

Horticulture Innovation Australia

Final Report

Avocado industry fruit quality benchmarking

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Avocados Australia Limited (AAL)

Project Number: AV11015

AV11015

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CONTENTS

Abbreviations and project codes used.....	1
Summary	1
Keywords.....	3
1.0 Introduction	4
2.0 Methodology.....	6
2.1 Review and update sampling plan.....	6
2.2 Update training for retail assessors.....	8
2.3 Conduct and Analyse retail quality surveys.....	9
2.4 Communicating findings.....	10
3.0 Outputs	12
4.0 Outcomes	13
5.0 Evaluation and discussion	14
5.1 Retail quality surveys.....	14
5.2 Maturity monitoring.....	23
6.0 Recommendations	27
7.0 Scientific refereed publications.....	28
8.0 Intellectual property/commercialisation	28
9.0 References.....	28
10.0 Acknowledgements.....	29
11.0 Appendices.....	30

ABBREVIATIONS AND PROJECT CODES USED

ABBREVIATIONS

AAL: Avocados Australia Limited

DM: dry matter

HAL: Horticulture Australia Limited

HIA: Horticulture Innovation Australia Limited

QDAF: Queensland Department of Agriculture and Fisheries

HAL / HIA PROJECT CODES USED

- *AV06006: Scoping of a national avocado quality system and management of avocado industry information systems*
- *AV06025: Australian consumers perceptions and preferences for Hass avocado*
- *AV07018: Avocado quality retail surveys*
- *AV08034: Avocado retail quality surveys phase 2*
- *AV09001: National avocado quality and information management system*
- *AV09026: Shepard avocado maturity consumer sensory research*
- *AV10019: Reducing flesh bruising and skin spotting in Hass avocado*
- *AV11015: Avocado industry fruit quality benchmarking (this project)*
- *AV12012: Coordination of data management and avocado quality improvement and extension program*
- *AV12013: Implementing improvements in the avocado supply chain*
- *AV15004: Avocado data management and quality innovation extension program.*

SUMMARY

Avocado quality is recognized as having significant impact on consumer purchase behaviour and has been quantified in a number of Australian avocado industry research projects, including *AV06025: Australian Consumers Perceptions and Preferences for Hass Avocado* and *AV09026: Shepard Avocado Maturity Consumer Sensory Research*. This set of research projects allowed the industry to understand the consumers' expectations of avocados in regards to maturity, ripeness and internal quality. It has also

allowed the establishment of minimum benchmarks for these attributes to which the industry aspire in order to maintain the consumers' confidence in the product.

In this research it has been possible to monitor the industry's performance against the minimum benchmarks derived in through the above projects. This monitoring was undertaken on a continuous basis through this project - *AV11015: Avocado Industry Fruit Quality Benchmarking* and its predecessors; *AV07018: Avocado Retail Quality Surveys* and *AV08034: Avocado Retail Quality Surveys Phase II*. The consecutive projects ran from 2007 to 2015. The data collected through these projects now spans eight years. It shows that in 2008, the level of Hass fruit that did not meet consumer expectations was approximately 28% and there has been a trending decline in this figure to 20% in 2015.

The research clearly demonstrated the range of internal defects that consumers were experiencing, with bruising being the most significant internal defect followed by fruit body rots. Samples of fruit taken before ripening also identified immature fruit as an ongoing issue especially at the commencement of harvest in each region.

The data was also analysed to look at the damage and incidence of bruising by store type. The results show that independent retailers consistently have lower incidence of total damage and bruising compared to other store types.

The outputs from this project include annual retail survey reports detailing the quality of retail fruit and monthly dry matter reports developed each month showing the dry matter levels for all producing regions. Individual dry matter reports were also sent to businesses that had fruit sampled. All findings from the project were extended through the *Talking Avocados* magazine and Qualicado workshops across each of the eight avocado production regions and at wholesale markets in Brisbane, Sydney, Melbourne, Adelaide and Perth. Additionally individual reports were prepared for the major supermarket chains showing the quality of avocados at their surveyed stores over time. The results from the project have been used to inform sectors of the supply chain of the main quality defects and the levels that are being observed at retail level, as well as the incidence of immature fruit in the market. This information has been presented to a broad cross section of the Australian avocado supply chain to keep them informed of industry performance and to highlight the need for ongoing practice change to achieve the product improvement needed to better meet customers' expectations. In addition the findings have supported the development of other quality related projects both in development and evaluation including AAL/HIA project: *AV12013: Implementing Improvements in the Avocado Supply Chain* and QDAF/HIA research project *AV10019: Reducing flesh bruising and skin spotting in Hass*.

KEYWORDS

avocado; avocado quality; avocado retail quality; avocado maturity; internal quality defects; avocado bruising; avocado body rots; stem end rot; diffuse flesh discolouration; vascular browning; avocado quality monitoring; avocado maturity monitoring.

1.0 INTRODUCTION

The profitability of the avocado industry in Australia is adversely affected by variability in fruit quality experienced by consumers. Variable fruit quality introduces inefficiencies into the supply chain, therefore increasing costs, whilst at the same time dampening demand for the product.

Avocados Australia has consistently taken a proactive approach in addressing fruit quality issues, realising that inaction at an industry level would lead to the devaluation of the entire category.

In the Australian Avocado Industry Strategic Plans 2005–2010 and 2011-2016, which set out a range of strategies aimed at improving the profitability of the industry, fruit quality, productivity and supply chain efficiency have consistently been recognised as priority areas for investment. The Plans also recognised that numerous interrelated factors affect the attributes. The current plan's objectives and required outcomes include:

Objective 1: To build a sustainable and competitive supply of Australian avocados to meet consumer needs.

Strategy 1.2: To ensure that consumers can confidently purchase consistently high quality fresh avocados at retail level.

Outcome to be realised by Objective 1: To increase the percentage of fruit sold at retail level meeting consumer requirements (as quantified by industry research studies from 75% in 2010 to 90% in 2015).

As a result of these plans there has been investment in a number of projects including:

- *AV06006: Supply chain improvement project.*
This initial project was aimed at defining the performance of the industry in terms of quality and efficiency and identifying points where supply chain performance could be improved.
- *AV06025: Australian consumers' perceptions and preferences for Hass avocado and AV09026: Shepard avocado maturity consumer sensory research.*
The research undertaken in these projects developed benchmarks for industry performance regarding eating quality (primarily maturity and level of acceptable internal damage i.e. rots or bruising) by measuring the points at which fruit quality impacts on actual consumer purchasing behaviour. The results of this work confirmed that fruit quality was a continuing issue. A summary of the results of these projects is provided in Appendix 1.
- *AV07018: Avocado retail quality surveys (Oct 07 to Sep 08), AV08034: Avocado retail quality surveys phase II (Oct 08 to Oct 11) and AV11015: Avocado industry fruit quality benchmarking (this project).*
These projects were initiated to determine how the industry was tracking in terms of quality as measured by the benchmarks set within AV06025 and AV09026.

The results from these projects indicated that there has been an improvement in 'overall internal avocado quality' in Hass fruit as the incidence of internal damage of fruit in retail stores reduced from around 28% to 20%. The incidence of 'total damage' in Hass fruit reached a low of

17% in 2012. Results from the three projects continue to show bruising as the biggest issue in terms of internal avocado quality. It was also illustrated that there are still significant volumes of immature fruit marketed at the beginning of each region's season.

The continued monitoring of internal avocado quality via retail quality surveys undertaken in this project was considered essential to measure the impact of industry RD&E investment in quality improvement and the industry's progress in achieving the desired outcomes of the Industry Strategic Plan.

The results generated by AV11015 were also used to help chain stores track quality improvements and for other quality focused projects to measure changes in levels of specific quality issues addressed by those projects.

The objectives of this project were to:

1. Use the ongoing survey results as one of the tools to monitor the quality improvement program being rolled out through Projects AV09001: *National Avocado Quality & Information Management System*, followed by AV12012: *Coordination of Data Management and Avocado Quality Improvement and Extension Program*, and
2. Monitor fruit quality over time to measure improvements proposed as a result of specific projects aimed at improving quality including HAL/HIA Projects: AV10019: *Reducing flesh bruising and skin spotting in Hass avocado*; AV09001: *National avocado quality and information management system*; AV12013: *Implementing improvements in the avocado supply chain* and AV12012: *Coordination of data management and avocado quality improvement and extension program*. All of these projects used the results from the surveys.
3. Provide time series data to illustrate fruit quality by growing season, store type and city.
4. Report back to members of the supply chain on a regular basis as to the level of quality of assessed fruit.
5. Provide an up to date analysis of what current quality issues are, to be used as a foundation for future R&D work in the area of quality management.

2.0 METHODOLOGY

The surveys were carried out in line with the methodology used in *AV07018: Avocado Retail Quality Surveys* and *AV08034: Avocado Retail Quality Surveys Phase II*. The methodology was carried out in four stages:

1. Review and update sampling plan
2. Update training for assessors (annually)
3. Conduct retail surveys
4. Communicate findings at specific intervals.

2.1 REVIEW AND UPDATE SAMPLING PLAN

2.1.1 RETAIL QUALITY SURVEYS

Fruit quality surveys were conducted in 16 stores in Perth, Brisbane, Sydney and Melbourne each month (a total of 64 stores nationally) by third party contractors engaged by Avocados Australia. The stores were selected to ensure a mix of major supermarkets, independent supermarkets and independent green grocers were sampled. The criteria for selection of sample stores for each city is shown in Table 1, below.

Prior to commencement of the surveys, Australian Bureau of Statistics (ABS) data was used to identify localities and specific stores to ensure a spread across suburbs with varied socio-economic profiles.

Table 1: Sampling Plan - Retailers

Type	Retail sector/ business	Number of stores per city
A	Woolworths	3
B	Coles	3
C	IGA/ Foodland/ Foodworks	3
D	Independent chains (e.g. Harris Farms, Cocos)	3
E	Large volume/ price sensitive retailers	2
F	High quality retailers	2

Prior to commencement of the surveys, Australian Bureau of Statistics (ABS) data was used to identify localities and specific stores to ensure a spread across suburbs with varied socio-economic profiles.

In the cities where independent chains were not able to be identified sampling was increased in the independent retailers sector (Type E & F, above).

In the initial phase of the project 10 or 15 pieces of fruit per variety (Hass and Shepard – the two major varieties grown and consumed in Australia) per store were collected each month and when in season. The sample size was reduced to 10 pieces of fruit halfway through the project for cost effectiveness. The smaller sample size did not compromise the validity of the results.

The procedure for sampling and assessing quality used in projects *AV07018*, *AV08034* and *AV11015* (this project) was developed by Avocados Australia and the Queensland Department of Agriculture and Fisheries (QDAF). The procedure for sampling and assessing fruit is detailed below.

Third party contractors engaged by Avocados Australia conducted the monthly surveys and assessments in each city and provided completed survey forms to Avocados Australia each month. The contractors were trained by Avocados Australia and Queensland Department of Agriculture and Fisheries (QDAF).

PROCESS FOR RETAIL SAMPLING & ASSESSING FRUIT

The procedures that contractors were required to follow in regard to in-store sample collection and display evaluation are provided in Appendix 3.

A copy of the data collection form is provided in Appendix 2.

The procedures that contractors were required to follow in regard to fruit sample assessment, the day after collection are provided in Appendix 4.

2.1.2 MONTHLY DRY MATTER TESTING

The dry matter sampling plan used in projects *AV07018*, *AV08034* and *AV11015* (this project) was developed in conjunction with QDAF.

Fruit was collected from the trading floor in Sydney Markets. This market was chosen as it is the largest market for avocados and has a diverse supply base, hence it is likely to be the most representative market in Australia.

A sample of 10 pieces of fruit from each tray was determined to be statistically significant. A maximum of 220 pieces of fruit was sampled each month from as many different growers as possible to obtain a cross section of fruit from each growing region supplying fruit at that time of year.

The fruit was immediately shipped to the QDAF testing facility (Maroochy Research Station, Nambour, Queensland). QDAF staff tested each fruit individually for its dry matter percentage using the Hofshi method¹. This involved collecting and drying flesh samples from each fruit. The dry matter percentage for each fruit was then determined, recorded and the collated results forwarded to Avocados Australia at the end of the assessment week.

¹ Avocados Australia website: <http://industry.avocado.org.au/MaturityMonitoring.aspx#Instructions>

2.2 UPDATE TRAINING FOR RETAIL ASSESSORS

2.2.1 RETAIL QUALITY SURVEYS

Training was provided to the third party contractors responsible for the fruit assessment when they commenced work on previous projects. In this project initial training was provided to new contractors and refresher training was provided to all contractors on an annual basis. This refresher training predominantly covered assessment procedures and usage of resource materials. As new elements were added to survey forms contractors were also provided instruction in how to implement these changes.

The focus on regular training across the life of the project was considered important to maintain consistency and uniformity of assessments over time and between the four assessors.

Training was conducted by Avocados Australian in partnership with QDAF.

2.3 CONDUCT AND ANALYSE RETAIL QUALITY SURVEYS

The retail quality surveys and the dry matter maturity testing were conducted monthly using the above assessment procedures.

2.3.1 RETAIL QUALITY SURVEY ANALYSIS

Raw data from the completed retail quality survey forms was entered into an excel spread sheet every month by an Avocados Australia administrator. This data was analysed on a six monthly basis by Plant and Food Research New Zealand.

Both total damage and specific defects (bruising, diffuse flesh discolouration, vascular browning, stem end rot and body rots) of Hass and Shepard fruit with a penetrometer reading less than 1kgf² were analysed with respect to their incidence:

- By state,
- By state by month,
- By store type,
- By store type by state,
- By store type by state by month.

The analysis also sought to identify individual business that had higher incidence of quality issues.

Defect intervals were set for total damage and specific defects. These were as follows:

- (if x = total level of damage) then
 - * No damage at all, $x = 0\%$,
 - * 10% damage: $0 < x \leq 10\%$,
 - * 25% damage: $10\% < x \leq 25\%$,
 - * 33% damage: $25 < x \leq 33$,
 - * 50% damage: $33 < x \leq 50$,
 - * 50%+ damage $x > 50$.

When each fruit was assessed the contractor was required to estimate the percentage of damage evidenced for each defect type.

Over the life of the project there were improvements made to the data recording processes to improve the data sets available for analysis.

2.3.2 SKIN-SPOTTING ANALYSIS

The assessment of the incidence of skin-spotting analysis was also included in this project. The results of the assessments undertaken were provided to QDAF for use in their project *AV10019: Reducing flesh bruising and skin spotting in Hass avocado*

² kgf is kilogram-force and is a gravitational metric unit of force.

2.3.3 MONTHLY DRY MATTER ANALYSIS

Dry matter (DM) testing was undertaken for both Hass and Shepard fruit. In order to analyse how much fruit complied with current industry standards, DM% was broken into two intervals for Hass fruit: below 23% and 23% & above. For Shepard fruit DM% was broken into two intervals: below 21% and 21% & above. In order to analyse how much fruit complied with different consumer preferences, DM% for both varieties was also analysed against the following data intervals:

- ≤18%
- 18.1% - 20.9%
- 21% - 22.9%
- 23% - 28%
- 27.1% - 40%
- >40%.

Results for each region were similarly analysed.

All results were analysed by Avocados Australia and an experienced biometrician from Plant & Food Research New Zealand.

2.4 COMMUNICATING FINDINGS

Information generated by project activities was communicated to industry stakeholders through a range of activities, including:

- Industry meetings, workshops and field days, especially the Qualicado workshops that were held annually in the eight major production regions and five major wholesale markets annually.
- *Talking Avocados* (Avocados Australia's quarterly industry magazine)
- The industry e-newsletter, *Guacamole*.
- Industry conferences
- Milestone and final reports.

Project findings were also continuously posted to the Avocados Australia website over the life of the project, including:

- Retail quality surveys: The analysed results tracking quality over time by state and month were added to the Avocados Australia website³: <http://industry.avocado.org.au/QualityProgram.aspx>. These results were updated each year as new data was analysed.
- Monthly dry matter testing: On a monthly basis the aggregated DM% results for each season were included in the Infocado weekly report which is disseminated to packers and wholesalers. These aggregated results were also published monthly on the Avocados Australia website⁴:

³ Avocados Australia website – Quality Program: <http://industry.avocado.org.au/QualityProgram.aspx>

⁴ Avocados Australia website – Dry Matter results: <http://industry.avocado.org.au/MaturityMonitoring.aspx>.

Individual businesses were notified if their fruit had been sampled for maturity testing in a given month and the result, regardless of whether DM levels were low or high, were posted and emailed to the relevant businesses separately with a cover note explaining the importance of ensuring the market was only supplied with mature fruit.

3.0 OUTPUTS

Outputs from this project include:

- Annual retail survey reports detailing the quality of retail fruit.

These annual retail survey reports were developed from data generated from the 16 sample assessments undertaken in each of 4 key markets (Brisbane, Sydney, Melbourne and Perth) each month over the life of the project.

The reports illustrate the quality differences between State and store type and the extent that specific defect types were observed at retail level in a given year and across each month of the year.

- Monthly dry matter reports developed each month showing the dry matter levels for all regions.

These were distributed through the weekly Infocado Report (on a monthly basis) and on the Avocados Australia website. Monthly report information was also used in articles in *Talking Avocados* to highlight dry matter related issues that were identified through the research.

Individual dry matter reports were also sent to businesses that had fruit sampled.

