Gold3 – Are we driving the right behaviour?

Lorry Leydon

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Executive Summary

The issue of low taste being a significant risk to Gold3 was highlighted to growers very early in the Gold3 journey. Zespri was transparent with Gold3 growers about the risk and the fact that the answers lay with growers in ensuring they produced high taste fruit acceptable to the markets.

Zespri research efforts aimed at highlighting new orchard technologies to improve taste have been significant. Countless studies and trials have been done in an effort to better understand what drives high taste.

Grower engagement has been excellent from day one. Led by OPC (Orchard Productivity Centre), Zespri have used a fantastic extension programme to highlight key orchard behaviours which have influence on taste. Methods used successfully include field days, Webinars, Tech Forums, Infographics, and the availability of a plethora of easy to access information.

The Zespri payment model is complex and not easily understood by the average grower. Taste payments are designed to encourage good orchard behaviour but their effect it lessened if growers don't fully understand the implications. Further work needs to be done to determine the percentage of growers who fully understand the payment system and the relevant payment drivers.

The Gold3 payment system at present isn't perfect and doesn't adequately incentivise growers to provide high taste fruit. The 2015 Zespri Taste Review, which is currently under consultation, highlights several areas of improvement including making a higher Minimum Taste Standard and changing the TZG curve to increase the amount of money which is distributed through taste payments. These measures would likely achieve the stated goals of better rewarding growers for producing fruit the consumers want, as well as removing the tail of poor tasting fruit getting into the market.

There are several other methods of adjusting the financial model that should be considered. Re-introducing a Market Delivery Premium to those growers who provide high taste fruit would be something the growers would easily identify with. Growers are more likely to change behaviours in response to what they understand. Increasing the Gold3 Maximum Taste Payment percentage would achieve similar results to amending the TZG curve by better redistributing grower payments so more weighting is placed on taste. This method is likely to be more easily understood by growers and therefore has more potential to drive better behaviour.

Introduction

The beginning of the Gold3 story followed similar lines to previous Zespri new varieties released to growers. Small quotas of pre-commercial licence were released to growers in 2008 with the aim to learn more about all facets of the variety. The first small commercial harvest of around 1million trays took place in 2011. The structure of how Gold3 licences were to be made available wasn't confirmed at this stage, but it was anticipated that Gold3 was to make a gradual introduction into the Zespri portfolio as confidence in the variety increased.

The advent of Psa-V into New Zealand, and the subsequent demise of Zespri's pioneer gold variety Hort16a, drastically changed this situation. Gold3 was fast tracked through the commercialisation process and thrust into the limelight as the replacement premium Zespri Gold variety.

By the end of 2013 Zepsri had issued Gold3 licences which equated to somewhere in the range of 50-60million trays of a promising but largely untried variety. This was destined for international markets which had only previously ever dealt with 29.9million trays of Zespri gold (Kiwiflier, August, 2012).

My report follows the Gold3 story and in specific looks at the challenges faced in providing a consistent, high taste product to the consumer. For Gold3 to be successful it is important that the correct incentives are in place to encourage positive grower behaviour.

I look into three key areas – how well have Zespri highlighted the risk of low taste Gold3, the relevance and success of research and extension, and the financial drivers created by the Zespri Gold3 payment model.

The report also explores the trend between yield and taste and whether a grower should be considering lowering cropload in order to grow higher taste fruit. My work for a kiwifruit management company is centred around increasing grower profitability. This means growing crops that are the most financially beneficial for the grower, and I want to delve into whether this is in conflict with what the markets (and Zespri) demand.

I also take the chance to explore the Gold3 payment model. The model is complex, and in my experience very few growers have a thorough understanding of it. Fundamentally orcharding is a business, and each grower's main focus is to produce the most financially beneficial crop. To this point it is extremely important that all growers understand the payment structure and also the financial drivers which their payments are generated by. By looking at the model piece by piece, I also look at the proposed changes in the 2015 Taste Review paper and whether these will have the desired impact in decreasing poor tasting in the market and better rewarding growers for producing the fruit that consumers want to eat.

