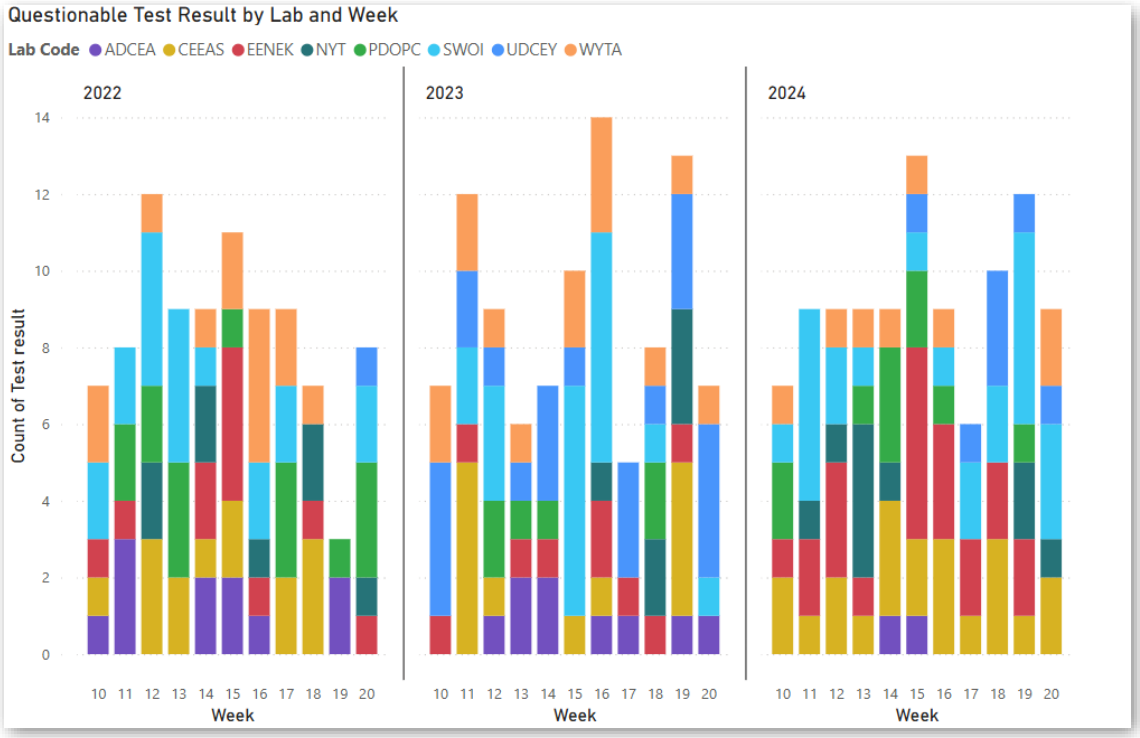


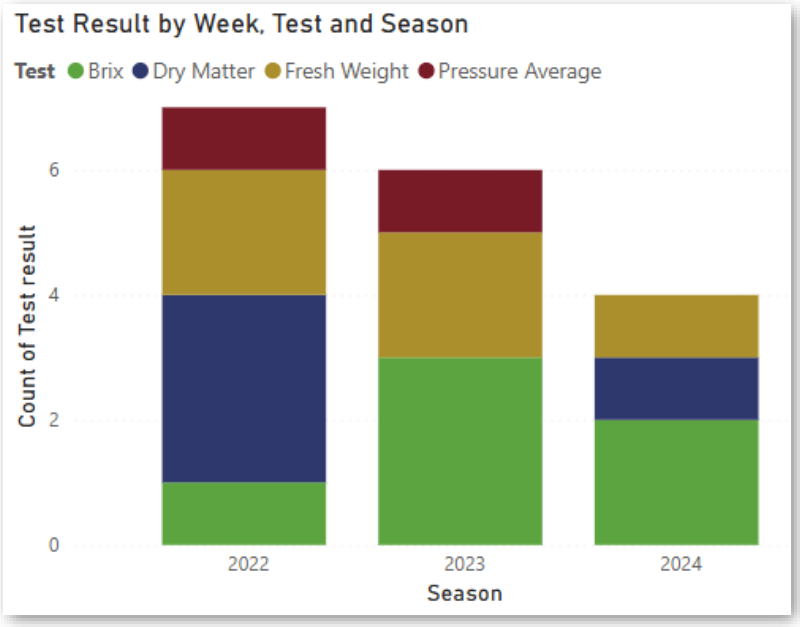
Chart 12 – Questionable Results by ISO



5.1.1.2. Unsatisfactory Results

Despite a slight increase in questionable results, the unsatisfactory results, or all those tests with a 'Z score' of three or greater, has decreased over the last three years. It should also be noted that no specific maturity criteria stands out as an outlier year to year. At less than half of half a percent of all proficiency inter-lab testing, this is a particularly good result and an even more pleasing trend.

Chart 13 – Unsatisfactory Results



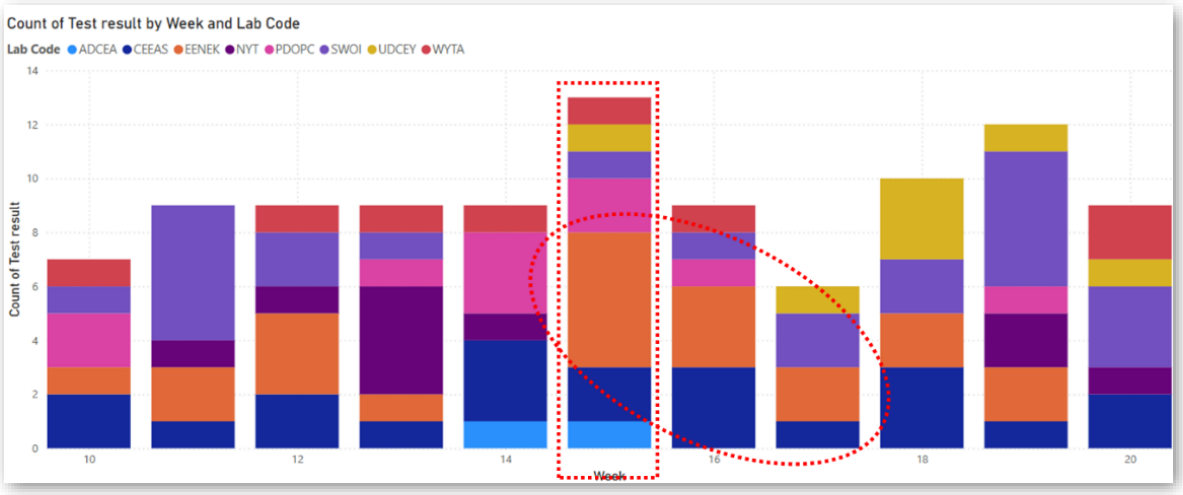
5.1.1.3. Corrective Actions

Once the proficiency sample results are available, they will be subject to a review by the Fruit Performance team, who produce a weekly report with blinded results for sharing with service providers. When outliers are identified the service providers are invited to comment on the differences identified.

Zespri shared in confidence two email threads as examples of corrective actions. While the investigations conducted by the service providers were thorough, it was unclear how Zespri followed up or formally closed off these cases. It appears that Zespri may not have a standardised procedure for investigations, instead relying on service providers to provide templated responses when available. The below is a good example of an intervention from Zespri for (blind) service provider EENEK showing some questionable

results in Brix in 2024, and the corresponding reduction in the quantity of questionable results in the following weeks.

Chart 14 – Questionable Results by Lab Code 2024



5.1.2. AZ Samples

The AZ Sampling Program conducts audits on the sampling and testing of clearance samples by service providers. A duplicate clearance sample is allocated randomly to a service provider to ensure that fruit collected from the same maturity area and day, produces consistent and reliable results. AZ samples are then analysed to assess the variability between samples across each laboratory. The differences between AZ and clearance samples are calculated for all measured parameters, and a statistical analysis (t-ratio and t-probability[7]) is performed to identify any significant differences in trends between the two sample types.

Service providers with significant differences over time are flagged by the Fruit Performance Team for further review by the MCS team. The statistical testing method, designed by an independent statistician, assesses whether the differences between AZ and clearance samples exceed what would be expected by random variation. This test is applied to each lab's AZ samples across all measured parameters throughout the season.

[7] T-probability measures the likelihood of observing a result (or a more extreme result) assuming that there is no real effect or difference. A small T-probability (usually ≤ 0.05) indicates that the observed result is unlikely to occur by chance, suggesting a statistically significant effect or difference. A large T-probability (> 0.05) indicates that the observed result could easily occur by chance.

NZKGI were provided the results of all AZ samples from the past three years. A summary of the findings is provided below. For consistency, 2024 data is included for both varieties[8].

Note that the results represent the average maturity measures for each day, as some AZ samples may have been completed across more than one service provider on the same day. Commentary is provided if the visual representation does not accurately reflect current 2024 trends as well as any service provider specific commentary by week. A 3% upper and lower tolerance has been added for visualisation[9] purposes only, where any deviations beyond this 3% tolerance will be considered outliers.

Table 2 – Upper and lower 3% tolerances by maturity metric

Measure	Average	Upper	Lower
Colour	105.00	108.15	101.85
Weight	140.00	144.20	135.80
Brix	9.00	9.27	8.73
Dry Matter	17.50	18.03	16.98
TZG[10]	0.70	0.77	0.73

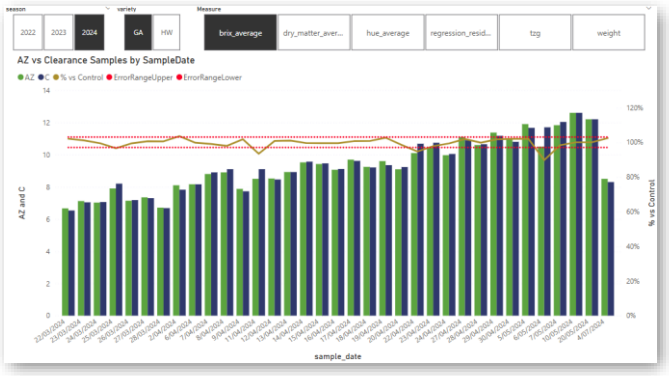
5.1.2.1. Brix

In 2024 there were five GA Brix outliers. The result is almost identical to 2022 and 2023. As Brix increased throughout the season there was no noticeable difference in outliers identified, with the fruit becoming more mature. At a service provider level there were no significant outliers identified, with one service provider potentially requiring some follow up.

[8] A comprehensive report covering all years, maturity measures, and varieties is available upon request.
[9] This does not seek to replace the T-ratio and T-probability analysis already being completed by Zespri.
[10] TZG Outliers have been increased to 10% as TZG is reported in fractions.

In HW there were three identifiable outliers in 2024, none in 2023 and two in 2022. Notably 2024 produced the most consistent results at the tail end of the season where the fruit was becoming more mature.

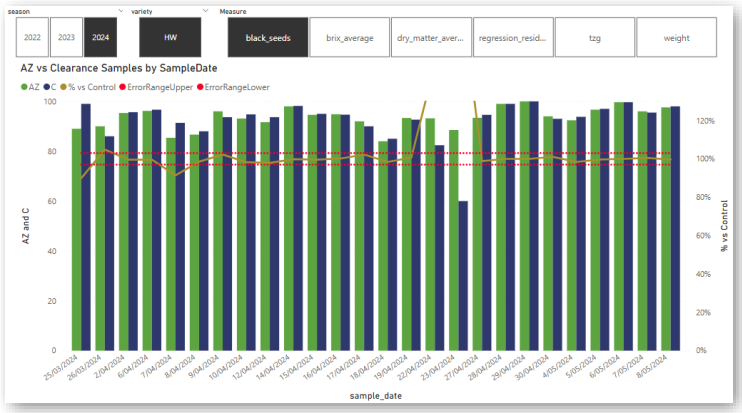
Chart 15 and 16 – Unsatisfactory Results: Brix



5.1.2.2. Seeds

Except for two extreme outliers on the 22nd and 23rd of April of 2024, seed results were similar between AZ and Clearance samples. The outliers were notable across two different service providers, and these were extreme outliers against their own long-term trends also. This suggests noticeable differences in the actual seed count within the fruit as opposed to process concerns, as it would be a fair assumption to make that a seeds percentage from 88% to 60% would be easily identified. Removing these from the commentary, there were only two other outlier results in 2024 recorded, and this is consistent with 2022 and 2023 where there are one to two results outside the range identified each year.

Chart 17 and 18 – AZ results for 2024: Seeds



5.1.2.3. Colour

Colour results were excellent with no outliers identified across any year or service provider.

Chart 19 – AZ results for 2024: Colour

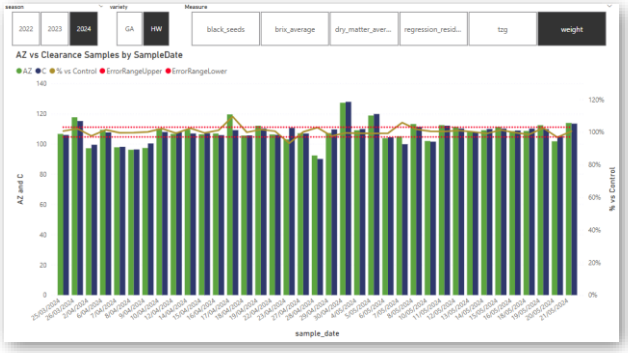
5.1.2.4. Weight

In 2024 there were eight outliers in GA for weight. This is consistent with previous years' results. Each service provider produced outliers throughout the season, with similar quantities year-on-year.

HW had four outliers, two more than in 2022 and 2023. However, service provider-level results in HW showed consistent levels of outliers annually. As the measure is using a 90-fruit blind (random) sample, a level of variability is to be expected for weights as fruit selection will have an impact on outcomes.

Notably, while GA's overall outlier trend remained steady, significant variations existed between service providers. Some providers had results differing by up to 19% (137g vs. 115g) between samples, exceeding the 3% tolerance threshold. These results of course are from different pieces of fruit, so natural orchard variability and fruit selection needs to be considered.

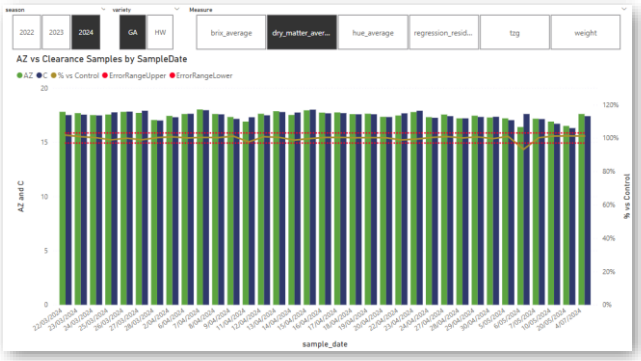
Chart 20 and 21 – AZ results for 2024: Weight (gm)



5.1.2.5. Dry Matter

2024 was the only year of the last three that produced any DM outliers, one each for GA and HW, respectively.

Chart 22 and 23 – AZ results for 2024: Dry Matter



5.1.2.6. TZG

The TZG review yielded more variable results. This supports the rationale behind grower decisions in that the fluctuating nature of TZG results can be expected and growers can capitalise on these variations to achieve commercial benefits.

