



KELLOGG
RURAL LEADERSHIP
PROGRAMME



Predicaments Around Storage Pooling in the Kiwifruit industry

Kellogg Rural Leadership Programme

Course 47 2022

Abdul Jabbar

I wish to thank the Kellogg Rural Leadership Programme Investing Partners for their continued support.

Strategic Partners



Programme Partners



Service Partners



Disclaimer

In submitting this report, the Kellogg Scholar has agreed to the publication of this material in its submitted form.

This report is a product of the learning journey taken by participants during the Kellogg Rural Leadership Programme, with the purpose of incorporating and developing tools and skills around research, critical analysis, network generation, synthesis and applying recommendations to a topic of their choice. The report also provides the background for a presentation made to colleagues and industry on the topic in the final phase of the Programme. Scholars are encouraged to present their report findings in a style and structure that ensures accessibility and uptake by their target audience.

This publication has been produced by the scholar in good faith on the basis of information available at the date of publication. On occasions, data, information, and sources may be hidden or protected to ensure confidentiality and that individuals and organisations cannot be identified.

Readers are responsible for assessing the relevance and accuracy of the content of this publication & the Programme or the scholar cannot be liable for any costs incurred or arising by reason of any person using or relying solely on the information in this publication. This report is copyright, but dissemination of this research is encouraged, providing the Programme and author are clearly acknowledged.

Scholar contact details may be obtained through the New Zealand Rural Leadership Trust for media, speaking and research purposes.

Table of Contents

1	Executive Summary	6
2	Acknowledgements	8
3	Introduction	9
4	Methodology	10
5	Review of Literature.....	11
5.1	Types of Incentives in Kiwifruit Industry	11
5.1.1	Taste Incentive	13
5.1.2	KiwiStart Incentives.....	14
5.1.3	Time Payments or Storage Incentives.....	14
5.2	Pooling in the Kiwifruit Industry	14
6	Findings	16
6.1	Storage pooling in the kiwifruit industry.....	16
6.2	Storage pooling in various packhouses	17
6.3	Determining and choosing the storage pools	18
6.4	Is one packhouse's pooling system better or worse than another's?.....	20
6.5	Role of the packhouse to impact behaviours related to storage pooling	21
6.6	Storage pooling formats and inventory management.....	22
6.7	Growers influence on the loadout decisions	23
6.8	Impact of storage pooling on behaviours.....	24
6.9	Grower's behaviour for KiwiStart, taste payments vs time payments and pooling.....	26
6.10	Role of packhouse & growers	28
6.11	Incentive system and predicaments around storage pooling.....	29
7	Overall Conclusions and Recommendations.....	33
8	References.....	35
9	Appendix 1.....	35

Table of Figures

Figure 1: Zespri target demand volume for 2031 (NZKGI, 2022).	9
Figure 2: Seasonal comparison of orchard gate returns (ORG) per tray and per hectare for Zespri Green and Zespri SunGold Kiwifruit (Zespri Annual Report, 2022/23).	10
Figure 3: Grower payments flowsheet defined by Zespri (Anonymous, 2023)	12
Figure 4; 2022/23 Season grower payments portions – total fruit and service payments (Kiwiflier, Feb 2023, #444)	13
Figure 5: Example of grower entity and its role in the kiwifruit industry system (Anonymous, 2022b).	15

1 Executive Summary

Kiwifruit exports contribute \$2.8 billion to New Zealand's total horticultural export revenue, with Zespri International operating as the exclusive exporter and marketer. Harvesting of New Zealand grown kiwifruit can be categorised into two main groups, KiwiStart for early shipments and main pack for long-storing, later shipping supply across the remainder of the season. Growers, aiming to maximise orchard gate returns (OGR), consider taste payments, KiwiStart incentive, and time payments. These commercial incentives encourage growers to supply high-tasting fruit early and/or over an extended storage period.

KiwiStart incentives and taste payments comprise a significant proportion of grower OGRs and play a crucial role in on-orchard and harvest decisions. Time payments, distributed through packhouse pooling systems, vary among packhouses to manage storage risks and incentive, and ensure relative equity across growers. Storage pooling formats, such as 100% direct, high-risk pools, low-risk pools, and regional pools, are defined by grower councils or entities within the kiwifruit industry. The complexity of packhouse storage incentive pools diminishes the impact of published time-based payments for growers, influencing their decisions to supply fruit with sub-optimal storage potential. Over recent seasons, growers have tended to prioritize the KiwiStart incentive and prioritize taste payments over actively seeking time-based payments – albeit some growers are unable to actually grow KiwiStart fruit (due to regional or other orchard factors). This has been a result of the relative weighting between Kiwistart and time payments, and the discrepancy between returns earned by Kiwistart and mainpack growers.

The study aimed to understand the challenges related to storage pools in the kiwifruit industry and examine how storage pool formats might influence grower behaviour regarding earning time payments. Interviews with industry leaders from packhouses, growers, and grower entities/councils were conducted, focusing on open-ended questions to generate discussions about storage pools and their impact on growers' behaviours.

The key findings were that storage pools in the kiwifruit industry serve to shield growers from storage losses – in other words, diluting both the risk and the reward of storing fruit over the season. Although packhouses may present various pool formats/rules, there is generally no definitive advantage of one pool over another from a different packhouse. Growers would opt for a high-risk or low-risk pool depending on their financial and philosophical motivations to share the risk with other growers while aiming to maximize their OGR's. Some growers also prefer a 100% direct pool. Industry leaders expressed a common concern that many growers lack an understanding of pool structures and associated rules. The importance of growers comprehending these rules and their impact on returns was emphasized. From the packhouse's perspective, grower's pool preferences do not affect them as pooling offers flexibility for inventory management. The packhouse would utilize load-out priority models for load-out decisions regardless of the pool structure or grower preference. From a grower's perspective, pooling protects them from storage risk but they cannot interfere in packhouse load-out decisions. Most of the growers would prefer to be in the KiwiStart pool and accumulate as much taste payment as possible. There is also a perception that firstly growers don't see much value in the time payments and secondly, money gets diluted by the pool, so pool structure doesn't matter in their view. Some growers put more emphasis on taste which was sometimes at the detriment of fruit quality as they know a low-risk pool would protect them from any unintended storage losses. To some extent, the packhouse could influence grower's behaviours by introducing pool rules around maturity. However, the packhouse also has to consider the

competitive risk of losing the growers. All of the participants also agree that there is an imbalance between the KiwiStart incentive and taste payment vs time-based payments and suggested the review of the overall incentive system.

Key recommendations are summarised as follows;

- Review and rebalance the incentive system in the kiwifruit fruit industry and bring certainty to the time payments.
- Educate growers by providing technical information and tools (e.g. time payment calculator) to understand time payments, pool rules and highlight the value of growing for long-term storage.
- Introduce a sub or combination of pools to incentivize or penalize depending on fruit quality and overall losses.
- Growers should proactively provide feedback to the packhouse regarding the impact of pools on grower's returns.

2 Acknowledgements

I am grateful to Zespri International for supporting me in completing the Kellogg Rural leadership programme. I would like to extend my heartfelt appreciation to all the industry leaders for their time, support and valuable insights around this project. I would like to express my appreciation for the support and motivation provided by Frank Bollen (Technical Manager at Zespri International) that enabled me to complete this program and finalize this report. I am grateful to Anna Tootill for reviewing this report and for having valuable discussions on this topic.

I offer my deep gratitude to the entire team behind the Kellogg Rural Leadership Program for crafting an exceptional course. I would also like to express my thanks to my fellow cohort members for the wonderful experiences, friendships, and thought-provoking discussions we shared.

Lastly, I want to acknowledge the unwavering support and encouragement from my wife (who is also a Kellogg scholar). I must also make a special mention of my two boys, who admirably coped with my juggling between work and program activities.

3 Introduction

New Zealand kiwifruit accounts for \$2.8 billion (38%) in exports of the total Horticultural products in the year 2021/22. New Zealand grown kiwifruit is exported to more than 59 countries with Greater China, Japan, Spain, Portugal, Germany, Taiwan and France being the major markets (NZKGI, 2023). There are three main kiwifruit varieties (i.e. Zespri Green, SunGold™ and RubyRed) currently grown commercially in New Zealand. The kiwifruit industry comprises almost 2800 growers over a 14,500 ha area, with around 80% of kiwifruit grown in the Bay of Plenty region.

Zespri International (New Zealand based Kiwifruit export company) expects significant growth in the volume of Zespri kiwifruit both from New Zealand production and from their global production (Figure 1). Zespri aims to achieve a 12-month supply of kiwifruit in the major markets. With the majority of Zespri kiwifruit grown in New Zealand, this ambition of a 12-month supply comes with the challenge for the New Zealand kiwifruit industry to supply the fruit to markets over the extended supply duration. To achieve the extended supply, the industry harvests fruit in two main categories i.e. KiwiStart (early harvest – shipped to markets early) and main pack (fruit packed and stored for consistent supply to markets).



Figure 1: Zespri target demand volume for 2031 (NZKGI, 2022).

Zespri has an incentive system in place to encourage the availability and supply of good-tasting fruit in the KiwiStart and main pack category. Fruit harvested in the KiwiStart window accounts for financial incentives to compensate the growers for forgone taste and growth and for the value generated by selling the fruit early. Meanwhile, the main pack fruit receives time payment incentives to compensate the growers for cool storage costs and fruit losses associated with storing and supplying fruit over time, throughout a season. Kiwifruit growers also receive taste incentives to reward them for producing better tasting fruit for consumers. All of the incentives, along with fruit value payments, collectively form the basis of overall orchard gate returns (OGR) for a kiwifruit grower (Figure 2).

Time payments or storage incentives are usually distributed via packhouse pooling system. There are almost 40 packhouses in the New Zealand kiwifruit industry (NZKGI, 2023) and each packhouse could have different pooling formats/rules. Incentives are observed to be driving the grower's behaviours around on-orchard and harvest decisions, and further implications on fruit quality. Pooling of storage incentives within packhouse has been

considered complex and one of the main contributors to growers' contemplation of the value of long-term storage and fruit quality.