Significance of taste in the market

Ever since the Zespri® brand was launched in 1996 it has been synonymous as the premium player in the Kiwifruit world. In a competitive international marketplace, Zespri and New Zealand Kiwifruit growers, face significant hurdles compared to their international competition. Increased cost of labour, and extreme distance from market, both add up to increased cost of production. This means that Zespri need to sell their product at a premium to ensure sustainable returns for their growers. A big part of achieving this premium is delivering the customer a superior eating experience – and a lot of that comes down to taste.

Part of delivering on the promise of providing a premium taste experience has meant that Zespri have put into place steps to ensure customer expectations are met or exceeded. In an effort to enhance the overall quality of Zespri Kiwifruit, the Taste Zespri programme was launched in 2001. Taste Zespri was based on the premise that Japanese consumers preferred a sweeter tasting kiwifruit and were prepared to pay for it (Palmer, 2013).

Early Zespri Research conducted in 2007 reinforced the importance of taste by showing that Taste & Quality was the number one reason (19%) for repurchase in consumer decision-making factors influencing consumption of kiwifruit (Palmer, 2013).

This sensory research has been ongoing and Zespri has now conducted 25 studies across five countries, involving 14,000 responses. Data from 2014 research underlined the fundamental relationship between Dry Matter and liking, which is the foundation of the Taste Zespri programme (Taste Review, 2015)

This ongoing research is the basis for the 2015 Taste Review Consultation paper which is currently being debated by Zespri and New Zealand kiwifruit growers. The proposals in this paper seek to fine tune the existing taste programme rather than overhaul it.

Gold 3 – highlighting the risk to growers

Ever since Gold3 has taken over the mantle of Zespri's premium gold, offering taste has been one of the major talking points. Zespri's previous gold offering, Hort16a has set the bar high and our international customers now expect Zespri gold varieties to deliver a premium taste experience.

The Japanese market had a first-hand experience of low dry matter Gold3 in 2011 and this had consumers questioning the quality of the product (Chamberlain, White, & Mazey 2013). This was one of the first indications to Zespri that growers would have to carefully consider vine management and orchard decisions to produce a crop that met the market's taste expectation.

Following the 2011 market feedback, with Gold3 still in its infancy, Zespri were clear in highlighting the risk of delivering an inferior tasting product to the markets. This was the start of a concerted campaign to inform growers of the risks, in an effort to drive the correct behaviours to minimize any market risk.

The concern around taste was referred to in the 2012 New Varieties Information Guide which was distributed to all growers looking to graft to the new variety. Although consumer testing of Gold3 sensory appeal is positive, lower dry matter Gold3 may not deliver an acceptable eating experience to consumers (New Varieties Information Guide, 2012).

The same document refers to the flavour profile in Gold3 being very distinctive and the risk that the product is less preferred, due to a more pronounced sour flavour (New Varieties Information Guide, 2012).

These concerns haven't lessened overtime and a lot of time, effort, and money have gone into understanding the Gold3 taste profile and what provides an acceptable eating experience for our different consumers. Zespri has been very forthright and engaging with its growers in an effort to educate them on the market's taste requirements and the risk the growers run if they fall short of expectations.

A letter from Lain Jager to all G3 growers in June 2014 discusses the fact that Gold3 is unforgiving from a taste perspective and low dry matter Gold3 will not be accepted by consumers. He highlights the fact that the 2014 season was a high dry matter year and this resulted in consumer acceptance being strong. He goes in to detail around the taste profile and talks about the higher acid levels in Gold3 which need to be balanced by high sugar content to deliver a sweet flavour profile. (Jager, 2014)

Again, an earlier letter from Lain to all Gold3 growers perhaps best sums up the risk in taste - Gold3, with its great size and potentially strong yields, has the same potential as Hort16a to lead the Gold category globally and be a great financial success for growers, provided we can take the collective action needed to deliver on its taste promise (Jager, 2013)

The continued communication to growers is ongoing and has recently been seen again. Continued research has identified that our current minimum taste standards allow for a 'tail' of poor tasting fruit in the market that is disliked by a significant portion of consumers (Taste Review, 2015).

Increasing taste in Gold – driving on-orchard behaviour

Having identified and communicated the risk in low taste Gold3, Zespri have put considerable time and money into research designed to provide growers with tools they need to deliver consistently high-taste fruit.

Extensive research has highlighted the key points below which are all examples of vine manipulation or management which will increase dry matter in Gold3 and improve taste.