- A number of articles and research summaries were presented in *Talking Avocados* magazine (the avocado industry's quarterly publication),

These articles outlined the project, its objectives, methods and research findings and were presented in *Talking Avocados* editions: Autumn 2013 (volume 24 no.1); Winter 2013 (volume 24 no. 2); Winter 2014 (volume 25 no.2); Summer 2014 (volume 25 no.4) and Winter 2015 (volume 26 no.2).

- Articles highlighting findings of the research and performance of the industry presented in Guacamole, the fortnightly industry e-newsletter. Avocados Australia also distributed media releases about the project and research findings.

- Results were presented at Qualicado workshop across each of the eight avocado production regions and at wholesale markets in Brisbane, Sydney, Melbourne, Adelaide and Perth.

- Milestone reports 102 – 108 submitted to Horticulture Australia Limited / Horticulture Innovation Australia between August 2012 and August 2015, as per contract requirements. These milestone reports summarised the project activities and six monthly quality analysis results.

- Individual reports prepared for the major supermarket chains showing the quality of avocados at their surveyed stores over time.

These were prepared and presented so that retailers were aware of issues and could take remedial action where appropriate.

- The final project report (this report) submitted in February 2016.

4.0 OUTCOMES

As a result of this project:

- The data reported has been used to inform sectors of the supply chain of the main quality defects and the levels that are being observed at retail level as well as the incidence of immature fruit in the market.

This information has been presented to growers, packers, wholesalers, ripeners and the major retail chains to keep them informed of industry performance and to highlight the need for ongoing improvement.

- All Australian avocado industry supply chain participants were able to access regional dry matter maturity reports a week after sampling occurred to educate them on the need to closely monitor dry matter at the beginning of harvest.
- Findings have been used as the foundation for the quality improvement program (Qualicado). The major defects identified through this project have informed the focus and content of the Qualicado program.
- Findings have supported AAL/HIA project: *AV12013: Implementing Improvements in the Avocado Supply Chain*. This project focuses on retailer training and the adoption of best practice to maintain fruit quality through the supply chain.
- QDAF/HIA research project *AV10019: Reducing flesh bruising and skin spotting in Hass avocado* was able to be supported through the provision of data on the incidence of relevant defects. *AV10019* identified where the majority of damage in the supply chain was occurring.
- The data is being used to inform future research and extension activities aimed at improving fruit quality.
- A detailed historic data set of avocado maturity by month and region, clearly illustrating the trend of all regions sending immature fruit to market at the beginning of their harvest seasons.
- A detailed historic data set of avocado quality issues at retail level by month, city, store type and defect type indicating the extent to which consumer expectations have been met.
- Annual retail quality reports that clearly depicted the major internal defects affecting consumer experience and how the industry was progressing with quality improvement.
- A mechanism to monitor the main quality issues to determine changes / improvements over time in line with the required outcomes of the 2010 – 2015 strategic plan.

5.0 EVALUATION AND DISCUSSION

5.1 RETAIL QUALITY SURVEYS

Retail quality surveys were successfully completed throughout the project on a monthly basis for fruit sourced from Brisbane, Sydney, Melbourne and Perth retailers. At the beginning of the project the methodology was revised by Avocados Australia and QDAF staff to ensure accuracy and integrity of results.

As the analysed results of the retail quality monitoring illustrate (Appendix 5), the type of defect and the incidence level of each of the defects was able to be clearly identified. The results were analysed in six month periods so as to be able to provide timely commentary on the current internal defects observed by consumers.

5.1.1 TOTAL DAMAGE BY VARIETY

At a variety level, the results in Figure 1 and Figure 2, below, show the total damage recorded for Hass and Shepard fruit respectively over the life of the project (and during earlier projects).

The results for Hass show a clear trend of reduced damage in fruit at retail level. The results for Shepard indicate low levels of total damage - less than 10% over the first 7 years of monitoring. However, the spike in total damage to 17.7% of fruit sampled in 2015 requires further consideration. The data shows that bruising, diffuse flesh discolouration and vascular browning in May 2015 were the main contributors to this increased damage. This may be due to larger than normal volumes of late season Shepard overlapping with increasing volumes of new season Hass. As a result Shepard fruit may have been stored for too long and on the retail shelf longer than the optimal time, resulting in increased bruising damage.

Increased Hass damage over the last three years (2013 – 2015), observed in Figure 1 below, is possibly the result of higher retail prices during this period encouraging consumers to be more discriminating and handling the fruit more before they make a selection, which has manifested as increased bruising in fruit on display.

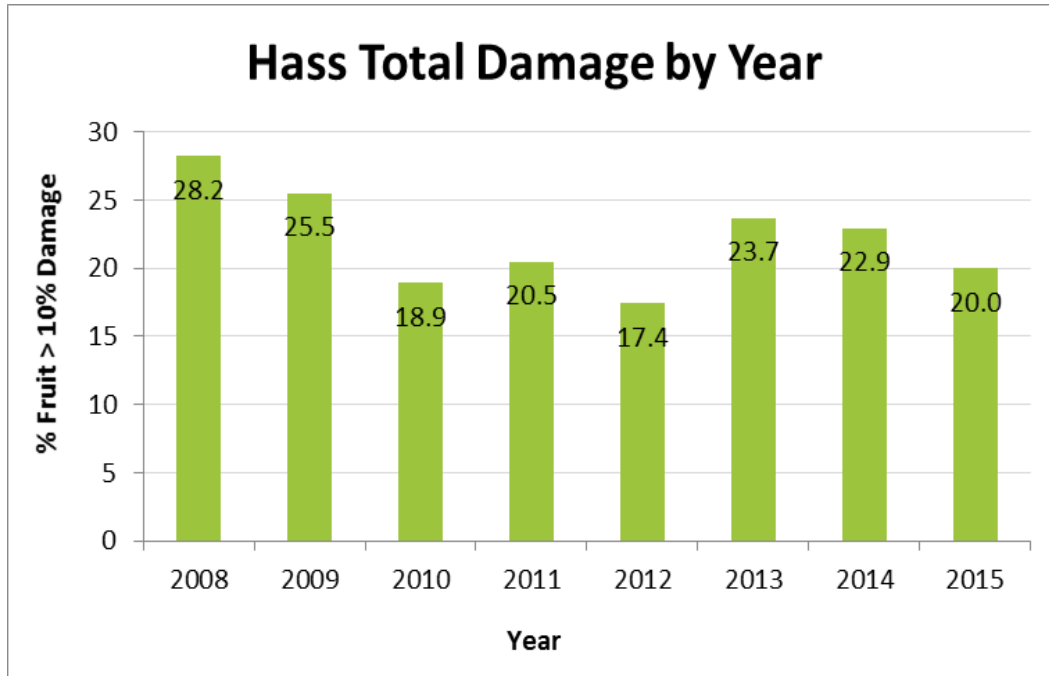


Figure 1: Hass – Total Damage by Year – 2008 -2015

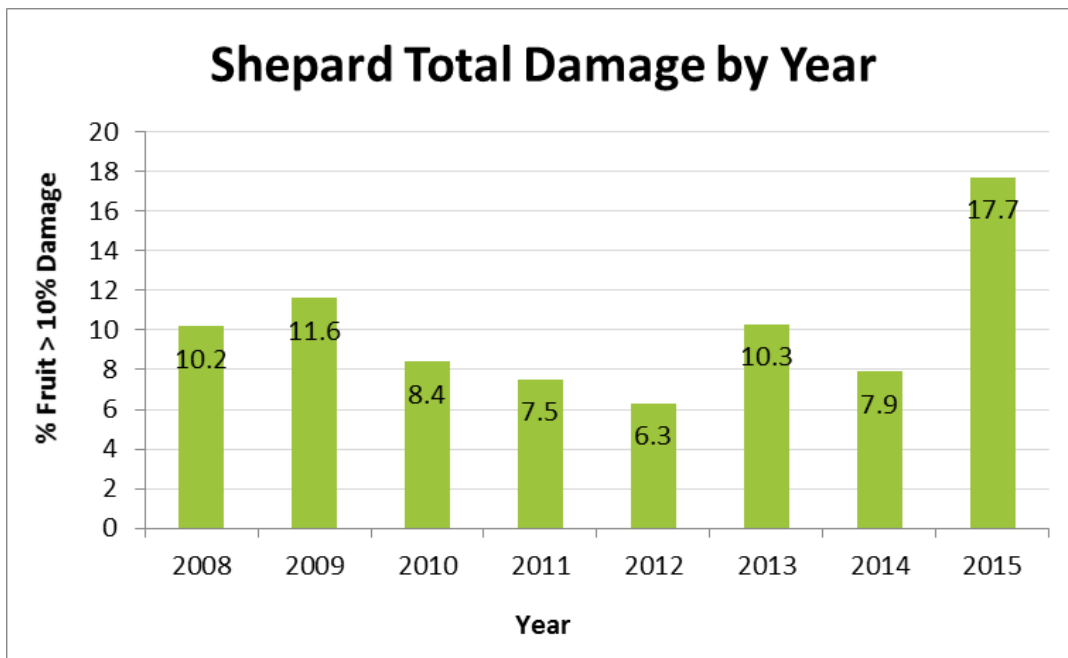


Figure 2: Shepard – Total Damage by Year – 2008 -2015

5.1.2 INCIDENCE OF DEFECTS BY VARIETY

The two main quality issues identified through monitoring were bruising followed by body rots in both Hass (Figure 3 & 4) and Shepard (Figure 5 & 6), although body rots have declined significantly in Shepard.

In Hass, the incidence of diffuse flesh discolouration has gradually improved over the last 7 years. Whilst in Shepard stem end rot and body rots can be seen to have both improved, however diffuse flesh discoloration is an increasing problem (Years 2012 – 2015). This defect needs close attention and education of supply chain partners to reduce its incidence.

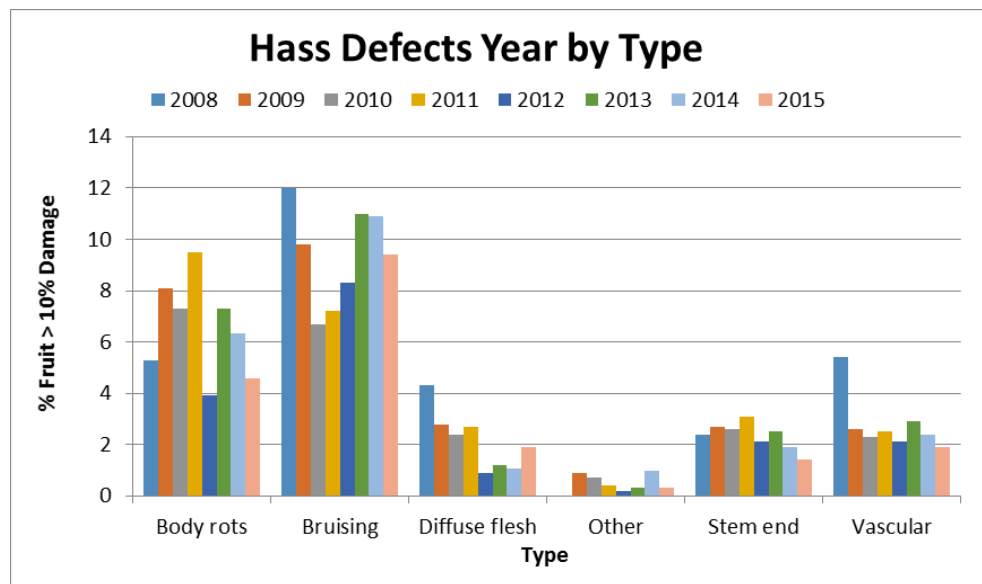


Figure 3: Hass Defects – Year by Type, January 2008 – December 2015

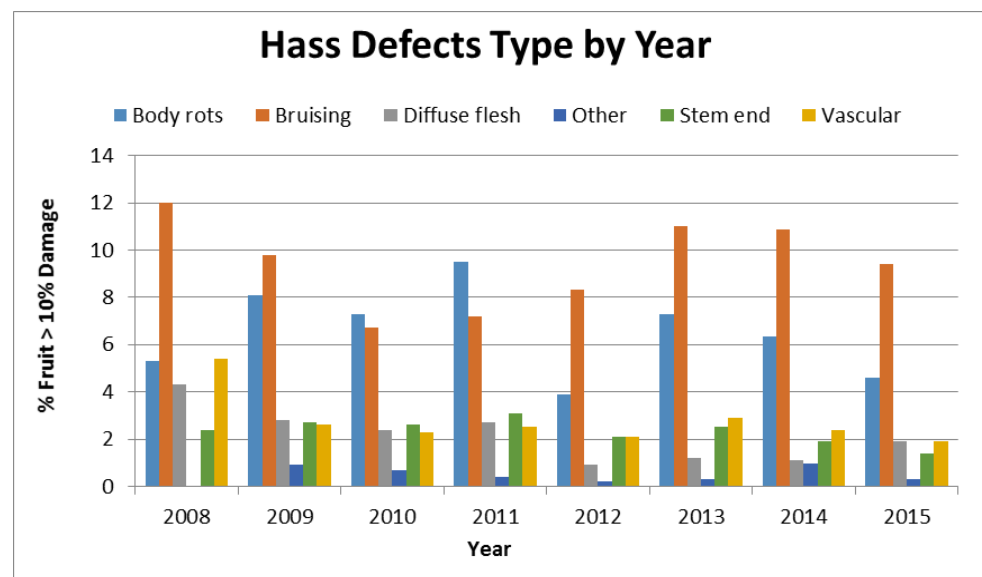


Figure 4: Hass Defects – Type by Year, January 2008 – December 2015

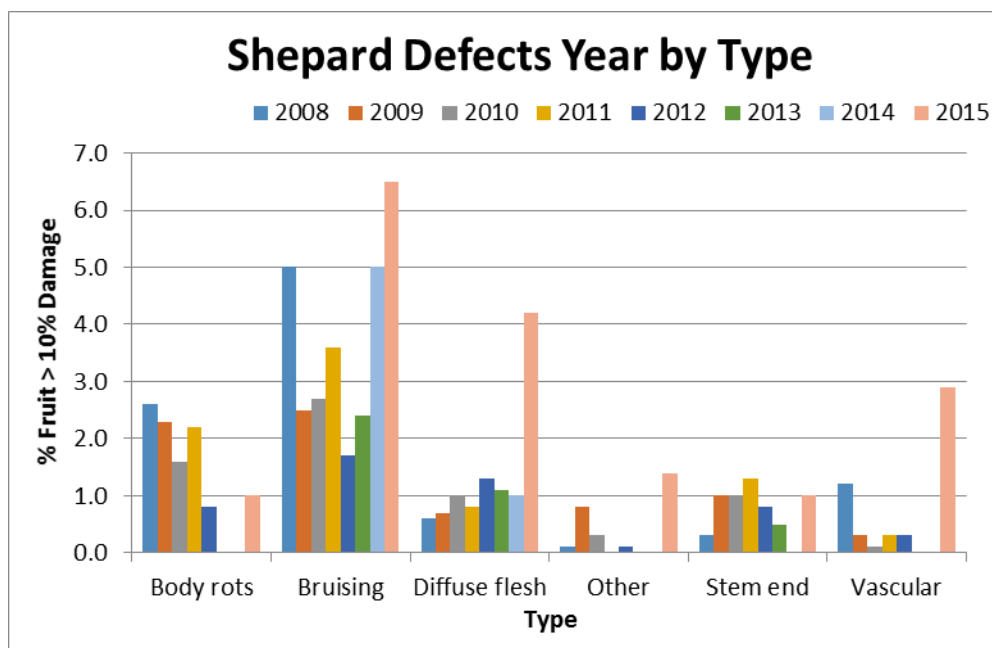


Figure 5: Shepard Defects – Year by Type, January 2008 – December 2015

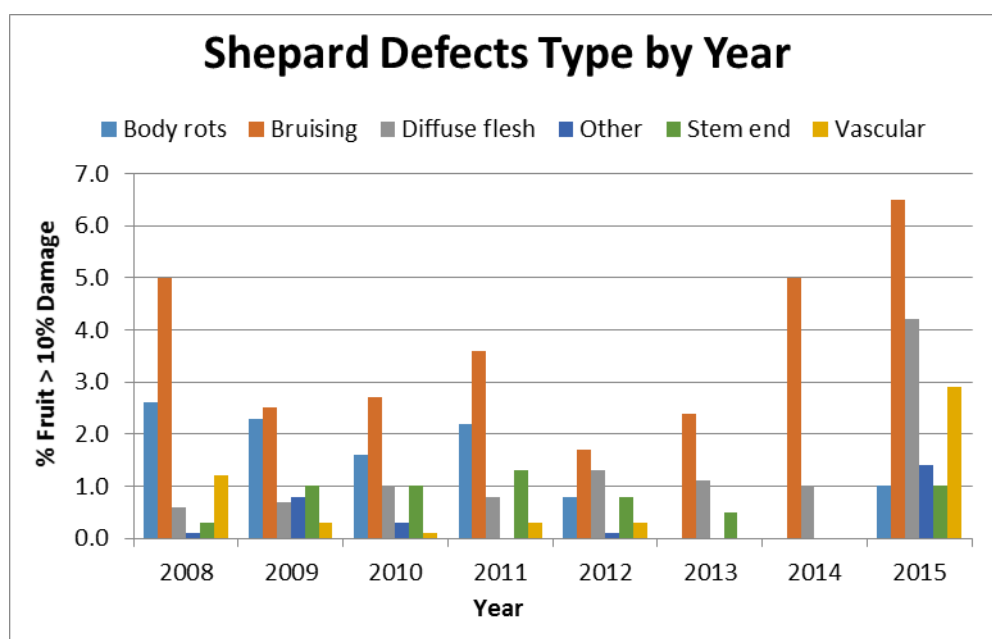


Figure 6: Shepard Defects – Type by Year, January 2008 – December 2015

More graphical depictions of total damage and specific defect are provided in Appendix 6. These include:

- Hass – Total Damage by Month for Years 2008 – 2015
- Hass – Total Damage by Year (by Month) – 2008 - 2015
- Shepard - Total Damage by Month for Years 2008 – 2015
- Shepard- Total Damage by Year (by Month) – 2008 – 2015.