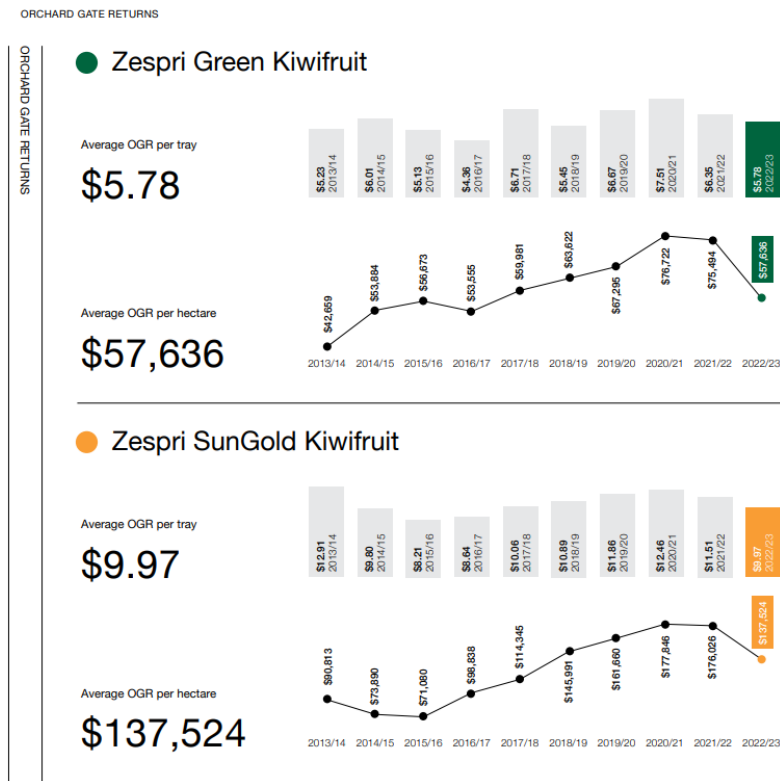


Figure 2: Seasonal comparison of orchard gate returns (ORG) per tray and per hectare for Zespri Green and Zespri SunGold Kiwifruit (Zespri Annual Report, 2022/23).

This report attempts to discuss in detail incentives in the kiwifruit industry and provides some reflections on how these incentives may generate a substantial impact on grower behaviours, fruit quality and consequently affect the orchard gate returns. The aim of this study was to draw industry perspectives around the complexity and value of the storage pooling system as well as enlist the pros and cons of storage pooling in the kiwifruit industry. This study also expands to draw some recommendations for storage pooling and its implications on grower behaviours and emphasis on fruit quality.

4 Methodology

This project relates to NZ kiwifruit industry specific settings. The literature review was conducted to understand the available information on this topic. Literature presents a thorough view of the types of incentives in the kiwifruit industry and also highlights the impact on growers/industry behaviours.

Kiwifruit industry leaders from various domains were approached for participation in this study and help explain the storage pooling system in the kiwifruit industry and its implications on growers behaviour. Interviews were conducted with nine participants representing various roles within the kiwifruit industry, including growers, technical managers, commercial

managers, grower council/entity members, packhouse executives and senior industry leaders. Open ended questions were asked to provoke genuine discussions and questions were not shared with the participants before time (appendix 1).

Thematic analysis was performed to extract valuable insights and identify recurring themes relevant to the research questions. Thematic analysis is a method for identifying themes from a set of qualitative data. This qualitative method of analysis is the most common and offers the benefit of flexibility (Braun and Clarke, 2006).

5 Review of Literature

5.1 Types of Incentives in Kiwifruit Industry

Zespri's payment system to growers defines different types of commercial incentives and payment formats. Zespri payment structure accounts for fruit value, commercial incentives and service payments (Figure 3). Fruit value payments cover the standard payments for fruit pieces submitted to export as per Zespri grade standards. Incentive payment covers Zespri taste payment (defined by Zespri's taste programme to ensure a great eating experience for consumers); KiwiStart premium (for delivering the best quality fruit to start the markets earlier) and supplier accountability (for ensuring optimal fruit quality in the markets) payments. All three incentive payments encourage NZ kiwifruit growers and industry to consistently produce and deliver the best tasting and premium quality fruit to our customers and consumers across various markets.

Service payments include time and pack-related payments. Time payments comprise the additional cost of storing fruit and overtime supply to the markets. Both the KiwiStart and time payments are the key commercial drivers to extend the selling window of kiwifruit. Overall, along with fruit payments, commercial incentives and service payments drive the industry behaviours to ensure New Zealand grown kiwifruit remains the globally preferred brand.

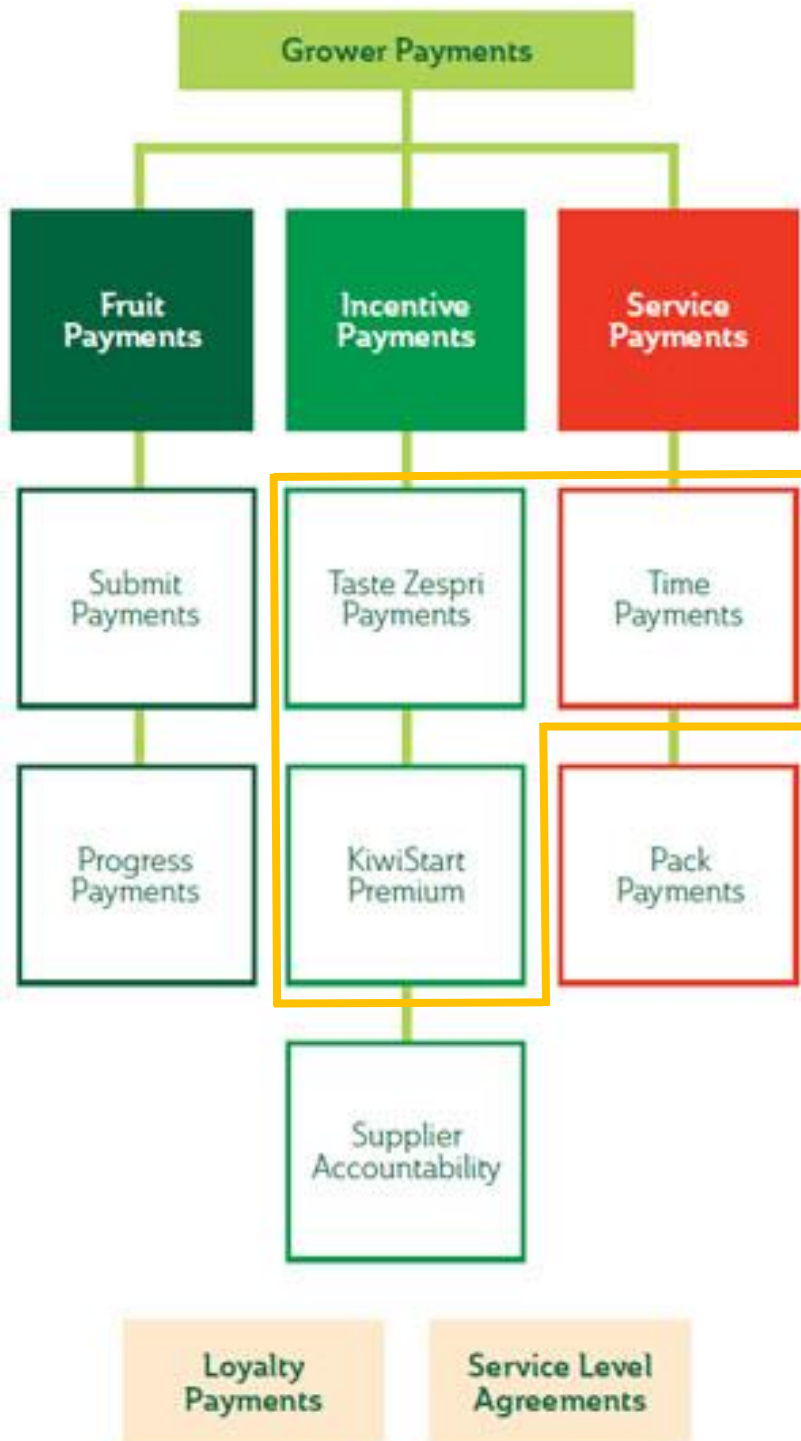


Figure 3: Grower payments flowsheet defined by Zespri (Anonymous, 2023)

Figure 4 explains various payment portions to growers accounting for total fruit and service or incentive payments. These payment portions are illustrative but demonstrate the approximate allocation of money paid out for the various incentives present in the kiwifruit industry. Among all types of payments/incentives, Taste incentives, KiwiStart and Time payments are considered to have a significant impact on growers' behaviours and on-orchard decision making to deliver best tasting fruit to customers and to extend the selling window. The following sections will provide further background and relevant contextual information about these commercial incentives/payments.