Research trials have been conducted to show that trunk girdling vines in either late January or February increased dry matter (DM) by about 1.1%. Applying girdles in *both* January and February increased DM by 2.5% (Snelgar & Blattmann, 2012).

Research trials have shown that root pruning has the potential to increase fruit dry matter content. When used in conjunction with summer trunk girdling the positive effects are additive, increasing the potential to improve dry matter and therefore taste (Patterson, Pentreath, Black, 2013).

Research conducted in 2012 by consultants Peter Mulligan and Mike Muller showed the value in keeping open canopy. Their work illustrated that where canopy shading has caused leaf loss, this consistently had a negative impact on Gold3 Dry Matter (Muller, & Mulligan, 2012)

Plant and Food research trials have shown that the use of bio stimulants (Benefit® in this case) can lower DM in Gold3, particularly at medium and high cropload (Snelgar, Blattmann, Blattmann, Maxwell, 2011).

Delaying harvest can have a positive effect on dry matter. A Plant and Food research trial of four harvests on an orchard from 1 March to 1, in one season revealed DM content increasing at a rate of 0.3% per week (Chamberlain et al., 2013)

Having done the research and armed with a core set of tools to improve taste, Zespri has set about an extensive extension programme to encourage grower uptake. Led by the Zespri OPC (Orchard Productivity Centre) team, growers have had a consistent flow of fieldays, grower testimonials, webinars, infographics, and a plethora of easy to access information on increasing Taste in Gold3. Tech forums with postharvest and management company representatives have also been used to disseminate new technology and techniques to growers.

These tools and resources have been well utilised by Kiwifruit management companies with many of the tools implemented as standard practise for Gold3. In saying this, measuring the uptake from the average grower is difficult as there is very little data capture of orchard practices and vine management techniques. Comparing yearly TZG averages may give some indication of changing orchard practices but seasonal variation is likely to skew this data.