5.1.3 INCIDENCE OF DAMAGE AND DEFECTS BY STORE TYPE

The data was also analysed to look at the damage and incidence of bruising (the main defect) by store type. The following graphs show Hass – Total Damage by Store Type (Figure 7) and Hass – Total Bruising by Store Type (Figure 8). Similarly graphs are shown for Shepard – Total Damage by Store Type (Figure 9) and Shepard – Total Bruising by Store Type (Figure 10).

The results show that independent retailers consistently have lower incidence of total damage and bruising compared to other store types. Results for the other store types has been variable, especially the increase in bruising exhibited in Hass fruit at one of the major retailers over 2013 – 2015. (see Figure 8). As discussed earlier, the increase in bruising may possibly related to lighter supply and / or higher prices impacting the behaviour of shoppers, the amount of time a fruit is present on display and number of times a displayed fruit is handled.

The Independent Supermarkets recorded the highest levels of total damage (bruising being the most prominent) in 2015.

The key for these graphs are as follows:

- M1 = Major retailer
- I = Independent retailer (e.g. green grocers)
- IS = Independent supermarkets (e.g. IGAs/ Foodworks / Foodland)
- M2 = Major retailer

For confidentiality reasons the identity of M1 and M2 has not been disclosed.

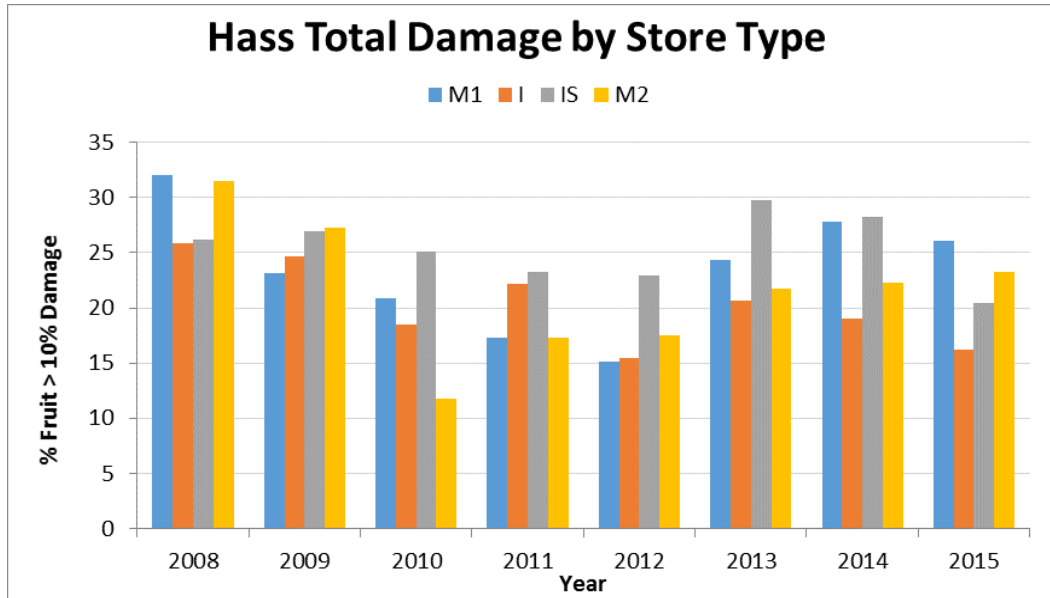


Figure 7: Hass – Total Damage by Store Type – 2008 - 2015

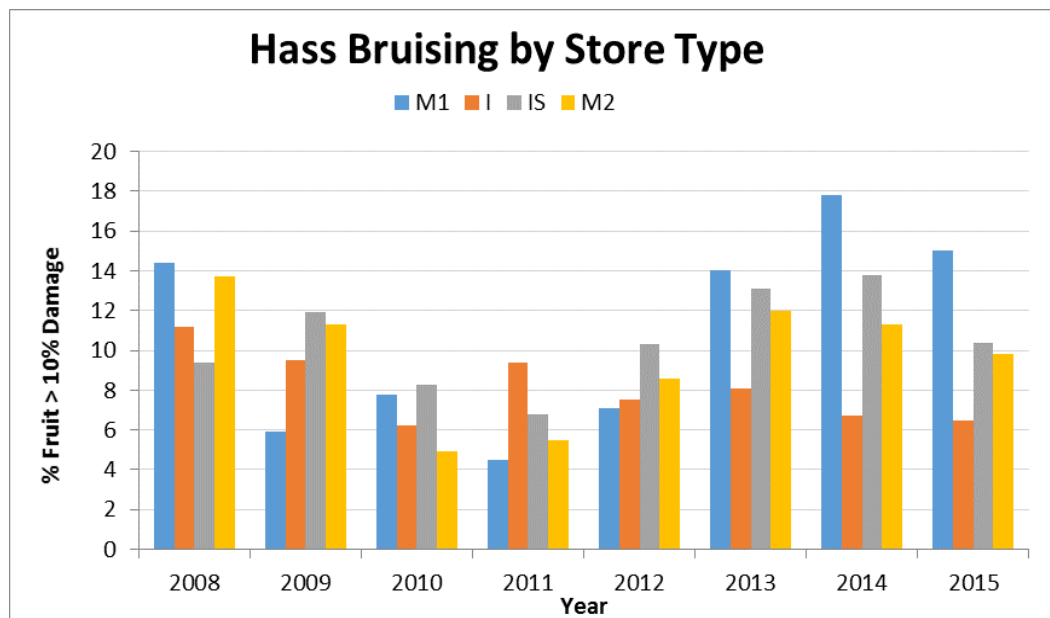


Figure 8: Hass – Total Bruising by Store Type – 2008 - 2015

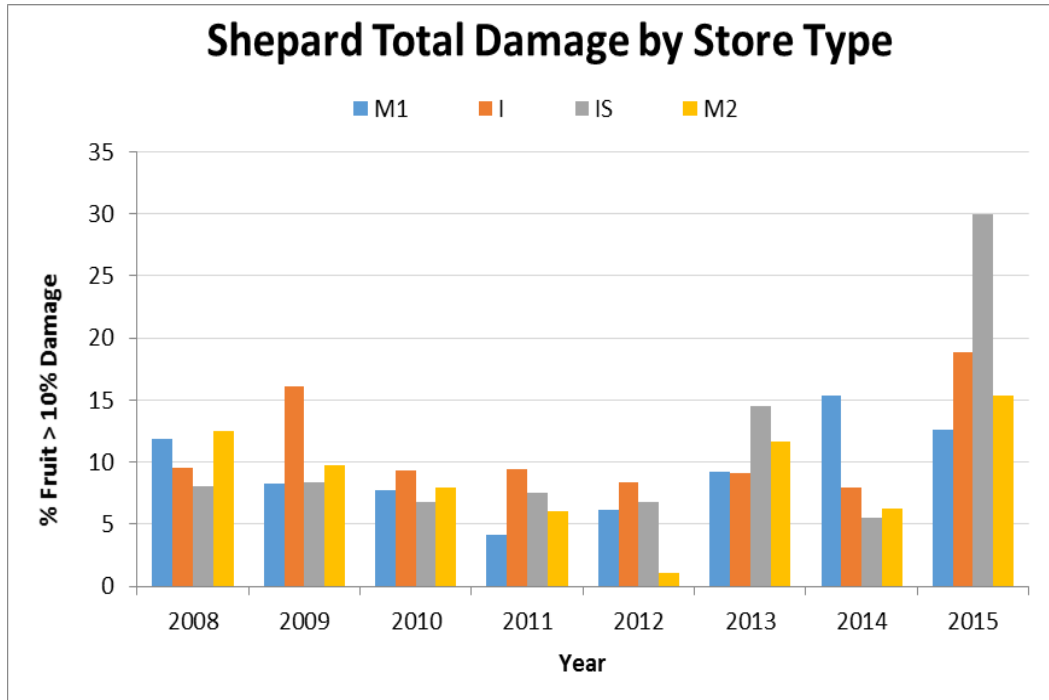


Figure 9: Shepard – Total Damage by Store Type – 2008 - 2015

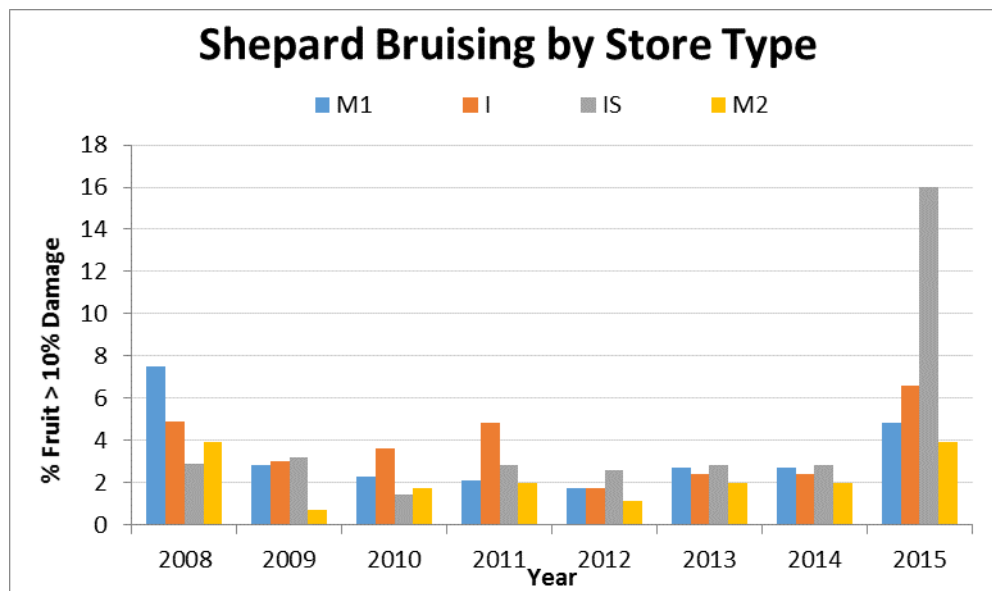


Figure 10: Shepard – Total Bruising by Store Type – 2008 – 2015

As part of the extension of the research undertaken, information related to performance of fruit in the major retailers was shared with the relevant party. This was with the expectation that any retail

handling and supply chain issues contributing to less than ideal category performance, and that were within retailer's control, could be addressed.

5.1.4 PROFILE OF FRUIT PRESENTED FOR DISPLAY

As part of the sampling process contractors were required to provide reasons why Hass fruit was not purchased for assessment. This data provides interesting insight into the profile of fruit presented for display by retailers. Figure 11 shows the reasons over the course of the project the fruit was not able to be sourced for assessment (codes 1 -6). The coding has been devised to encapsulate all purchasing scenarios and ensure transparency of why fruit isn't sampled. The major reason for fruit not being sampled was due to fruit being 'too hard / not ripe enough' as per the consumer preferences that were established in earlier projects.

As can be seen from Figure 12 the same reasons for 'Reasons For Not Purchasing' existed with Shepard as with Hass. It was however more pronounced for Shepard with approximately 23% of incidence (compared to 18% for Hass) where no samples were collected due to the fruit on display not being ripe enough. Fruit that was considered 'too hard / not ripe enough' is shown as Code 2 in Figures 11 and 12.

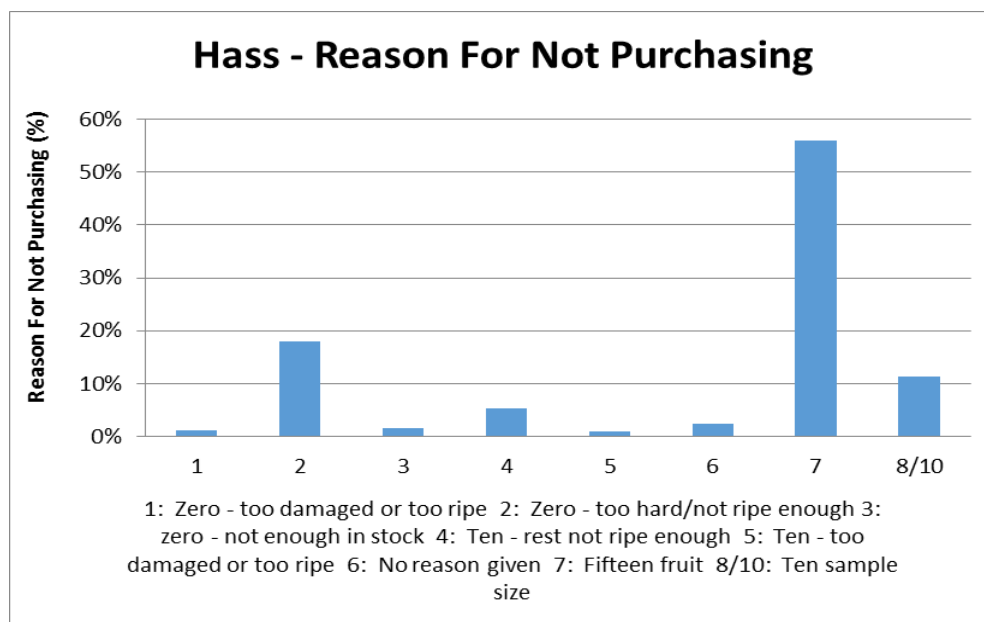


Figure 11: Hass – 'Reason For Not Purchasing' graph, January 2008 – December 2015

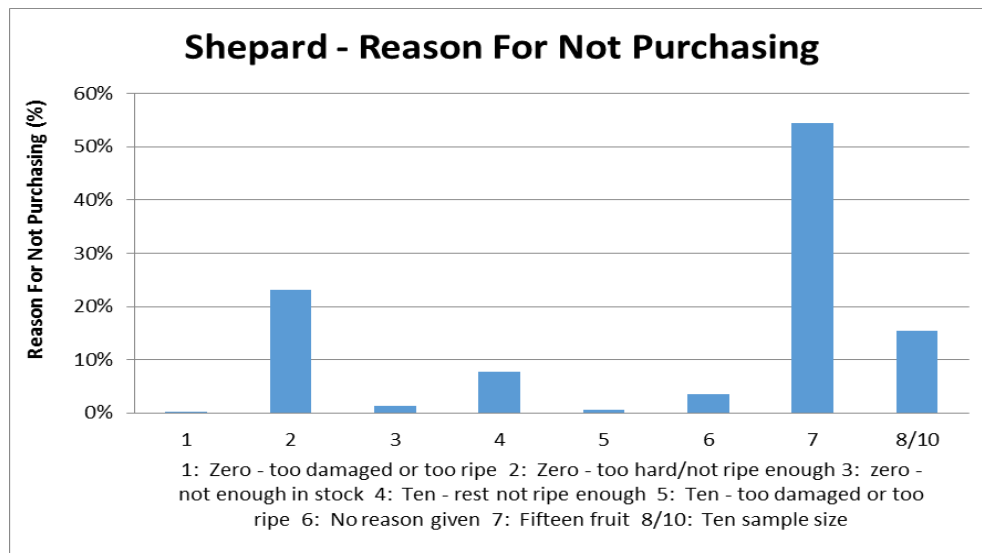


Figure 12: Shepard – ‘Reason For Not Purchasing’ graph, January 2008 – December 2015

Figure 13, below, shows the percentage of fruit available to consumers by colour rating. The graph illustrates that a majority (55%) of available fruit is meeting consumer ripeness preferences with the vast majority of consumers wanting avocados to eat in 1 to 2 days (colour rating 4 & 5). The amount of fruit recorded at 1 (hard), 2 (rubbery), 3 (softening) (37%) and 6 (soft to over ripe) (6%) shows there is still the opportunity to improve the product offering to consumers. This conclusion is supported by the findings in Figure 11 above, where the main reason for non-sampling of fruit was because the fruit was too hard / not ripe.