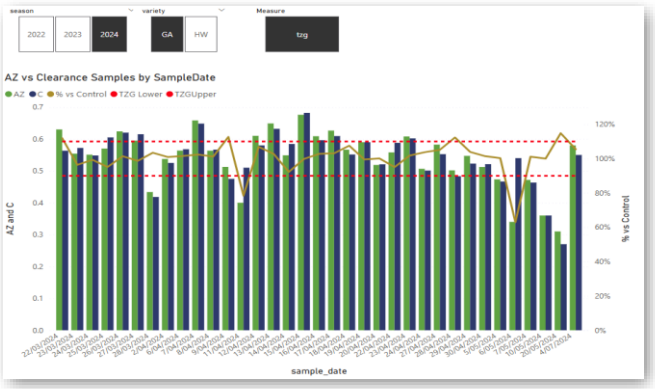
TZG outliers have been updated to a 10-basis points range to visually allow for expected results which will have natural bounce in them and considers that TZG results are presented as decimals. There were still more outliers in 2024 than in the previous two years in GA. Considering fruit weight results produced eight outliers in 2024, and TZG is a product of fruit weight and DM, these results are not entirely unexpected. There is

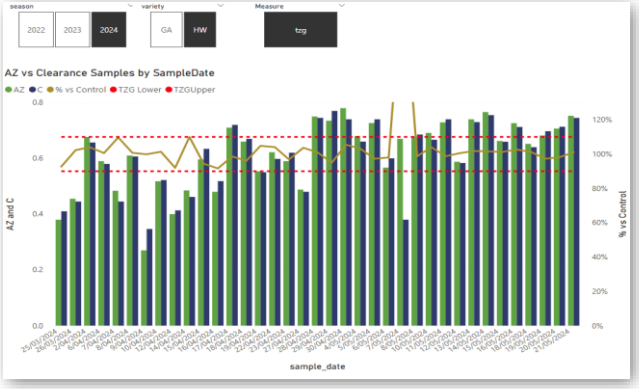
no consideration made in this commentary for any natural variability as properties recover from the cyclones of 2023.

Not unlike the results seen in GA fruit weight (see 4.1.2.4 Weight), while the overall outlier trend was consistent, significant variations were observed between service providers with some differing by (absolute) 20% and up to 50% (0.40 to 0.50 TZG points and 0.24 to 0.36 TZG points respectively) between samples. Like clearance samples, these are allocated in line with service provider share so it would be unfair to represent outliers as a share of AZ samples completed, however note that one service provider has outstanding results considering the amount of AZ samples completed.

In 2023 and 2024 there was only one outlier week identified in HW. This was an improvement on 2022 where seven outliers were observed. Between service providers, one reported no outliers, with another having produced a disproportionate number of outliers in both the net count and the range of, with one extreme result of 0.27 TZG points in the clearance sample to 0.84 in the AZ sample[11]. This should be noted as the only extreme of that scale across all years and service providers. Unlike Brix or Colour, variable TZG results is expected.

Chart 23 and 24 – AZ results for 2024: TZG





[11] Upon investigation, this result had a 11.5 gram different in weight and 2.1 difference in Dry Matter so this result is not unexpected and can be explained through fruit selection in the sample rather than equipment or process failure.

5.2. On-Orchard Sampling Audit

Seasonal sampling audits are conducted across all service providers to ensure compliance with Zespri's standards. Audits are independently administered by Foodspec. In 2024, 202 audits were completed. The audits were distributed among service providers based on their assumed volume share. A risk-based approach prioritises employees new to the industry. Audits involve on-site observation of samplers, followed by a review of acknowledgments and corrective actions analysis of GPS tracking results. Service providers are given advanced notice of audits.

The audit results are reviewed and determined if there is a training issue or something more concerning, where anything not deemed of concern is managed by the service providers to review training requirements and share back any corrective actions with Zespri. Serious issues prompt Foodspec to complete an investigation.

A typical audit includes:

- Ensuring the sampler has adequate information available to them and includes the map, address, and maturity areas (MAs) to be sampled down to variety and block level.
- A review of health and safety compliance as well as any additional processes and systems used such as apps (Onside or proprietary) and additional sanitation practices.
- A review of the full sampling procedure including but not limited to;
    - bag use
    - chain of custody control
    - technology adopted
- A summary of how the sampler chooses to select the fruit, being transect or linear patterns, and the rationale for that decision.
- The sampler is buddied during the audit, and sampling methodology is discussed to determine if the sampler understands the rationale about how they are sampling, including;
    - Blind sampling
    - Healthy vine sampling practices
    - Transects selection
    - Labelling
    - Representative spacing in the vine

A report is sent to both the Zespri MCS team and the service provider at the end of each audit. A full end-of-season report is then summarised and sent to Zespri reviewing the full season and highlights observations, insights, and recommendations for improvement.

Key findings from the 2024 report:

- Most providers had good processes in place, with some areas for improvement identified.
- Samplers generally understood the requirements for 60-fruit and 90-fruit samples but did note that some uncertainty remained.
- While some providers had varying methodologies for selecting fruit for sampling, these were part of service provider training and allowed an orchard-to-orchard flexibility. This was applied consistently within service providers, albeit not consistently *between* providers. It was however noted that these were done well.

Concerns raised:

- Excessive sward
- Unrestrained dogs on orchard
- Poor signage (although map improvements were noted() with samplers having to spend time confirming the blocks requiring sampling
- Comments were also made about the continued frustration with sprayers on orchard at the time of sampling.
- Service provider interpretation for selection of the 60-fruit

While the 60-fruit sample methodology was well understood by most samplers, Foodspec noted the service provider interpretation for selection of the 60-fruit sample did vary. Operating under instruction from Zespri, Foodspec audited that at the point of fruit selection, the sampler is to *pause*, *scan* (using arm's length as a guide) and *select* the smallest, healthiest piece of fruit in that area. It was noted that this method is not documented in the Zespri sampling specifications and noted that this leads to debate with service providers over which is the required and therefore correct method.

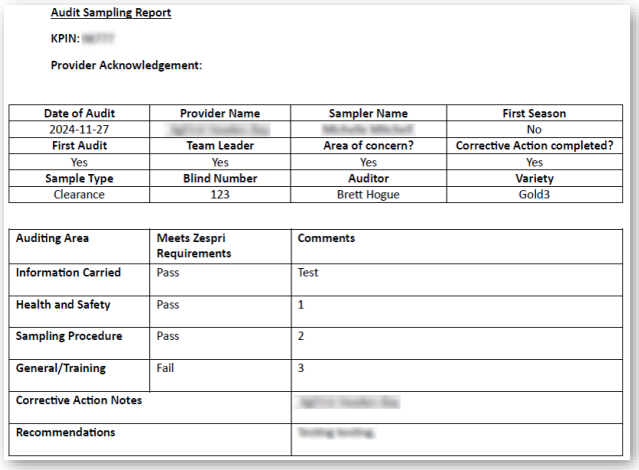
Single fruit per vine requirement was well covered in observed training sessions (note Foodspec only attended BoP training) but did note that some samplers did not seem to be aware of the requirement.

Concerningly, Foodspec has identified a trend where growers are approaching samplers to express frustrations regarding the 60-fruit sample selection process. Specifically, growers are objecting to the selection of smaller fruit sizes and questioning the necessity of the 60-fruit sample at all. This behaviour compromises the integrity of the program, poses health and safety risks, and undermines fairness across the industry. Foodspec also noted the varying qualities of sampler training across service providers.

The report made a number of recommendations. These were:

- To provide clarity around sampling methodology, specifically:
  - 60-fruit sample selection
  - One fruit per vine requirement
  - Sampling outside rows when using linear transects
  - Outside row management
- Managing 10-hectare blocks or larger for Residues samples
- That Zespri emphasise in messaging to growers the benefits of the 60-fruit sample

Image 4 – Example of an audit summary



Audit Sampling Report

KPIN: [redacted]

Provider Acknowledgement:

Date of Audit	Provider Name	Sampler Name	First Season
2024-11-27	[redacted]	[redacted]	No
First Audit	**Team Leader**	**Area of concern?**	**Corrective Action completed?**
Yes	Yes	Yes	Yes
Sample Type	**Blind Number**	**Auditor**	**Variety**
Clearance	123	Brett Hogue	Gold3

Auditing Area	Meets Zespri Requirements	Comments
Information Carried	Pass	Test
Health and Safety	Pass	1
Sampling Procedure	Pass	2
General/Training	Fail	3
Corrective Action Notes		[redacted]
Recommendations		[redacted]

Overall, the season-end report left the impression of a generally well-run collections program with easy wins identified across clear communication, consistent methodologies, and ongoing and consistent training to maintain the integrity of the clearance program.

5.3. Lab Quality Audit

The Zespri Internal Audit team complete annual audits of each of the service providers. Service providers are given a day's notice for a Process and Quality Systems Audit. Audits are in March or April annually.

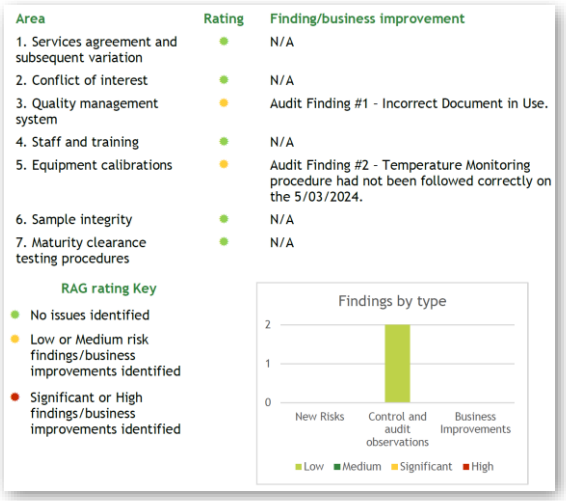
The objective of the audits is to confirm controls and processes observed are in compliance with both the Services Agreement, Variation Agreement(s) if any, and the service providers documented Quality Management Systems (QMS). The MCS team and service provider receive a copy of the report.

The audit covers the following:

- The Global Quality Services agreement and subsequent variation
- Conflicts of interest management
- Quality management system operations
- Staff and training
- Equipment calibrations
- Sample integrity
- ISO accreditation
- Sample chain of custody
- Testing capacity and turnaround times
- Lab Information Management Systems (LIMS)
- Sampling and compromised samples process
- Document control measures and management of records
- Staff resources around training, proficiency, and ongoing competency
- Internal auditing, subsequent review and continuous improvement is also audited
- That practical implementation of testing processes are followed and that tests are being carried out accurately and with adequate supervision
- A full equipment review, reviewing environment and infrastructure, product care (including handling and cleanliness), calibration and verification records as well as control of non-conforming products and corrective actions

Each area of focus is awarded a red (significant), amber (low / medium risk), or green (no issues) rating based on findings or business improvements identified, and the nature of these findings. These are then categorised into New Risks, Control and Audit Observations and recommended Business Improvements.

Image 5 – Example of a summary sent to the Service Providers



Area	Rating	Finding/business improvement
1. Services agreement and subsequent variation	●	N/A
2. Conflict of interest	●	N/A
3. Quality management system	●	Audit Finding #1 - Incorrect Document in Use.
4. Staff and training	●	N/A
5. Equipment calibrations	●	Audit Finding #2 - Temperature Monitoring procedure had not been followed correctly on the 5/03/2024.
6. Sample integrity	●	N/A
7. Maturity clearance testing procedures	●	N/A

The Quality Internal Auditor manages the audit findings and business Improvements where immediate issues are addressed directly with the service provider at the time-of-audit, and any required re-training is completed with supporting documentation. Any audit findings or business improvements are given a close-out date, agreed action, and a review rating is entered into the Zespri Audit and Risk Register, and reported to the Audit Risk Management Committee in a summary report.

Zespri shared an example report in confidence. We found the report to be thorough, neutral, and detailed with practical recommendations made.

While not in scope, we note that this audit is in addition to the service providers requirement to be ISO 17025[12] certified which is audited annually by International Accreditation New Zealand (IANZ). The Zespri audit process has a lot of crossover with the ISO 17025 audit, and given that ample notice is provided, it potentially reduces its effectiveness as an independent assessment. Improvements are suggested in the recommendations section of this report.

5.4. Result Release Times

Service providers are required to have confirmed and delivered 90% of the previous day's sampling data to Zespri by 9:00AM and 100% by 11:00AM. Service provider key technical personnel (KTPs) are required to sign off the raw data before submitting to Zespri.

Once data is received in fruit level or raw data format and marked as completed, the calculation engine runs every 15 mins picking up the latest set of new data. The Zespri team monitor their Incoming Measures Screen seeking to identify any delays and in the minority of days where there are delays, will connect with the service providers.

Once the engine has processed fruit level data to a completed sample, it moves to the release screen where manual data observations are made to ensure data accuracy, looking for such discrepancies as negative slopes or fruit sizes only clearing to size 18, as well as looking for any delayed clearances that require intervention. It is assumed

[12] ISO 17025 is the Competency Standard for Testing and Calibration Laboratories including, chemical, physical, electrical, and biological testing, and the calibration of measuring instruments.

from Zespri that it can take up to 17 minutes for the calculation engine to calculate a sample from start to finish.

5.4.1. Data Arrival Times from Service Providers

The below chart summarises the average arrival time of all results across all service providers by ISO day. Zespri only release completed data simultaneously as one batch and when all samples are completed, as it is essential that the release is equitable whether an individual maturity area has early processed data ready or not.

For analysis purposes, data has been aggregated into additional time bands of 10:00AM and 10:30AM, in addition to the existing 9:00AM and 11:00AM bands, calculating the percentage of total daily samples received prior to these times[13]. Using day 16.5 highlighted in the border below (Chart 25, ISO week 16, day 5 of 2024), 49% of the results were received by 9:00AM, 70% of the results were received by 10:00AM, an additional 20% were received by 10:30AM, with all results in by 11:00AM.

In 2024 service providers delivered almost all their results by 11:00AM every day. There were only three days in the season where results were less than 99% completed. An additional two results were not able to be delivered by 10:30AM, and a total of seven days where results were not able to be delivered by 10:00AM. There were 34 days across the 2024 season where results were not 100% received by 9:00AM. Where the delivery time of 9:00AM was not able to be met, the average delivery percentage across the 34 days was 90%[14].

[13] For consistency, data has been shown from ISO 9 to ISO 25 only.
[14] The KPI for 9 am is 90% delivered, for the purposes of this report, all missed times are assuming 100% delivery.

Chart 25 – % of samples received by time band – 2024.