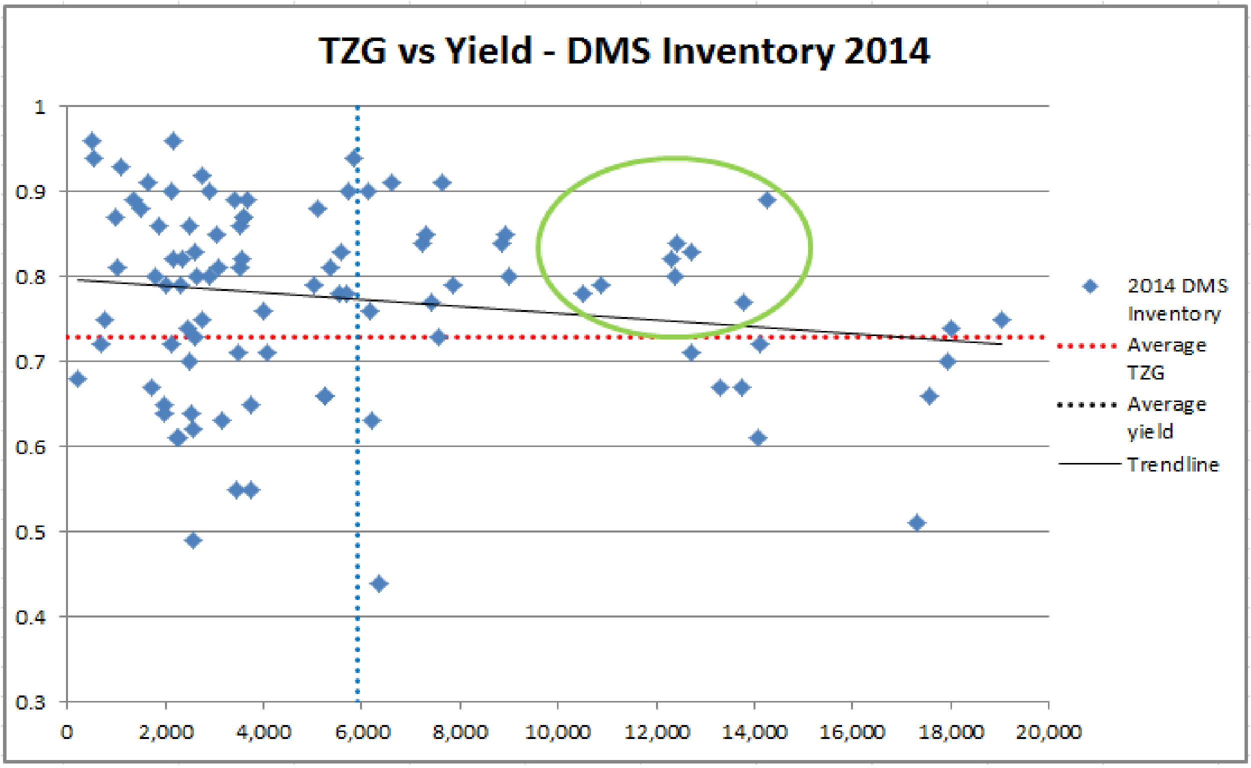
Taste vs Yield

The taste vs yield argument is an interesting one with Zespri cautioning growers about carrying too much fruit and the effect this could have in terms of lowering dry matter. This caution is reasoned with a Plant and Food Research trial which showed DM content dropped about 0.3% for every extra 10fruit m/2. This was approximately double the effect seen on other Zespri varieties (Chamberlain et al., 2013).

The taste vs yield argument is a common theme from Zespri with advice to growers stating that Gold3 is particularly sensitive to lowering dry matter as yields increase. Large yield increases coupled with a poorer grower season could significantly influence the amount of fruit reaching the MTS of 16.3% and therefore negatively impact Orchard Gate Return (Growing for Gold3 Taste, 2014).

Although this caution may be warranted, I believe there are too many contributing variables to suggest a grower should limit his yield (and therefore his financial return) to potentially increase the dry matter content of their fruit.

Below is a scatter graph showing each maturity area in an orchard packed by DMS Progrowers in the 2014 harvest. Each data point represents the relative yield and TZG of each maturity area. There is a weak trend showing a decrease in TZG as yield increases but it also illustrates that some growers are still managing to produce above average yield with above average taste.



This scatter graph highlights orchard variability and the fact that no two orchards can be expected to produce identical results even with identical vine management. This makes it difficult for Zespri to advise growers on ideal cropload to achieve optimum taste.

Do Gold 3 growers understand how they get paid for taste?

My dealings with growers throughout the years has illustrated to me that although growers know they are paid for taste they seldom understand the methodology behind this. Most growers understand that their TZG (Taste Zespri Grade) is derived from their dry matter result but this is the extent of many growers' knowledge. For growers to make educated decisions on-orchard to improve or potentially decrease taste it is important they understand what financial bearing these decisions will have.

To Zespri's credit, there is plenty of information online and regular seminars are held to help new growers to the industry understand the payment model.

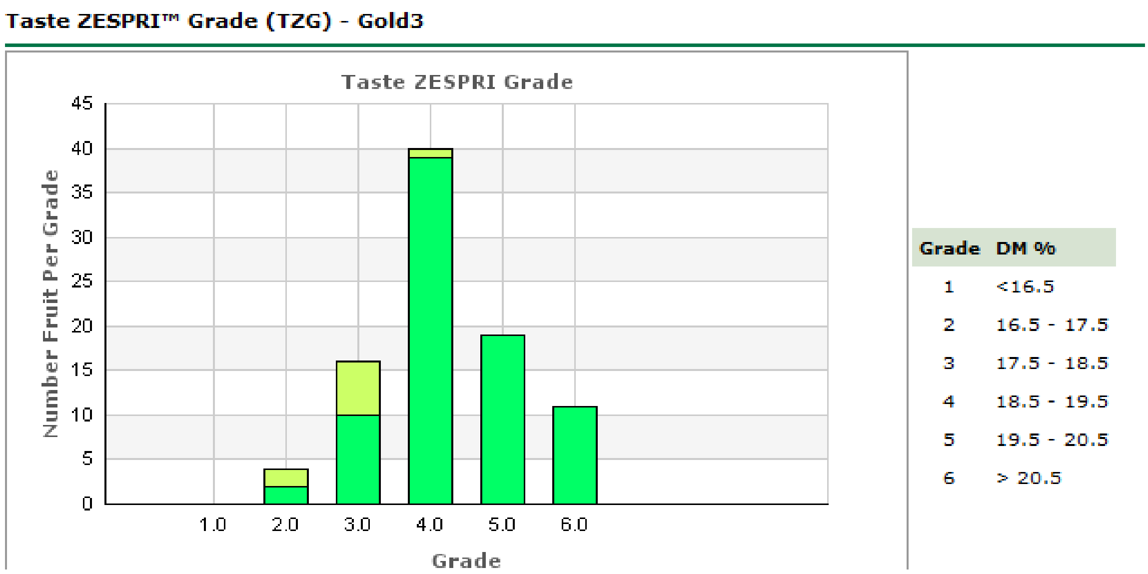
What is TZG and how is it calculated?