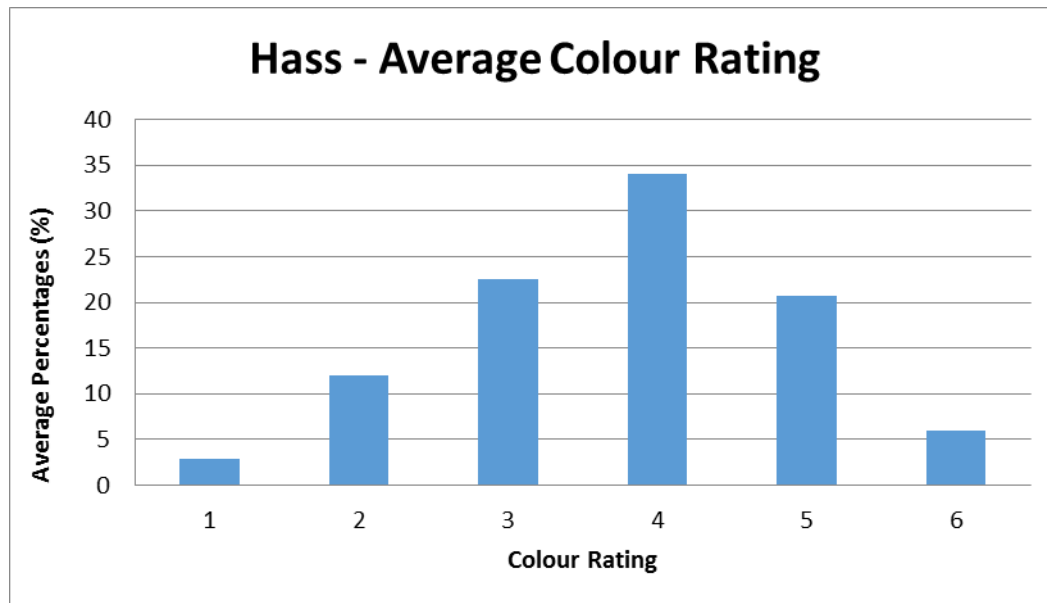


Figure 13: Hass Colour Rating graph, January 2008 – December 2015

5.1.5 VALUE AND INTERPRETATION OF RETAIL QUALITY DATA

The retail quality monitoring succeeded in obtaining extensive data on store type, defect type, the incidence and extent of each defect and the availability of ripe and ready fruit. The data collected clearly illustrates the rate of improvement or deterioration over time in relation to each defect.

Throughout the retail quality monitoring bruising and body rots were continually identified as the major defects leading to poor consumer experiences. Research undertaken in *AV10019: Reducing Flesh Bruising and Skin Spotting in Hass Avocado* aided and complemented AV11015 by identifying that a large portion of bruising was caused by supply chain handling with most of the bruising occurring at retail level. Body rots however are initiated in the orchard and manifest as a result of practices throughout the supply chain.

Although bruising and body rots were the major defects recorded, a number of other defects were identified as being detrimental to avocado quality for the consumer. These defects included vascular browning, diffuse flesh discolouration and stem end rot. The level of incidence of each of these defects was low ranging, from 1 – 4% of fruit assessed which had greater than 10% damage.

Overall the retail quality monitoring was a success with all defect types and their extents clearly recorded. The methodology used captured the changes in level of defects detected in retail samples, the percentage of available fruit that matched consumer preferences, the percentage of fruit that did not and the different damage levels attributable to different store types.

A weakness of the data collected was the inability to be able to confidently ascribe, on a consistent basis, the packhouse and / or region from which fruit originated. This is a challenge with many supply chain projects as additional work needs to be done for better traceability from retail shelf back to packhouse. A number of packhouses have successfully implemented labelling systems that remedy this though the practice is not as widely adopted. If so it would enable for more meaningful and targeted results (region and packer specific) and extension (feedback directly back to the packhouse).

5.2 MATURITY MONITORING

An example Dry Matter Report has been included in Appendix 7.

The maturity monitoring program succeeded in capturing a snapshot of the DM levels for each region from the commencement of harvest. Results show the average and the range of DM levels of fruit collected for a region on a given day and the expected increase in DM levels as a region progresses through its harvest. Where possible, the pack date was recorded providing an indication of fruit age. However, this was often not available. The information also helps map the preferential windows for harvest for different varieties and regions, which assists in maximising fruit quality and improve supply chain efficiencies.

The results show that immature fruit continues to be a problem at the commencement of harvest in many regions but particularly at the beginning of the Shepard and Hass seasons in North Queensland (Figures 14 & 15) and Central Queensland for the Hass season (Figures 16).

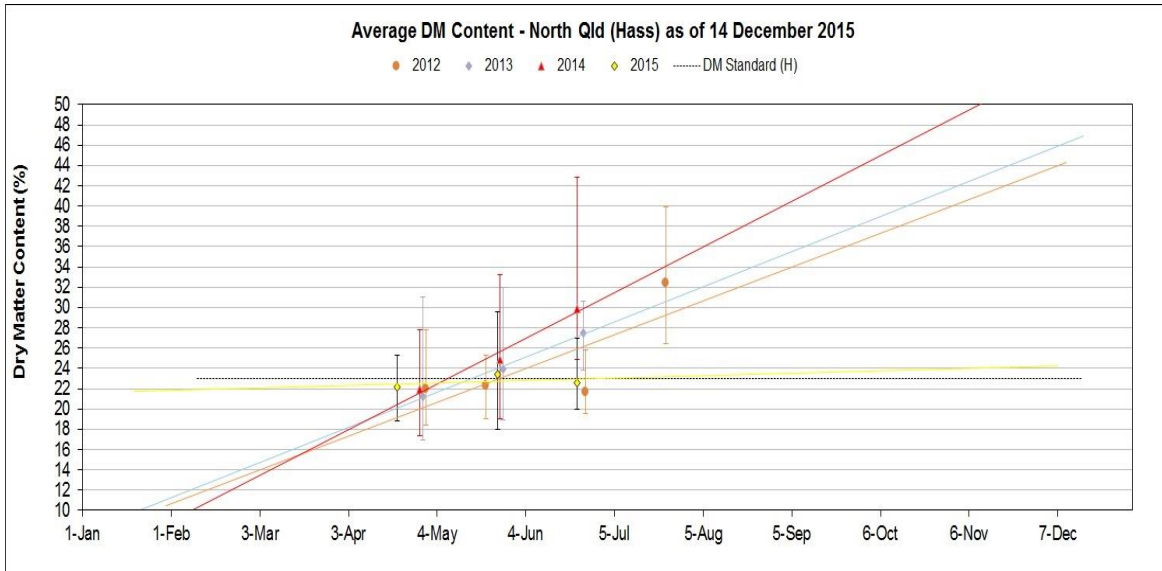


Figure 14: Average DM content- North Queensland Hass 2012 – 2015

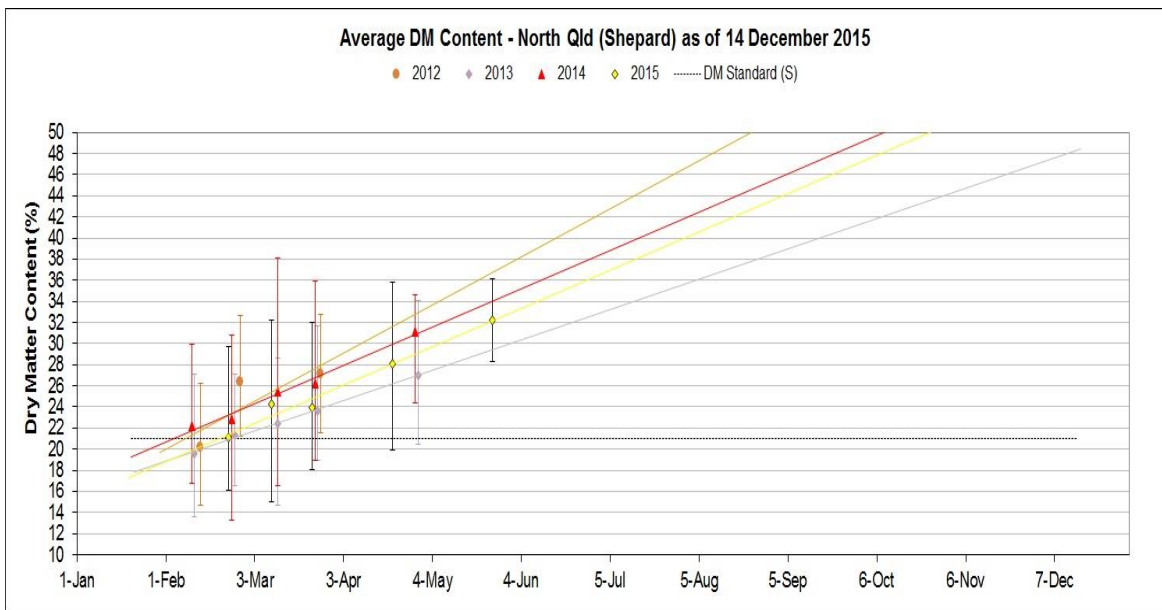


Figure 15: Average DM content- North Queensland Shepard 2012 – 2015

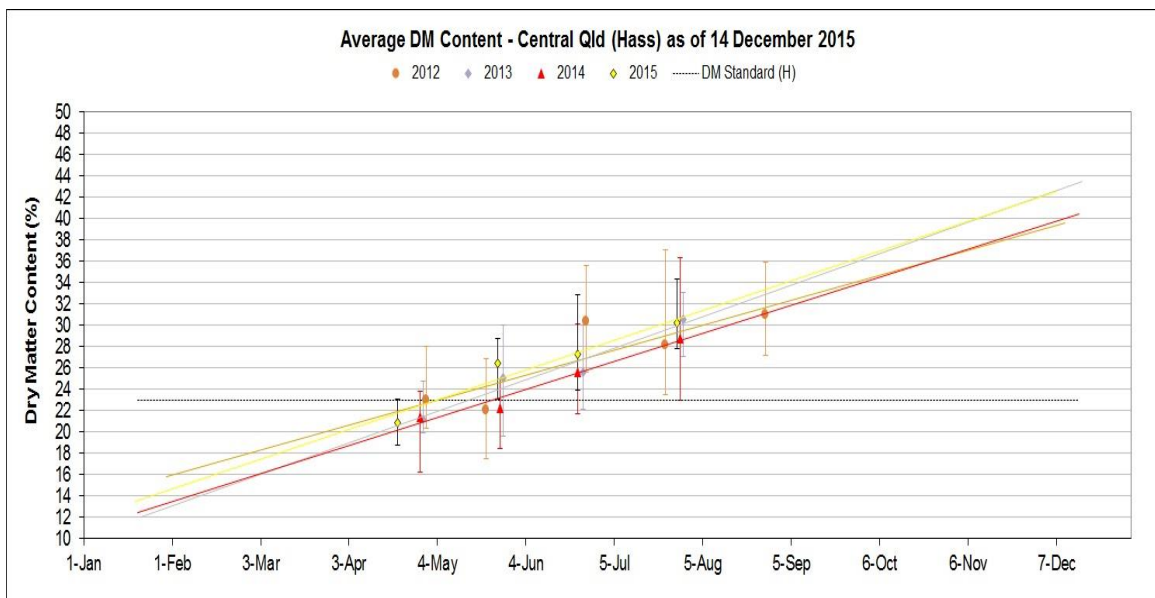


Figure 16: Average DM content- Central Queensland Hass 2012 – 2015

Also, very high maturity levels have been recorded at the end of a long harvest season and this fruit can have a very short shelf life and eating quality that is not acceptable to consumers.

By collating and extending this information to growers and the supply chain over a long period of time it has raised awareness within the industry of issues related to timing of harvest and affect immature fruit on the market.

The variability in maturity across blocks can be significant and many growers may not have had an appreciation of this affect, when selecting harvest start dates. The results generated from the monitoring provided the opportunity to highlight to growers, packers and wholesalers the need to be mindful of this during the early phases of the harvest period and understand how different blocks mature.

Appendix 8 provides a summary of the DM testing results from 2007 to 2015. These graphs show the number of samples and results for each production region for Hass and Shepard (North and Central Queensland) each month over this period.

The results from the maturity monitoring program were extended to industry via four methods. As stated above the results were reported in the week following sampling in the weekly Infocado report. Results were also placed on the Avocados Australia website, presented at Qualicado workshops and articles in *Talking Avocados* highlighting the findings and in particular the implications of immature fruit on the market and supply chain. All delivery methods proved to be useful and of value in ensuring timely information was extended to as many industry stakeholders to elicit action by supply chain parties and facilitate wider industry understanding of the issue.

A smaller study was also undertaken through AV11015 to ascertain the difference in DM determination methods. The grated flesh and Hofshi coring methods were compared. The study was conducted over two samplings, with 160 pieces of fruit per sample. The test results were also compared to QDAF results from the same sample period.

The results from the study illustrated that there was minimal variance between the two DM level testing methods. A difference 0.6-0.7% DM between the means of the two different testing samples was not considered commercially significant. The results did show that the variability between fruit in a sample contributed more to variability than the method used.

The results also provided evidence that there was minimum variation between results when the Hofshi coring method was performed by two different service providers.

It has been recommended that growers use whichever method is more suited to their operation and available equipment.

Overall the maturity monitoring program has been successful in monitoring DM levels over the Australian harvest season and highlighting specific issues related to harvest maturity, variability and timing and the impact of immature fruit on market and supply chain performance. The program also provided evidence that the grated flesh and Hofshi coring methods are both suitable for determining DM levels.

6.0 RECOMMENDATIONS

It is recommended that:

- Retail quality monitoring is continued.

It is important to challenge the industry to continue to improve its performance. Quality remains one of the largest barriers to increased sales in the avocado category, so continual improvement is necessary. Without retail quality monitoring, it is not possible to quantify the types of internal quality defects that consumers are experiencing, the levels of these defects or the frequency of occurrence. Without this information, it is difficult to drive practice change throughout the supply chain. Retail quality monitoring also provides an essential evaluation mechanism for the investment made by industry in all quality improvement projects, including bruising research and retail training.

For example incidence of diffuse flesh discoloration in Shepard fruit is an increasing problem (Years 2012 – 2015), albeit from a low base. This issue needs to be highlighted so the supply chain can take remedial action.

- A new retail quality monitoring procedure should be designed and implemented to meet the Australian avocado industry's needs.

There are some inherent challenges in sampling fruit across four cities on a regular basis. This includes consistency in sampling and evaluation, maintaining and training staff and containing costs. Additionally as discussed it is often difficult to identify source of fruit at the retail level, hence there should be additional emphasis on tracing fruit and understanding the source of quality issues throughout the supply chain. A new approach which addresses these issues has been proposed and should be adopted.

- Dry Matter monitoring should continue at a reduced rate.

Immature fruit continues to be problematic at the start of each harvest season, especially for North and Central Queensland, hence concentrated efforts should be made to monitor and highlight this issues. In addition, changes in production and market conditions is driving modified harvest practices in the southern production regions. Understanding these changes and the impact they are having on fruit quality, especially maturity, is important to ensure the Australian avocado industry supply chains remain efficient. Hence some monitoring across the year should be maintained to identify specific issues.

The results of individual maturity tests should be provided to the supplier of the fruit, but also to the buyer so that both parties are aware of the quality of the fruit that is being traded.

- Extension of historic dry matter results should be incorporated into HIA Project: *AV15004 Avocado Data Management and Quality Innovation Extension Program*.

This is important to continue to drive practice change within the industry, both at a production and supply chain level. It is important to reinforce the need to growers to carefully monitor dry matter levels at the start of harvest. This will contribute to improving quality by reducing immature fruit within the marketplace.

7.0 SCIENTIFIC REFEREED PUBLICATIONS

None to report.

8.0 INTELLECTUAL PROPERTY/COMMERCIALISATION

No commercial IP generated.

9.0 REFERENCES

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10.0 ACKNOWLEDGEMENTS

Appreciation is expressed to the following people for their contributions in completing *AV11015: Avocado Industry Fruit Quality Benchmarking Data Collection to Facilitate Supply Chain Transparency*.

- Nathan Symonds, Amanda Madden, Maree Tyrell, Joanna Embry and Julie Petty – Avocados Australia
- Johanne Applebee, Rod Hall, Brenda Morse and Carmel Carmichael – Avocados Australia retail contractors
- Terry Campbell, Dr Peter Hoffman and Noel Ainsworth – Queensland Department of Agriculture and Fisheries
- Mark Wohlers – Plant & Food Research New Zealand

11.0 APPENDICES

Appendix 1 – Summary of consumer sensory work

Appendix 2 – Retail Quality Survey Form

Appendix 3 – Procedure - store information collection

Appendix 4 – Procedure - fruit assessment

Appendix 5 – Retail Quality Tables, Dec. 2015 – Hass & Shepard

Appendix 6 – Incidence of fruit damage by variety details

Appendix 7 – Dry Matter Report (from fruit collected December 2015)

Appendix 8 – Dry Matter Summary Graphs 2007-2015

APPENDIX 1: SUMMARY OF CONSUMER SENSORY WORK

In *Projects AV06025: Australian Consumers Perceptions and Preferences for Hass Avocado* and *AV09025: Shepard Avocado Maturity Consumer Sensory Research*, the research undertaken assisted in developing benchmarks for industry performance regarding eating quality (primarily maturity and level of acceptable internal damage i.e. rots or bruising) by measuring the points at which fruit quality impacts on actual consumer purchasing behaviour.

A summary of the results of these projects is provided below:

Maturity

Consumers showed a progressive increase in liking and intent to buy Hass avocados as the Dry Matter percentage (DM%) increased, however at 28% DM purchase intent was maximized and further increases in maturity did not result in further improvements in consumer willingness to buy avocados.

There was an approximately linear increase in liking and purchase intent that occurs as DM increases from 22% to 28%. Thus, improvements in DM in this range have the potential to stimulate consumer demand and consequently increase prices and/or increase volume of sales.

Research on Shepard confirmed that 21% DM is a suitable minimum standard to achieve consumer acceptance.

Ripeness

Consumers assessed firmness of whole fruit as well as the taste of the avocado flesh.

After handling (squeezing) avocados from the hardest firmness categories (~5 kgf ("sprung") and ~1.05 kgf ("firm ripe")) the consumers indicated that they would leave the avocados to eat/use on a later date.

Consumers who tasted avocados indicated that on average the fruit that were about 1.05 kgf firmness were significantly less liked, less likely to be purchased and less acceptable than fruit that were 0.65 kgf "ripe" or 0.45 kgf "soft ripe".