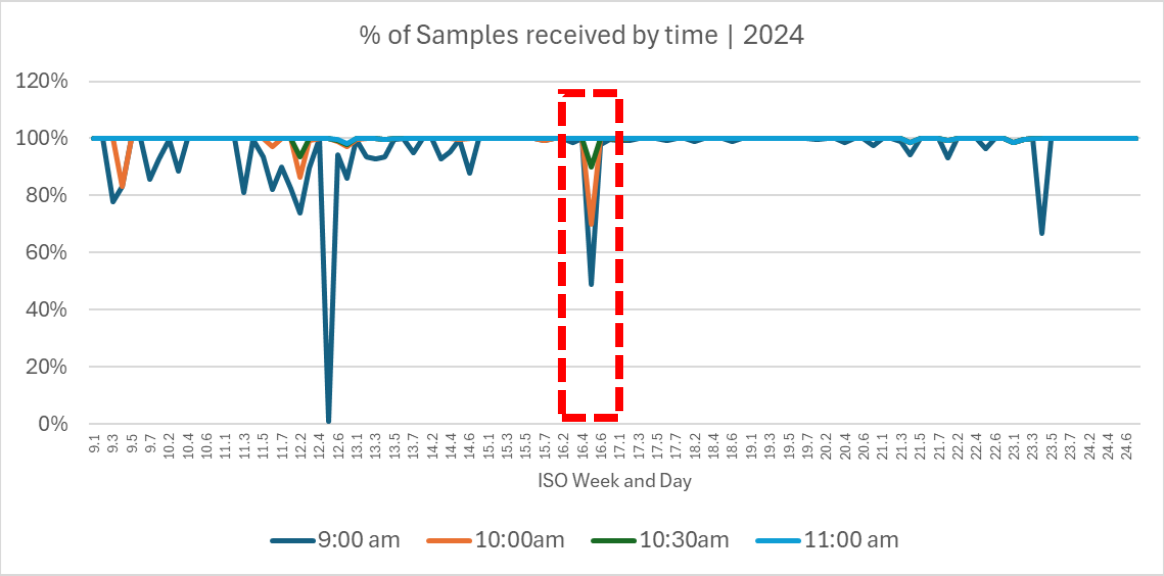
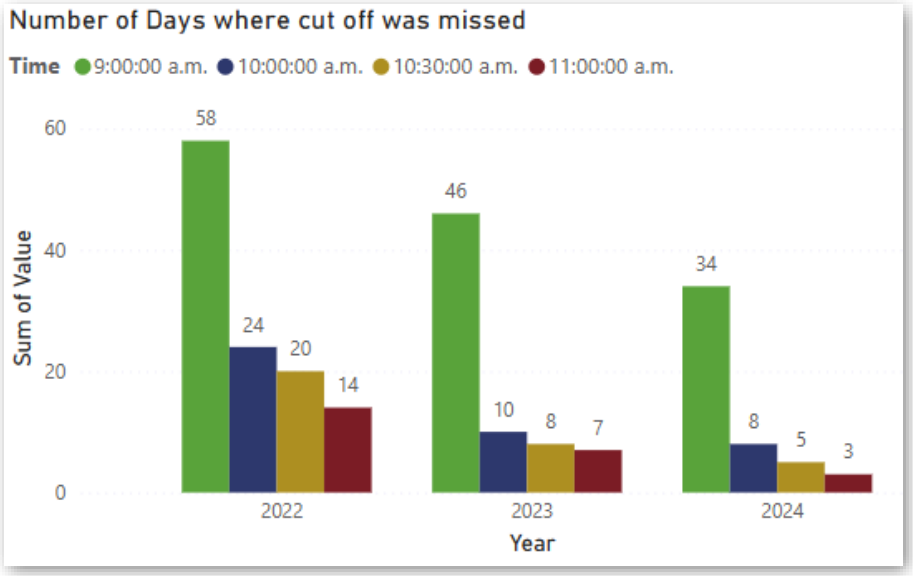


Chart 26 below shows the number of days where 100% delivery was missed by time band[15]. Across each time band, the direction of travel is positive with the quantity of missed days declining year on year. The number of days where 11:00AM was missed has all but halved each year since 2022, reducing to just three days in 2024. Similar trends are noticeable in the 10:30AM cut-off time also.

[15] Example, the 9AM cut off was missed 46 days in 2023.

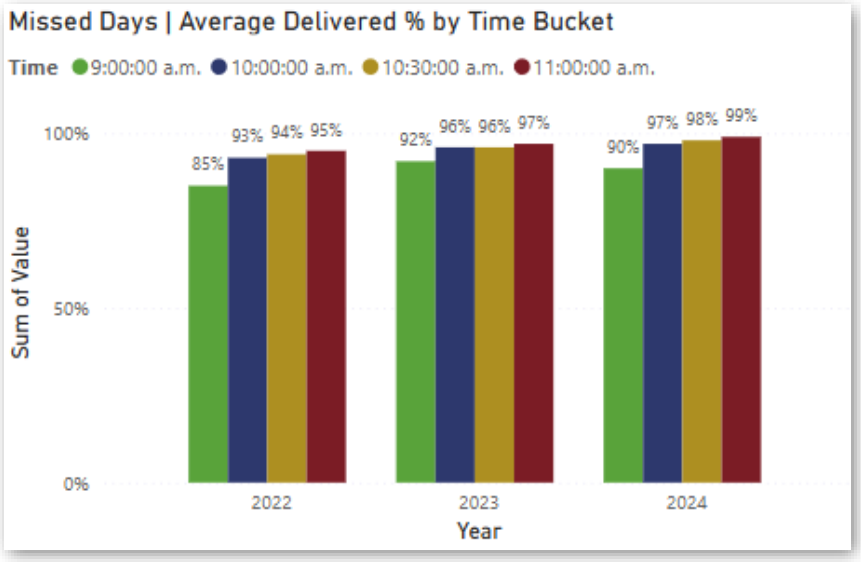
Chart 26 – Count of Days where delivery time was missed by Year.



Despite a large decline from 2022 from 24 days to eight, data receipt times from service providers still have a reasonable chance of being late after 10:00AM, with an average of 97% delivery at this time. Although outside the scope of this report, it is worth noting that the processes for receiving, calculating, reviewing, and releasing data may impact the feasibility of earlier release times. While an 11:00AM release time may be achievable for most of the days, setting expectations for 10:30AM or earlier may be overly ambitious and could lead to inconsistent delivery and subsequent disappointment. If the Zespri 'only release completed data simultaneously' position is reviewed then this possibly expands this where results releases can be staggered as they are ready.

In a related but separate context, returning back to the industry's historical and desirable 7:00AM release time requires careful consideration of its feasibility. Achieving this goal necessitates having KTPs work either night shifts or extremely early morning hours to facilitate timely sign-off of DM results from the previous day's testing. Given the critical role DM plays in growers' commercial outcomes, the role demands the highest calibre of technical personnel available for this task, typically relying on full-time employees rather than seasonal staff. Attempting to expedite this process would place undue burden on less experienced staff members working less-than-desirable hours, potentially compromising quality, and accuracy.

Chart 27 – Delivery % by year on days where cut off was missed.



As shown by chart 28 below, while significantly better (and improving year on year), service provider delivery times by 10:00AM are still a challenge.

Chart 28 – % of samples received by 10AM, last three years.

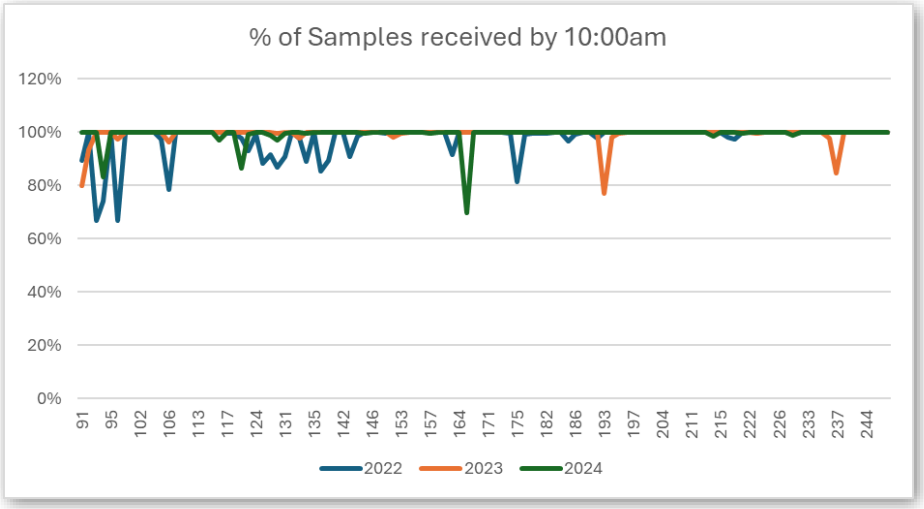


Table 3 – Summary of sample delivery by time band and Season, missed days and average delivery % on missed days.

	2024		2023		2022	
	Missed days	Average % on missed days	Missed days	Average % on missed days	Missed days	Average % on missed days
9:00AM	34	90%	46	92%	58	85%
10:00AM	8	97%	10	96%	24	93%
10:30AM	5	98%	8	96%	20	94%
11:00AM	3	99%	7	97%	14	95%

6. Sample Variability

Zespri define DM outliers[16] as any DM result that is more than 0.5 DM points higher or lower than the expected result, being determined by the combined samples model using the industry standard DM curve.

Post-harvest facilities can also challenge any sample at the end of the season by supplying the sample number(s) and the reason for the challenge. Zespri would then review this and confirm the outcome.

Seasonal DM anomalies are inevitable, as illustrated in Chart 29. These variations can arise from factors such as natural kiwifruit variability, sampling complexities, or the less likely equipment calibration. While the 90-blind and 60-small fruit samples, as well as drying temperature and time efficacy can contribute to anomalies, evidence indicates

[16] Zespri completes a dry matter check on maturity areas with at least three tests within any 25-day window. Any clearance samples with dry matter significantly below what was predicted for the maturity area, are not charged.

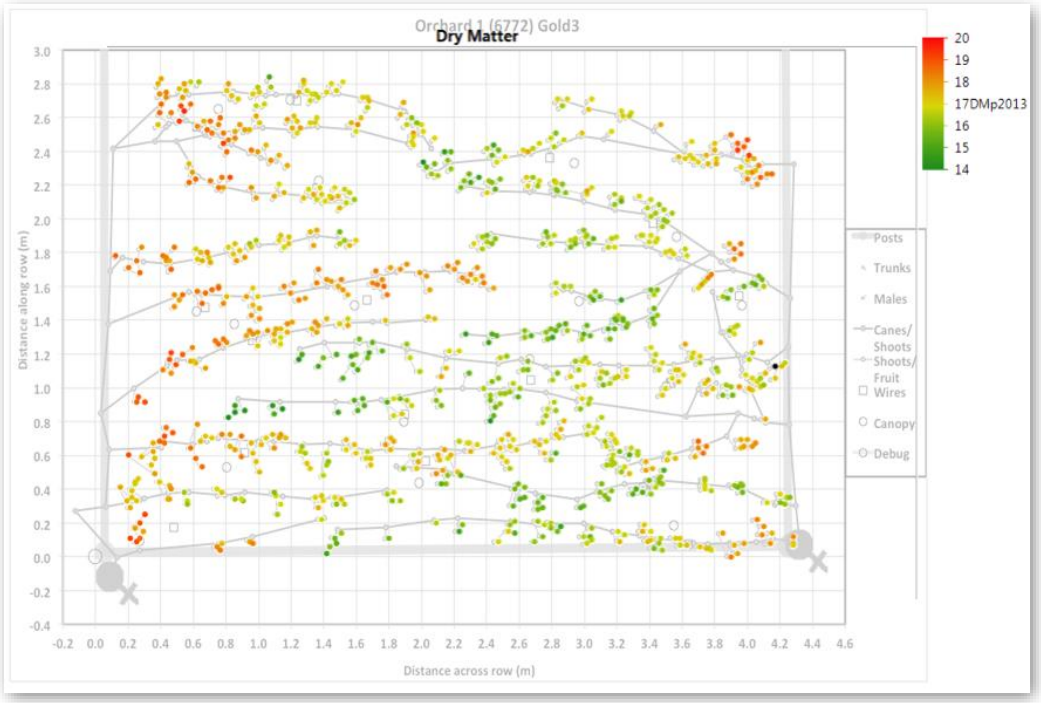
that Zespri has implemented controls to detect and investigate outliers across these potential sources of variation.

As seen below, every kiwifruit bay contains natural variability[17] with differing DM outcomes not only within the bay, but cane and also shoot. As such, Zespri has a standardised fruit sampling process involving collecting kiwifruit from three specific locations within the bay.

1. Base of the cane (Bay 1)
2. Midway down the cane (Bay 2)
3. End of the cane (Bay 3)

This cycle is then repeated for subsequent bays to ensure a randomised sample. However, the below does show the challenge in designing a fit-for-all-orchards procedure.

Image 6 - Individual Fruit Dry Matter measurement from a GA Opposing Female bay.



[17] Source: Bob Jordan and Andrew McGlone, Plant and Food Research Ruakura. 3D imaging and corresponding Dry Matter measurement from a GA Opposing Female bay.

Chart 29 below shows DM outliers for the last four years.

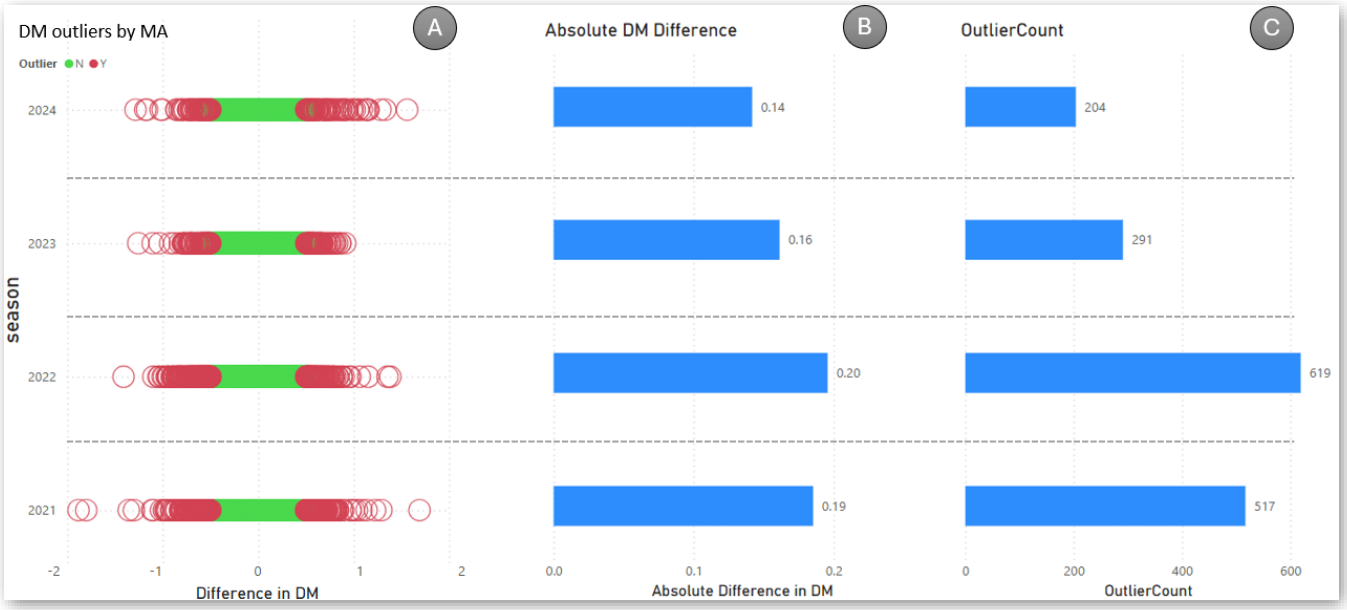
- Chart A (DM outliers by MA) is the number of MAs by year that meet the outlier threshold (red circles, or Outliers = Y. Green circles are not outliers or within an absolute 0.5 DM points)
- Chart B (Absolute DM difference) is the average deviation in DM from the expected result expressed as an absolute value, thereby avoiding any potential skewing of averages
- Chart C (Outlier Count) is the net count of samples with outlier results, or the sum of the red circles

The season-to-season range of differences in DM remains relatively stable. Of note the intensity of the range (the number of red circles) is less in 2024 and this contributes to a positive result in charts B and C also. The range of the outliers in 2021 has not been seen since, suggesting an overall positive trend.

Standardising the DM difference to an absolute value, the long-term trend is promising and shows the absolute DM difference year to year decreasing from a peak of 0.20 in 2022 to 0.14 in 2024.