Taste Zespri Grade (TZG) is the mechanism used for calculating Taste Zespri payments and was originally based on the premise that Japanese consumers preferred a sweeter tasting kiwifruit and were prepared to pay for it (Palmer, 2013).

TZG is calculated separately for each individual maturity area on an orchard and is the basis for a grower's taste payment. TZG is calculated using the following methodology.

Step 1
A 90 fruit sample is collected from each maturity area by a ZESPRI accredited laboratory sampler and dry matter is assessed on each fruit.

Step 2
The individual dry matter value for each fruit is assigned to one of the six Taste Zespri™ grades. Each grade has a grade value which reflects the likely consumer response based on market studies (diagram below).



Step 3
The percentage of fruit in each grade is calculated, and the sample percentage is multiplied by the appropriate Grade Value and the resulting values are added together. The resulting total is your TZG – this will be a value between 0.00 and 1.00.

Grade	1	2	3	4	5	6	Fruit Count	TZG
Grade Value	0	0.4	0.6	0.75	0.9	1		
Fruit per grade (all)	0	4	16	40	19	11	90	
% of fruit per grade	0.00%	4.44%	17.78%	44.44%	21.11%	12.22%	100.00%	
TZG Grade	0	0.02	0.11	0.33	0.19	0.12		0.77

How does a grower figure out their Taste payment from their TZG?

Even at this stage a grower cannot quantify their taste payment as the payment is worked out as a percentage of total fruit payments. In February/March each year, each grower is given a Zespri Grower Payment Booklet. This uses the previous year's December forecast as a guideline of the likely taste payment for the coming year[1].

The grower payment booklet also explains how taste payments are worked by showing how each variety has a Maximum Taste Payment percentage. Each variety is allocated a maximum taste percentage which reflects not only the ability of the variety to achieve certain taste levels, but also to focus efforts on growing for taste and fulfilling market requirements. Gold3 has a maximum taste percentage of 70% which reflects that Gold3 is positioned as a premium product, therefore the requirement to deliver a superior taste experience is critical in achieving premium returns for growers (Grower payment booklet, 2014)

This Maximum Taste Percentage is then multiplied by forecasted Total Fruit payment + average taste payment to get the Maximum Taste Payment (MTP) for the year. This is shown in the table below:

	Gold 3		
Year	2014	2015	
Total fruit payment	$7.38	$4.65	*based on forecast
plus Average Taste payment	$6.34	$3.62	*based on forecast
equals Total fruit payment including taste	$13.72	$8.27	
× Maximum Taste Payment %	70%	70%	
equals Maximum Taste payment per TE	$9.60	$5.79	

[1] In the 2015 Grower payment booklet the Gold3 taste/total fruit payment forecast was based on the 2015 forecast as the 2014 December forecast was likely to overstate the likely taste payment

So if a grower has a TZG result of 0.70 in both 2014 and 2015 they would multiply this by the relevant Maximum Taste Payment to get a forecast taste result (as per the table below).

Gold3 Taste	2014	2015
TZG	0.70	0.70
	x	x
Maximum Taste Payment (MTP)	$9.60	$5.79
Forecast Taste Payment	$6.72	$4.05

Note that even with the same TZG result in 2014 and 2015 the grower will receive a far lower taste result in 2015 as overall fruit payments will be lower. As outlined, this is only a forecast and the payments are adjusted based on the August forecast to give the grower their actual taste payment for the year.

What percentage of growers payments are made up in taste?