Visible internal defects

A conjoint study approach was used to explore the impact of bruising on consumer preferences. The study has demonstrated that all three experimental factors (i.e., price, level of bruising and incidence of bruising) significantly affect consumers' future purchase decision.

Bruising of avocados needs to be minimised in order to maintain high future purchase probability. Generally, only the lowest levels of bruising (e.g. 10% flesh damage) at very low incidences (e.g. 1 in 5 or 1 in 10 avocados) were acceptable in terms of not reducing consumers' purchase intent below 70% ('probably buy'). A higher level of bruising (25% flesh damage) was acceptable if it occurred at a very low incidence (1 in 10 avocados), but only at the lowest prices.

APPENDIX 2: RETAIL QUALITY SURVEY FORMS

Avocado Retail Quality Survey – Store and display information

1. Store Name :		2. Store Location :		3. Store Code (Office Use Only) :	
4. Date Collected :		5. Time Collected :		6. Variety (please circle) : Hass / Shepard / NA	
7. Size of display (WxL) :		8. Display Type (please circle) : Single Layer / Stacked			
9. Proportion of different coloured fruit on display – see laminated avocado colour chart <i>Please indicate the percentage of each colour rating that is on the display (total should add up to 100%)</i>					
% colour rating 1: emerald green:	% colour rating 2: forest green	% colour rating 3: approx. 25% coloured	% colour rating 4: approx. 75% coloured	% colour rating 5: purple	% colour rating 6: black
10. Fruit Price (each), calculate from multi buy price if only one available :			11. Country of Origin (on display sign) :		
\$ / avocado			Australian	New Zealand	Imported Other
			Mixed Origin	Not Specified	
12. Skin Spotting – the below 5 boxes should add up to 100% Only applicable for colour stage 1 – 3 in Hass, all Shepard are assessed					
Estimate of % of assessable fruit easily visible in display with skin spotting level 0 (0%)					
Estimate of % of assessable fruit easily visible in display with skin spotting rating level 1 (1-10% slight)					
Estimate of % of assessable fruit easily visible in display with skin spotting rating level 2 (11-25% moderate)					
Estimate of % of assessable fruit easily visible in display with skin spotting rating level 3 (26-50% severe)					
Estimate of % of assessable fruit easily visible in display with skin spotting rating level 4 (>50% extreme)					
13. No. of Avocados Purchased (please circle number, right hand column) :					
No fruit purchased – too damaged or too ripe				1	
No fruit purchased – all too hard (not ripe enough)				2	
No fruit purchased – not enough in stock				3	
All 10 pieces of fruit purchased				10	

14. Any other comments (i.e. storage temp's, if no Hass or Shepard are available) :

Assessor name:

Avocado Retail Quality Survey – Fruit Quality Information

Date of Assessment:							Time of Assessment:					
							Type of Defects %					
Fruit no.	Sticker (s)	Fruit Weight (g)	Skin colour (3 – 6)	Firmness Rating (2 - 4)	Penetrometer Reading	% Total Damage	% Bruising	% Diffuse flesh discolour	% Vascular browning	% Stem end rot	% Body rots	% Other defects
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

- Note the exact % level for each defect observed for each fruit. The % for types of defects should add up to the “Total Damage %”

APPENDIX 3: PROCEDURE - STORE INFORMATION COLLECTION

The procedures that contractors were required to follow in regard to sample collection and display evaluation procedures is provided below.

PROCEDURE FOR INFORMATION COLLECTION AT STORE LEVEL:

(Version 4 – 27 May 2015)

Note: bracketed numbers relate to numbered sections of survey

Note: as of this version of instructions AAL requires only 10 pieces of fruit now to be purchased / store

- Take photograph of outside sign of store name before entering
- Where possible pick up a catalogue before going into the store
- Note **Store Name** (1)
- Note **Store Location** (2)
- **Store Code** leave blank - this is coded by AAL upon receiving of forms (3)
- Note **Date Collected** (4)
- Note **Time Collected** (5)
- Circle **Variety (ONLY Hass & Shepard are sampled)** (6). If there is no stock on display, cross both out and record in No. of Avocados Purchased and Comments (14).
- Locate the main avocado display/s in the store or fruit and vegetable section. For most of the year this will be Hass avocados but from February through June you may find Shepard avocados. Only do Shepard and Hass avocados –
 1. If there is only a display of Shepard avocados then assess and collect the Shepard avocados. If there are displays of both then assess and collect fruit from both displays (*i.e. Complete 2 forms and purchase 20 pieces of fruit in total*). During March especially, in the supermarkets you may find that there is only Shepard on sale. In some stores you will not be able to collect fruit because it is not ripe enough. Only collect 10 pieces of fruit or no fruit at all dependent upon the fruit ripeness at time of survey.
 2. Only collect Shepard fruit if it is clearly marked that it is Shepard i.e. on the signage or stickers on the fruit. There are other green skin varieties that may look similar so if it is not clearly marked don't collect any.
- Do a rough assessment of **size of display** (note length and width) (7)
- Circle **Display Type (Single Layer OR Stacked)** (8)
- Assess the **colour rating** of display in terms of proportion of coloured fruit for the entire amount that is available for the consumer (as per laminated sheet provided). This is only relevant for Hass – *If a Shepard display, note N/A in this part* (9).
- Collect **Price** information / individual fruit. If only multi buy price is the only option then divide by the number of fruit and record the single fruit price (10)
- Collect **Country of Origin** information from the signage on the display. If the sign on the display indicates that it is Australian Fruit but the stickers on the individual pieces of fruit indicates that it is NZ fruit you **record "Australian Fruit"** (11). In this event make a note in the comments section what the stickers indicate (NZ / mixed origin) (14)
- When assessing **Skin Spotting** on Hass fruit, only assess fruit of a colour stage between 1 and 3. This is because as Hass skin colour darkens it can be very difficult to see the skin spotting.

If the Hass on display is 4 – 6 record N/A against the skin spotting. **For Shepard, all fruit is assessable.** Assess the display as it is, you only need to look at the top layer of fruit that you can easily see and record the percentage of **skin surface area affected**. Please refer to “*The International Avocado Quality Manual*” or the “*Skin Spotting Instructions*” for examples of the ratings. Only use the ratings listed below: (12)

1. Rating Level 0 – 0% - nil
2. Rating Level 1 – 1-10% - slight
3. Rating Level 2 – 11-25% - moderate
4. Rating Level 3 – 26-50% - severe
5. Rating Level 4 – greater than 50% - extreme

Note: The percentages for Skin Spotting rating levels 0-4 when recorded should add up to 100%. Otherwise N/A will be noted.

- Collect a **Photograph** of the stand
- Collect either 0 or 10 pieces of fruit from the main display depending on the availability of ripe fruit. The main display is the one that contains good uniform fruit i.e. size, colour, etc., NOT the discount table.
 - For Hass only fruit of a colour rating of 3 or above should be chosen or feels ripe for assessment the next day.
 - For Shepard gently squeeze the stem end of the fruit and select fruit that feels soft enough to eat tomorrow.
 - Collect fruit from a part of the display that is within easy arm’s length unless fruit of suitable colour is not available. In this instance collect fruit from further back in display or a layer below.
 - Do not select fruit that to look at is obviously rotten, mummified or displays excessive shrivelling.
- Collect fruit in an avocado tray/carton (or similar) and clearly label with the store name. Ensure the fruit is placed carefully in the tray as we don’t want to cause any bruising.
- Record the **No. of Avocados Purchased** by circling the appropriate number next to the reason (13). Place the assessment sheet in the box to ensure that correct sheet is attached to sample.
- Note any **Comments** (14) that are applicable i.e. if no Hass & Shepard available but Gwen or Reed is on display, ripeness of fruit on display, if fruit has been stored or transported with high temps, etc.
- Pay at checkout and ensure you get a receipt.
- When transporting the trays of avocados have an insulation blanket to cover the avocado samples to reduce temperature fluctuations.
- Fruit to be stored overnight in the trays they were collected in, in a cool shaded place. Assessments to be made no later than the following day after collection.

APPENDIX 4: PROCEDURE - FRUIT ASSESSMENT

The procedures that contractors were required to follow in regard to fruit sample assessment procedures, the day after collection, are provided below.

PROCEDURE - FRUIT ASSESSMENT, THE DAY AFTER COLLECTION

Have all your scoring sheets and equipment set out for comfortable operations as this will probably be a long assessment session.

Scoring sheet information

- A separate sheet for each store and variety
- Do all assessments for one store before moving on to the next store's sample
- Do all of the assessment for each avocado before moving onto the next one. Meaning work across the page noting all data before beginning the next fruit.
- Remove the sticker and place on sheet
- Weigh the fruit (round to 1g)
- Rate the fruit for skin colour (**only for Hass – for Shepard leave blank**)
- Assess the fruit for its skin spotting rating level using the images in The International Avocado Quality Manual as a guide. Only use the listed ratings (0-4) – there is no need to list more detailed rating levels (e.g. 2.5). Record the rating in the Skin Spotting Column on page 2 of the assessment sheet. If Hass fruit is too dark to assess write NA in the column.
- Using the Avocado Firmness Models as a comparison, rate the avocado from 1-4 in relation to firmness, when assessing sample fruit firmness the score should generally be 3 - 4.

Now we start cutting the fruit

- Take a thin slice of skin from one side to expose the flesh.
- Hold the penetrometer in one hand around the dial gauge.
- Ensure the pointer is at zero (re-zero).
- Place the fruit on the table with the exposed flesh at the top.
- Push the probe into the flesh vertically until the probe reaches the line. Be sure to use even force – do not stab the fruit. The fruit are soft and will require little force to get the result.
- Read the dial and record the result on the sheet. If the reading is less than the lowest reading that the penetrometer can record just put the lowest value that is displayed on the penetrometer i.e. **.50 not <.50**
- Re-zero the instrument.
- Cut the fruit in halves.
- Remove the seed (use a spoon for safety).
- Cut each half into half again (quarters or eighths) and peel the skin back to fully assess each portion of fruit
- Record the total percentage of fruit with damage; fruit that is inedible. This should be recorded in the column titled % total damage the total percentage of the flesh affected by defects.

- ***Always assess for the major defect that is present down to the one that is least present. This will aid in obtaining the major causes of defects in avocados at the time of assessment. When fruit has a total damage GREATER than 10% it is fine to work in rounded figures (5's, 10's, etc.) though if the total damage is LESS than 10% more precision is needed (1's, 2's, 3's).***

Note: Remember that when you cut the fruit into eighths one of those sections equates to approximately 12% of the flesh total

- Record the exact percentage of damage for the following if present:

- % bruising
- % diffuse flesh discoloration
- % vascular browning
- % stem end rot
- % body rots
- % other defects

Note the exact percentage % of the different types of defects i.e. if no damage note "0%". If 15% vascular browning note 15% in that column.

The cumulative total of the different types of defects should be exactly the same as "Total Damage%".

- If there is more than one defect present, rate for each separately. If it is confusing which defect is present, rate under the defect you think it is, from the photos provided. The "other" column relates to minor defects (as illustrated in your HortResearch assessment book)
- If there is a defect present that appears to be greater than 50%, record the actual figure. Score in the relevant defect column. Still note zero (0) in any column where that defect is not present
- Now repeat the above procedure for the rest of other 14 avocados that were sampled and for each store

Skin spotting

This may be called 'lenticel spotting', nodule damage or 'peel spotting/damage'.

Description

- Brown or black areas on the skin, less than 3mm diameter
- In 'Hass' it is often on top of the nodules (bumps) on the skin surface
- This damage excludes damage due to insect feeding or tree rub
- These symptoms are confined to the skin and do not penetrate into the flesh, which distinguishes the injury from damage due to rots
- Becomes less obvious in 'Hass' as fruit ripens and the skin darkens

Rating Scale for skin surface area	Rating	Description
0	0%	Nil
1	1-10%	Slight
2	11-25%	Moderate
3	24-50%	Severe
4	>50%	Extreme

Causes

Physical damage from abrasion, impact or compression during harvesting, grading, packing and transport



Rating

0 (Nil)

1 (1-10% slight)

2 (11-25% moderate)

3 (26-50% severe)



Assessment of display in store

- For Hass fruit, only assess fruit of a colour stage between 1 and 3. This is because as Hass skin colour darkens it can be very difficult to see the skin spotting. **For Shepard, all fruit is assessable.**
- Keeping in mind the above point, assess the display as it is – you only need to look at the top layer of fruit that you can easily see. You don't need to spend time picking up individual pieces of fruit, just assess the display as it appears.
- Now assess the percentage of **skin surface area affected**. Please see The International Avocado Quality Manual or the previous page for images showing examples of the ratings. Only use the below listed ratings – there is no need to list more detailed rating levels (e.g. 2.5).
 - o Rating Level 0 – 0% - nil

- Rating Level 1 – 1-10% - slight
- Rating Level 2 – 11-25% - moderate
- Rating Level 3 – 26-50% - severe
- Rating Level 4 – greater than 50% - extreme

- Note: these percentages for rating levels 0-4 should add up to 100%.

Percentage of surface area affected with skin spotting



In terms of the surface area with skin spotting, the avocado on the left has 50% or rating level of 3 – severe.

On the photo to the right, the avocado has between 1-10% surface area affected, therefore it has a rating level of 1 - slight.



Individual fruit assessments

Assess each piece of fruit for its skin spotting rating level using the images in The International Avocado Quality Manual as a guide. Only use the above listed ratings – there is no need to list more detailed rating levels (e.g. 2.5).

Record the rating in the Skin Spotting Column on page 2 of the assessment sheet. If Hass fruit is too dark to assess write NA in the column.

APPENDIX 5: RETAIL QUALITY DATA

Table 1: Percentage of total damage in Hass by month during 2008 and 2009

Month	2008							2009						
	Total Damage							Total Damage						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	32.60	41.20	15.50	2.60	4.00	4.10	682.00	43.60	41.80	9.30	0.90	2.00	2.30	644.00
Feb	40.30	36.60	12.90	1.50	6.20	2.50	596.00	38.90	38.60	17.80	1.00	3.10	0.50	578.00
Mar	40.30	40.30	11.80	1.10	4.30	2.20	186.00	38.50	23.50	18.40	3.40	10.60	5.60	179.00
Apr	31.50	37.30	19.20	2.80	5.60	3.60	391.00	47.80	37.80	9.00	1.50	3.50	0.50	201.00
May	40.50	25.20	15.80	9.50	7.00	2.10	660.00	40.90	33.00	12.10	3.30	6.20	4.50	663.00
Jun	35.90	32.40	17.10	6.50	4.50	3.60	694.00	43.00	32.20	13.70	2.00	4.40	4.70	597.00
Jul	38.70	30.20	15.10	2.40	8.00	5.60	788.00	41.20	33.50	12.50	3.30	6.00	3.50	514.00
Aug	34.10	31.60	20.90	2.90	6.60	3.90	727.00	41.60	30.50	16.60	2.50	4.20	4.60	567.00
Sep	38.70	40.20	13.30	1.90	4.30	1.50	736.00	48.30	29.70	13.20	2.00	4.00	2.80	646.00
Oct	43.20	37.80	12.40	1.60	4.10	1.00	630.00	39.20	30.70	17.50	2.90	6.30	3.40	622.00
Nov	30.80	38.20	21.90	2.70	4.40	2.00	699.00	36.30	37.70	16.80	2.20	4.70	2.20	578.00
Dec	33.90	36.60	18.70	1.90	7.50	1.30	669.00	31.20	34.80	21.90	2.50	6.50	3.20	727.00
Total	36.59%	35.19%	16.46%	3.26%	5.64%	2.85%	7,458.00	40.49%	34.07%	15.11%	2.26%	4.88%	3.16%	6,516.00
	<=10%			>10%				<=10%			>10%			
Percentage	72%			28%				75%			25%			

Table 2: Percentage of body rots in Hass by month during 2008 and 2009

Month	2008							2009						
	Body Rots							Body Rots						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	58.90	28.40	7.20	3.80	0.90	0.70	682.00	84.00	12.60	1.40	0.50	-	1.60	644.00
Feb	76.30	19.10	3.40	0.50	0.50	0.20	596.00	82.00	15.60	2.20	-	0.20	-	578.00
Mar	71.00	22.00	5.90	1.10	-	-	186.00	62.60	24.00	10.60	2.20	0.60	-	179.00
Apr	77.50	17.90	2.80	1.30	0.50	-	391.00	73.10	22.90	3.00	-	1.00	-	201.00
May	81.40	10.90	5.50	2.10	-	0.20	660.00	67.90	23.10	6.50	1.20	0.90	0.50	663.00
Jun	79.30	14.80	4.30	1.20	0.30	0.10	694.00	77.40	12.40	4.90	1.80	1.30	2.20	597.00
Jul	86.30	9.40	2.80	0.80	0.30	0.50	788.00	78.40	13.20	3.90	2.70	0.40	1.40	514.00
Aug	83.90	10.60	3.30	0.80	-	1.40	727.00	76.00	14.80	5.80	1.10	0.90	1.40	567.00
Sep	84.50	12.90	1.60	0.70	0.10	0.10	736.00	76.90	15.30	4.80	0.80	1.20	0.90	646.00
Oct	86.20	11.30	2.20	0.20	0.20	-	630.00	72.80	15.10	6.30	3.10	1.00	1.80	622.00
Nov	86.60	9.70	3.30	0.30	-	0.10	699.00	76.00	17.60	4.70	1.00	0.50	0.20	578.00
Dec	82.20	14.50	2.20	0.40	0.30	0.30	669.00	70.70	18.80	6.10	1.90	1.00	1.50	727.00
Total	80.31%	14.42%	3.58%	1.09%	0.26%	0.34%	7,458.00	75.55%	16.43%	4.81%	1.38%	0.76%	1.09%	6,516.00
	<=10%			>10%				<=10%			>10%			
Percentage	95%			5%				92%			8%			