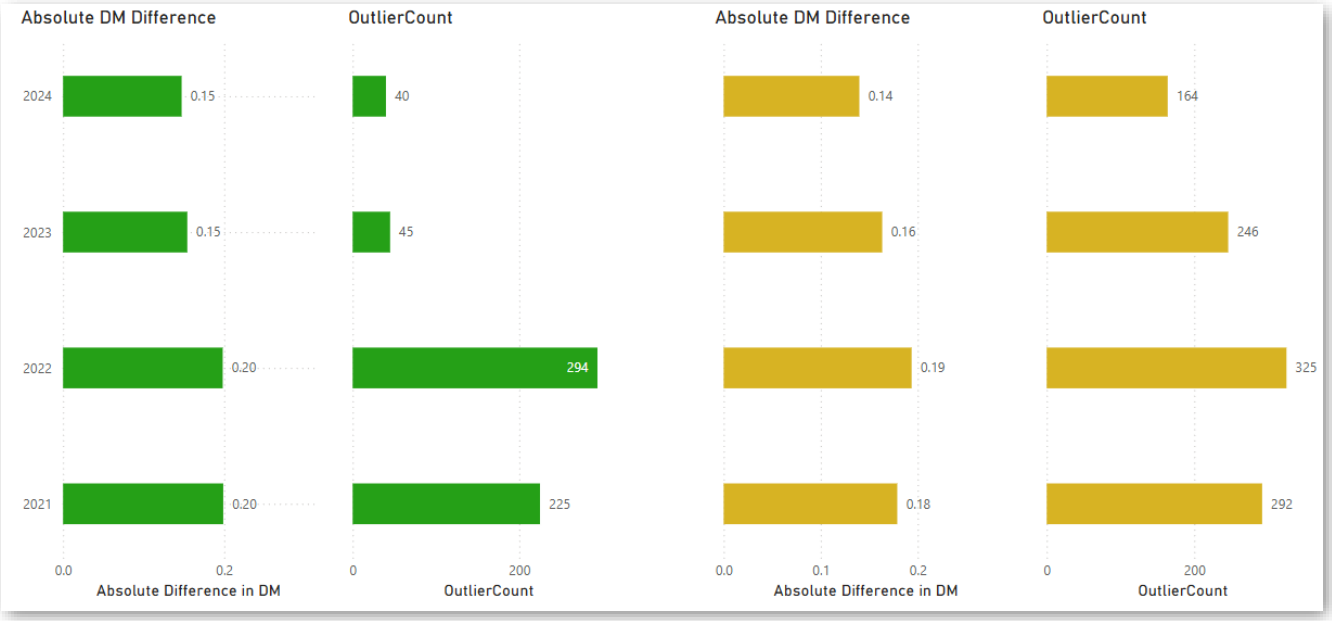
This is largely mirrored in part C of chart 29, which is the count of actual outliers identified by season, decreasing from the peak in 2022 of 619, to 204. 204 outliers is 0.7% of all clearance events.

Chart 29 (A, B and C) - Dry Matter (DM) outliers for the last four years



Separating these results by variety (note the colour coding), it does show similar directions of travel for both varieties, however the results are a lot stronger in HW then they are in GA.

Chart 30 – Absolute DM difference and count of outliers for the last four years – HW and GA



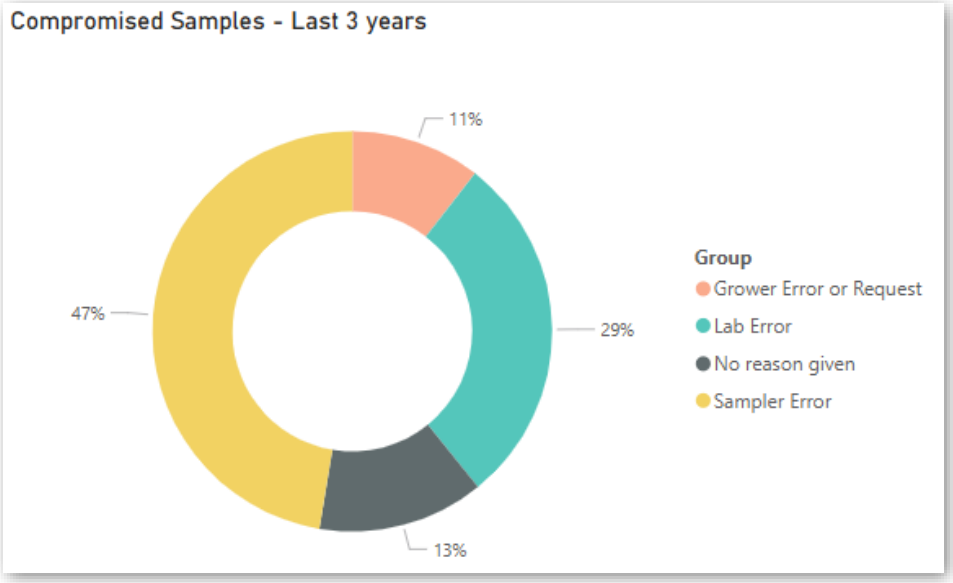
Overall, it appears that Zespri, and therefore service providers, have responded well to the challenges of 2021. Last season delivered improving results for absolute and actual outliers, as well as outliers where DM is less than expected.

7. Test Quality

7.1. Compromised Samples

Zespri define a compromised sample as any sample that has not met the sample requirements, placing responsibility on the service provider to both alert Zespri and remedy. Zespri compromised samples data was provided in raw format, categorised, and then grouped into four main themes; grower error or request[18], lab error, sampler error, or no reason given where internal notes or commentary was missing. At an average of 60 over the last three years, compromised samples average less than 0.25% of clearance events in any given year.

Chart 32 - Compromised Samples - Last three years

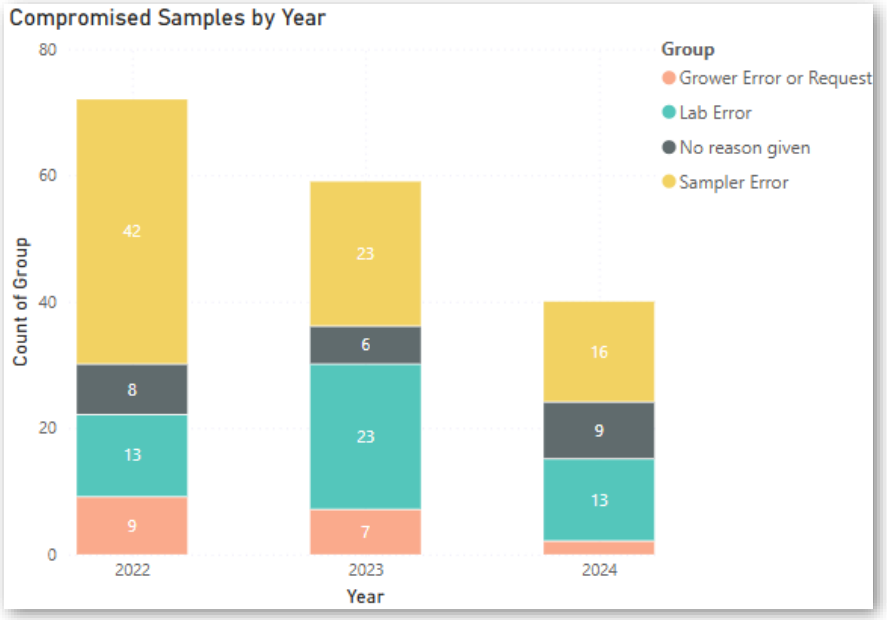


47% of all compromised samples have been due to sampler error and 29% were lab error. Grower errors were 11%, and only 13% were not recorded correctly therefore unable to be categorised.

[18] While Grower errors are technically not compromised samples, they have been included to highlight challenges faced on orchard when samples cannot be completed.

Looking at the wider three-year trend, there has been a 44% decline from the number of compromised samples identified in 2022. The driver of these was a 62% decline in sampler error issues from 42 in 2022 to 16 in 2024.

Chart 33 - Compromised Samples - Last three years

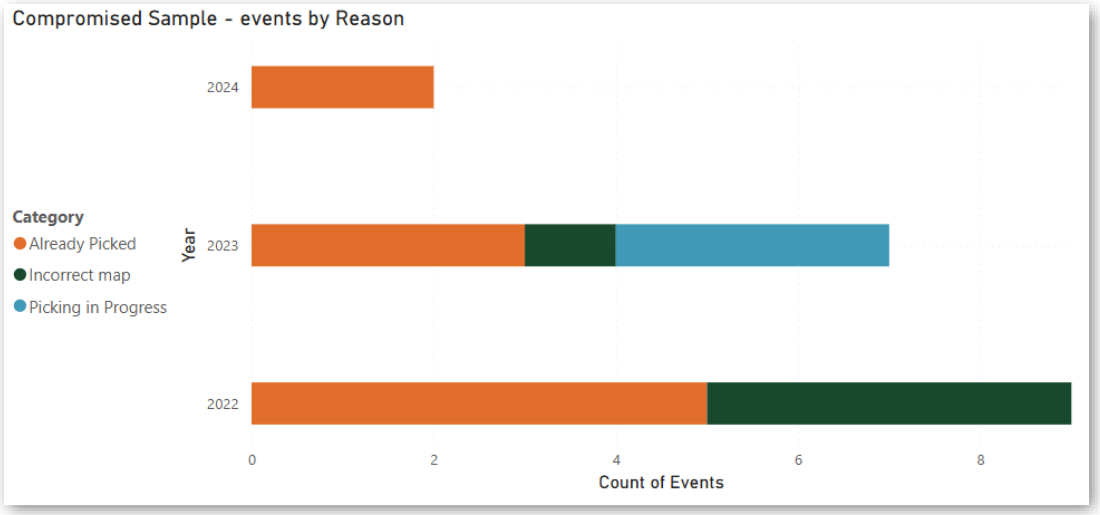


7.1.1. Grower Error

Acknowledging that grower errors do not necessarily result in compromised samples, as they were in the data set, they have been included in this report to highlight challenges faced on orchard when samples cannot be completed.

As shown in chart 34 below, orchards already picked is a multi-year issue, indicating improvements could be made ensure resources are used efficiently. It is good to see maps improving over time as noted in the Foodspec report above also. Picking in progress issues appears isolated to 2023.

Chart 34 - Compromised Samples for last three years – Grower Issues



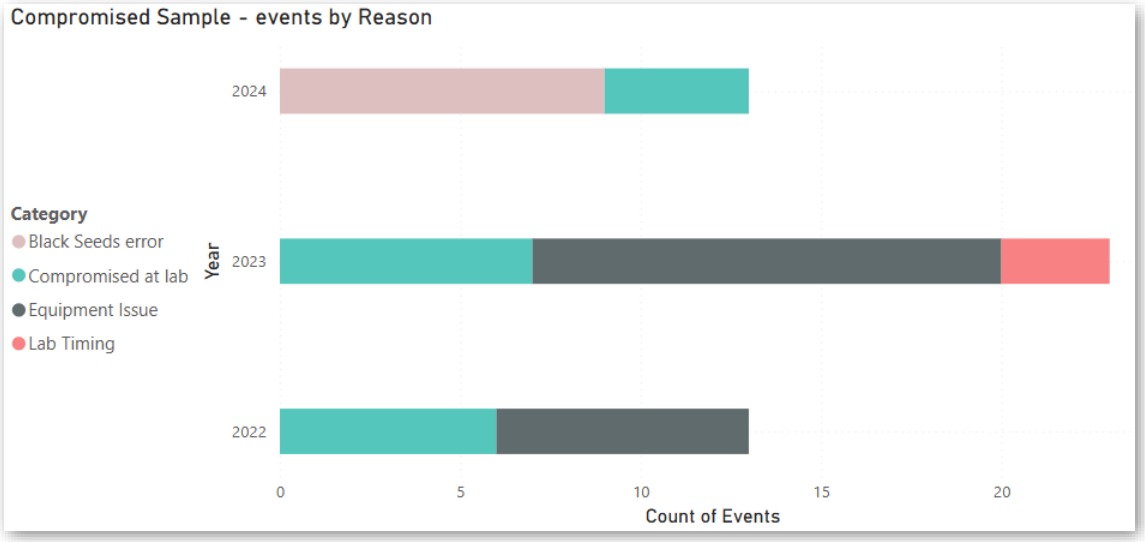
7.1.2. Lab Error

Chart 35 shows compromised samples due to lab errors have increased. Lab errors peaked in 2023 with:

- 13 equipment issues (usually DM timing or dropped samples)
- 3 due to lab timing (samples not logged in on time)
- 7 compromised at lab (with comments ranging from human error to simply 'compromised at lab')

The industry's ongoing challenge with seeds was prevalent in 2024. There were no equipment issues in 2024.

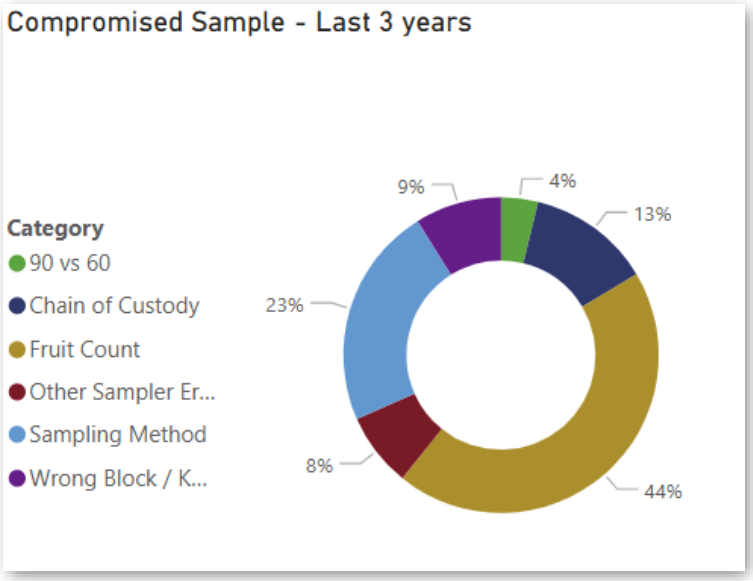
Chart 35 - Compromised Samples for last three years – Lab issues



7.1.3. Sampler Error

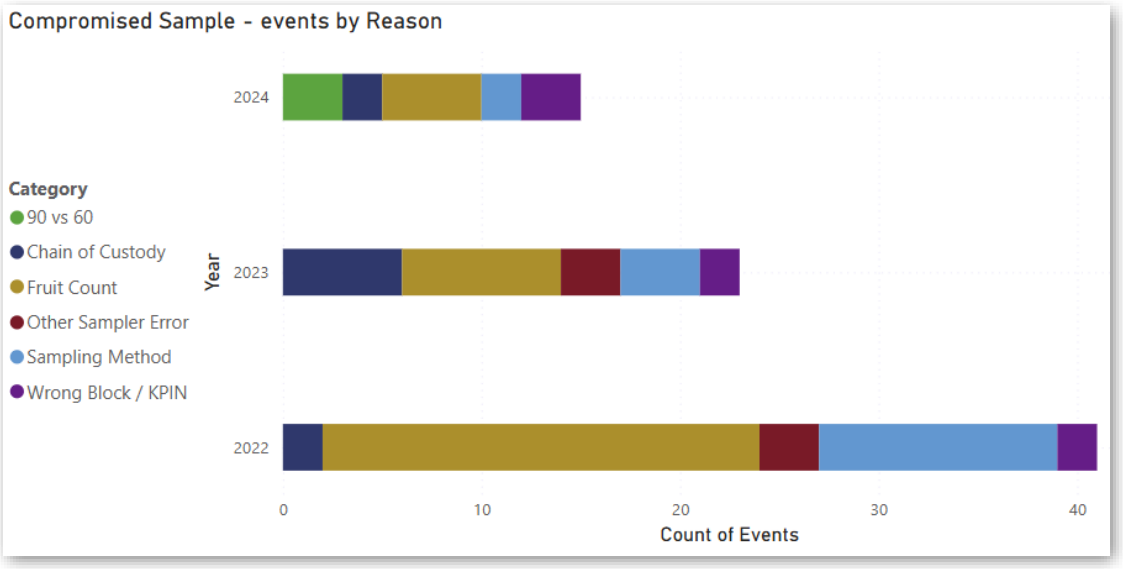
Sampler errors dropped from 41 in 2022 to 15 in 2024. As seen in chart 36 below, Fruit Count (90- and 60-fruit samples being short of fruit and going below the allowable tolerance) have been the largest error type, followed by sampling method challenges and then chain of custody issues (usually labelling or lost bags).