2022/23 FEBRUARY FORECAST

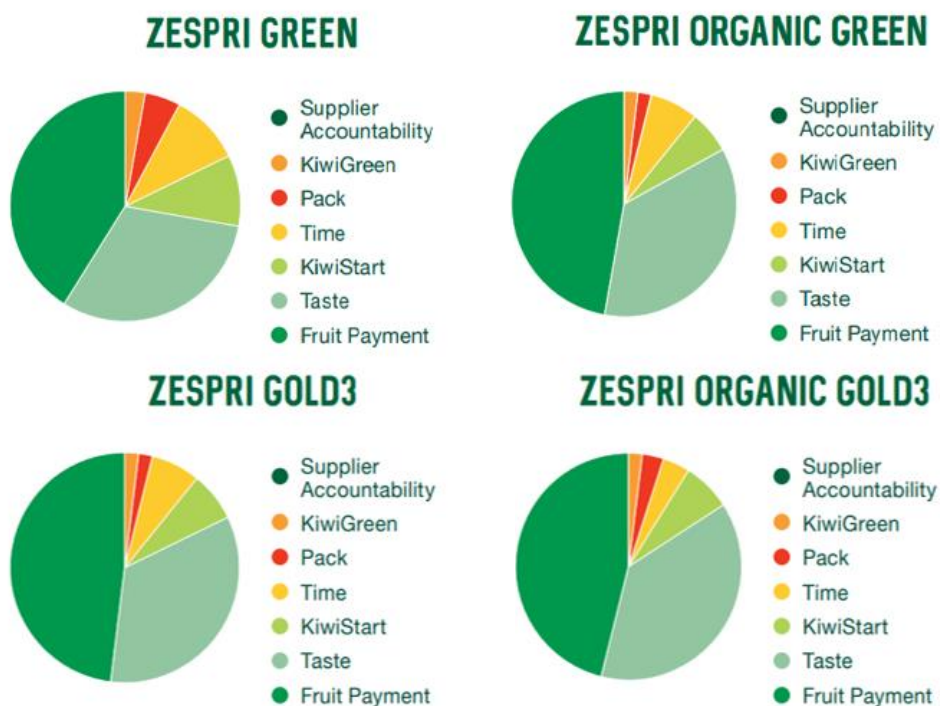


Figure 4; 2022/23 Season grower payments portions – total fruit and service payments (Kiwiflier, Feb 2023, #444)

5.1.1 Taste Incentive

Taste incentive payment reflects the importance of taste and ensures growers are fairly rewarded for their efforts to produce every fruit piece with good taste. Zespri's taste programme represents one of the great incentive systems across the entire fruit industry. Taste is defined by the amount of sugars and acids in the fruit and reflected as a strong quality metric linked with consumer likeness.

Market research confirmed that consumers were willing to pay for sweeter tasting fruit. Hence Zespri taste incentive programme was launched in 2001 to enhance the overall quality of Zespri kiwifruit and to ensure consistent delivery of superior tasting fruit to consumers. Fruit with higher Taste Zespri Grade (TZG) would ensure a greater proportion of maximum taste payments to the grower(s). Zespri calculates maximum taste payments reflecting the high premium that consumers are willing to pay for superior tasting fruit (NZKGI, 2017a).

At the time of harvest, fruit from each grower is assessed for the total level of carbohydrates and this defines taste incentive payments for the achieved TZG for any grower. Annually, TZG incentives roughly accounts for 30-35% (depending on the variety and growing method) of the Zespri payments to the growers (Figure 4). Taste incentive payments are made to the growers and directly influence OGRs. Hence TZG incentive payment drives grower's behaviours to

optimize orchard management and harvest decisions to then reflect in the highest possible TZG every season.

5.1.2 KiwiStart Incentives

KiwiStart program defines the early supply of NZ-grown kiwifruit to the markets to ensure consistent supply and to reduce on-shore storage and fruit loss costs (NZKGI, 2017b). KiwiStart supply also provides an opportunity to manage labour shortages, packing capacity limitations and potential natural constraints.

KiwiStart incentives were brought in place to compensate for the loss of fruit size and taste (TZG) as fruit is harvested earlier than optimal stage and also pay premium to encourage early harvest of fruit. Annually, KiwiStart incentives account for 6-10% (depending on variety and growing method) of the Zespri payments to growers (Figure 4). KiwiStart incentive reflects rates paid to the KiwiStart growers accounting for the submitted fruit in the inventory and then loaded out within the KiwiStart ISO weeks.

This early supply incentive encourages growers to make the best efforts to earn premium value for supplying fruit early. To be eligible for KiwiStart supply, growers must meet certain market access, at harvest standards and loadout requirements set out by Zespri. After taste payments, KiwiStart incentives have a direct and significant contribution to orchard gate returns for those who could meet the set KiwiStart criteria. Therefore, KiwiStart incentives become one of the main drivers of grower's behaviours for orchard management and harvest decisions.

5.1.3 Time Payments or Storage Incentives

Time or storage incentives represent the additional costs of on-shore storage and over-time supply of fruit to the markets. Along with fruit value and Taste incentives, time or storage incentives are to compensate and encourage growers and packhouses for cool storage, management of changing fruit quality during storage and repacking before shipping. Time payments include compensation for fruit loss and forgone taste payments. Storage incentives as premiums are also paid on top of fruit loss compensation (NZKGI, 2017b). From all the payments, time or storage incentives account for 4-10% depending on variety and the growing method (Figure 4).

Unlike KiwiStart and Taste payment as direct contributors to orchard gate returns, time payments are paid to the packhouse entity (who packs and stores fruit), the packhouse then distributes the time payments among growers depending on the growers pooling preferences and agreements. Time payment and entity pooling rules are crucial for growers to understand as pooling rules in particular would define the actual payments made to the respective growers.

5.2 Pooling in the Kiwifruit Industry

In New Zealand, kiwifruit packhouse operators or entities are not regulated by the kiwifruit bill. An active competition exists between packhouse operators for packing and cool storage of New Zealand grown kiwifruit. Competition between packhouse operators helps control the packing and cool storage costs for growers. The smallest facilities pack 200,000 trays (3.55kg/tray) per season whilst the largest pack upwards of 15 million trays (NZKGI, 2022). Pooling

formats and rules vary between packhouse operators. Pooling systems and formats are usually defined and agreed upon by the packhouse cooperatives and/or grower entities/councils.

Grower entity groups represent the voice of growers and administer the relevant postharvest operators for the distribution of grower funds and provide feedback for financial outcomes to the grower community. Grower entities are usually comprised of growers elected or appointed representing all the major growing regions. There are several grower entities in the kiwifruit industry, e.g. EastPack Entity Trust, Seeka Grower Council, DMS Horticulture Limited, and Apata Suppliers Entity Limited.

One of the prime focuses of the grower council or entity group(s) is to provide governance services on behalf of kiwifruit growers supplying kiwifruit to the packhouse. Grower entities also administer the pool and payment policy, monitor service provision and authorise all fruit and service payments. Financial reports are reviewed by the entity advisors to make recommendations for pool policy and grower services.

The grower entity is responsible for the fair and equitable distribution of funds via a pooling system. The grower council/entity may have different rules or pooling formats for fund or payment distribution among the entity member growers. Rules for fund distribution are defined in a way to encourages good grower practices, to allow good fruit delivery throughout the supply season and to ensure maximised orchard gate returns. Overall, the grower entity plays a crucial role in maintaining an ethical and grower-centric culture (Anonymous, 2022a & b).

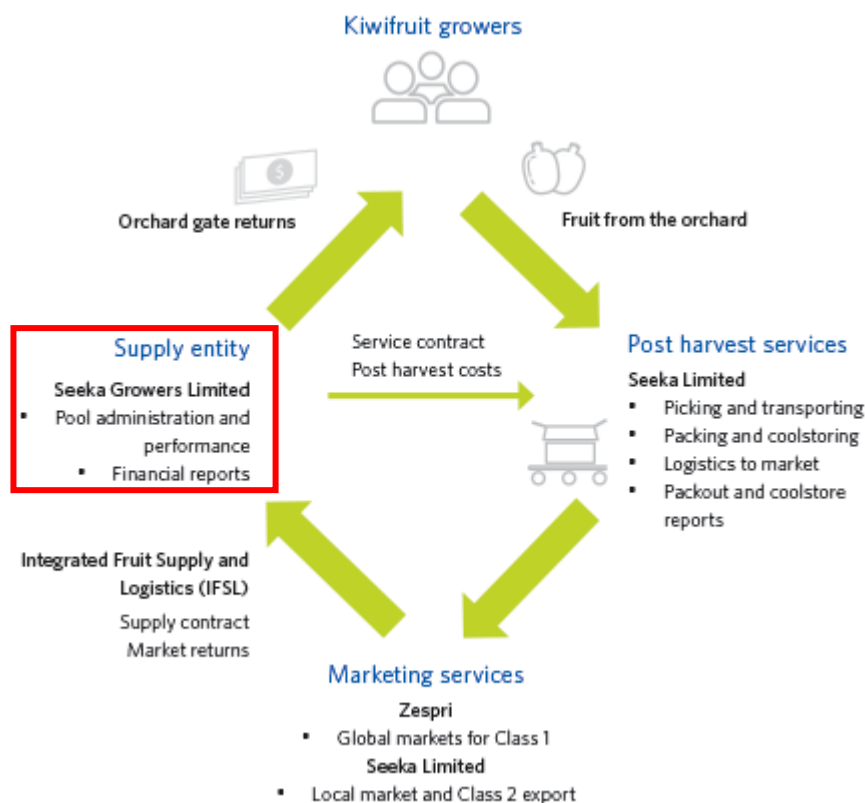


Figure 5: Example of grower entity and its role in the kiwifruit industry system (Anonymous, 2022b).

Pooling formats in various packhouses in the kiwifruit industry are independent of the Zespri payment system. Zespri pays fruit and incentive payments to the grower/supply entity and the supply entity then distributes the payments to respective growers after the deduction of fruit handling, packing and storage costs (Figure 5).

Pooling generally follows generic guidelines followed by agricultural cooperatives with the fundamental concept of coming together to share resources, information, risks and benefits. In the kiwifruit industry, pooling generally helps growers to share the risk of fruit loss that generally increases during storage. Various formats of storage incentive or time payment distribution among growers are also referred as storage or time payment pooling systems. For packhouses, pooling gives them the flexibility to manage the inventory and maintain equity without exposing any grower to unnecessarily higher risk. If growers choose not to pool returns, they could expose themselves to significant risk or reward depending on how their fruit performs and gets checked in the markets (NZKGI, 2017b). These storage or time payment pooling formats contribute towards maintaining the competitive advantage between different grower entities or packhouses. Hence storage or time payments pooling formats and resulting OGR's can be the defining factor for a grower's decision to become a member of any entity. Growers choose to become part of any grower entity or packhouse considering philosophical values, pooling format, competitive advantage and region.