Table 3: Percentage of bruising in Hass by month during 2008 and 2009

Month	2008							2009						
	Bruising							Bruising						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	66.70	22.90	6.90	2.90	0.40	0.10	682.00	62.60	30.00	4.20	1.10	0.50	1.70	644.00
Feb	74.80	18.60	5.40	0.80	0.20	0.20	596.00	66.30	29.60	3.60	-	0.30	0.20	578.00
Mar	83.30	10.80	5.40	0.50	-	-	186.00	83.20	13.40	3.40	-	-	-	179.00
Apr	43.20	37.10	11.30	3.80	2.60	2.00	391.00	67.20	26.90	5.00	0.50	0.50	-	201.00
May	50.80	33.30	12.40	2.00	0.90	0.60	660.00	52.50	31.80	8.40	3.60	2.60	1.10	663.00
Jun	48.80	36.70	9.90	2.00	0.90	1.60	694.00	59.60	28.30	7.70	1.80	0.50	2.00	597.00
Jul	52.70	33.50	10.30	1.00	1.40	1.10	788.00	60.70	28.60	7.40	2.10	1.00	0.20	514.00
Aug	44.60	37.40	11.80	2.90	0.80	2.50	727.00	61.90	26.50	9.90	1.10	0.40	0.40	567.00
Sep	50.30	39.50	8.30	1.10	0.30	0.50	736.00	64.90	26.90	4.60	1.20	1.40	0.90	646.00
Oct	57.50	34.60	6.30	0.80	0.20	0.60	630.00	59.00	28.60	8.40	2.40	0.60	1.00	622.00
Nov	47.60	42.20	8.60	0.90	0.10	0.60	699.00	61.90	32.90	4.50	0.30	0.30	-	578.00
Dec	56.40	35.70	6.70	0.30	0.60	0.30	669.00	62.30	25.40	9.80	1.70	0.10	0.70	727.00
Total	54.71%	33.32%	8.81%	1.58%	0.69%	0.88%	7,458.00	61.91%	28.33%	6.74%	1.48%	0.75%	0.79%	6,516.00
	<=10%			>10%				<=10%			>10%			
Percentage	88%			12%				90%			10%			

Table 4: Percentage of diffuse flesh discolouration in Hass by month during 2008 and 2009

Month	2008							2009						
	Diffuse Flesh Discolouration							Diffuse Flesh Discolouration						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	93.10	3.20	1.30	0.60	0.70	1.00	682.00	93.30	4.30	0.60	-	0.20	1.60	644.00
Feb	90.80	6.90	1.20	0.70	0.30	0.20	595.00	89.60	8.50	1.40	0.20	-	0.30	578.00
Mar	91.40	6.50	1.10	1.10	-	-	186.00	88.30	10.60	-	0.60	0.60	-	179.00
Apr	93.90	5.10	1.00	-	-	-	391.00	96.00	3.50	0.50	-	-	-	201.00
May	92.00	3.60	2.90	0.80	0.30	0.50	660.00	90.00	7.10	2.40	0.30	0.20	-	663.00
Jun	86.90	5.50	5.00	1.40	0.40	0.70	694.00	87.60	9.40	1.50	0.70	0.30	0.50	597.00
Jul	87.30	6.00	3.00	1.00	1.00	1.60	788.00	83.10	12.80	3.10	0.20	0.20	0.60	514.00
Aug	91.50	5.40	1.70	0.30	0.10	1.10	727.00	83.60	10.40	3.50	1.20	0.50	0.70	567.00
Sep	90.40	4.90	3.40	0.80	0.30	0.30	736.00	89.90	8.20	1.40	0.20	-	0.30	646.00
Oct	91.90	6.00	1.70	0.20	-	0.20	630.00	91.60	6.60	0.80	0.30	0.20	0.50	622.00
Nov	86.80	9.60	2.30	0.70	-	0.60	698.00	87.90	10.10	1.40	0.30	0.30	-	577.00
Dec	83.10	9.60	4.60	2.20	-	0.40	669.00	88.90	8.00	1.70	0.70	0.10	0.70	727.00
Total	89.62%	6.01%	2.61%	0.83%	0.30%	0.63%	7,456.00	88.94%	8.31%	1.66%	0.40%	0.20%	0.49%	6,515.00
	<=10%			>10%				<=10%			>10%			
Percentage	96%			4%				97%			3%			

Table 5: Percentage of other in Hass by month during 2008 and 2009

	2008							2009						
	Other Defects							Other Defects						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	99.00	0.90	0.10	-	-	-	682.00	98.30	1.70	-	-	-	-	644.00
Feb	93.60	6.40	-	-	-	-	596.00	97.60	2.20	0.20	-	-	-	578.00
Mar	93.50	6.50	-	-	-	-	186.00	94.40	2.20	2.80	-	0.60	-	179.00
Apr	99.70	0.30	-	-	-	-	391.00	96.50	3.00	-	-	0.50	-	201.00
May	99.50	0.50	-	-	-	-	660.00	96.40	1.50	2.00	-	0.20	-	663.00
Jun	99.30	0.70	-	-	-	-	694.00	99.00	0.80	0.20	-	-	-	597.00
Jul	98.50	1.50	-	-	-	-	788.00	96.30	3.30	0.40	-	-	-	514.00
Aug	99.20	0.70	-	-	-	0.10	727.00	96.30	2.60	0.70	-	0.20	0.20	567.00
Sep	98.50	1.40	-	-	0.10	-	736.00	97.20	2.20	0.60	-	-	-	646.00
Oct	99.20	0.80	-	-	-	-	630.00	95.20	3.70	0.60	0.20	0.20	0.20	622.00
Nov	98.60	1.40	-	-	-	-	699.00	96.90	1.60	1.60	-	-	-	578.00
Dec	99.00	0.90	-	-	0.10	-	669.00	97.40	1.00	1.50	-	0.10	-	727.00
Total	98.44%	1.53%	0.01%	-	0.02%	0.01%	7,458.00	96.98%	2.05%	0.83%	0.02%	0.10%	0.04%	6,516.00
Percentage	<=10%		>10%					<=10%		>10%				
	100%		0%					99%		1%				

Table 6: Percentage of stem end rot in Hass by month during 2008 and 2009

	2008							2009						
	Stem End Rot							Stem End Rot						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	77.30	18.80	2.60	1.30	-	-	682.00	79.20	18.20	1.70	0.20	0.20	0.60	644.00
Feb	78.00	19.00	2.90	0.20	-	-	596.00	75.40	23.40	1.20	-	-	-	578.00
Mar	86.00	12.40	1.60	-	-	-	186.00	68.70	20.70	10.60	-	-	-	179.00
Apr	81.60	15.90	2.00	0.50	-	-	391.00	89.10	10.90	-	-	-	-	201.00
May	84.20	12.00	3.50	0.30	-	-	660.00	86.00	11.30	2.60	0.20	-	-	663.00
Jun	86.00	10.70	3.00	0.30	-	-	694.00	84.60	11.60	3.70	0.20	-	-	597.00
Jul	87.70	10.20	1.60	0.30	0.10	0.10	788.00	88.30	8.40	3.10	0.20	-	-	514.00
Aug	89.40	8.00	1.80	0.10	0.10	0.60	727.00	91.50	6.70	1.60	0.20	-	-	567.00
Sep	92.70	6.40	1.00	-	-	-	736.00	91.00	7.90	0.60	0.20	0.30	-	646.00
Oct	88.10	11.10	0.80	-	-	-	630.00	87.00	11.30	1.00	0.20	-	0.60	622.00
Nov	76.10	21.20	2.60	0.10	-	-	699.00	79.60	18.30	1.70	0.30	-	-	578.00
Dec	76.50	22.30	0.90	0.10	-	0.10	669.00	71.10	23.70	4.40	0.40	-	0.40	727.00
Total	83.74%	13.85%	2.04%	0.28%	0.02%	0.08%	7,458.00	82.90%	14.37%	2.35%	0.20%	0.05%	0.16%	6,516.00
Percentage	<=10%		>10%					<=10%		>10%				
	98%		2%					97%		3%				

Table 7: Percentage of vascular browning in Hass by month during 2008 and 2009

	2008							2009						
	Vascular Browning							Vascular Browning						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	71.70	22.00	3.10	2.10	0.30	0.90	682.00	88.00	10.40	1.10	0.20	-	0.30	644.00
Feb	85.70	9.40	2.30	1.20	0.50	0.80	596.00	86.30	11.20	2.20	0.20	-	-	578.00
Mar	73.70	19.40	3.80	0.50	2.20	0.50	186.00	76.00	15.10	6.10	1.70	0.60	0.60	179.00
Apr	84.40	10.20	3.30	1.30	0.30	0.50	391.00	92.50	6.50	1.00	-	-	-	201.00
May	89.40	5.60	3.90	0.80	0.30	-	660.00	96.40	2.70	0.50	0.30	-	0.20	663.00
Jun	91.10	5.60	2.90	0.40	-	-	694.00	91.80	5.20	1.70	0.30	0.20	0.80	597.00
Jul	84.40	8.90	3.80	1.30	0.80	0.90	788.00	86.80	9.70	2.50	0.40	0.60	-	514.00
Aug	87.60	6.60	3.00	1.40	0.10	1.20	727.00	85.40	11.30	2.30	0.50	0.40	0.20	567.00
Sep	89.10	7.70	1.50	1.00	0.30	0.40	736.00	90.10	8.40	1.40	0.20	-	-	646.00
Oct	90.00	5.90	3.00	0.80	0.20	0.20	630.00	88.40	9.20	1.90	0.30	-	0.20	622.00
Nov	81.00	12.30	3.90	1.60	0.70	0.60	699.00	78.40	18.20	2.40	0.70	0.20	0.20	578.00
Dec	79.20	13.00	6.10	0.90	0.60	0.10	669.00	80.20	16.90	2.30	0.40	0.10	-	727.00
Total	84.61%	9.96%	3.36%	1.15%	0.42%	0.52%	7,458.00	87.06%	10.35%	1.90%	0.37%	0.15%	0.19%	6,516.00
Percentage	<=10%		>10%					<=10%		>10%				
	95%		5%					97%		3%				

Table 8: Percentage of total damage in Hass by month during 2010 and 2011

Month	2010							2011						
	Total Damage							Total Damage						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	47.70	32.50	11.40	2.60	3.50	2.40	545.00	43.60	41.80	10.70	1.20	1.80	1.00	505.00
Feb	41.70	26.70	17.60	4.80	4.80	4.30	393.00	22.90	53.00	15.80	3.00	4.40	0.90	436.00
Mar	-	-	-	-	-	-	-	31.80	44.60	15.00	1.70	4.70	2.20	359.00
Apr	62.70	22.90	10.80	-	3.60	-	83.00	42.00	40.80	8.90	2.50	5.10	0.60	157.00
May	50.60	28.40	11.80	1.60	2.00	5.60	557.00	48.10	35.10	12.70	1.60	1.00	1.60	695.00
Jun	55.70	32.90	6.60	2.00	1.40	1.50	715.00	37.50	37.30	14.00	2.90	4.00	4.20	520.00
Jul	45.70	31.70	12.70	2.70	3.90	3.20	621.00	40.30	35.20	14.80	1.90	3.70	4.00	722.00
Aug	51.00	33.90	11.90	0.60	1.30	1.30	628.00	45.30	35.80	10.10	2.00	0.90	5.80	651.00
Sep	44.40	31.10	14.80	2.40	4.10	3.20	656.00	43.10	39.00	12.30	1.70	1.20	2.80	652.00
Oct	49.80	34.80	10.70	1.00	1.90	1.70	578.00	36.60	37.50	14.50	2.90	2.90	5.70	560.00
Nov	54.50	30.50	9.90	1.50	1.80	1.80	675.00	48.20	36.20	5.80	1.30	3.60	4.90	608.00
Dec	41.10	39.60	12.60	1.10	1.30	4.30	609.00	51.70	25.90	8.30	2.50	4.80	6.70	683.00
Total	48.80%	32.28%	11.70%	1.90%	2.51%	2.79%	6,060.00	41.96%	37.46%	11.88%	2.05%	2.94%	3.71%	6,548.00
	<=10%			>10%				<=10%			>10%			
Percentage	81%			19%				79%			21%			

Table 9: Percentage of body rots in Hass by month during 2010 and 2011

Month	2010							2011						
	Body Rots							Body Rots						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	76.00	15.20	4.60	1.80	0.70	1.70	545.00	80.20	13.70	4.80	0.40	0.40	0.60	505.00
Feb	75.80	11.20	6.40	3.60	0.80	2.30	393.00	73.90	17.90	6.20	1.10	0.20	0.70	436.00
Mar	-	-	-	-	-	-	-	70.80	20.10	7.00	0.60	1.40	0.30	359.00
Apr	92.80	4.80	1.20	1.20	-	-	83.00	77.70	16.60	5.70	-	-	-	157.00
May	75.80	14.40	4.80	1.30	0.50	3.20	557.00	78.80	15.00	3.70	1.30	0.30	0.90	695.00
Jun	81.00	12.00	3.50	1.50	0.70	1.30	715.00	68.10	21.70	5.20	1.50	1.20	2.30	520.00
Jul	78.30	13.50	3.70	1.10	0.60	2.70	621.00	75.10	15.10	6.20	1.40	0.80	1.40	722.00
Aug	83.10	13.20	1.80	0.80	0.20	1.00	628.00	78.00	13.10	5.10	1.10	0.60	2.20	651.00
Sep	79.50	12.20	5.60	1.40	-	1.20	655.00	75.20	16.40	4.90	1.20	0.80	1.50	652.00
Oct	82.00	12.60	3.50	0.30	0.20	1.40	578.00	68.80	16.60	6.80	2.90	0.70	4.30	560.00
Nov	84.60	9.50	3.60	1.00	0.30	1.00	675.00	79.80	11.00	3.30	1.80	1.50	2.60	608.00
Dec	81.40	11.70	2.50	1.30	0.80	2.30	609.00	81.30	5.10	4.00	1.60	2.00	6.00	683.00
Total	80.21%	12.41%	3.86%	1.33%	0.46%	1.74%	6,059.00	75.92%	14.64%	5.09%	1.36%	0.88%	2.14%	6,548.00
	<=10%			>10%				<=10%			>10%			
Percentage	93%			7%				91%			9%			

Table 10: Percentage of bruising in Hass by month during 2010 and 2011

Month	2010							2011						
	Bruising							Bruising						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	72.70	20.60	4.20	0.70	0.60	1.30	545.00	82.80	15.00	2.00	-	-	0.20	505.00
Feb	73.00	17.00	6.60	2.30	0.50	0.50	393.00	69.50	21.80	7.10	1.10	-	0.50	436.00
Mar	-	-	-	-	-	-	-	83.00	13.60	2.50	-	0.60	0.30	359.00
Apr	69.90	21.70	6.00	1.20	-	1.20	83.00	72.60	24.80	2.50	-	-	-	157.00
May	73.20	15.80	6.50	2.50	0.20	1.80	557.00	69.80	21.60	7.20	0.60	0.30	0.60	695.00
Jun	75.40	21.00	2.50	0.70	-	0.40	715.00	58.30	28.70	9.00	2.50	0.80	0.80	520.00
Jul	73.40	20.30	4.00	1.10	0.30	0.80	621.00	66.60	26.00	6.50	0.70	-	0.10	722.00
Aug	72.90	21.70	5.10	0.20	-	0.20	628.00	68.40	23.70	6.60	0.50	-	0.90	651.00
Sep	71.30	20.60	5.80	1.20	0.80	0.30	656.00	64.40	30.40	4.30	0.30	-	0.60	652.00
Oct	78.20	17.00	4.00	0.30	0.20	0.30	578.00	57.50	33.90	4.80	2.30	0.20	1.30	560.00
Nov	77.50	17.00	3.90	0.60	-	1.00	675.00	67.30	29.40	1.50	1.20	-	0.70	608.00
Dec	73.20	20.20	3.90	1.50	0.20	1.00	609.00	65.40	24.00	5.90	1.20	0.60	2.90	683.00
Total	74.10%	19.29%	4.55%	1.05%	0.26%	0.75%	6,060.00	67.89%	24.90%	5.27%	0.93%	0.21%	0.83%	6,548.00
	<=10%			>10%				<=10%			>10%			
Percentage	93%			7%				93%			7%			

Table 11: Percentage of diffuse flesh discolouration in Hass by month during 2010 and 2011