Chart 36 - Stop Samples by Sampler Error - Last three years.



Almost all categories have reduced the quantity of issues in 2024 with the exception of 90 v 60 issues.

Chart 37 - Compromised Samples for last three years – Sampler issues



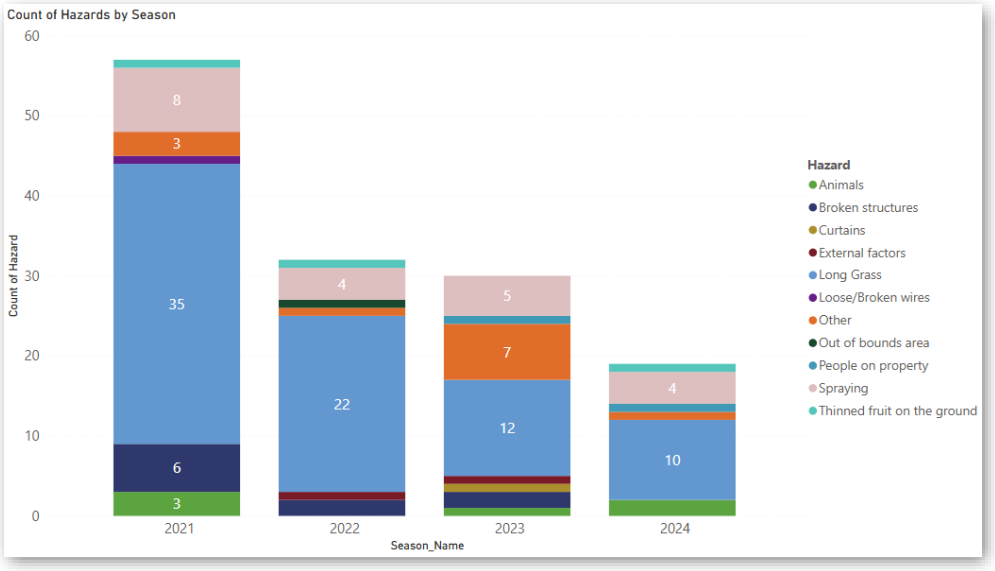
7.2. Stop Sampling Events

Assuming an average of 26,000 clearance events per season across all varieties, Stop Sampling[19] equates to approximately 10% of 1% of all samples (0.115%). The direction of travel of stop sampling events is positive with a year-on-year decline since 2021.

The majority of all stop sampling events each year are long grass, and these remain the highest year-to-year despite a 71% decrease since 2021. Almost all potential stop sampling events are within growers' control, so it is pleasing to see the improvement in results.

[19] Stop Sampling events caused by the impacts of cyclones have been removed from this data where season long Stop Sampling events were placed against affected orchards.

Chart 38 – Stop Sampling events, 2021 to 2024 by reason.



7.3. Grower Disputes

All growers can challenge or dispute their clearance charges where there is a genuine query regarding a sample. Disputes are raised through the post-harvest operator. Zespri do not offer free/refunded tests throughout the year, nor do they complete bulk investigations without support evidence, rather allowing growers the opportunity to challenge results at the end of the year once all samples have been completed. This is also supported by a proactive process from Zespri, where any MAs that completed at least three tests within any 25-day window producing DM averages significantly below what was predicted[20] for the MA, will be zero-charged at the end of the season. This process only happens once harvest has completed.

Data on grower disputes was not available in 2022 and 2023 due to personnel changes within the MCS team. There were two challenges in 2024; one MA each from two post-harvest operators. The outcomes of both challenges were unsubstantiated (either the results themselves or the process for collecting) and were charged in full.

[20] This was achieved by taking the average of all samples within the 25-day window, adjusted by the growth curve, and checking the difference of each sample to that average.

7.4. Grower Complaints

In 2024, Zespri received 22 formal complaints. The complaints were provided to NZKGI, and are categorised in chart 39, and summarised below. Data was not available in 2022 and 2023 due to personnel changes.

- 35% of all complaints were for the results. Growers felt there was a disproportionate sample result (DM or TZG falling beyond expectations) or asking Zespri to review the outcomes due to “one piece of fruit holding it back” or asking for manual dispensation where the “seeds and brix result continue to bounce around”
- 20% of the complaints were due to time on orchard

Influence over methodology (or inability to do so), negative DM slope and sampling pattern issues received two complaints each with the rest being cancelled samples concerns, health and safety and sampling cost concerns.

On review of the complaints, our observation was that Zespri dealt with each issue quickly and determined an appropriate approach. In most cases the Fruit Performance team completed a qualitative desktop review of the results or asked the service provider to confirm their sampling methodology or time on orchard. Service providers provide GPS walking tracks and or sign in / out times on orchard via proprietary apps, which is a term of the contract[21]. Image 7 below show a typical service provider supplied GPS track.

[21] pers. comm, Kerri St Clair

Chart 39 - Grower Complaints - 2024

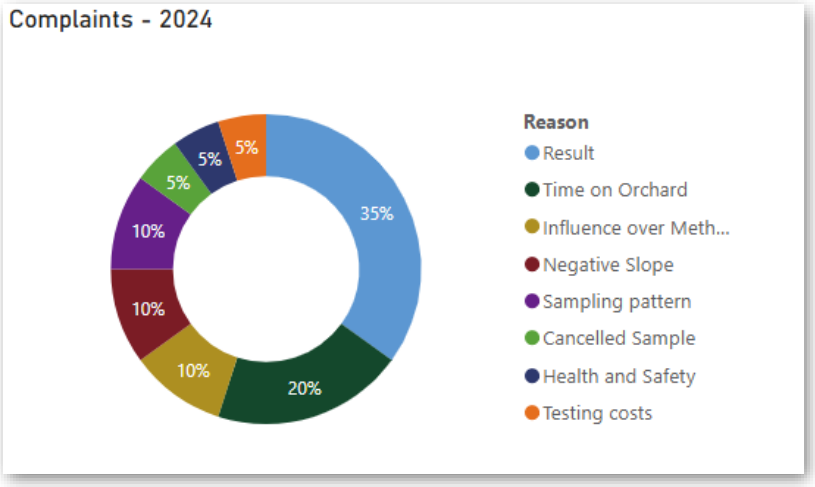
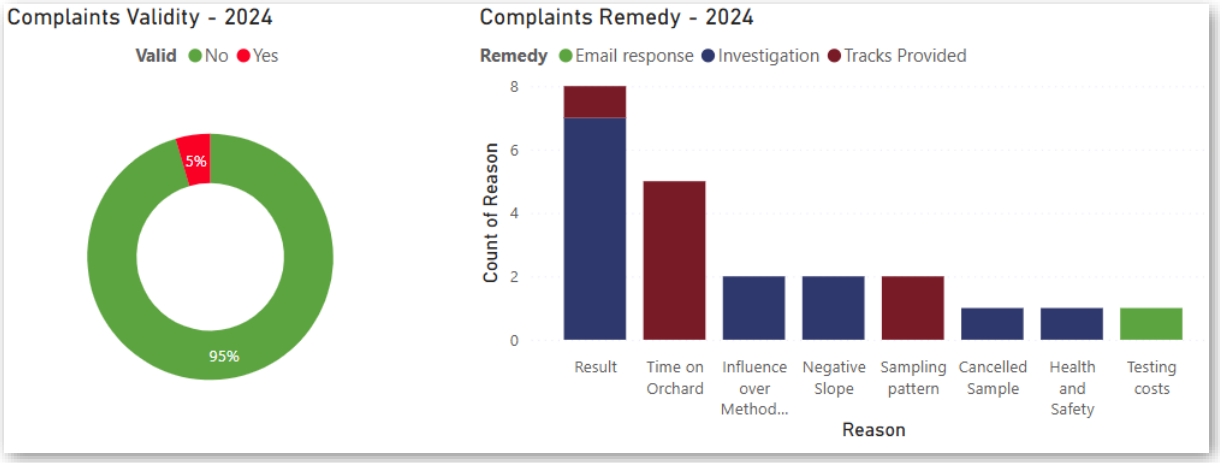


Image 7 – Typical provided GPS walking tracks showing a sampler's track on orchard.

Each technical investigation or service provider-supplied walking track determined that each of these queried samples were either compliant with Zespri processes or calculated correctly.

Only one complaint was upheld in 2024. The complaint was about a health and safety matter on-orchard. The sampler acknowledged they inadvertently walked down a track they were not supposed to, going outside health and safety requirements on the orchard. We found Zespri's responses to growers factual and consistent.

Chart 40 - Compromised Samples for last three years – Sampler issues



8. Zespri Service Provider engagement

Zespri have a formal engagement program with service providers. This is a pre-season and post-season review, fortnightly in-season catch ups, and annual pricing reviews (and or contract renewals where required).

8.1. Pre- and Post-season Reviews

Pre-season reviews provide an opportunity for Zespri and service providers to align on the season requirements, clarify any concerns and agree on how reporting and measurement will take place.

Zespri discuss the intended format and content of the fortnightly meetings, reconfirm any fortnightly and other measurement reporting commentary, cover off any changes to escalations of health and safety or stop sampling processes, and updates to auditing. The opportunity is also given to the service providers to raise any concerns they may have.

Post-season reviews are a detailed results-based review on the season just completed. A full data review is completed on the 90 v 60 sampling results, such as examples where the 60-fruit average weight from the sample is larger than the 90-fruit as well as comparing the fruit weights to that of the maturity area packout at packing time so see how accurately a maturity area was representatively sampled[22]. A review of all auditing data is discussed across proficiency tests, AZ audit samples and Foodspec audits, as is the quality of the sampling and testing throughout the year including delivery and quality of the sample data to Zespri, including compromised and stop sampling events and hazards reported. Zespri take this opportunity to ensure the service providers are measuring and therefore reporting on their DM efficacy ensuring specifications around time and temperature are being met.

Finally, an open discussion is had on in-season queries and industry sentiment to ensure all parties can discuss ongoing issues such as feedback around result timing, black seeds concerns, and concerns / perceptions that growers feel they are always getting the same sampler.

[22] The author acknowledges the historical c. 8-gram difference between sampled fruit and the maturity area packout, being the sampled fruit is often bigger.

8.2. Fortnightly Reviews

Fortnightly reviews are a formal catch up between the service provider and Zespri and are of a similar agenda to the annual post-season review but are often slightly more detailed.

Proficiency and AZ samples data is shared from the Fruit Performance team when outliers are identified, and if available, questionable, and unsatisfactory results will be reviewed, and the same for any AZ samples that have been completed. Zespri note they are looking at overall trends over time, and not isolated issues that may surface, which is different to how AZ samples have been reviewed in this report. Like the end-of-season review, a fortnightly look at the percent of delivery of the final sample data to Zespri, any compromised and stop sampling events are reviewed, as well as any hazards reported. A general conversation on any in-season queries and industry concerns noted, both pan-industry but also service provider specific. If completed, the Foodspec audits are also discussed.

Historically, specific measurement of the on-going performance of the 90-fruit vs. 60-fruit sample accuracy has not been discussed as an agenda item. Zespri intend to include this at future meetings.

Zespri requests the same data from all service providers in preparation for the meeting, but it is observed that the formats and quality of that data does differ, ranging from best-in-class presentations to more manual information bundles.

8.3. Annual Reviews and or Contract Renewals

Service providers may provide to Zespri a price adjustment request in October of each year. A cross functional team from Zespri and a representative from NZKGI review the price adjustment requests made by the service providers.

Price adjustments must be justified and the factors contributing towards the adjustment and the effect on the price by line must be produced, as with the total new adjusted price. These factors can be published indices from Statistics New Zealand or a notification of price increases from commodity suppliers (e.g. power). Zespri endeavour to make a decision on price adjustment requests by the 15 December that year.

A set of principles are adopted for engaging with suppliers, being that any annual price adjustment should be due to a legitimate cost driver of delivering the services to the kiwifruit industry, reasons must be referenced or sourced and must be detailed to each line on the contracted Collecting or Testing services for transparency. These principles extend to the fact that the annual price adjustment *should not* include any recovery of

losses from the previous year or reference any components that are not relevant to the running of the operation for Zespri. Lastly, Zespri note the focus is always to try and minimise cost whilst ensuring sustainability of supply for the industry.

In preparation for the reviews, Zespri conducts an objective analysis to establish a baseline understanding of industry costs for maturity clearance services. This involves gauging the average cost structure of providing these services, including labour, fuel, mileage, and other operational expenses. These costs are then weighted against relevant national indices, such as labour cost and consumer price indices, fuel, and rent indices, to inform a data-driven expectation. This approach enables Zespri to identify any deviations from the expected outcomes, facilitating focused discussions and ensuring that conversations are grounded in market realities. Section 8.1 of this report reviews the last four years of these meetings and the impact on grower charges.

9. Sampling Costs and Pricing

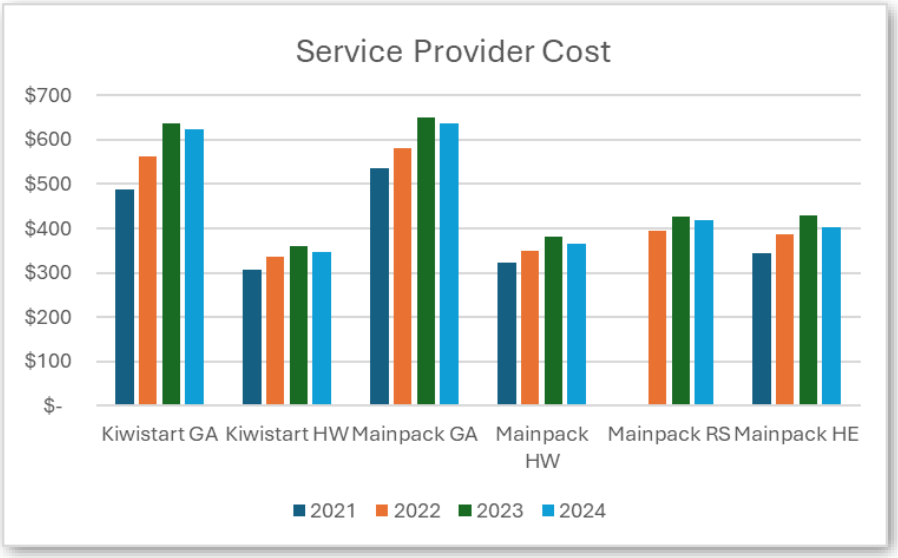
9.1. Service Provider Costs

To review pricing (and to ensure commercial sensitivities and not unfairly expose service providers operating in regions where they are the sole service provider) a weighted average analysis of testing costs was utilised at test type level.

While it is acknowledged that the mix of sampling volume each year can have an influence on the outcomes, such as KiwiStart vs. MainPack, GA vs. HW or large shift in regional testing volume (for example, Gisborne vs. Pukehina), this was deemed to be the fairest comparison season to season. The methodology was endorsed by Zespri in both approach and accuracy. For analysis purposes, this was also indexed against numeric averages at regional and service provider levels to identify outliers, with any concerns raised directly with Zespri.

The rate of the weighted average service provider costs has increased steadily each year by approximately 10%, though in 2024 the industry experienced an average 3.4% *decline* in the average service provider cost. Acknowledging this was not across all service providers or regions, this was the result of price decreases across a number of growing areas across the country and more than one service provider and was recognised across all test types.