6 Findings

6.1 Storage pooling in the kiwifruit industry

In the past, packhouses were required to treat all growers equitably, for example, if they had a brilliant storing line, and if packhouse stored it for long time (i.e. until November) and then found the fruit “fell over”, they risked getting sued because the packhouse did not treat that grower line equally as far as drawdown goes. However, packhouses were unable to keep good fruit late and in some cases, they had to keep poor fruit and let it “turn to custard”. Overall, it was completely wrong what the industry was doing (reported by an industry leader).

“Storage pooling was introduced in 1992 and the only reason of forming a pool was to reduce and share fruit loss, it was not to make incentives”

This implies that after the packhouse evaluated the quality of fruit from a grower, they had the freedom to take appropriate actions without imposing any risk on the grower. For instance, if the packhouse made an incorrect judgment, the grower wouldn't bear the loss; however, if the packhouse performed well, the value would be shared among all growers. According to one industry leader, pooling assists in minimizing fruit loss. A similar perspective was shared by another packhouse representative who highlighted that historically, storage pooling exists primarily for growers to collaboratively manage risks.

“Fundamentally the pooling system as a whole has been set up with the right intentions and with right parameters. However, the problem we have that pooling system was established 25-30 years ago”

The kiwifruit industry is running a system (including all the incentive systems, procurement/supply systems and packhouse storage pool systems) for an 80 million tray

business, while the industry has grown to almost 160 million tray business and with further growth anticipating meaning the kiwifruit industry is set to grow to 250 million trays per annum. So it is imperative that the pooling system in the kiwifruit industry be optimised for growth.

“If we look at the whole system including storage pools, we may find pools are correct but rules in which system operates probably are not correct and fit for growth”

6.2 Storage pooling in various packhouses

Packhouse operators provide multiple pooling options, and the selection of these options is driven by grower preferences. For example, a major postharvest operator might offer more than five plus KiwiStart pools for Hayward crops and more than six plus KiwiStart pools for SunGold crops. The pool-to-direct ratios may vary, including options like 70%:30%, 30%:70%, 60%:40%, 50%:50%, a direct pool (for growers who prefer not to pool and opt for direct participation), and a regional pool (e.g., with a ratio of 30%:70%). Growers have the autonomy to choose from eligible pools based on their preferences

“Growers are aware about the variety of pools available at the time of signing their contracts with the packhouses and growers can decide to elect any pool they want”.

According to another representative from a packhouse, their offered pooling structure is 50%:50%, aiming to distribute both fruit loss and storage incentives equally. They acknowledge that this ratio might be perceived as aggressive, but they clarify that they don't pool fruit loss for taste. From their perspective, the 50%:50% pooling of storage incentives encourages growers to be mindful of on-orchard activities and decisions, as they would bear 50% of the fruit loss during storage. Interestingly, certain packhouses also group fruit from specific growers into sub-pools within a larger pool. For instance, sub-pooling might be based on factors like girdling in orchards. However, the loading of fruit is generally not determined by pool or sub-pool criteria, making risk-sharing with presumably already at-risk fruit less beneficial for growers.

“Too small pools or sub-pools to keep some fraction of people happy doesn't work all the time. It may work in a good performance year but in a bad or average performance year this doesn't work. In a bad performance year, having all the growers in the same pool helps everyone”.

One of the packhouse representatives shared that they only offer 60%:40% (60% by pooling and 40% direct). They also have a rule of enforcing a 100% direct pool of growers (SunGold) if the fruit comes in at a certain sub-optimal maturity from a storage point of view. This rule is in place to protect the main pool growers from the added risk of poor performance fruit.

Another packhouse reported that they only offer one pool format (40% by pooling and 60% direct) and the way pooling rules are setup, it motivates and incentivises growers to provide good quality and good storing fruit. They also acknowledge some packhouses offer quite different pools e.g. 50%:50%, 60%:40% and some packhouses even offer the least risky pools like 80%:20%.

“From the packhouse’s point of view, good outcomes from any pool depend on the good quality fruit provided by the grower so fruit stores well and on other side fruit must be treated and managed well in storage”

Any grower in high-risk pools (e.g. 40% direct & 60% by pooling) would usually aim to deliver better quality fruit to the packhouse and the packhouse would also try to do their best to store the fruit well. High-risk pools put more pressure on the growers but it also gives them the confidence to earn most of the time payments.

“Any grower wouldn’t want to share the risk they would rather prefer to be in 100% direct pool”

Some growers would consistently prefer to be in the 100% direct pool. However, the majority of growers do not choose the 100% direct pool. According to a representative from a major packhouse, this is because most growers are unwilling to assume the associated risk, given that they lack control over how the fruit will be loaded out. Therefore, it can be assumed that growers in the 100% direct pool weigh the incentives for earnings against potential fruit loss, compared to those in other pool formats who are seeking to manage their risk. The primary reason for growers to choose the 100% direct pool could be attributed to their commercial orientation, as they desire full accountability for their performance, irrespective of external factors.

“It’s a commercial and philosophical reason they choose to be in 100% direct pool, and they commercially believe that’s where they should be because they commercially want be accountable”

6.3 Determining and choosing the storage pools

Pooling formats are not controlled by the packhouse or corporate entity; rather, pools are determined by the grower council, usually an independent entity formed by a group of trustees. This council, comprised of growers, has the authority to make decisions about pooling, which the packhouse then implements. Grower entities or councils, represented by growers, are present in almost all packhouses, defining the pooling formats that their respective packhouses offer to growers.

According to a representative from a main packhouse grower entities or councils do not direct or make suggestions to growers for storage pooling selection, instead growers have the autonomy to choose the pool they want to be in. Growers have a choice until the end of harvest to elect which pool they want to be in or what pooling combination they may opt for. Pool selection is usually at maturity area (a defined area cleared to harvest the fruit) level. Growers have the flexibility to opt for multiple or direct (as they prefer to take the full risk) pools. The decision on pooling ratios such as 50%:50%, 70%:30% and 60%:40% is usually influenced by the grower's views or ambitions for commercial outcomes.

“Usually the pools are split because they know they've had an issue on orchard, so they're moving away from where they normally would be to sharing of the risk”

For instance, a grower who would usually be in the direct pool may choose to switch to another pool for risk management purposes. Some smaller packhouses may exclusively offer a single low-risk pooling format (70% pooled and 30% direct). This choice is driven by the

understanding that riskier pooling formats, like 50% pooled and 50% direct, could expose growers to unnecessary fruit loss risks, especially in years with a small volume and challenging storage conditions. Additionally, this approach safeguards the packhouse's flexibility in managing inventory, particularly for reasons related to pack types or market access.

“Some of the people among growers and even in Zespri still don't understand and believe that pooling system is watering down the benefits to growers producing fruit with good storage potential but mostly growers are not even willing to take 100% risk and they must want to share the risk” shared by one packhouse representative.

A representative of growers entity or council states that “pooling is a great system in the kiwifruit industry and it's required because of the way industry deals with the fruit packing to shipment. Growers can have varied outcomes depending on load-out timing, so the pooling system allows required equalisation in the industry”. While pooling offers benefits, there are instances where growers with high-performing fruit may not receive their due share, and those with less successful outcomes might face undeserved consequences or receive minimal rewards. It was also noted that the existence of direct/separate pools is often influenced by the prominent growers who could influence the entity/council. While direct/separate pools are generally advantageous, when challenges arise blame tends to be placed on others.

A grower in any format of the pooling system, gets some value of the time payment as a result. However, a grower has no control over when their fruit is going to be loaded out. So there is a genuine question that while not having control over when their fruit will be loaded out and also not knowing how much storage incentive they may earn could also be driving behaviours to give weightage to time payments.

One packhouse representative expressed the intention to reward growers for late storage. However, using the example of a 70%:30% pool, where the pool absorbs a substantial portion of the incentive or penalty, growers are left bearing only 30% of the risk individually. In some cases, these pools are not very large, and the crop in the least risky pool could be quite insignificant. This approach differs from some other packhouses that offer only one or two types of pools while simultaneously managing inventory

There are two perspectives on the impact of storage pooling on grower returns. One grower felt disadvantaged in the 70% pooled and 30% direct pool, believing that the significant value of their fruit was diluted within the pool. Consequently, they requested their respective packhouse to consider changing the pool rule, possibly to a 50%:50% format. However, in the following year, when their fruit performed poorly and incurred substantial fruit loss, the same 70%:30% pool arrangement acted as a cushion and protected them from wearing the full cost of their loss.

Some growers may perceive their fruit as superior and request a direct or separate pool. However, from the packhouse's perspective, growers join pools for risk-sharing and reward purposes, ensuring equitable drawdowns. The outcomes growers achieve are sometimes influenced by how the packhouse manages them. When growers advocate for direct pools, packhouses often manage and persuade them that staying in a pool is beneficial for risk-sharing, potentially safeguarding them from the impact of a disastrous year.

One packhouse representative shared that they would preferably only offer the 100% direct pool option when they do not have confidence or data available e.g. 100% direct pool for new Red variety. With time as fruit loss data becomes available over years and packhouse

understanding of the new variety improves, then packhouses start changing the pool formats to start sharing the fruit loss risk.

Different pools appeal to various types of growers. For instance, some growers, through no fault of their own, may struggle to produce fruit with good storage potential, perhaps due to factors like location or labour issues. For these growers, opting for the least risky pools, such as 80%:20%, could be commercially reasonable, providing them with a sufficient buffer from risk. On the other hand, growers who can consistently ensure good quality and storage potential may find somewhat riskier pools, like 40%:60% and 50%:50%, more attractive, as these formats allow them to earn a substantial share of time payments. In essence, not every pool format suits every grower. Each pool format is designed to attract a specific type of grower, helping them manage risk and earn time payments.