The percentage of total fruit payments paid in taste will fluctuate between years, depending whether it is a high or low dry matter year. It is a figure that isn't visually available to the grower but can be worked out using the year's financial analysis. Below is a table outlining 2013 and 2014 Gold3 payments, both on a per tray basis and for the total Gold3 inventory. The figures pertain to the average payment given to a Gold3 grower. There will be growers who earn more or less depending on the profile of fruit submitted.

	2013	2014
Total Forecast	**G3**	**G3**
Total trays supplied (m)	2.3	10.60
Average size ($m)	30.5	28.00
Fruit payments ($m)	16.8	58.50
Fruit incentives ($m)	15.9	62.70
Service costs ($m)	4.3	13.50
Fruit and service payments ecl. Loyalty premium	**37**	**134.80**
Total Forecast per tray ($)		
Submit payment	2.80	2.80
Progress payments	4.46	2.72
Total fruit payments per net submit trays	**7.26**	**5.52**
Kiwistart	0.00	0.05
Taste Zespri	6.76	5.82
Supplier Accountability/intercheck	0.13	0.05
Fruit incentives	**6.89**	**5.91**
Pack type	0.72	0.86
Time payment	1.13	0.41
Service costs	**1.85**	**1.28**
Class 1 forecast fruit and service payments per net submit trays	**16.00**	**12.71**
Loyalty Premium	0.25	0.25
Class 1 fruit and service payments per net submit trays incl. loyalty	**16.25**	**12.96**

If we look at taste payments as a percentage of total fruit payments and taste payments for 2013 and 2014 we get the following:

	2013	2014
Taste as a % of taste plus fruit payments	48.22%	51.32%

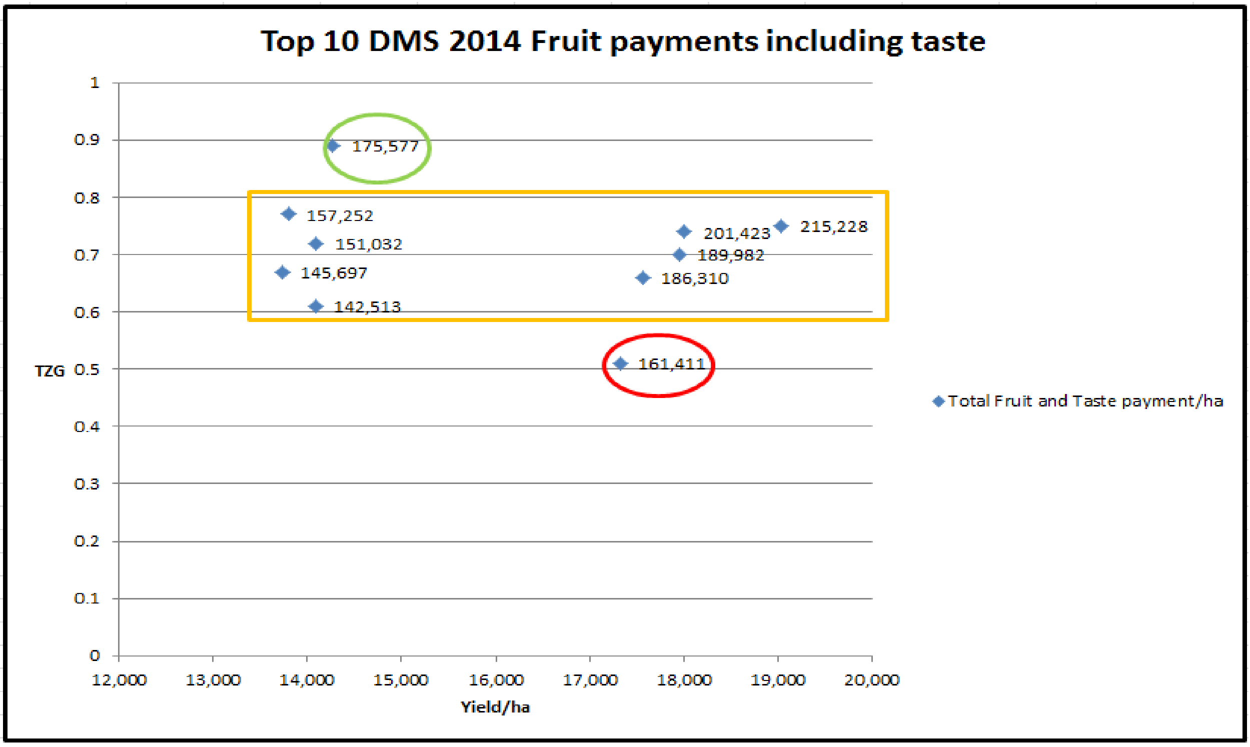
If we measure taste as a percentage of total class one fruit and service payments (incl. loyalty payment) the incentive to grow high taste fruit becomes even less.