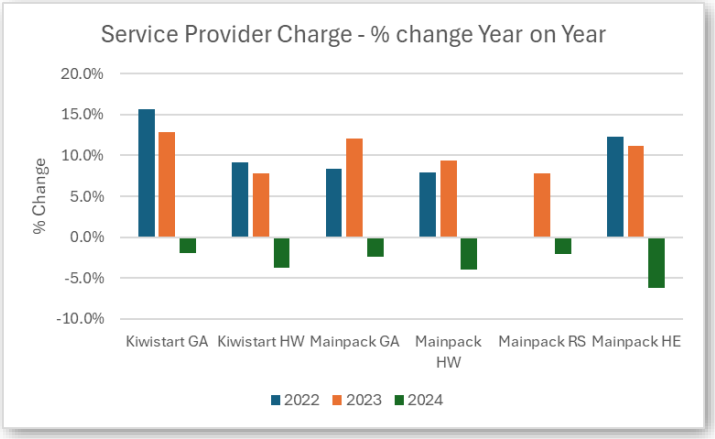
Chart 40 – Weighted average service provider cost by test type, last four years.



The percentage change year-to-year is relatively consistent. GA test types in MainPack and KiwiStart have increased at a faster rate than the other varieties and conversely not

at the same rate of percentage decline in 2024. The average GA increase was 12% in 2022 and 12.5% in 2023, compared to the (average) 8.5% increase over the last two years in HW. The corresponding average GA decline in 2024 was 2.2% against a 3.9% decline in HW[23].

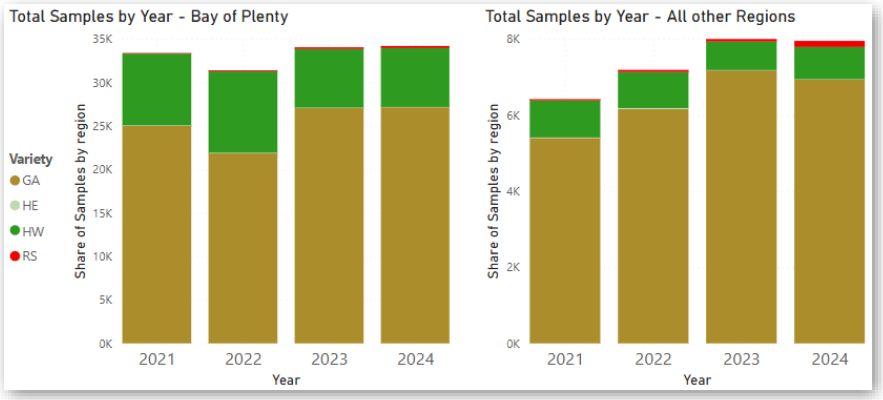
Chart 41 - % change of weighted average service provider cost by test type, last four years



While there is additional equipment required to test GA[24], it is not clear why GA sampling costs are increasing at a faster rate than HW, where the natural volume shifts assume an economies of scale impact. The growth of GA volume has two impacts on service provider costs, with DM capacity and therefore cost increasing 1.6 x as a 90-fruit sample becomes and 90- and 60-fruit sample, and the increased requirement for Colour measurement where a Minolta Chromameter can cost upwards of $16,000[25] for the measuring head alone. This is driven by what appears to be price adjustment in different years across different service providers. However, there is some evidence that this is a result of adopting a weighted average for this analysis as the year-to-year increases in the BoP are not has high as the other regions, which incur higher costs due to orchard locations, as shown below.

[23] There was no commercial RS pricing in 2021.
[24] Colour measurement and additional drying trays.
[25] https://www.thermofisher.com/order/catalog/product/1878-864

Chart 42 -Total Samples per year and variety by BoP and all other, last four years



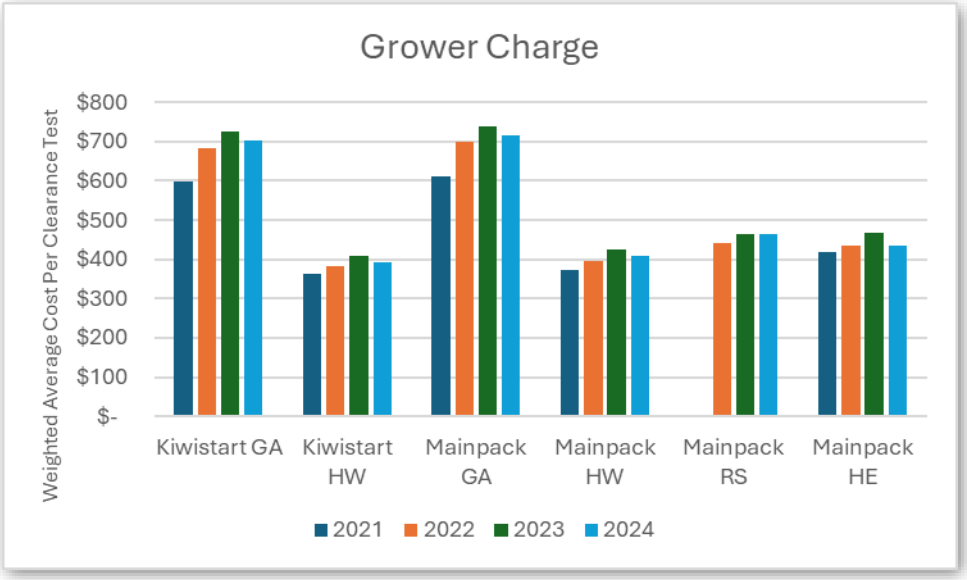
9.2. Grower Charges

A weighted average analysis was again used to determine the annual grower charges for sampling services, with the same acknowledgments made above. Again, this was also indexed against numeric averages at regional and service provider levels to identify outliers.

The rate of grower charges has increased steadily each year. 2022 experienced an 8.8% increase while 2023 experienced a 6.5% increase. In 2024, industry experienced an average 3.5% *decline* in the average sampling charge.

Grower charges have generally risen at a slower pace or fallen more quickly than service provider charges. This trend reflects Zespri's scrutiny of the price increase process and the diminishing 'reporting charge' as discussed in section 9.3. 2022 was a disproportionate increase due to a Zespri oversight where the reporting charge, which is charged at a per sample level, was only against the 90-fruit sample in 2021 and not the 60-fruit sample. It was adjusted and charged from 2022 onwards and not back charged, but explains the large(r) percentage increase in 2022.

Chart 43 - Weighted average grower charge by test type, last four years



We observed in 2022 the proportionality in GA increase was quite pronounced against HW. Specifically, while the GA service provider charges rose by 12.0%, the corresponding grower charge increase was 14.4%. While a large proportion of this can be put down to the missed reporting charge it appears out of step with HW which saw a more moderate increase, with service provider charges rising by 8.5% and grower charges by 5.7%. These trends were similar in 2023, with 2024 showing more proportion between the varieties in both service provider and grower charge percentage increases.

Chart 44 - % change of weighted average grower charge by test type, last three years

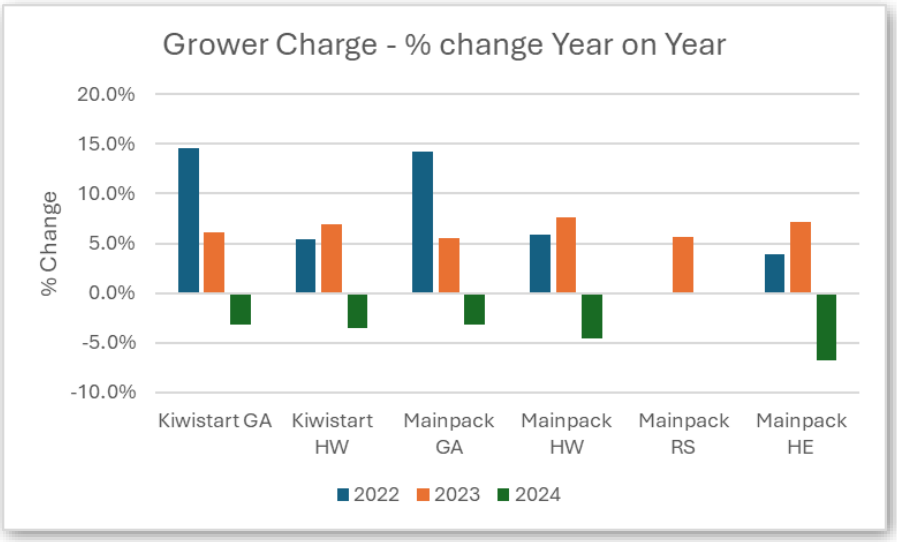


Table 4 - change of weighted Average service provider cost by test type, last three years

Service provider increase	2022	2023	2024
GA	12.0%	12.5%	-2.2%
HW	8.5%	8.6%	-3.9%
RS		7.8%	-2.1%
Sweet Green	12.3%	11.2%	-6.2%
Grower Charges	**2022**	**2023**	**2024**
GA	14.4%	5.8%	-3.1%
HW	5.7%	7.2%	-4.0%
RS		5.6%	0.0%
Sweet Green	3.9%	7.2%	-6.8%

9.3. Reporting Charges

The reporting charge has two components:

- The recovery of initial MCS system development costs
- Ongoing direct costs for supporting the MCS system

Zespri uses a net present value (NPV) calculation to ensure the initial MCS system development costs are recovered over ten years. The ongoing costs, including database hosting fees and direct costs associated with managing the MCS system, make up the second component. This calculation is reviewed annually, as it is influenced by sample volume.

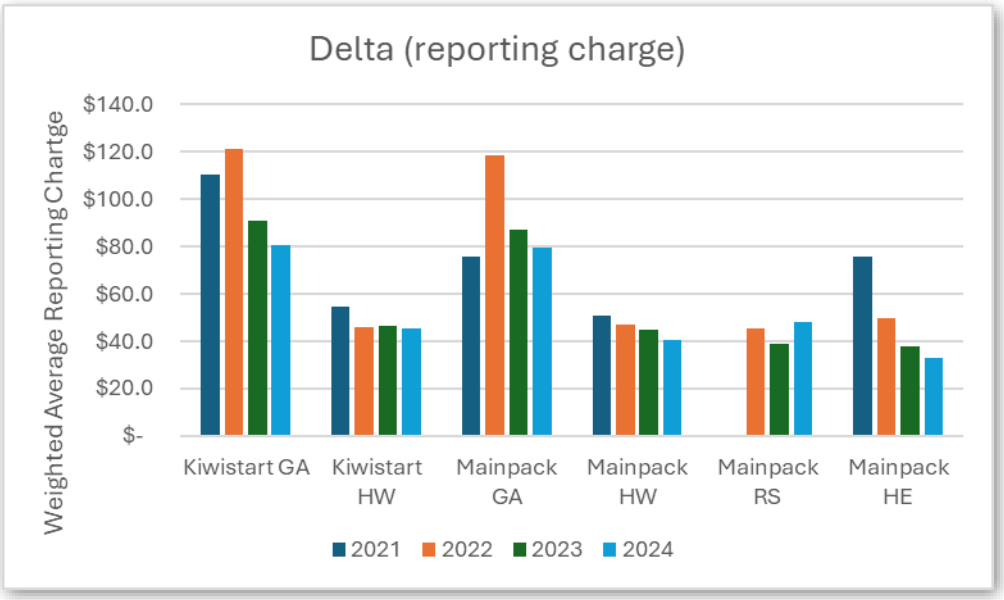
The initial MCS system development costs are forecasted to be fully recovered by 2031 which will result in a reduction in the reporting charge for 2032 onwards. However, this assumes that volume forecasts remain as expected and no additional significant MCS system enhancements are required.

The reporting charge is not considered in the service provider costings but is in the grower charges. Therefore, for the purposes of reporting, the weighted average sampling charge has been deducted from the weighted average grower cost of that same year to derive what the estimated weighted reporting charge is.[26]

As noted in 9.2 above where GA had an incorrect reporting charge in 2021, the direction of travel for all reporting charges (except RS) has been pleasing with all test types declining since 2022. RS charges have not been treated disproportionately but rather the product of the weighting calculation as additional regions come on stream with increased volume.

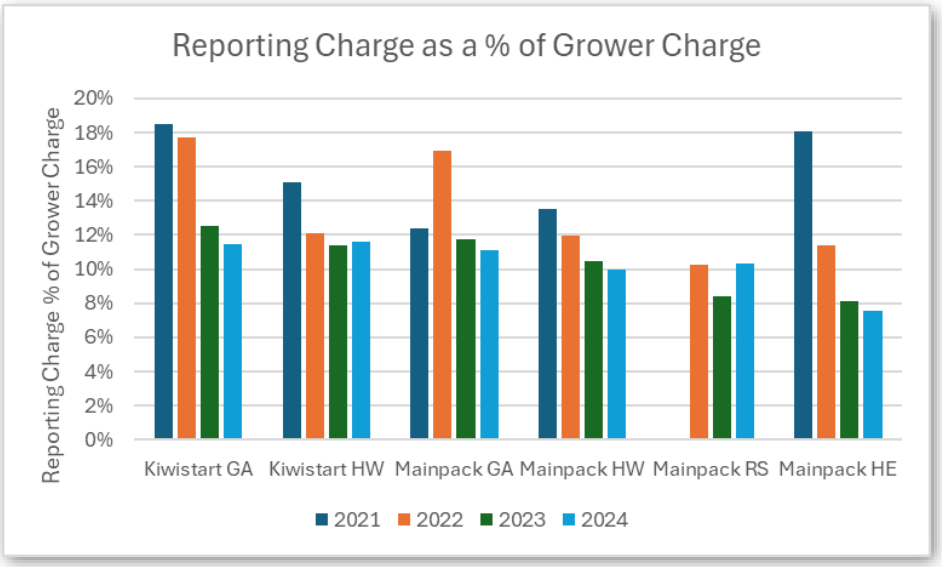
[26] This is not the actual published reporting charge of that year but rather a calculation as provided above, the reporting charges have been shown in chart 47 below.

Chart 45 – Assumed reporting charge (difference between service providers cost and grower charge



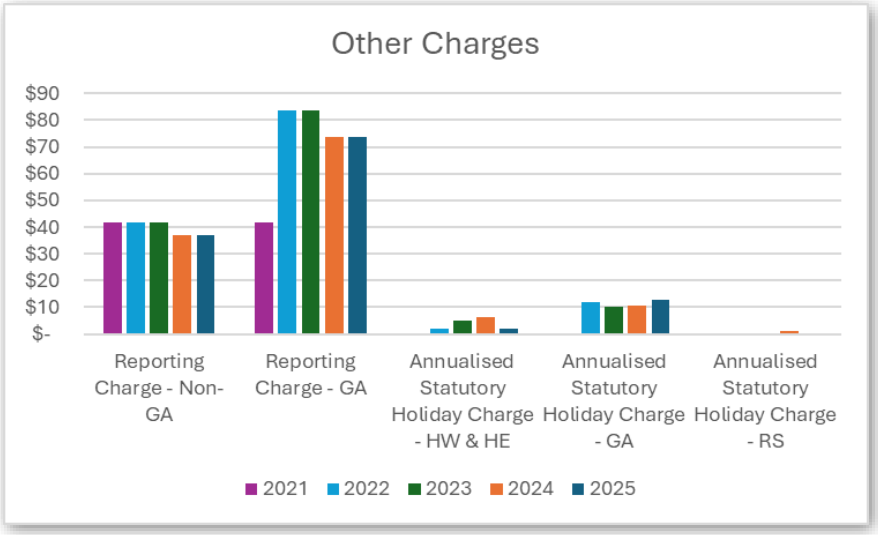
GA reporting charges are decreasing faster than HW, but as seen in chart 46 below, the grower charge as a percentage of the total grower charges remain consistent across all fruit groups and test types.

Chart 46 – Reporting Charge as a % of Total Grower charge – 2021 to 2024



As shown in chart 45, the weighted average reporting charge has been declining. This is consistent with the below chart 47 which details the actual reporting (and other) charges published by Zespri. The purpose of the annualised statutory holiday charge is to spread the expected additional costs of sampling and testing on statutory holidays across all samples to avoid artificial peaks in sample collection and testing demand immediately before or after statutory holidays. The charge is calculated by estimating the daily number of samples around each statutory holiday and applying a 35% cost surcharge for the additional costs that may be incurred through working on statutory holidays[27]. This has remained relatively stable over the past four years.