One progressive grower shared their practice of packing with a packhouse that offers both a low-risk pool (70%:30%) and a high-risk pool (50%:50%) and growers have the flexibility to choose the pool that aligns with their risk tolerance. In their packhouse, certain pooling rules come into effect after a specific time in the season, ensuring that fruit loss for the remaining volumes in storage cannot exceed the average. So typically, most growers opt for the low-risk pool (70%:30%), either because they prefer avoiding risk or lack confidence in their crop storage/quality. In contrast, a smaller number of growers would choose the high-risk pool, taking a calculated risk based on their confidence in crop quality and historical storage performance. For example, assuming 40% of the crop goes into KiwiStart, approximately 50% may be allocated to the low-risk pool, while only 10% goes to the high-risk pool. The grower further noted that in their packhouse, the average net time payment for the low-risk pool was \$0.23 per tray, compared to \$0.36 per tray for the high-risk pool. This example illustrates that the high-risk pool can yield greater time payment earnings for growers focusing on storage. However, it comes with the caveat that in seasons with increased fruit loss, growers in the high-risk pool may face higher losses.

According to two of the packhouse representatives “a lot of growers do not understand the pooling system”. In their view, different packhouse could have different underlining rules in the contract but they were uncertain whether growers really understand those rules around pooling. Mostly growers look at their OGR’s and they do not really delve into pooling rules and the impact on their OGR’s. Hence, if growers do not really understand the pooling rules this means they may not be able to relate the effect of their on-orchard decisions to their returns and be able to change on-orchard behaviours. One of the packhouse representatives suggested that growers need to exercise caution in making decisions around which pool they select as if they end up with in a group of bad storing lines then there is huge risk of sharing losses only.

6.4 Is one packhouse's pooling system better or worse than another's?

“No, I don't see that one packhouse pooling options would be better or worse than others. There are always group of growers who philosophically pack with one packhouse, because the packhouse creates a commercially viable scenario for them”. Quote from packhouse

One would argue growers packing with any packhouse is more of a commercial decision instead of a philosophical one, while as matter of fact there are always number of growers who would not move to any other packhouse for various philosophical reasons and may prefer to stay where they are, as all packhouses offer various forms of pools to manage risk. Similar views were shared by another packhouse that growers basically trust the packhouse to

pack/store their fruit and they also trust the grower council or committee with respect to administering the pool format and the rules around it.

From a packhouse's perspective the pooling system has no real value to them other than that it provides the flexibility to manage their inventory. Pooling formats in most of the packhouses are largely similar and pooling is not considered better or worse between packhouses. One of the packhouse representative shared that it is hard to drastically change pool rules. Some packhouse facilities may try to increase the percentage of growers in direct pools but this comes with a trade-off of less flexibility and exposes growers to risk.

Another packhouse representative thinks, there is no competition for the fruit exporter (i.e. Zespri) and between growers, while packhouses compete with each other so pooling formats create one form of commercial difference between the packhouses. However, when growers choose any packhouse or pools they consider the commercial aspects and most of the time they end up following a self-fulfilling prophesy that their packhouse or pool selection is the best suited option for them at that time. For example, a grower in 40%:60% pool often wants good time payment earnings compared to a grower with a commercial preference for the least risky pool of 80%:20%. In essence, pool selection becomes a self-fulfilling prophecy for growers irrespective of the pool the choose.

Additionally, a packhouse highlights the significance of the relationship and loyalty between packhouses and growers. Growers tend to stay connected with a particular packhouse not necessarily due to a preference for a specific pooling format but rather because of the established relationship and allegiance. Consequently, growers may be less inclined to explore alternative pooling formats, rooted in their loyalty to the packhouse they are currently associated with.

6.5 Role of the packhouse to impact behaviours related to storage pooling

With the growth of SunGold volumes (Figure 1), more volumes will need to be stored for longer so packhouses will need to implement a combination of maturity levers and pool rules to drive the harvest of fruit at the right maturity. Packhouses can ask growers to consider the risk of delaying harvest (as fruit reaches a certain softness) and the entity could apply conditions for them to be put in direct pools to face the full risk – this is the only thing the packhouse could do. One packhouse reported that with this enforced rule around maturity and pooling, they have seen a reduction in the number of growers waiting longer than they should as they fear the risk of being in the direct pool. One grower shared that one year when they delayed harvest and had to bear the fruit loss, so the next season they asked their orchard manager to optimize orchard management and compromise the taste a little to harvest the fruit at the right maturity for long-term storage.

Growers trust their packhouse to keep good storing lines longer and if fruit loss turns out different than expected then growers lose trust in the packhouse. Growers respond to money and some packhouses can try to improve pool performance and subsequently overall packhouse performance, by implying incentive and penalty structures within their systems. However, one packhouse representative thinks threatening growers with the stick by adding a reject penalty does not work either as this does not reward/recognize growers who are contributing significant value to the pool. They believe in educating the growers about what happens when their fruit leaves the orchard.

In a similar context, another representative from a packhouse expressed that for many years all of the packhouses have shielded growers too much from what their actual fruit quality might be because packhouses have been competing with each other to fill their packing and storage capacity. Packhouses were accepting whatever the fruit growers were bringing to their doors. Whereas now some of the packhouse capacity is beginning to fill up, so the industry is becoming more comfortable talking about fruit quality and the related costs with their growers. Some packhouses even ask growers to come and observe themselves, when fruit is getting packed and during repacking. This comes down to educating growers and making them aware of their fruit quality issues as well as rewarding those who are trying to improve fruit quality. A progressive grower also thinks packhouses do have a role to play, in their view, there are about 50-60% of the orchards are managed by the industry, so it would be interesting to know what drives most of the growers to be in low-risk pool.

Contrary to this, one packhouse representative thinks it is important to note that pools are not managed by the corporate bodies (of packhouses), instead pools are managed by the growers. Therefore, packhouses cannot drive or influence growers behaviours towards pools. They further said, on one side, Zespri has got this great system of time payments but then when it gets iterated through into the pools, it becomes something different again.

“Packhouses can't drive growers behaviours that because of the separation between the two payment systems i.e. Zespri time payment and growers pools, both are very different”

6.6 Storage pooling formats and inventory management

Loadout time and the pooling format have a direct link with the time payment any batch of fruit may earn. All the representatives from packhouses said that inventory is loaded on out on merit and has nothing to do with the pooling format.

“The inventory managers don't even see the pool, they don't even know what growers have selected”

Packhouse and growers emphasized that pooling is intricately linked to a grower's income but is not linked with the operational management of their fruit. It is primarily a strategy for risk management, where growers share risks with those who share similar preferences in terms of packing in a specific packhouse and being part of the same pool. For packhouses, pooling gives the flexibility to manage the inventory considering the fruit storage potential irrespective of the pooling format. Packhouses would prefer to have as much fruit with long-term storage potential because after considering all the factors (i.e. taste groups, pack types and market access), it contributes to their flexibility with respect to inventory management. It is important to note a scenario in which there could be a grower who could have opted for multiple pools. So basically fruit cannot be loaded out based on the storage pool (or pooling formats). It was further clarified that the storage incentive pooling operates in a manner where there is no dedicated long-term storage pool. Instead, it encompasses anything harvested after the KiwiStart period, which the packhouse can store and subsequently load out based on order requirements, extending to November or up to the last order of the season.

“Packhouses look at the criteria of the order (market access, pack type, size category etc) versus the risk of keeping that fruit”

To determine if the fruit is eligible for long-term storage, the packhouse would evaluate that the fruit has no market hold, was harvested at good maturity (so no urgency to loadout), has good fruit quality (historically and in the current season) and its condition checking is looking positive. So from a packhouse's perspective, pooling provides ease to manage the inventory in cool stores and gives flexibility with loadout. For example, if there is some proportion of fruit with sub-optimal quality, the packhouse can load it out earlier and pooling gives the packhouse flexibility to make such loadout decisions.

Another packhouse also reported that pooling gives them some flexibility to manage the inventory. In their view, different pack types and market access related factors sometimes represent limitations for inventory management but pooling helps overcome those limitations and allows more flexibility. However, packhouses will not have any flexibility if they get poor quality fruit coming into their cool stores. So packhouses should consider carefully when defining the pooling system as they do not want to drive behaviour where growers do not even care about the fruit quality in storage.

6.7 Growers influence on the loadout decisions

“Growers understand that the pooling formats don't matter or effect the packhouse inventory management decisions because fruit will only be loaded out considering the historical performance of the fruit and its quality in any given season”.

Growers in the same pool may not grow fruit differently to share risk with others. Irrespective of the pooling preferences, growers have no control over when their fruit will load out. All growers are aware that the fruit will be evaluated within the packhouse loadout priority system and their fruit will get loaded out based on the maturity, history and quality. Growers believe their fruit load out is based on merit, even 100% direct pool growers still cannot influence the fruit loadout, said one of the main packhouse representatives.

Another packhouse representative believes growers do not grow for long-term storage, as growers can only ensure their fruit comes in with quality and at the optimum maturity to encourage the packhouse that fruit has the potential to store well. Growers have no control and cannot influence the fruit load out. It is up to the packhouse to take care of the fruit as best as possible. When it comes to filling the order, the packhouse can still load out the fruit early whether or not the fruit has the potential to store for another few more months. A grower acknowledged that from a loadout perspective, the packhouse would manage fruit quality irrespective of the pooling. For example, if a grower is in the high-risk pool believing their fruit stores well and they should be earning time payments, however, if the loadout priority of the fruit changes, then the packhouse will respond to the quality and will load the fruit out.

A grower shared an observation that the packhouse tends to target specific fruit based on historical performance, either knowing that it performs well or poorly. However, this also means packhouses may keep some fruit for longer duration. This situation sometimes makes some growers (especially those in high-risk pools) raise the question to their packhouse about why their fruit is not loaded out if they believe packhouse should not be storing it any longer. Some packhouses believe that high-risk pools could drive grower's behaviours to become involved in the load out decisions. High-risk or direct pools are perceived to be taking away the control or flexibility of the packhouse to manage the inventory. For example, a grower with a history of poor fruit quality might prefer the packhouse to store the fruit longer to earn time payment, while a grower with good fruit quality may want the packhouse to load it out earlier.