Month	2010							2011						
	Diffuse Flesh Discolouration							Diffuse Flesh Discolouration						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	89.00	6.60	0.70	1.30	0.60	1.80	545.00	97.80	2.00	0.20	-	-	-	505.00
Feb	89.30	9.20	0.80	0.50	-	0.30	393.00	93.30	5.70	0.20	0.20	0.20	0.20	436.00
Mar	-	-	-	-	-	-	-	95.80	3.90	0.30	-	-	-	359.00
Apr	94.00	6.00	-	-	-	-	83.00	91.10	7.60	0.60	-	0.60	-	157.00
May	89.60	7.40	0.90	1.30	0.20	0.70	557.00	95.30	2.30	1.40	0.30	-	0.70	695.00
Jun	91.90	5.50	0.80	1.00	-	0.80	715.00	92.50	2.30	1.90	1.70	0.40	1.20	520.00
Jul	90.20	7.40	1.60	0.30	-	0.50	621.00	81.30	10.70	4.00	1.50	0.60	1.90	722.00
Aug	89.00	9.60	1.30	-	-	0.20	628.00	86.50	8.10	1.40	0.80	-	3.20	651.00
Sep	91.00	5.30	0.80	1.10	0.60	1.20	656.00	92.90	6.60	0.50	-	-	-	652.00
Oct	96.50	2.60	0.50	0.20	-	0.20	578.00	88.40	9.60	0.40	0.40	-	1.30	560.00
Nov	96.40	1.60	0.70	0.60	-	0.60	675.00	94.10	5.30	0.20	0.20	-	0.30	608.00
Dec	94.40	2.80	1.00	0.50	0.20	1.10	609.00	91.20	6.70	0.70	0.30	-	1.00	683.00
Total	91.91%	5.64%	0.90%	0.67%	0.16%	0.74%	6,060.00	91.28%	6.01%	1.11%	0.51%	0.13%	0.95%	6,548.00
	<=10%			>10%				<=10%			>10%			
Percentage	98%			2%				97%			3%			

Table 12: Percentage of other in Hass by month during 2010 and 2011

	2010							2011							
	Other Defects							Other Defects							
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq	
Jan	94.70	3.30	1.80	0.20	-	-	545.00	99.40	0.40	0.20	-	-	-	505.00	
Feb	97.50	0.50	2.00	-	-	-	393.00	95.40	4.60	-	-	-	-	436.00	
Mar	-	-	-	-	-	-	-	98.30	1.40	0.30	-	-	-	359.00	
Apr	100.00	-	-	-	-	-	83.00	96.80	1.90	1.30	-	-	-	157.00	
May	97.10	1.10	0.90	0.20	0.20	0.50	557.00	97.10	2.60	0.30	-	-	-	695.00	
Jun	99.70	0.30	-	-	-	-	715.00	97.50	1.50	0.60	0.20	0.20	-	520.00	
Jul	98.20	1.30	0.20	-	-	0.30	621.00	97.60	2.20	0.10	-	-	-	722.00	
Aug	98.90	1.10	-	-	-	-	628.00	98.00	1.70	0.30	-	-	-	651.00	
Sep	96.30	1.70	1.70	0.20	0.20	-	656.00	93.60	5.70	0.60	0.20	-	-	652.00	
Oct	99.00	1.00	-	-	-	-	578.00	97.90	1.40	0.70	-	-	-	560.00	
Nov	99.40	0.60	-	-	-	-	675.00	97.90	1.60	0.30	-	-	0.20	608.00	
Dec	98.20	1.30	0.30	-	0.20	-	609.00	99.00	0.70	0.10	-	0.10	-	683.00	
Total	98.02%	1.19%	0.61%	0.06%	0.06%	0.08%	6,060.00	97.39%	2.18%	0.34%	0.04%	0.03%	0.02%	6,548.00	
	<=10%		>10%						<=10%		>10%				
Percentage	99%		1%						100%		0%				

Table 13: Percentage of stem end rot in Hass by month during 2010 and 2011

	2010							2011						
	Stem End Rot							Stem End Rot						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	78.70	16.90	3.50	0.90	-	-	545.00	73.70	24.40	1.60	0.40	-	-	505.00
Feb	76.10	17.80	4.60	1.30	-	0.30	393.00	56.40	38.10	5.50	-	-	-	436.00
Mar	-	-	-	-	-	-	-	52.10	40.70	7.20	-	-	-	359.00
Apr	83.10	15.70	1.20	-	-	-	83.00	81.50	15.30	2.50	-	0.60	-	157.00
May	84.40	11.30	3.20	0.70	0.20	0.20	557.00	86.60	11.70	1.60	0.10	-	-	695.00
Jun	89.90	7.60	2.10	0.30	0.10	-	715.00	83.50	12.30	3.70	0.60	-	-	520.00
Jul	84.90	13.20	1.80	-	-	0.20	621.00	84.30	13.90	1.50	0.30	-	-	722.00
Aug	89.50	9.60	1.00	-	-	-	628.00	87.60	9.20	2.80	0.30	-	0.20	651.00
Sep	91.90	6.90	1.10	0.20	-	-	656.00	86.70	11.70	0.90	-	-	0.80	652.00
Oct	91.70	7.30	0.90	-	-	0.20	578.00	80.50	14.60	4.50	0.20	-	0.20	560.00
Nov	88.60	9.20	2.10	0.10	-	-	675.00	90.30	8.10	1.20	0.30	-	0.20	608.00
Dec	76.50	20.20	3.30	-	-	-	609.00	86.80	9.50	2.30	0.10	-	1.20	683.00
Total	85.74%	11.67%	2.23%	0.30%	0.03%	0.08%	6,060.00	81.03%	15.84%	2.68%	0.21%	0.01%	0.26%	6,548.00
	<=10%		>10%					<=10%		>10%				
Percentage	97%		3%					97%		3%				

Table 14: Percentage of vascular browning in Hass by month during 2010 and 2011

	2010							2011							
	Vascular Browning							Vascular Browning							
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq	
Jan	92.50	6.10	1.30	0.20	-	-	545.00	90.30	8.10	1.40	0.20	-	-	505.00	
Feb	77.40	18.30	2.80	1.00	-	0.50	393.00	78.90	15.40	2.50	1.60	1.10	0.50	436.00	
Mar	-	-	-	-	-	-	-	86.10	11.10	2.50	0.30	-	-	359.00	
Apr	98.80	1.20	-	-	-	-	83.00	89.80	9.60	-	0.60	-	-	157.00	
May	92.30	4.50	1.40	0.20	0.20	1.40	557.00	97.70	1.60	0.60	0.10	-	-	695.00	
Jun	97.10	2.10	0.80	-	-	-	715.00	93.30	4.60	1.50	0.20	0.40	-	520.00	
Jul	88.20	9.80	1.10	0.80	-	-	621.00	89.60	9.70	0.30	0.10	-	0.30	722.00	
Aug	94.70	4.80	0.50	-	-	-	628.00	90.20	7.80	1.10	0.50	0.20	0.30	651.00	
Sep	92.80	6.10	1.10	-	-	-	656.00	92.20	6.70	0.60	0.20	-	0.30	652.00	
Oct	92.60	5.20	1.20	0.70	-	0.30	578.00	85.00	10.50	2.70	1.10	-	0.70	560.00	
Nov	90.50	4.70	3.10	0.90	0.40	0.30	675.00	86.80	8.20	2.60	0.30	0.30	1.60	608.00	
Dec	89.80	6.10	1.60	0.50	0.20	1.80	609.00	92.20	3.80	1.20	0.60	0.60	1.60	683.00	
Total	91.47%	6.21%	1.43%	0.40%	0.08%	0.40%	6,060.00	89.84%	7.59%	1.39%	0.44%	0.22%	0.50%	6,548.00	
	<=10%		>10%						<=10%		>10%				
Percentage	98%		2%						97%		3%				

Table 15: Percentage of total damage in Hass by month during 2012 and 2013

Month	2012							2013						
	Total Damage							Total Damage						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	50.10	31.00	12.40	2.10	1.60	2.90	623.00	54.30	31.30	11.20	0.50	2.00	0.70	562.00
Feb	56.20	30.30	9.80	0.70	2.50	0.50	603.00	48.00	31.20	15.80	1.50	1.30	2.30	613.00
Mar	27.30	30.10	29.50	4.40	2.70	6.00	183.00	50.40	34.10	9.90	1.20	2.40	2.00	252.00
Apr	49.70	34.30	11.00	2.00	2.30	0.70	300.00	66.70	25.00	6.30	-	2.10	-	48.00
May	51.70	37.80	7.50	0.80	1.20	1.00	598.00	65.60	18.90	10.30	2.30	2.30	0.70	439.00
Jun	49.20	31.70	13.20	1.20	2.80	1.80	597.00	56.50	29.90	8.20	1.50	1.00	2.90	478.00
Jul	57.50	29.00	10.70	1.40	1.20	0.20	572.00	50.20	27.30	14.50	3.70	1.40	2.90	516.00
Aug	49.00	32.30	14.90	1.70	1.60	0.50	759.00	44.90	30.60	18.00	1.80	3.30	1.50	673.00
Sep	53.70	34.40	9.20	0.50	1.30	1.00	630.00	52.30	29.00	12.40	1.90	2.40	2.10	631.00
Oct	54.60	32.70	10.90	0.60	0.50	0.60	617.00	43.50	27.70	21.00	3.90	3.40	5.00	563.00
Nov	43.80	34.30	16.50	2.80	1.40	1.20	650.00	37.90	26.00	20.40	5.00	4.00	6.80	604.00
Dec	41.30	34.30	17.10	3.20	2.40	1.80	721.00	41.10	20.60	20.10	4.90	6.70	6.70	718.00
Total	49.78%	32.82%	12.80%	1.64%	1.71%	1.26%	6,853.00	48.82%	27.60%	15.30%	2.70%	2.90%	2.80%	6,097.00
<=10%								<=10%						
>10%								>10%						
Percentage	83%							76%						

Table 16: Percentage of body rots in Hass by month during 2012 and 2013

Month	2012							2013						
	Body Rots							Body Rots						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	84.30	7.90	5.00	1.00	0.20	1.80	623.00	93.10	5.30	0.70	0.20	0.20	0.50	562.00
Feb	88.90	7.00	3.00	1.00	0.20	-	603.00	83.20	10.90	4.60	0.20	0.50	0.70	613.00
Mar	65.00	19.10	7.10	2.20	1.10	5.50	183.00	96.40	1.20	2.00	0.40	-	-	252.00
Apr	88.00	8.00	3.30	-	0.30	0.30	300.00	91.70	8.30	-	-	-	-	48.00
May	92.10	6.50	1.00	0.20	-	0.20	598.00	95.00	3.60	1.40	-	-	-	439.00
Jun	86.30	9.00	4.00	0.20	0.30	0.20	597.00	88.70	6.50	2.30	1.50	0.20	0.80	478.00
Jul	94.60	5.20	0.20	-	-	-	572.00	84.90	8.70	3.70	2.50	-	0.20	516.00
Aug	93.00	6.30	0.50	0.10	-	-	759.00	77.70	13.10	6.50	1.20	0.60	0.90	673.00
Sep	93.20	4.10	1.40	0.20	0.20	1.00	630.00	85.40	7.40	5.20	1.40	0.20	0.30	631.00
Oct	92.70	6.00	0.80	0.30	-	0.20	617.00	78.30	10.10	8.50	2.10	0.40	0.50	563.00
Nov	84.60	8.30	4.60	1.20	0.30	0.90	650.00	80.10	11.60	6.00	1.20	0.70	0.50	604.00
Dec	86.00	8.30	3.10	1.90	0.10	0.60	721.00	73.10	12.00	10.60	1.80	1.10	1.40	718.00
Total	88.81%	7.25%	2.52%	0.64%	0.16%	0.62%	6,853.00	83.80%	8.90%	5.10%	1.20%	0.40%	0.60%	6,097.00
<=10%								<=10%						
>10%								>10%						
Percentage	96%							93%						

Table 17: Percentage of bruising in Hass by month during 2012 and 2013

Month	2012							2013						
	Bruising							Bruising						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	61.50	28.90	7.40	1.00	0.30	1.00	623.00	65.10	30.80	2.50	0.90	0.40	0.40	562.00
Feb	68.80	27.20	2.70	0.70	0.30	0.30	603.00	65.40	29.00	4.60	0.70	0.20	0.20	613.00
Mar	51.90	42.10	3.80	0.50	0.00	1.60	183.00	69.00	27.80	2.40	-	0.40	0.40	252.00
Apr	61.70	27.70	9.00	1.30	0.00	0.30	300.00	81.30	18.80	-	-	-	-	48.00
May	62.40	30.40	5.40	1.30	0.30	0.20	598.00	69.20	19.40	8.00	2.70	0.50	0.20	439.00
Jun	58.80	30.70	7.40	2.30	0.70	0.20	597.00	61.70	29.30	7.30	0.20	0.80	0.60	478.00
Jul	67.10	25.90	5.20	1.20	0.50	0.00	572.00	61.80	29.30	5.60	2.10	0.60	0.60	516.00
Aug	58.00	31.60	9.00	0.90	0.30	0.30	759.00	55.60	35.50	7.60	0.40	0.30	0.60	673.00
Sep	65.90	28.30	5.10	0.50	0.30	0.00	630.00	69.30	23.10	6.50	0.60	0.30	0.20	631.00
Oct	66.30	29.00	3.90	0.30	0.20	0.30	617.00	61.50	28.20	8.70	0.70	0.50	0.40	563.00
Nov	53.80	33.50	9.50	2.20	0.20	0.80	650.00	51.70	26.50	14.40	4.30	1.50	1.70	604.00
Dec	60.10	30.90	7.80	0.80	0.00	0.40	721.00	54.70	21.90	14.20	4.00	2.60	2.50	718.00
Total	61.78%	29.99%	6.49%	1.10%	0.28%	0.39%	6,853.00	61.70%	27.30%	7.80%	1.60%	0.80%	0.80%	6,097.00
<=10%								<=10%						
>10%								>10%						
Percentage	92%							89%						

Table 18: Percentage of diffuse flesh discolouration in Hass by month during 2012 and 2013

Month	2012							2013						
	Diffuse Flesh Discolouration							Diffuse Flesh Discolouration						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	92.10	7.20	-	0.30	-	0.30	623.00	90.20	9.80	-	-	-	-	562.00
Feb	93.00	6.80	0.20	-	-	-	603.00	90.40	9.30	0.30	-	-	-	613.00
Mar	82.50	16.40	1.10	-	-	-	183.00	92.50	4.80	-	1.20	0.40	1.20	252.00
Apr	93.30	6.70	-	-	-	-	300.00	97.90	2.10	-	-	-	-	48.00
May	92.10	6.50	0.70	0.20	-	0.50	598.00	96.10	3.40	0.50	-	-	-	439.00
Jun	92.10	7.00	0.70	0.20	-	-	597.00	95.00	4.60	0.20	-	-	0.20	478.00
Jul	90.00	9.80	0.20	-	-	-	572.00	87.80	7.40	2.10	1.20	0.20	1.40	516.00
Aug	90.90	8.30	0.70	-	-	0.10	759.00	88.40	11.00	0.40	0.10	-	-	673.00
Sep	90.50	8.90	0.30	0.20	-	0.20	630.00	91.10	7.80	1.00	-	-	0.20	631.00
Oct	90.10	9.60	0.20	-	-	0.20	617.00	91.80	7.80	0.20	-	-	0.20	563.00
Nov	89.50	8.50	0.90	0.30	-	0.80	650.00	95.90	2.00	1.70	0.30	-	0.20	604.00
Dec	89.70	8.00	0.70	1.00	0.30	0.30	721.00	95.40	2.40	1.80	0.30	-	0.10	718.00
Total	90.84%	8.23%	0.47%	0.21%	0.00	0.23%	6,853.00	92.20%	6.50%	0.80%	0.20%	0.04%	0.20%	6,097.00
<=10%								<=10%						
>10%								>10%						
Percentage	99%							99%						

	2012							2013						
	Other Defects							Other Defects						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	99.40	0.60	-	-	-	-	623.00	99.50	0.40	-	-	-	0.20	562.00
Feb	98.70	1.20	0.20	-	-	-	603.00	99.30	0.70	-	-	-	-	613.00
Mar	97.30	2.70	-	-	-	-	183.00	99.60	0.40	-	-	-	-	252.00
Apr	100.00	-	-	-	-	-	300.00	95.80	-	4.20	-	-	-	48.00
May	98.50	1.20	0.20	-	-	0.20	598.00	99.50	0.50	-	-	-	-	439.00
Jun	96.80	2.30	0.80	-	-	-	597.00	97.70	1.70	0.20	0.20	-	0.20	478.00
Jul	98.30	1.70	-	-	-	-	572.00	96.10	2.50	1.20	0.20	-	-	516.00
Aug	95.90	3.60	0.40	0.10	-	-	759.00	96.70	3.30	-	-	-	-	673.00
Sep	100.00	-	-	-	-	-	630.00	97.60	1.70	0.60	-	-	-	631.00
Oct	99.70	0.30	-	-	-	-	617.00	96.10	3.20	0.70	-	-	-	563.00
Nov	99.20	0.60	0.20	-	-	-	650.00	99.30	0.70	-	-	-	-	604.00
Dec	99.00	0.70	0.10	-	-	0.10	721.00	99.00	1.00	-	-	-	-	718.00
Total	98.55%	1.24%	0.18%	0.00	-	0.03%	6,853.00	98.10%	1.50%	0.30%	0.01%	0.00%	0.00%	6,097.00
	<=10%		>10%					<=10%		>10%				
Percentage	100%		0%					100%		0%				