Chart 47 – Published Reporting (and other) Charges 2021 to 2025



9.4. Grower Charges as a percentage of Growing Costs

While cost per hectare[28] is not a common measure of clearance testing, it has been used to equalise against the known numerator of the orchard growing costs[29] as provided by Zespri. Despite the year-to-year increases as described above, sampling service costs as a percentage of all other growing costs[30] remains consistent, if not declining over the last four years.

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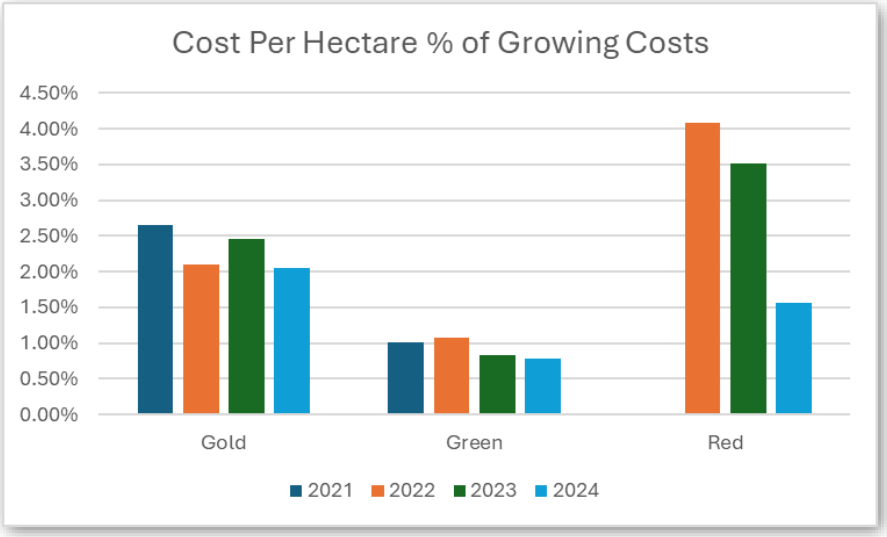
[27] pers. comm, Rob Carter, Zespri
[28] Methodology: Determine the total grower charges and divided by total producing hectares of that year. This was correlated against the average size of an MA, the average cost of clearance test and the average clearance tests per MA, deriving to the same outcome.
[29] Excluding management salaries.
[30] 2021-2024 On-Orchard Costs report, Zespri.

Chart 48 – Sampling Cost per hectare as a % of growing costs

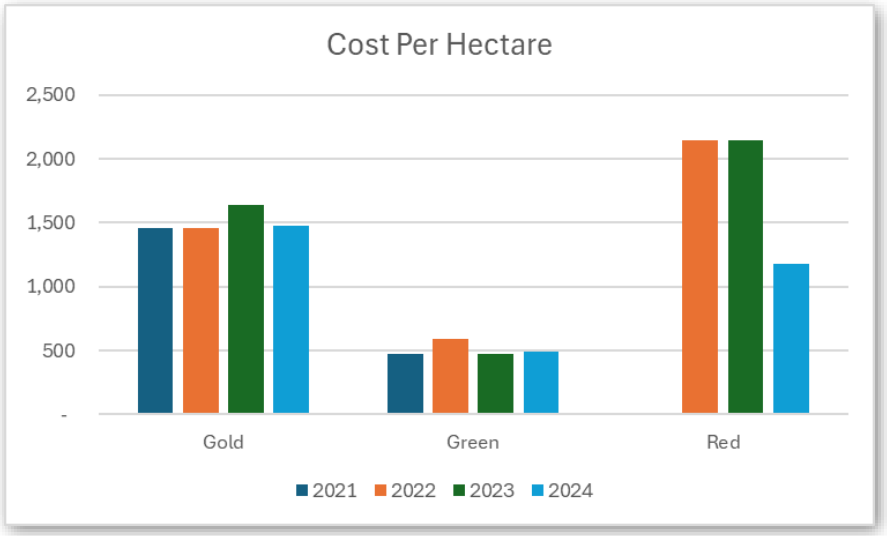


The average GA sampling cost per hectare decreased by $158 in 2024 to $1,479, down from the previous three-year average of $1,529. As a result, the average cost of GA sampling now accounts for 2.06% of total orchard growing costs, below the previous three-year average of 2.4%.

A similar trend was observed for HW, with both cost per hectare and percentage following comparable patterns. Sampling costs per hectare slightly grew to $495, but on the back of other costs increasing faster, now represent approximately 0.78% of total orchard growing costs, down from the three-year average of 0.97%.

In contrast, Red, now with critical mass of hectares in the data, has declined significantly to $1,176 per hectare, from $2144 or 1.57% compared to a two-year average of 3.8%.

Chart 49 – Sampling Cost per hectare ($)



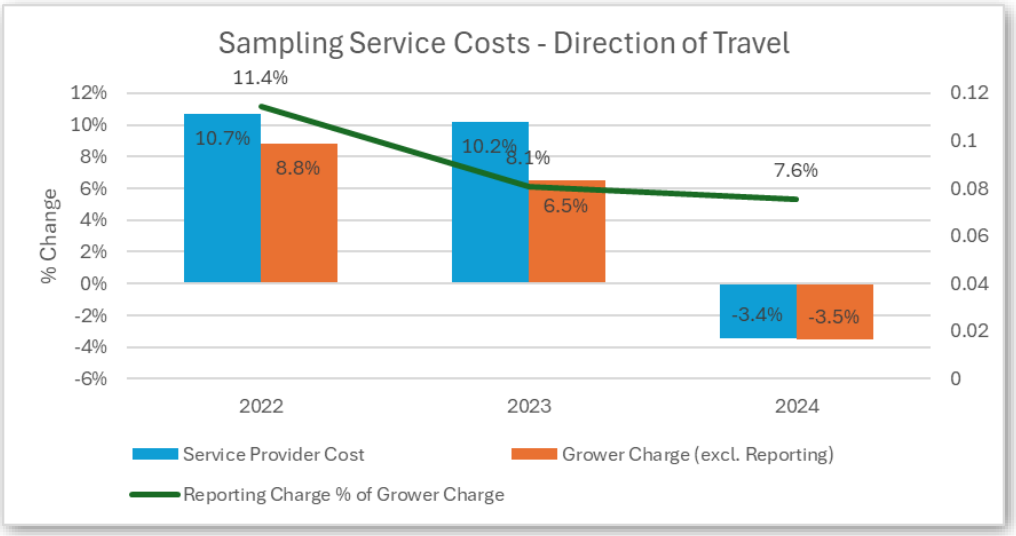
Overall, it is fair to say that the sampling cost as a percentage of on-orchard costs has remained relatively stable over the last three years with an overall positive direction of travel.

9.5. All Charges Summary

The below summarises the direction of travel at a total level by year for service provider costs, the corresponding grower charges, and the reporting charge as percentage of grower charges.

In 2022 the service provider cost increased an average of 10.7% where the grower charges only increased 8.8%. Reporting charges, on the back of the 2021 error adjustment, was 11.4% of grower charges. 2023 saw a slower increase in service provider costs (10.2%) where again the grower charges increased at a slower rate of 6.5% and the reporting charge also decreased to 8.1% of the total grower charge. In 2024 the 3.4% decrease in service provider cost, as well as the reporting charge reducing and being only 7.6% of the total grower charge meant that the weighted average grower charge across all tests declined 3.5%.

Chart 50 – Sampling charges summary



9.6. Pricing headwinds

Zespri face continual pricing pressures due to the operating environment of its service providers. As mentioned above, Zespri considers labour shortages, wages, fuel, and lease costs as well as electricity, rents and rates when reviewing increases. All growers are operating in an environment characterised historically by high inflation but now a slowing Consumer Price Index (CPI) increase, a relatively stable Labour Cost Index (LCI), volatile petrol prices, stable electricity price increases, gradually increasing insurance and rates, and slowdown in rent price increases year to year.

The CPI[31] is following a decreasing trend from 7.20% in 2022 to 4.70% in 2023 and further to 2.20% in 2024. While this suggests a slowing down of inflation, the LCI[32] is relatively stable, with a slight increase from 2.90% in 2023 to 3.30% in 2024.

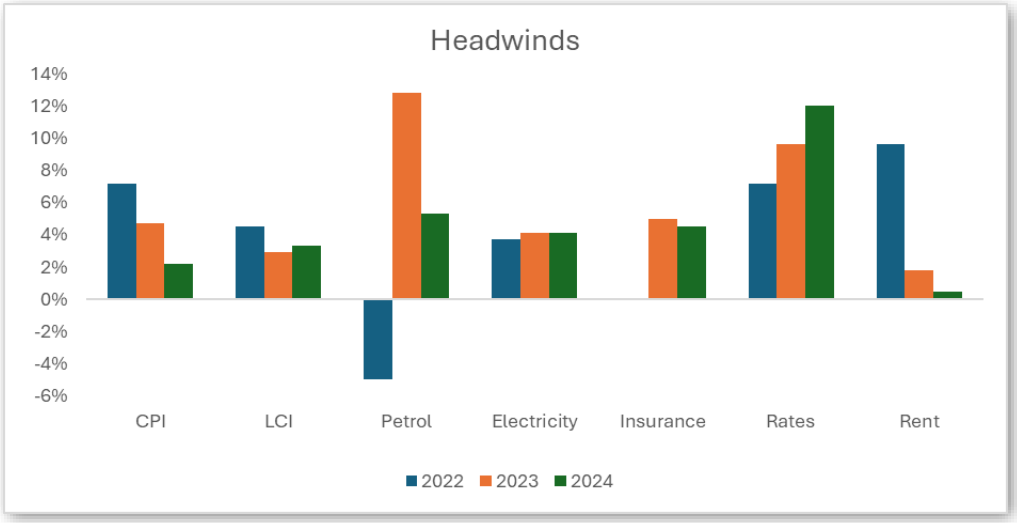
Petrol is showing some volatility, with a decrease of -4.95% in 2022, followed by a sharp increase of 12.80% in 2023, and then a moderate increase of 5.35% in 2024[33]. There are stable increases in electricity[34], with a consistent rate of 4.10% in both 2023 and 2024. While insurance is showing a gradual growth percentage slow down[35], from 5.0%

[31] https://www.stats.govt.nz/indicators/consumers-price-index-cpi/
[32] https://www.stats.govt.nz/information-releases/labour-market-statistics-december-2024-quarter/
[33] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/weekly-fuel-price-monitoring
[34] https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-statistics-and-modelling/energy-statistics/energy-prices
[35] https://www.stats.govt.nz/information-releases/business-price-indexes-december-2024-quarter/

in 2022 to 4.5% in 2023, rates[36] have shown steady percentage increases year-on-year from 7.2% in 2022 up to 12% in 2024. The rate of increase in rent[37] is slowing significantly from 9.60% in 2022 to 1.80% in 2023, and further to 0.50% in 2024.

Effective grower advocacy, driven through open and robust industry dialogue, has shown to mitigate cost fluctuations, resulting in these being relatively stable amidst a turbulent environment[38].

Chart 51 – Average annual increase expense



[36] https://www.stats.govt.nz/information-releases/consumers-price-index-december-2024-quarter/
[37] pers. comm, https://prpnz.nz/
[38] We note that this is not a compounding impact as number of these categories are already in the CPI index calculations.

10. Additional and Out of Scope Commentary

As the awareness of this report grew, NZKGI was approached with additional comments and feedback from the grower community. While some were out of scope, for transparency and keeping our commitment to growers, this is shared below, as well as any other comments that were out of scope but identified in this report.

- There was a strong call for 'all other data' to be released before DM, enabling those growers that are simply waiting for a non-DM result to confirm a harvest decision before waiting on DM. There were general comments about the pulling forward of release times, however we note the narrative seems to be changing from historical 7am to "even an extra hour helps".
    - Analysis reveals that, on most days, sample release times can be pulled forward by up to 60 minutes. Furthermore, if the current policy of releasing all samples simultaneously when 100% completed is revised, the data suggests that up to 95% of harvest days could see sample releases occur up to 90 minutes earlier.
- Not unlike the commentary on Waikato and Auckland and the costs of managing those regions from the Bay of Plenty, it was noted that some of the more remote regions are getting into some unsustainable levels of sampling costs, with regions such as Wairoa, Mohaka and Whanganui being an average of 60% more expense then the weighted average of a clearance test. While their remoteness and travel time is obviously a factor, we encourage Zespri to investigate satellite service providers (e.g. Massey Palmerston North, Hills Waikato) or subsidised transport costs to keep these in check. The cost of sampling in Whanganui was also a grower complaint in 2024, due to its cost and limited availability of days.
- Growers have asked if pricing can be improved if Zespri moved to a single variety for sampling providers, rewarding price for volume at a variety level. A quick desktop review showed that there is an (absolute) +/- 5% difference within the weighted average between service providers in the Bay of Plenty in HW and an (absolute) 8 to 18% difference in GA. While it is clear there could be savings to pass on, it is however acknowledged that any swings in volume between service providers may have unintended consequences as economies of scale change.
- Growers consistently express the view that using quadbikes for sampling will yield cost benefits, particularly through faster testing turnaround times and subsequent cost reductions. However, history highlights health and safety concerns, and we anticipate that modifications will be necessary to comply with any new WorkSafe/Zespri health and safety requirements if quadbikes or side-by-sides are reintroduced into the sampling service. This is likely considering the immediate time savings but is overlooking the required capital investment, modification costs, and the expense of devices remaining idle for eight months. Notably, while the RFP

tender did leave the door open for quadbike options, it is understood none of the service providers submitted pricing for this option.

- Further analysis was completed at Regional Level. The numeric average of a variety level sample was calculated for each growing region. The distance of this from the weighted average mean was then calculated to surface regions of concern. Whilst this calculation method is not consistent with the rest of the report, it is used to visually represent those regions which are being disproportionately affected.
    - While an orchards distance from a physical service provider site is the largest factor, this further validates Whanganui, Nuhaka and Tolaga Bay concerns, while supporting concerns raised with Auckland and Waikato. Whangarei and Kerikeri distance from the mean was a surprise considering there is a local service provider, but not unlike Poverty Bay, orchards are spread out. GA and HW charts are below (HE and RS follow similar patterns).