Meanwhile, growers in low-risk pools may not be as invested in when their fruit is loaded out. Packhouse representatives shared that growers ask questions if their fruit is loaded out early and the packhouse had to explain the risks and reasons for not holding onto their fruit for too long. Meanwhile, another packhouse also reported that the real purpose of the storage pooling (to share risk) is lost these days as some growers try to take advantage of the pooling system by growing/supplying sub-standard fruit as they know the pool will absorb any fruit loss during storage.

6.8 Impact of storage pooling on behaviours

A participant from a major packhouse expressed the perspective that pooling does not drive the right behaviours because the time payment, which does not cover the associated risks, makes it impractical. Storage pools are seen as diluting incentives given there is not enough motivation to offset risks, except for a few risk-takers seeking a commercial advantage. Most growers opt for pools with low (70% pooled & 30% direct) or high (50% pooled & 50% direct) risk, acknowledging the limited financial gains in time payments and the prevalent risks.

“Some growers have said to Zespri for over many years now that there is an imbalance between KiwiStart and time payments because time money does not take into account risk”.

When asked if more money in time payments would solve the problem or if is it the way time payments are distributed among growers that drives the behaviours, one packhouse representative thinks unfortunately industry has the wrong mentality about time payments that high fruit loss means more time payments. There should be definitive time payments for any group of growers those achieve lower than average fruit loss. From an industry point of view, it is the grower’s money so the system should let them have it, as money goes back to the growers and does not go to the corporate. We know growers will follow the money and behaviour will change. However, it looks like the industry is fixated on pushing down the time payment curves.

“Overall all the incentives aren’t aligned. Storage incentives will never be direct because growers can’t influence their crop loaded out time (as mentioned earlier that loadout is on the basis of LOP merit). So grower will pool to manage the risk”.

So, no matter the overall proportion of OGR that time payments incentive makes up, money will still get diluted depending on the pooling format. There will be some growers who will take it directly, but not all growers have that appetite for risk.

One packhouse representative mentioned that they would prefer to have more fruit with long term storage potential. Packhouses wish to identify such growers even before harvest and are willing to harvest them at the optimal stage to then store them for long term but in reality, many growers’ crops are not there for expected storage potential.

Another packhouse operator shares the view that “it is difficult to shift the cost of their fruit quality back to the growers. The risk is when pool rules are strict to put individual costs back to the growers then they start getting involved in the loadout process and start asking not to hold their fruit longer and sometimes that is the fruit with long-term storage potential. Even if some growers take risks, in case of higher fruit loss they would consider moving to another packhouse. Moreover, from a packhouse view, it is hard to penalize growers for supplying poor storing fruit, first of all, it is very hard to prove to the grower the direct cost of quality

representative of their fruit (as we only check 5% of the product). Secondly, even if a packhouse could find a way to penalize growers, growers do not like receiving a charge and are likely to move to another packhouse. In the packhouse's view, to drive the right behaviours the whole industry would need to shift, as in the current system there is a luck factor and so it is hard for a packhouse to change their rules to penalize the growers.

A progressive grower suggested that it would be good to sheet back the cost of quality to growers. In the grower's view, there is too much pooling and many growers don't know how their fruit stores, as they do not necessarily get direct information about their fruit quality. This drives behaviours towards prioritizing increased taste and increased fruit value. However, this is more of a case for SunGold growers compared to Green kiwifruit growers. For SunGold, the grower needs to find a balance (between taste and fruit value) to harvest at the right maturity. On the other hand, Green growers know that delaying harvest will give them good taste, increase yield and also increase the chance of time payments. Overall, pooling and time payments drive behaviours more for SunGold kiwifruit growers. Storage incentive pooling helps share risk and gives flexibility to packhouse while the growth in SunGold volumes and various pooling scenarios available in the industry, grower's behaviours have changed to optimize the returns and they follow the money. In years like 2022 (with high fruit loss and market quality issues), it is sad for the growers who have been intentionally making efforts for the last many years to make sure their fruit is stored longer and they bring time payments to the pool but they had to share a lot more of their value with the growers who never really cared about their fruit quality in storage because of the pooling.

Another packhouse representative believes that slightly risky pools like 50%:50% and 40%:60% drive grower's behaviour where some of the growers exclusively grow for storage. There are also examples of some big growers who would be making orchard decisions to ensure some of their fruit gets into KiwiStart, some of the fruit comes in as early main pack maturity (so doesn't get stored for long) and some of the fruit gets harvested at optimal maturity to ensure fruit stores well and earns some time payments. From a grower's view, orchard location and vines potential to achieve KiwiStart are also decisive factors if grower knows they cannot achieve KiwiStart then some progressive growers would make their best efforts to ensure fruit stores well so they can make some time payment earnings. Some of these growers would also prefer to opt for high-risk pools (50%:50% and 40%:60%) to maximize their time earnings.

A representative of a council/entity assumes that 90% of the growers aim to produce the best fruit possible, without specifically intending to be in the best or worst position within the pool. Having said this some growers are aware of their orchard conditions and the respective decisions they make (e.g. canopy management, crop load & foliar fertilizer application) to have an impact on their OGR. These are the growers who would consistently strive to produce best-quality fruit and aim for good financial outcomes. In a way, it is not solely about the orchard location or crop load, it is about the efforts they consistently invest in the process.

One generalized view is that industry culture has changed over the last 20 years. Nowadays, there remains a considerable proportion of growers who are deeply passionate about learning and producing the best quality fruit. At the same time, there is a proportion of the growers that may not consider fruit quality in storage and pooling because these are not growers, instead they are owners. Growers may be part-time orchardists with a full-time job or they could be orchard owners paying someone else to manage the crop for them. They may be enthusiastic about horticulture or growing kiwifruit but may be less passionate about each crop compared to an owner-operator orchard. Therefore, for most growers maximizing taste incentive and

yield becomes the primary objective and storage incentive may be secondary. For pooling selection, most growers would take a low-risk approach. There are very few growers in direct or high-risk pools and only because they historically have the lowest fruit loss anyway. Some growers would also opt for regional pools as they know and trust their fellow growers to produce good quality fruit. Most growers aim for long-storing fruit to earn time income, but many simply check the boxes without understanding the fundamentals of the pooling system. Pool rules and models are complex and many growers are not even interested in understanding them.

Hence, the primary factors contributing to the industry culture and grower behaviours are the lack of experience in the industry and a limited understanding of the pool system/rules.

“Someone tells them that the better the fruit stores, the better the money, they will follow the money”

6.9 Grower’s behaviour for KiwiStart, taste payments vs time payments and pooling

KiwiStart incentives and taste payments directly contribute to growers’ OGR’s. In general, there is no pooling system for KiwiStart fruit. Zespri publishes the KiwiStart rates and taste incentives that determine the earnings for growers.

“The KiwiStart incentive gives good money and most importantly an absolute certainty to the growers, whereas with time payments, there is no certainty plus money comes in drips and drabs as fruit gets loaded out and there is always some loss”

Many growers, especially those not in the KiwiStart pool or involved in late storing, do not have much confidence in receiving sufficient returns from time payments and fruit value. However, these growers supply mid-term storing fruit that sustains Zespri’s supply until the end. Currently everyone wants to be in the KiwiStart, not necessarily for the money (although that is a significant part of it) but because it entails lower risk. For the KiwiStart growers, there is the KiwiStart incentive and fruit is loaded out early as well, making the KiwiStart fruit low risk. In the same context another packhouse expressed the perspective that SunGold growers do not see real value in time payments as models imply low losses and because of the pool format they may opt. Not getting the KiwiStart alters the mindset to hold off harvesting and maximize taste payments, as direct incentives and pooling act as safeguards for storage losses, if any. Meanwhile, Green kiwifruit growers (especially the good ones) traditionally understand their fruit performance to generate time payments to offset the losses. Such growers think of optimum maturity for long-term storage. However, a grower who cannot be in the KiwiStart and also struggles to achieve optimal maturity for any reason (e.g. region, frost risk, etc), their fruit doesn’t have storage potential to earn time payments. Such growers face a huge loss compared to the KiwiStart and those harvest the crop at optimum maturity for storage. In a way incentive system is not doing justice to the Green kiwifruit growers who are stuck in the middle. Grower suggests for Green growers, time payments need to start earlier.

One of the postharvest operators shared that mostly they do not vote or like the increase in the rates for KiwiStart because they believe the lack of risk motivates enough growers to be in the KiwiStart. In the postharvest perspective, most growers (particularly SunGold kiwifruit growers) are not focusing on storage. They aim to harvest fruit in the KiwiStart and maximize taste. Storage is not a top priority for them. As long as they get clearance and their fruit is packed, they are not overly concerned about it. One packhouse representative thinks people have become smarter to manipulate the system to maximize their returns. For example, some

growers delay harvest to gain more taste payment (that isn't pooled) at the cost of fruit softening. This softer fruit comes in the pool and ships out earlier (minimizing their fruit loss). Overall, this also creates inequality amongst returns for growers.

“KiwiStart rates have been too high for too long”

“Growers are very money driven, they'll tell you they're not, but they are, honestly, they'll follow the money”

KiwiStart rate changes are not driving the right behaviours as well. One packhouse representative stated that “assuming a net revenue divided for taste incentive payments, for KiwiStart incentive, for time payments and then fruit value. Considering a chunk of growers have never got an opportunity to earn KiwiStart money, they are never going to get that share from the KiwiStart bucket, and hence this whole redistribution is also weighting towards the KiwiStart growers and KiwiStart incentives”.

“A KiwiStart grower gets a huge cash flow advantage because of the timing of those payments to them compared to a main pack grower”

One packhouse shared that their growers could see comparative statistics from both the industry and from packhouses. These statistics would show range of payments by maturity area and growers can see KiwiStart is always at the top end compared to main pack maturity areas. Some believe that the current incentive system overcompensates the KiwiStart growers for the average size and taste forgone. Growers believe relativity is not there for the KiwiStart versus the main pack crop. One grower representative thinks average size and TZG in the first 3 weeks provides view about the average of the population 12 weeks later. Hence compensation for KiwiStart only needs to be for that section.