	2013	2014
Taste of % Class one payments incl. loyalty	41.60%	44.91%

Although this tells a story, it is not a fair measure as service payments and other fruit incentives (other than taste) are necessary to drive other grower and post-harvest behaviour and optimise total potential fruit returns.

Does the current financial model provide adequate incentive?

With the current Maximum Taste Percentage set at 70%, the Maximum Taste Payment for a grower scoring 1.00 TZG is 70% of total fruit payments including taste. In reality, as shown above, taste payments have made up roughly 50% of the average Gold3 fruit payments in the past two seasons. Although substantial, I would argue this figure is not high enough to drive better grower behaviour.



The graph on the previous page shows the top ten DMS Gold3 growers with the measure being total fruit and taste payments per hectare. The data point highlighted in the green circle is what the financial model is trying to incentivise – a grower with a moderate cropload with above average taste. This grower is being rewarded for providing fruit that is likely to be well received by the markets. Conversely, the data point highlighted by the red circle shows what the financial model is trying to discourage – a grower holding a big crop but producing fruit with barely acceptable taste. These two extremities show that the model is working to some extent in extreme circumstances with the green data point earning significantly more per/ha than the red data point.

However, the data points highlighted in the orange square are more representative of the average growers. All are producing acceptable taste fruit with yield being the major difference between their incomes.

The current system still has yield as the number one driver in increasing grower profitability, with the only major disincentive in place being the MTS (minimum taste standard) which presents the risk to the grower that their fruit may not be accepted into inventory if the dry matter is below a minimum standard.

What is the Minimum Taste Standard and is it an effective disincentive?

Each Zespri variety has a minimum taste standard which is a measure of average dry matter. If a crop falls below the minimum dry matter threshold, Zespri is not obliged to accept the fruit into inventory.

Gold3 is unique to other Zespri varieties in that it has strong relationship between size and dry matter in which small fruit tend to have lower dry matter (Grower Payment Booklet, 2015). Consequently Gold3 is segregated into three size groupings (large, medium, and small) and each grouping is measured separately against the minimum dry matter standards.

At present each of the minimum dry matter for Gold3 is set at 16.3% which results in very little fruit being excluded from Zespri inventory.

What changes can be made to the model to drive better grower behaviour?

Zespri's efforts so far in working with Gold3 growers to improve taste profile, have been commendable but it's questionable whether growers will change their behaviours unless more aggressive financial incentives are in place.

Gold3 growers are currently in consultation with Zespri around a taste review which outlines several proposed changes to the financial model. These changes have two core intentions –

to lower the existing tolerance for poor tasting fruit in the market and to better reward growers for producing the fruit consumers want (Taste Review, 2015).

The first issue, preventing poor tasting fruit reaching the market, has a fairly easy practical solution. The current minimum taste standard is set conservatively, and results in very little fruit being excluded from market. At individual grower level, the threat of fruit not making minimum taste standards is barely considered by the majority of growers.

Zespri's proposed solution is to change the standard to a defect and tolerance methodology which in effect will raise the MTS to 16.8%. This will result in higher levels of fruit excluded from inventory – and safeguard consumers from having a negative eating experience. At present, the major deterrent to a Gold3 grower producing low taste fruit is the fact they will earn slightly less through TZG payments. The proposed new minimum taste standard could potentially see some, or all, of the grower's crop excluded from inventory. An emotive gesture such as this is very likely to change growers' thought patterns and have an effect on grower behaviour.

The other proposal is a change to the TZG curve which will lift the average taste payment paid to nearly all lines of fruit (Taste Review, 2015). By paying out more in TZG, Zespri are effectively paying out less in residual fruit value.