Chart 52 – GA - Numeric Average | Distance from the Weighted Average Testing Price ($)

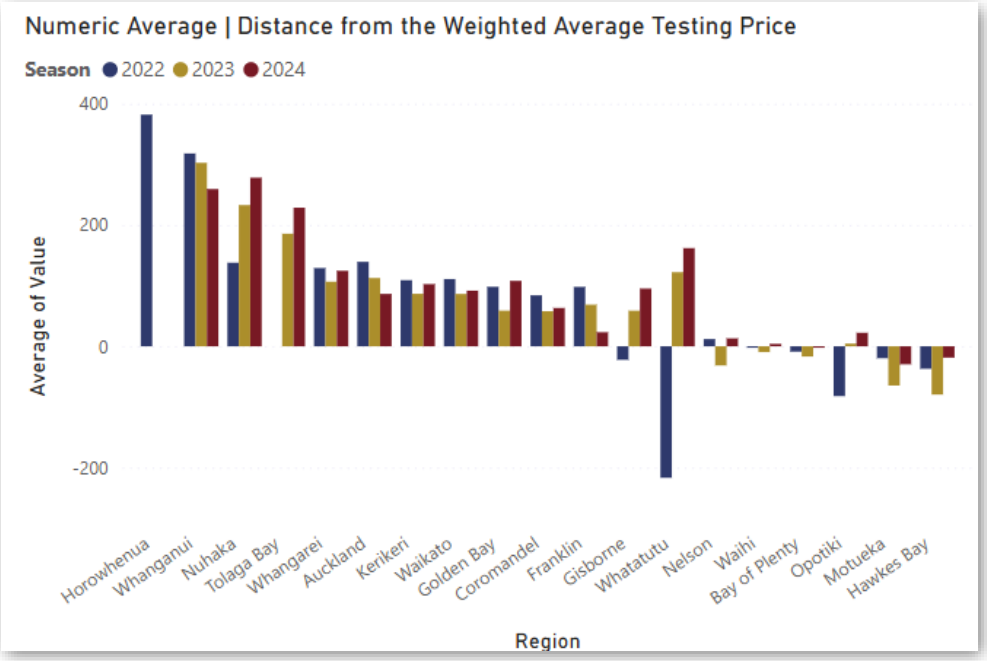
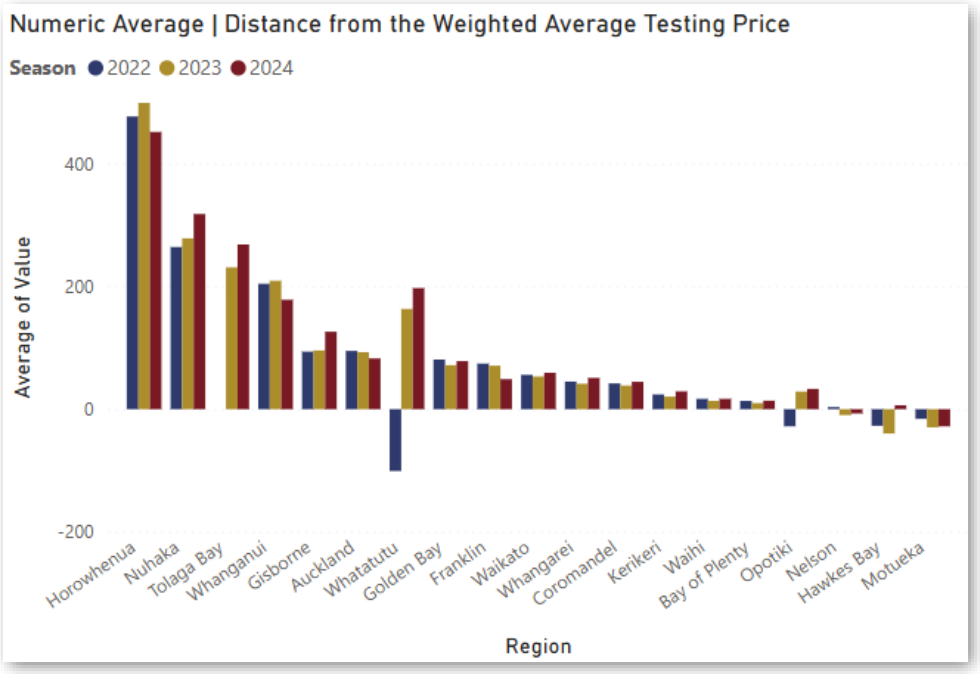


Chart 53 – HW - Numeric Average | Distance from the Weighted Average Testing Price ($)



- Growers have consistently asked for a combination of more time, leniency close to expiry or speed in residue results.
- Seeds, and the inherent 'bounce' in results was a constant pain point. While a digital or AI solution is required, Zespri are encouraged to engage more with industry in this space if progress is being made. Attempts at dispensation were acknowledged but largely ineffective.
- As briefly mentioned in this report, there was a clear outlier in the proficiency tests, and again in another service provider (unable to confirm if the same) identified in AZ samples that has disproportionate results to the others. Zespri are encouraged to investigate any ongoing issues.

11. Recommendations

Proficiency and AZ sampling

Recommendation 1: Expand proficiency sampling program to include all varieties.

We recommend expanding the Proficiency Sampling program to include HW, effective immediately. This expansion is also recommended to extended to Red in 2026 and beyond, once a sufficient critical mass of volume is achieved. Colour should be included in Red as the industry struggles with effectively measuring this.

Rationale: The reason for exclusion of HW from the program was unclear, and its inclusion is necessary to ensure quality control. While the implementation of Black Seeds swatches is commendable, it is essential to maintain focus on all varieties throughout the season to guarantee consistent quality. As Red volumes grow, it is critical that this is included as well.

Recommendation 2: Enhance discipline and standardisation in proficiency sampling program.

We recommend enhancing the Proficiency Sampling program by introducing additional structure and discipline. Specifically, we suggest establishing a standardised calendar for administering and reporting proficiency sample results, outliers identified or not. This should be supported by clearly defining expectations for result availability and communication to the MCS Manager. We also recommend developing a Standard Operating Procedure (SOP) for initiating then conducting investigations and closing these out.

This will ensure a more predictable, efficient, and effective process for managing proficiency sampling and investigations. It is equally recommended to ensure these investigations and outcomes are recorded for good access to historical data / end of year reporting.

Rationale: There is an opportunity to enhance the process for communicating outliers to the MCS Manager, moving from an exception-only basis to a more regular and predictable schedule. Additionally, Zespri will benefit from developing its own internal operating procedure for the investigation process, while still leveraging the SOPs of service providers. By doing so, Zespri can strengthen its oversight and control. Our observations were that any investigations were by exception only, could be considered casual by nature, without a formal process to be followed.

Recommendation 3: Enhance discipline and standardisation in AZ sampling program.

Like Recommendation 2, we recommend implementing additional structure and discipline within the AZ Sampling programme, specifically establishing a standardised calendar for reporting AZ samples, defining expectations for result availability and as above, developing a SOP for investigation. This again is for all results, outliers identified or not.

Rationale: This recommendation aligns with Recommendation 2, as both aim to bridge the gap between MCS management and Fruit Performance team analysis. Historically, when MCS and Fruit Performance teams had the same direct manager, there appeared to be greater integration and alignment between the two functions. This recommendation seeks to address the reports view of disconnect and foster closer collaboration between the two teams, ensuring more effective communication and decision-making for the benefit of service providers and growers.

Recommendation 4: Moving beyond statistical probabilities.

It is recommended that Zespri expands its approach to outliers analysis by extending from a sole reliance on probability-based statistical trends over time to a more granular approach. This revised approach would treat each weekly data point as a unique result, reporting any individual anomalies as they occur. To enhance this process, it is suggested that Zespri establish upper and lower limits for outlier detection, enabling the identification of sample-by-sample variations. While these variations may not always necessitate investigation, they would provide additional data points to complement statistical modelling, offering a more comprehensive understanding of the data.

Rationale: While probability statistics can provide valuable insights and provide statistical context to an outcome, relying too heavily on them can lead to a false sense of security and overlook errors or the potential for grower frustration. By examining each data point individually and considering the possibility of error e.g. the DM outcomes from one MA from one service provider, Zespri can identify and address errors or anomalies more effectively, reducing the risk of grower frustration and improving overall data confidence.

Auditing

Recommendation 5: Review of Foodspec scope to expand to evidence based 90 vs. 60 audits.

Foodspec runs a strong auditing program. It is recommended that Zespri increases the scope of this audit to include reviewing that the service providers are completing their own 90-fruit vs. 60-fruit audits, inclusive of the quantity of audits completed, outcomes and corrective actions inclusive of retraining frequency. It is also recommended that Zespri sets the parameters for how this audit is completed and the data points being sought, for example the gross difference between sample sizes in grams.

Rationale: The 60-fruit small fruit targeted samples is a critical part of the GA clearance process, where its role is to elongate the distribution of fruit and bulk up the sample size, therefore making the regression more reliable and more stable between samples. This is key in GA due to the strong DM to size relationship. While some service providers are able to provide evidence to Zespri that they are monitoring this, it was not clear if everyone is, and consistently. Service providers providing facts in this space, and the subsequent reporting back from Foodspec will increase oversight in this critical part of the GA clearance process.

Recommendation 6: Increase frequency of Zespri lead internal audit.

The Zespri internal early season audit is robust. Its role is to reflect that the Zespri QMS is being followed and represents that a service provider has shown they have processes in place to meet these requirements. It is however well telegraphed, with many similarities to the ISO 17025 standards. Therefore it is recommended that there is another random audit completed (and with no or little notice) during the season in addition to this. The timing of this audit should be in the natural lull between HW and GA sampling volumes (although it is imperative GA is available for this audit), where its goal is to ensure that what is in the QMS and is committed to in the beginning-of-season audit is being followed with documented evidence in support.

Rationale: As service providers are expected to adhere to strict ISO 17025 requirements in addition to the Zespri Internal audit, it is assumed that they possess the necessary expertise and capabilities to undergo audit requirements, where it highlights the importance of maintaining documented processes and practices. This recommended mid-season audit aims to confirm that documented processes are being consistently applied, documentation is current and accurate, and implementation is effective, thereby ensuring compliance with pre-season audit requirements. The short notice is in line with equivalent products and systems audits completed by packhouses.

Sampling Methodology

Recommendation 7: Educate growers on the role of the 60-fruit sample

We recommended that the significance of the 60-fruit sample in the GA clearance test be clearly communicated to all growers, improving their awareness and understanding. Education should explicitly outline the risks associated with a GA sample if the additional 60-fruit *was not* completed.

Rationale: As per Recommendation 8 below, there was a trend identified where growers are approaching samplers to express concerns and frustrations regarding the 60-fruit sample and questioning the necessity of the 60-fruit sample at all.

Recommendation 8: Set clear expectations for grower interactions with the samplers.

We strongly recommend that Zespri takes a proactive leadership role to address the issue of growers approaching sampling staff to influence or complain about their 60-fruit sample, setting clear expectations about on-orchard interaction. This should be that the samplers are not to be influenced or coerced in any way with regards to the perceptions of the standard, or requirement of the 60-fruit sample - and that failure to do so will result in a stop sampling event at the service providers discretion - resulting in a collections charge.

Rationale: Both in the grower complaints section of this report, and as reported by Foodspec, there was a concerning trend identified where growers are approaching samplers to express concerns and frustrations regarding the 60-fruit sample selection process, either attempting to coerce the selection of this sample, or questioning the necessity of the 60-fruit sample at all. This behaviour compromises the integrity of the program, poses health and safety risks, and undermines fairness across the industry.

Recommendation 9: Set clear guidelines for how a 60-fruit sample should be taken.

To eliminate subjectivity and ensure consistency, Zespri must establish clear guidelines for collecting a 60-fruit sample, defining what constitutes a best-in-class, small fruit targeted sample. Currently, the pause, scan, select recommendation (Section 5.2, on-orchard Sampling Audit) is not universally adopted by service providers and lacks documentation, and the single fruit per vine was not universally understood. While some argue that skilled collectors can gather quality samples without this pause, scan, select method, the varying implementations highlight the need for standardised guidelines. We also note that a 'competent collector' was deemed as such subjectively. Quoting from

the Foodspec report: “The messaging for the requirements of the 60-fruit sample was well understood by most samplers although the methodology for selection of the 60-fruit did vary between providers”.

Rationale: This must be implemented the same way across all service providers. The 60-fruit small fruit targeted samples is a critical part of the GA clearance process, where its role is to elongate the distribution of fruit and bulk up the sample size. Incorrect or out-of-spec 60-fruit samples can have material outcomes on a maturity area sample result, which could also impact growers’ commercial outcomes.

Recommendation 10: Set clear expectations of what an in-spec 90 v 60 sample looks like and ensure service providers are reporting on these outcomes at their fortnightly meetings.

It is recommended that 60-fruit sample quality and comparison to 90-fruit samples be added as a standard agenda item for the fortnightly meetings between service providers and the MCS manager. Currently not all service providers are sharing this information, and it is even less clear who is collecting it. There is also a lack of clarity around what constitutes a satisfactory comparison between the two samples. While the end-of-season review provides some insight, it is insufficient as it only occurs after the season has concluded. A more timely and objective measure is needed to identify on-going differences between the samples. One potential approach, as learned from a recent field day, is to use a 10-gram (or other) difference between the 90 and 60-fruit samples as a benchmark, which seems pragmatic and effective. Another could be the count of fruit from the 60-fruit sample that is larger than the average weight of the 90-fruit sample.

Rationale: Regular discussion and monitoring of 60-fruit sample quality can help identify areas for improvement, ensuring that samples are representative and accurate. By establishing a clear and objective benchmark for comparing 60-fruit and 90-fruit samples, consistency across service providers can be improved. A regular review and discussion of sample quality can help identify issues or discrepancies in a timely manner, allowing for prompt corrective action.

Data Management

Recommendation 11: Improved data collection and coding for stop sampling, compromised sample events and grower complaints.

It is recommended that future data collection on stop sampling, compromised samples, and grower complaints adhere to a standardised format and categorisation system and hosted in a database or similar.

Rationale: As highlighted in this report, the provided data from previous seasons was often unavailable, inadequately coded, or in the format of saved emails. This required some intervention for reporting and analysis. Standardising data collection and categorisation ensures that information is accurate, complete and consistent, enabling reliable analysis and decision-making. By using a consistent format and categorisation system, data from different seasons and sources can be easily compared, enabling trend analysis and continuous improvement.

Recommendation 12: Develop a standard fortnightly meeting data sharing structure.

The fortnightly meetings between service providers and the MCS manager were found to be effective, with all necessary information provided in a timely manner. However, inconsistencies were observed in the format and quality of reporting across service providers. To enhance efficiency and effectiveness, it is recommended that a standardised reporting format be established, leveraging advances in API, file sharing (SharePoint), and data visualisation (Power BI) to free up the MCS Managers time and ability to analyse effectively. This standard format could also be a pre-completed PowerPoint report such as being provided already by some service providers.

Rationale: Standardising reporting formats reduces the time and effort required for the MCS manager to collect, analyse, and compare data from different service providers. This would enable the MCS manager to focus on exception management and high-value tasks rather than data collection and formatting, receiving data that is 'analysis ready' rather than spending time preparing the data.

Recommendation 13: Review that the surplus capacity remains fit-for-purpose.

It is recommended that a review be conducted to assess the surplus sampling capacity and ensure it is not resulting in unnecessary costs to growers. The review should identify opportunities for optimisation and cost savings, acknowledging growth in non-BoP regions while enabling stakeholders to benefit from more efficient use of resources and acknowledging peak volume requirements.

Rationale: At a high level, the industry has the capacity to process 1,350 samples per day but is only utilising approximately 80-90% of this capacity for a small number of peak days per year. Although there are individual days in the season where capacity has been breached, there remains significant surplus capacity to accommodate seasonal spikes. Additionally, there are regions where sampling volumes are growing faster than the average, and these areas are not centrally located to a service provider.

Conversely, those in outer regions are disproportionately affected by higher sampling costs.

Recommendation 14: Review the needs of the outer regions and their disproportionate charges.

It is recommended that the pricing structure for sampling services for growers who are not located near a service provider is reviewed. The review should consider the higher costs associated with servicing these areas and assess the feasibility of alternative providers, delivery logistics or competitive tenders that reflect the unique challenges and costs of servicing more remote growers.

Rationale: The review of pricing for growers remotely located from service providers is necessary as current charges incurred by these regions is at a level that is far beyond the industry average, and this disparity needs to be addressed to ensure not only equitable but sustainable pricing as noted in the out-of-scope commentary.

Recommendation 15: Review when and how data is released

It is recommended to review the current data release times and method across three areas.

1. Take advantage of the Service Providers exceeding the data delivery KPI and pull data release times accordingly.
2. Review if data can be released in batches when completed as opposed to when all industry data is ready.
3. Release non-Dry Matter data in a batch as early as possible as it is available from the previous day's collections, as this may be the only result holding up harvest decisions

Rationale: Service providers consistently meet or exceed Zespri's KPIs for data delivery, with the potential to release data up to 60 minutes earlier on most days during the season. To leverage this capability and support more efficient harvest decision-making, we recommend releasing non-Dry Matter data as soon as it becomes available.

12. Acknowledgements

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