“Almost 40% of the crop is KiwiStart, where growers not only get the fruit payment, they also get the KiwiStart incentive. This is with the assumption that they haven't got other incentives in the other parts of the supply cycle for them to potentially earn, KiwiStart growers are actually earning a double whammy in KiwiStart space”.

Payment timings are driving issues as KiwiStart growers have advanced cash flow while main pack growers have less access to money. Main pack growers do not receive payments in time to pay for the winter work. Growers usually rely on banking facilities to fund winter on-orchard work, whereas the KiwiStart growers tend to have available cash flow to fund it. One can look at the difference between the August payment for KiwiStart versus not KiwiStart grower and compare the cash flow. One of the packhouse representatives thinks Zespri does not even look at the cash flow - it just looks at the average payment. In their view, Zespri needs to model and report on a KiwiStart payment versus the main pack payment, as currently we just do an average.

Growers believe there is not enough money in time payments, relative to the risk in storage and more importantly relative to the KiwiStart incentive. Growers also think, that with the increase in crop volumes, there are going to be more volumes that will need to store well. In their view using a 5-year rolling average fruit loss curve for time payments may not be the best approach as we have some good and bad fruit loss years but overall as an industry, we are gradually having higher fruit loss over years. A representative from a grower council/entity also shared

similar views that the biggest reason growers chase the taste payments or the KiwiStart incentive is because growers see the direct increase in their returns, which drives less interest in the storage or time payments. The industry has been driving for an unprecedented fruit loss model by implying a five or previously seven-year average. Even in comparison to other fresh fruit industries, the kiwifruit industry has been striving for continuous improvement. However, it has come at the cost of a time payment model not reflecting the risks of higher fruit loss. Overall, some believe the models were not fit for purpose to start with and industry is still using the wrong models.

“We are not paying enough to encourage enough”

A number of packhouse representatives believe the KiwiStart incentive drives the on-orchard practices (4-5 girdles to meet KiwiStart taste criteria). Yet, according to one packhouse, certain growers, particularly those outside the KiwiStart window due to reasons like region or historical trends, might prioritize maturity or softening stage and its impact on storage quality. A grower mentioned that while decision-making involves maximizing profits, growers also take great pride in delivering high-quality fruit. Despite this, growers feel the reward is insufficient to consider long-term storage.

There is also a perception that in fact sometimes growers are trying to be just better than their neighbours. Similar views were also shared by a packhouse representative that some growers only look forward to July when they can sit together with their mates and compare their returns from any form of the incentive system. In the end, it all boils down to human factors and the desire to outperform others, whether it is surpassing peers, neighbours, or the company average.

6.10 Role of packhouse & growers

One packhouse representative thinks packhouses cannot address concerns about the imbalance between KiwiStart, taste, and time payments. It is all about grower’s money and the distribution of this, so growers must be the ones to raise this issue. However, one packhouse representative believes that only a proportion of growers (including a few members of grower Councils or entities) in the industry truly have a good understanding of this imbalance between the KiwiStart incentive and time payment. It is important to emphasise that growers need to understand the imbalance that prevails between KiwiStart and main pack growers. The whole industry structure (i.e. growers, packhouse and Zespri) needs to align and agree on some form of a solution around this. There was also sentiment that generally industry parties argue with each other to agree on a solution and this sometimes leads to suboptimal decisions in the industry.

Growers should engage in discussions with their packhouses to understand the impact of pooling on their returns. It is crucial for growers to grasp and trust the reporting of their fruit quality, investigating reasons for condition check failures and repack losses. While only a few growers currently observe the fruit checking and repacking process, more involvement is needed in quality-related decisions. Growers perceive a gap in specific information about their fruit quality between the packhouse and market. There are concerns about potential loopholes in the system, emphasizing the importance of allocating the cost of quality back to the packhouse and growers. Growers recognize the complexity of the process, considering shipping and market scenarios, and appreciate effective communication from packhouses.

6.11 Incentive system and predicaments around storage pooling

Various themes were identified from interview discussions. Themes were grouped to elucidate the gaps in the incentive system and challenges associated with storage pooling. The following sections describe the sequence of findings and recommendations.

Rebalancing of key incentives

For Green kiwifruit, the industry needs to think of a way to incentivise good storing lines to delay harvest during the main pack period. Meanwhile for SunGold kiwifruit, firstly there is a perception of no value in time payments and as a result growers do not consider fruit storage, secondly, they see more value in KiwiStart incentives. For SunGold kiwifruit there needs to be a balance between KiwiStart incentives and time payments to drive the right behaviours.

“The fruit loss curve in the time payment model needs to be reviewed to compensate realistically to drive the right behaviours”

SunGold kiwifruit growers compare the taste incentive (as a direct payment) and time payments (via a pooling system). Growers intentionally delay the harvest to accumulate higher taste payments. This highlights the importance of aligning taste incentives with time payments to encourage the right behaviour. Considering the perspective of a postharvest representative, a comprehensive review and realignment of the incentive system is necessary. In general, commercial strategies also need to be re-evaluated and adjusted.

The time model for Green kiwifruit is considered robust while for SunGold, the time payment model needs to be reviewed as there is an increasing expectation to store longer. Any model based on the past seasons (with lower volumes and shorter shipping season) does not reflect great incentive for growers to grow for long term storage. Time rates need to be commercially more attractive, in line with KiwiStart rates, to bring back the focus on quality. Additionally, packhouses could bring pooling rules around disincentivizing for sub-standard quality to drive the right behaviours.

It is important to note that the value of KiwiStart fruit is connected to the strong demand and successful season ending of the main pack fruit. In a way KiwiStart growers also need to consider that if fruit quality deterioration damages the brand, then next season KiwiStart fruit becomes less valuable and KiwiStart grower will not be able to earn the same incentives. Therefore, KiwiStart growers should back the adjustment of the KiwiStart incentive and the time payments.

“In a way both KiwiStart and time payment incentives are linked for the success of the brand”

Overall, the industry needs to review the whole incentive system. Zespri should send clear financial signals to both KiwiStart and main pack growers to encourage behaviours that result in supply of high quality fruit throughout the entire season.

Certainty in time payments

“At the moment we are paying relatively less for the risk and whatever is paid its get distilled by the pooling system”

A postharvest representative suggests implementing a linear model for time payments, allocating more funds to it (3%, 4%, 5% or more). The idea is to establish a fixed amount for time payments, regardless of actuals. If growers exceed this benchmark, they earn additional money. The rates should remain unchanged for about three years, providing stability. The focus should be on performance, not yearly variations. This approach acknowledges the competitive packhouse environment, emphasizing the importance of helping growers meet time payment goals. The representative also emphasized that Zespri don't have to put huge amounts as per this linear model, but this model must present certainty for growers, regardless of the actuals.

“The incentive system needs to ensure some certainty in time payments”

One would think this could make the already competitive environment between packhouses even more competitive. However, one of the main packhouse representatives thinks that there is a different dynamic about capacity-related competitiveness between postharvest operators. So, introducing a linear model may enhance competitiveness between packhouses, because suddenly time rates would become meaningful to the growers. At the moment there is so much risk for a grower for negative time income, and growers prefer not to be in that space.

Re-set the time payment rates

One of the packhouses representative thinks comparing growers over the industry average fruit loss curve would show that at the start of the season, mostly growers are aligned with the fruit loss curve but as the season progresses some of the growers would be way off the industry average fruit loss curve. So, it would be good to start the time payment rates bit earlier because some of the fruit loss is never really realised especially in the SunGold pools as in the past fruit was not loaded out late in the season.

“The risk is very real and industry average curve doesn't really do the justice for some of the late storing growers”

Grower education

Educating growers is crucial to encourage the right actions. Packhouse representatives suggest tailoring education and messaging to specific aspects of the business. For instance, growers should weigh storage incentives against the costs of condition checking, repacking, and additional cool storage expenses. Some packhouses may have varying rules impacting how growers perceive time payments in pooling.

There is a call for more emphasis on educating growers on how to cultivate fruit for storage and understanding pool rules. However, it is essential to recognize that a one-size-fits-all solution does not apply to growing for storage, given that good quality fruit results from numerous inputs, not just a single change. To aid understanding of pool rules, packhouse annual seasonal reports with comparative statistics on net storage earnings offer valuable context and perspective in the industry.

Grower education - role of progressive growers and packhouse reps

“95% of the growers follow the top 5% of growers, their packhouse and very few follow Zespri and NZKGI messages”

One industry leader thinks not all growers follow the same messages and not all growers have faith in the delivery of those messages. In their view, the majority of the growers look up to their packhouses for direction, especially around changing growing practices or technical advice. If they do not get the right messages or technical support they have limited reason to listen to Zespri and NZKGI directions. Zespri can deliver the message in various forms but it is the postharvest extension and grower services representatives that could drive the biggest change. Industry leaders suggest that all parties including NZKGI, Zespri, packhouses and industry leading growers should be sharing the same messages to get the 95% of the growers to follow or respond to the change in practices and behaviours. It was also reported that growers follow the dollars, so there is no point talking about change in growing practices or behaviours if the money does not reward them for that change.

Grower education – role of Zespri

Zespri could put more emphasis on the technical support provided to the growers to make right decisions. Technical support backed up with some solid pools rules in the form of disincentives or risk of sub-pooling may encourage the right behaviours to understand the impact of cost of quality. At this stage there is a significant amount of technical information available but the current pooling system saves growers from financial loss, so growers do not pay much attention to the technical information.

Time payment calculator

A suggestion was made to create a time payment calculator where a grower could select the pool structure and tweak some parameters (e.g. fruit volume, likely loadout time and history) to then understand the modelled time payment earnings paid to their postharvest on their behalf. This calculator could assume every packhouse is at average fruit loss and growers may be able to get an idea of their earning potential compared to the industry. It important to note that setting up this calculator could be a complex process and interpretation of the results may not be straightforward. Education would be a key success factor here.