Although this will have the effect of putting more money into taste as opposed to fruit payments, I would argue that the change is too complicated and unlikely to be understood by the average grower. Raising the MTP % of Gold3 would produce a similar outcome of redistributing payments so taste has a heavier weighting, whilst being a far easier concept for the average grower to grasp. Raising the MTP to 80% would have the following impact to a Gold3 grower using the 2014 December forecast. Remember taste payments are distributed first so if more is paid in taste, less will be paid in residual fruit payments.

	Gold 3 at present	
Year	**2014 Dec Forecast**	**2014 Dec Forecast**
Total fruit payment	$7.38	$7.38
plus Average Taste payment	$6.34	$6.34
equals Total fruit payment including taste	$13.72	$13.72
× Maximum Taste Payment %	70%	80%
equals Maximum Taste payment per TE	$9.60	$10.98
Hypothetical TZG	0.70	0.70
Forecast Taste payment	***$6.72***	***$7.68***

The MTP figure is something the average grower understands. They are more likely to understand the implication of increasing the maximum taste percentage than the amendment of the TZG calculation, something only a few would completely understand the way it stands. Any changes that are not easily understood by the grower are less likely to have the desired effect.

Another financial trigger Zespri could consider is the re-introduction of a Market Delivery Premium (MDP). The MDP was used by Zespri until 2011 as an incentive for growers who provided high TZG fruit eligible for premium markets. The MDP would be paid as a service cost before a grower was paid for taste and residual fruit payments. By re-introducing the MDP, Zespri would be sending a clear message that they want the best tasting fruit and they are willing to pay growers a premium for it. Logistically this wouldn't be difficult to exercise as there is already a taste segregation system in place which allocates only high taste fruit to our premium markets.

Further Work

Due to time constraints, this report made assumptions about the average growers' understanding of the current Zespri payment model. These assumptions have been formed from grower interaction in my day to day work. Qualitative research with grower interviews or focus groups would give a better understanding of this and identify specific parts of the payment system that the growers don't understand.

Grower interviews/focus groups would also provide qualitative data around what drives the average growers. Assumptions are made that the Gold3 grower main driver is profitability which again is based on my daily interactions with growers. Teasing out other drivers and the reasons behind their on-orchard behaviours would be useful.

Further work could be done around capturing data around on-orchard activities e.g girdling, root pruning. If growers had to record on-orchard activities this would provide a great resource to look for common trends and patterns which may be increasing dry matter. As part of Globalgap certification, growers are already obliged to electronically record each and every spray they apply, so because of this we have a great resource to help us understand spray efficacy. Perhaps there is an opportunity to expand on this to include recording on-orchard behaviour.

Conclusion

My report set out to explore low taste in Gold3. I wanted to see whether the risk had been well communicated to growers, whether enough research and extension resource had been put in place to counter the risk, and whether the current Gold3 financial model was providing the right financial drivers to encourage the correct on-orchard behaviour needed to achieve high taste fruit.

Zespri were quick to realise the risk of low taste Gold3 fruit in the market and have since been actively engaging with growers to minimise this risk. There has been comprehensive research done which has been designed around finding new orchard technologies and behaviours which can positively impact taste.

The extension effort, led by Zespri's Orchard Productivity Centre, has done a fantastic job in distributing this information to Gold3 growers. Methods used successfully include field days, Webinars, Tech Forums, Infographics, and the availability of a plethora of easy to access information. At present there is no data capture in terms of on-orchard activity so it is hard to quantitatively measure grower uptake of these new technologies.

The current Gold3 financial model does not have taste as the number one financial driver when growing a crop. With only 50% of the average grower's payment being paid in taste, and only a vague correlation between cropload and taste, the grower's best bet is to still grow for a high yield. Taste is a consideration but more of an afterthought than a primary driver.

Proposed changes in the Zespri model will go some way to remedying this situation. Redistributing more money to taste and subsequently less to fruit payments will mean a higher percentage of a Gold3 grower's payment is taste dependant. The higher this percentage is, the more likely the grower is to change on-orchard behaviour. There are potentially other changes to the financial model which will have similar results to the Zespri recommendation – with several other positive benefits. Both introducing a Market Delivery Premium and increasing the Maximum Taste Payment percentage are strong emotive signals to growers which are easy to understand.

Getting the financial model correct is the number one driver in changing orchard behaviour. Growing Gold3 is a business, and growers will adapt to grow their crop in the most financially beneficial way.

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