Packhouse sub-pooling

Packhouses could introduce sub-pooling within a pool or apply rules to disincentives (for quality issues) to drive the right behaviours. For example growers with certain levels of rots or explosive soft fruit could be re-grouped in a sub-pool or could have to bear the consequences in the form of extra cost or disincentive. It was suggested that packhouses should establish pool rules regarding fruit maturity, enforcing direct or sub-pools when fruit harvested at sub-optimal maturity.

Combination pools

There could be a combination of high-risk and buffer pool to drive the right behaviours that growers make their best efforts to take the risk and deliver best quality fruit while after certain stage of the season, rules should change to minimise the risk for a grower. With this model, a grower could take a calculated risk as they would know that a certain volume of their crop will be loaded out while they are in high-risk pool and some of the left over volume will be loaded out as part of the slightly less risky overall pool.

Late shipping programme

One postharvest representative thinks Zespri should tender or have some method of securing fruit for late storage (maybe call it a “late shipping programme”). Depending on the storage quality in one season, Zespri should define how much fruit any packhouse could provide for late shipping. Currently, the packhouse does not have to perform better because everything is in the pools. However, with this option of a late shipping programme, if any packhouse supplies suboptimal quality fruit in one year they will have less or no opportunity to participate in the late shipping program next year. This way every packhouse would try to influence growers to grow better fruit for late shipping and will try to be in this programme. This will create a competitive environment for packhouses to earn cool storage costs. This option will also create peer pressure between packhouses and then packhouses would put pressure on growers to deliver the best quality fruit for late shipping. Packhouse representatives, also acknowledge that this option may require a fundamental system change in the industry as this option goes against the current rules of providing equal opportunity to everyone in the system.

From a packhouse’s perspective, having a KiwiStart type programme for late shipping (by putting direct incentives to growers for storage quality) may not drive the right behaviours either as no matter how much money you put into the late shipping programme, growers would not want to take the risk. A grower wants to make money but does not want to take the risk.

Industry wide load out priority (LOP)

There could be an industry wide standardized LOP or storage rating system to define the storage potential of any fruit. Certain LOP numbers or storage ratings would mean the grower would get some extra incentive. However, this could be challenging in the competitive environment between packhouses. The industry would need to ensure the system is self-regulatory otherwise in case of poor performance this system would be blamed.

Growers feedback to packhouse

If growers believe pooling influences their behaviour, they should provide feedback on the pooling structure's impact on their returns. If someone feels disadvantaged and prefers more risk, they can request a direct pool from their packhouse. However, growers typically avoid risk, and packhouses may not favour growers opting out of the pool for effective management.

Industry as a whole

“Whatever we do and whatever model we adopt, the whole industry needs to align to drive the right behaviours, as packhouse would mirror any new model of storage incentives to then drive the respective behaviours”

A grower mentioned a challenge that altering the Zespri pool system is difficult as packhouse pools have their own rules, affecting money distribution. However, if the main industry pool undergoes significant changes for the better, grower entities/councils at various packhouses will need to adjust their pool rules to align with the industry pool. This process may take a few years, with some packhouses taking longer to adapt, but eventually, the industry will respond to the change.

Zespri and NZKGI (industry governance bodies)

A lot of kiwifruit growers take pride in their role of cultivating kiwifruit and being part of the great industry. Growers want to grow a good crop. They do not want to be involved in industry politics. Most of the growers trust and put faith in Zespri to fix this imbalance between incentives.

“Zespri should compare earnings of a main pack grower and a KiwiStart grower and then react to this considering the difference of earning between the two groups”

One would think that the industry could re-work the models around Zespri’s overall pool system to re-define or simplify incentive systems, while at the same time, there are a lot of complexities in the packhouse systems around pooling that water down the incentives. So Zespri and NZKGI should be looking at the structure of the whole 200 Million tray industry and ensure that the incentives system is equitable to everyone. The industry should not endorse any change on one side of the incentive system if the other side becomes imbalanced which could result in further issues. Following the industry-level re-alignment of the incentive system, packhouses would then also need to re-set their system of money re-distribution to growers. Industry leaders proposed including disincentives or penalties alongside incentives in the realignment process. Educating the industry is seen as crucial in this regard.

“Carrots, sticks and education are the key”

A participant agrees, saying, "It is like a big pie. It's not about who takes the largest slice but about growing the pie. If the pie gets bigger, even if our share stays the same, it is worth more". For a consistently successful industry, all three parties must be equally accountable and collaborate for everyone's benefit.

7 Overall Conclusions and Recommendations

The New Zealand kiwifruit industry has an incentives system in place to motivate growers to supply high tasting fruit early and for an extended storage period during a season. The KiwiStart incentive and taste payments directly impact grower’s OGR’s and are considered a top priority for growers to pursue. Time payments are paid to growers via packhouse storage pools. Pooling helps protect growers from the risk of fruit loss during storage but is also seen as causing a dilution effect on the time payment earnings. There are various formats of storage pools in the packhouses. Growers often do not fully understand the pooling rules and find them complex. Simultaneously, time payments are not attractive enough to drive the desired behaviours for supply of fruit with storage potential. High-risk pools (e.g. 40% pool, 60% direct and 50% pool, 50% direct) seem to create financial motivation for growers to grow for storage. Low-risk pools (e.g. 80% pool, 20% direct) on the other hand provide too much protection from risk of storage losses. Low-risk pools reduce the actual value of time payments for growers focusing on growing for storage. It is difficult to directly sheet the cost of quality back to growers to drive the right behaviours. Storage pooling allows packhouses flexibility in making loadout decisions based on the merit of fruit quality. The storage pooling system was established with right intentions but with the growth of industry pooling system needs to be realigned.

Overall, at the industry level there is a perception that the whole incentive system is outdated and needs to be re-balanced considering industry growth in coming years. Study participants

offered valuable suggestions to address and resolve issues related to storage pooling and its consequences.

The following recommendations are made for the New Zealand Kiwifruit industry;

- Review and rebalance the incentive system for the kiwifruit fruit industry and bring certainty in time payments. Align the KiwiStart and taste incentive with the time payment incentive. Re-define the time payment model to bring certainty in time payments. This will motivate growers to grow for long-term storage. All of the industry players, i.e. Zespri, packhouse, and growers would need to make a collective commitment to prioritize the fruit quality and brand value to then redefine the incentive system.
- Educate growers by providing technical information and tools (e.g. time payment calculator) to understand time payments, pool rules and highlight the value of growing for long-term storage. Provide education to growers regarding quality issues both on-shore and in the market. Zespri, Packhouse and progressive growers can play a significant role in educating growers regarding time payments and pooling rules impact on their orchard gate returns.
- Introduce a sub or combination of pools to incentivize or penalize depending on fruit quality and overall losses. Packhouses can introduce a combination of high risk and buffer pools to create conditions of more direct earnings for growers and at the same time provide risk protection throughout the later months of shipping. This will drive the grower's behaviours to make the best efforts to deliver the best quality fruit for storage.
- Introduce a special late shipping programme with certainty in time payment incentives for those who become eligible to participate in this programme.
- Growers should proactively provide feedback to their packhouse regarding the impact of pools on grower's returns.
- Introduce an industry wide standardised load out priority (LOP) or storage rating system to define storage potential of fruit.

“We will need to look at the whole system in a holistic view if we as industry wish to maintain the position of world leaders of kiwifruit production and sale”.

8 References

- Anonymous, 2022a. EastPack Entity Trust. <https://www.eastpack.co.nz/eastpack-entity-trust>; Retrieved Oct, 2022.
- Anonymous, 2022b. Seeka Grower Council. <https://www.seeka.co.nz/seeka-grower-council>; Retrieved Oct, 2022.
- Anonymous, 2023. 2023 Grower payments. https://www.zespri.com/content/dam/zipri/nz/corporate-information/regulatory-affairs/2023-Grower-Payment-Booklet_Redacted.pdf; Retrieved on Oct, 2023.
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Kiwiflier, 2023. Kiwiflier February 2023, #444. <https://www.zespri.com/content/dam/zipri/nz/publications/Kiwiflier/kiwiflier-2023/KF-444-February-2023.pdf>, Retrieved on Oct, 2023
- NZKGI, 2017a. Taste Zespri Grade (TZG). Fact sheet # 3, New Zealand Kiwifruit Growers Incorporation. https://www.nzkgi.org.nz/wp-content/uploads/2017/05/NZKGI-Factsheet_FS-3-TZG.pdf; Retrieved on Oct, 2022
- NZKGI, 2017b. Grower Payments. A growers guide to understand. December, 2017. New Zealand Kiwifruit Growers Incorporation. <https://www.nzkgi.org.nz/wp-content/uploads/2017/12/Grower-Payments-Guide.pdf>; Retrieved on Oct, 2022
- NZKGI, 2022. 2022 kiwifruit book. New Zealand Kiwifruit Growers Incorporation. https://www.nzkgi.org.nz/wp-content/uploads/2022/11/J002821_NZKGI_KF_Book_2022_RGB.pdf; Retrieved on Sept, 2023.
- NZKGI, 2023. The little green & gold book. ew Zealand Kiwifruit Growers Incorporation. <https://www.nzkgi.org.nz/wp-content/uploads/2023/02/NZKGI-Little-Green-Gold-Book-2023a-Web-Version.pdf>; Retrieved on Oct, 2023

9 Appendix 1.

Semi structured interview questions;

- Could you please describe in your view what is a storage pool in the kiwifruit industry?
- How does storage pooling works in the kiwifruit industry?
- What are different types of storage pools in the kiwifruit industry?
- Who defines the storage pool?
- How grower makes a pool selection?
- What keeps grower in the different pool formats at different packhouses
- How do grower assess the implications of various pool formats?
- What are the pros and cons of storage pooling?
- Are there any challenges you see with this pooling system in the kiwifruit industry?
- How does pooling affect packhouse decisions for loadout?
- Do growers try to influence the packhouse for loadout given their preference for any pooling format?
- What are your recommendations for storage pooling and incentive system in the kiwifruit industry?