	2012							2013						
	Stem End Rot							Stem End Rot						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	82.70	13.30	3.50	0.30	-	0.20	623.00	87.20	10.70	2.10	-	-	-	562.00
Feb	86.60	12.60	0.80	-	-	-	603.00	85.00	13.40	1.60	-	-	-	613.00
Mar	66.10	26.20	4.90	1.10	1.10	0.50	183.00	78.20	20.20	1.60	-	-	-	252.00
Apr	88.30	10.70	1.00	-	-	-	300.00	83.30	14.60	2.10	-	-	-	48.00
May	87.00	11.70	1.30	-	-	-	598.00	95.90	3.90	0.20	-	-	-	439.00
Jun	84.10	14.40	1.50	-	-	-	597.00	89.30	7.70	1.90	0.40	0.40	0.20	478.00
Jul	95.60	4.40	-	-	-	-	572.00	90.70	7.40	1.70	0.20	-	-	516.00
Aug	89.10	10.00	0.90	-	-	-	759.00	93.60	5.90	0.40	-	-	-	673.00
Sep	92.70	6.80	0.50	-	-	-	630.00	89.90	9.00	1.10	-	-	-	631.00
Oct	89.80	9.40	0.50	0.30	-	-	617.00	90.90	7.80	1.10	-	0.20	-	563.00
Nov	80.80	13.40	4.60	0.90	0.20	0.20	650.00	73.20	19.40	6.10	0.80	-	0.50	604.00
Dec	85.90	11.00	2.90	0.10	0.10	-	721.00	79.70	14.90	4.50	0.60	0.30	0.10	718.00
Total	86.84%	11.14%	1.74%	0.18%	0.06%	0.05%	6,853.00	86.70%	10.80%	2.10%	0.20%	0.10%	0.10%	6,097.00
	<=10%		>10%					<=10%		>10%				
Percentage	98%		2%					98%		3%				

	2012							2013						
	Vascular Browning							Vascular Browning						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	86.40	9.10	2.90	0.80	-	0.80	623.00	89.70	9.60	0.50	0.20	-	-	562.00
Feb	90.70	7.10	1.80	0.30	-	-	603.00	85.60	11.30	1.80	0.80	0.50	-	613.00
Mar	74.30	22.40	2.20	0.50	-	0.50	183.00	91.30	7.90	0.80	-	-	-	252.00
Apr	93.70	6.30	-	-	-	-	300.00	91.70	8.30	-	-	-	-	48.00
May	92.10	6.90	0.70	0.30	-	-	598.00	94.50	4.80	0.70	-	-	-	439.00
Jun	95.50	4.50	-	-	-	-	597.00	91.00	5.20	2.30	0.40	0.20	0.80	478.00
Jul	93.00	6.80	0.20	-	-	-	572.00	91.30	7.80	0.40	0.60	-	-	516.00
Aug	90.50	8.60	0.40	0.40	-	0.10	759.00	90.90	8.30	0.60	0.10	-	-	673.00
Sep	88.60	9.50	1.10	0.20	-	0.60	630.00	86.40	11.70	1.70	0.20	-	-	631.00
Oct	88.80	10.20	0.60	0.20	-	0.20	617.00	88.10	9.90	1.80	0.20	-	-	563.00
Nov	88.20	9.50	1.20	0.30	0.20	0.60	650.00	76.20	15.40	5.60	0.80	0.80	1.20	604.00
Dec	80.00	12.90	4.40	1.20	0.60	0.80	721.00	80.10	13.60	4.90	0.40	-	1.00	718.00
Total	88.99%	8.89%	1.33%	0.37%	0.00	0.31%	6,853.00	87.10%	10.00%	2.10%	0.40%	0.10%	0.30%	6,097.00
	<=10%		>10%					<=10%		>10%				
Percentage	98%		2%					97%		3%				

Table 22: Percentage of total damage in Hass by month during 2014 and 2015

Month	2014							2015						
	Total Damage							Total Damage						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	63.55	18.38	9.66	2.49	2.80	3.12	321.00	61.40	21.90	10.50	1.90	2.20	2.20	324.00
Feb	52.29	18.57	18.29	2.57	3.43	4.86	350.00	55.60	26.60	10.00	2.60	3.10	2.10	421.00
Mar	41.95	28.16	20.11	2.87	3.45	3.45	174.00	49.70	35.00	11.90	1.40	2.10	-	143.00
Apr	42.31	34.62	19.23	3.85	-	-	26.00	76.50	14.70	2.90	2.90	2.90	-	34.00
May	57.36	21.43	16.23	2.60	1.52	0.87	462.00	42.80	31.50	17.10	3.60	4.10	1.00	416.00
Jun	64.06	21.61	9.64	2.34	1.56	0.78	384.00	45.60	31.20	13.30	2.80	2.80	4.40	430.00
Jul	58.48	21.83	12.97	1.95	3.90	1.17	513.00	51.30	29.30	9.40	3.10	2.90	4.10	417.00
Aug	56.76	24.08	12.29	1.72	2.46	2.70	407.00	49.30	28.10	10.30	3.40	5.20	3.70	406.00
Sep	57.46	13.97	19.68	2.54	3.81	2.54	315.00	51.40	25.70	11.80	3.20	2.50	5.50	440.00
Oct	58.84	15.36	17.68	1.74	5.22	1.16	345.00	42.80	35.30	12.20	2.80	3.80	3.10	320.00
Nov	46.77	23.00	18.35	3.62	6.20	2.07	387.00	44.80	37.10	12.60	2.90	1.70	1.00	420.00
Dec	56.63	20.79	13.98	1.79	3.94	2.87	279.00	49.10	36.80	8.30	2.40	1.30	2.10	375.00
Total	56.42%	20.64%	15.01%	2.37%	3.41%	2.14%	3,963.00	51.69%	29.43%	10.86%	2.75%	2.88%	2.43%	4,146.00
	<=10%			>10%				<=10%			>10%			
Percentage	77%			23%				81%			19%			

Table 23: Percentage of body rots in Hass by month during 2014 and 2015

Month	2014							2015						
	Body Rots							Body Rots						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	82.13	9.57	5.74	0.85	0.64	1.06	470.00	84.60	8.60	5.20	0.60	0.90	-	324.00
Feb	78.57	10.29	7.43	0.86	0.57	2.29	350.00	80.30	15.40	2.10	0.50	1.40	0.20	421.00
Mar	89.66	8.62	0.57	-	1.15	-	174.00	90.20	8.40	0.70	0.70	-	-	143.00
Apr	84.62	11.54	3.85	-	-	-	26.00	97.10	-	-	2.90	-	-	34.00
May	85.06	9.52	4.98	0.43	-	-	462.00	86.80	8.40	3.60	1.20	-	-	416.00
Jun	84.90	9.38	4.43	1.04	0.26	-	384.00	84.00	11.40	2.60	0.70	1.40	-	430.00
Jul	86.16	7.60	4.48	0.58	1.17	-	513.00	87.80	6.20	3.80	1.00	1.00	0.20	417.00
Aug	88.21	7.62	3.19	0.98	-	-	407.00	88.40	6.20	3.70	1.00	0.70	-	406.00
Sep	79.37	12.06	6.03	1.59	0.95	-	315.00	90.50	4.50	4.10	0.50	0.50	-	440.00
Oct	83.19	13.04	3.48	-	0.29	-	345.00	89.40	7.20	3.10	0.30	-	-	320.00
Nov	78.55	12.14	6.72	0.78	1.81	-	387.00	83.30	13.30	2.90	0.20	-	0.20	420.00
Dec	90.32	6.09	3.23	0.36	-	-	279.00	90.90	5.90	2.70	0.30	0.30	-	375.00
Total	83.90%	9.77%	4.74%	0.73%	0.61%	0.25%	4,112.00	87.78%	7.96%	2.88%	0.83%	0.52%	0.05%	4,146.00
	<=10%			>10%				<=10%			>10%			
Percentage	94%			6%				96%			4%			

Table 24: Percentage of bruising in Hass by month during 2014 and 2015

Month	2014							2015						
	Bruising							Bruising						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	81.93	10.90	3.43	1.87	-	1.87	321.00	79.30	18.20	2.20	-	0.30	-	324.00
Feb	68.86	18.86	8.57	1.14	0.86	1.71	350.00	74.30	19.50	4.30	1.40	0.50	-	421.00
Mar	64.37	28.74	6.90	-	-	-	174.00	80.40	18.90	0.70	-	-	-	143.00
Apr	84.62	15.38	-	-	-	-	26.00	79.40	20.60	-	-	-	-	34.00
May	63.42	23.59	11.26	1.08	0.22	0.43	462.00	48.60	37.00	11.80	1.40	1.20	-	416.00
Jun	76.30	19.53	3.91	0.26	-	-	384.00	67.20	24.40	7.40	-	0.90	-	430.00
Jul	68.62	21.05	8.97	1.17	0.19	-	513.00	58.50	30.70	9.40	0.70	0.70	-	417.00
Aug	65.36	22.36	9.83	1.23	0.98	0.25	407.00	57.90	29.10	10.60	1.50	0.70	0.20	406.00
Sep	66.35	16.19	14.60	1.27	1.59	-	315.00	64.50	26.40	7.50	0.50	1.10	-	440.00
Oct	68.12	15.94	13.91	0.58	1.45	-	345.00	52.20	30.00	11.30	2.50	2.50	1.60	320.00
Nov	67.18	24.55	8.01	-	0.26	-	387.00	54.80	37.10	7.40	0.20	0.20	0.20	420.00
Dec	64.87	23.66	10.04	1.08	-	0.36	279.00	55.70	36.50	6.90	0.50	0.30	-	375.00
Total	68.81%	20.31%	9.06%	0.91%	0.50%	0.40%	3,963.00	64.40%	27.37%	6.63%	0.73%	0.70%	0.17%	4,146.00
	<=10%			>10%				<=10%			>10%			
Percentage	89%			11%				92%			8%			

Table 25: Percentage of diffuse flesh discolouration in Hass by month during 2014 and 2015

Month	2014							2015						
	Diffuse Flesh Discolouration							Diffuse Flesh Discolouration						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	95.33	0.62	1.25	0.93	-	1.87	321.00	99.10	0.60	0.30	-	-	-	324.00
Feb	98.00	0.57	1.14	-	-	0.29	350.00	99.00	0.70	-	-	0.20	-	421.00
Mar	94.25	4.60	1.15	-	-	-	174.00	91.60	7.00	1.40	-	-	-	143.00
Apr	96.15	3.85	-	-	-	-	26.00	97.10	-	2.90	-	-	-	34.00
May	98.05	0.22	0.87	-	0.22	0.65	462.00	97.40	0.50	1.90	0.20	-	-	416.00
Jun	97.14	2.34	0.52	-	-	-	384.00	93.50	2.60	2.60	-	1.40	-	430.00
Jul	97.66	1.56	0.78	-	-	-	513.00	95.20	1.40	1.90	1.20	0.20	-	417.00
Aug	94.35	3.69	0.49	0.49	0.98	-	407.00	96.80	2.00	0.70	0.20	-	0.20	406.00
Sep	98.10	1.59	0.32	-	-	-	315.00	93.00	1.60	2.50	0.90	1.10	0.90	440.00
Oct	100.00	-	-	-	-	-	345.00	98.10	1.30	0.30	0.30	-	-	320.00
Nov	99.74	0.26	-	-	-	-	387.00	98.60	1.00	0.20	-	0.20	-	420.00
Dec	100.00	-	-	-	-	-	279.00	99.20	0.50	0.30	-	-	-	375.00
Total	97.60%	1.31%	0.58%	0.13%	0.13%	0.25%	3,963.00	96.55%	1.60%	1.25%	0.23%	0.26%	0.09%	4,146.00
	<=10%			>10%				<=10%			>10%			
Percentage	99%			1%				98%			2%			

Table 26: Percentage of other in Hass by month during 2014 and 2015

Table 26: Percentage of Other in Pass by month during 2014 and 2015														
	2014							2015						
	Other Defects							Other Defects						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	96.88	2.49	0.62	-	-	-	321.00	97.20	2.20	0.30	0.30	-	-	324.00
Feb	91.14	6.00	2.86	-	-	-	350.00	97.90	1.70	0.20	-	-	0.20	421.00
Mar	93.68	1.15	0.57	-	1.15	3.45	174.00	95.80	4.20	-	-	-	-	142.00
Apr	100.00	-	-	-	-	-	26.00	94.10	2.90	2.90	-	-	-	34.00
May	98.05	1.73	0.22	-	-	-	462.00	97.80	1.70	0.20	0.20	-	-	416.00
Jun	97.40	1.82	0.78	-	-	-	384.00	91.40	8.40	0.20	-	-	-	430.00
Jul	98.44	1.36	-	-	-	0.19	513.00	98.30	1.40	-	0.20	-	-	417.00
Aug	99.26	0.74	-	-	-	-	407.00	98.50	0.70	0.70	-	-	-	406.00
Sep	98.73	0.95	0.32	-	-	-	315.00	96.80	3.20	-	-	-	-	440.00
Oct	96.23	1.45	0.58	-	1.16	0.58	345.00	99.40	0.60	-	-	-	-	320.00
Nov	98.45	1.55	-	-	-	-	387.00	98.80	1.20	-	-	-	-	420.00
Dec	97.85	1.08	0.72	-	0.36	-	279.00	99.70	0.30	-	-	-	-	375.00
Total	97.20%	1.84%	0.56%	0.00%	0.18%	0.23%	3,963.00	97.14%	2.38%	0.38%	0.06%	0.00%	0.02%	4,145.00
	<=10%		>10%					<=10%		>10%				
Percentage	99%		1%					100%		0%				

Table 27: Percentage of stem end rot in Hass by month during 2014 and 2015

Table 27: Percentage of Stem End Rot in Mass by Month during 2014 and 2015														
	2014							2015						
	Stem End Rot							Stem End Rot						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	81.31	13.71	4.36	0.62	-	-	321.00	82.00	16.10	1.50	-	0.30	-	323.00
Feb	78.57	16.57	4.29	0.29	0.29	-	350.00	80.30	18.50	1.00	-	0.20	-	421.00
Mar	79.89	20.11	-	-	-	-	174.00	69.90	28.00	2.10	-	-	-	143.00
Apr	57.69	34.62	7.69	-	-	-	26.00	100.00	-	-	-	-	-	34.00
May	89.61	8.66	1.73	-	-	-	462.00	89.70	9.60	0.50	0.20	-	-	416.00
Jun	94.79	2.86	1.82	0.52	-	-	384.00	84.00	13.70	2.10	-	-	0.20	430.00
Jul	95.91	3.70	0.39	-	-	-	513.00	90.20	7.40	2.20	0.20	-	-	417.00
Aug	96.31	3.69	-	-	-	-	407.00	88.90	9.60	1.20	-	0.20	-	406.00
Sep	92.38	6.35	0.63	0.63	-	-	315.00	90.20	9.80	-	-	-	-	440.00
Oct	92.46	7.25	0.29	-	-	-	345.00	90.90	8.80	0.30	-	-	-	320.00
Nov	78.55	19.38	1.55	-	0.52	-	387.00	89.00	9.30	1.40	-	-	0.20	420.00
Dec	87.46	9.68	2.87	-	-	-	279.00	93.30	5.30	1.10	0.30	-	-	375.00
Total	88.57%	9.54%	1.64%	0.18%	0.08%	0.00%	3,963.00	87.37%	11.34%	1.12%	0.06%	0.06%	0.03%	4,145.00
	<=10%		>10%					<=10%		>10%				
Percentage	98%		2%					99%		1%				

Table 28: Percentage of vascular browning in Hass by month during 2014 and 2015

		2014							2015							
		Vascular Browning							Vascular Browning							
		0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	%	Freq	
Jan	86.60	10.28	0.93	0.62	0.31	1.25	321.00	94.10	4.00	0.90	0.60	0.30	-	-	324.00	
Feb	88.57	8.29	2.57	0.29	-	0.29	350.00	92.20	7.10	0.70	-	-	-	-	421.00	
Mar	85.63	12.07	1.72	-	-	0.57	174.00	90.90	7.70	1.40	-	-	-	-	142.00	
Apr	57.69	38.46	3.85	-	-	-	26.00	100.00	-	-	-	-	-	-	34.00	
May	96.75	2.81	0.43	-	-	-	462.00	97.40	2.20	0.20	-	-	-	0.20	416.00	
Jun	97.40	2.34	0.26	-	-	-	384.00	96.50	2.30	0.50	-	0.70	-	-	430.00	
Jul	93.57	3.90	2.34	0.19	-	-	513.00	97.40	1.70	0.70	0.20	-	-	-	417.00	
Aug	90.42	6.39	2.70	0.25	0.25	-	407.00	92.90	4.20	1.00	1.70	-	-	0.20	406.00	
Sep	95.24	3.49	0.95	0.32	-	-	315.00	88.90	7.70	2.00	0.70	0.70	-	-	440.00	
Oct	94.20	5.22	0.58	-	-	-	345.00	90.30	8.40	0.90	-	-	-	0.30	320.00	
Nov	80.62	13.18	5.17	0.78	0.26	-	387.00	92.10	5.20	2.10	-	0.20	0.20	0.20	420.00	
Dec	88.89	7.89	1.08	1.08	0.72	0.36	279.00	88.80	6.70	2.10	1.60	0.50	0.30	0.30	375.00	
Total	90.99%	6.64%	1.77%	0.30%	0.13%	0.18%	3,963.00	93.46%	4.77%	1.04%	0.40%	0.20%	0.10%	0.10%	4,145.00	
		<=10%		>10%					<=10%		>10%					
Percentage	98%		2%							98%		2%				

* - Denotes months when fruit wasn't available

Table 29: Percentage of total damage in Shepard by month during 2008 and 2009

Month	2008							2009						
	Total Damage							Total Damage						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	40.00	60.00	-	-	-	-	5.00	80.00	20.00	-	-	-	-	5.00
Feb	72.41	25.29	2.30	-	-	-	87.00	61.54	30.77	7.69	-	-	-	39.00
Mar	51.27	39.95	7.39	0.23	1.15	-	433.00	49.37	37.13	11.81	0.42	1.27	-	237.00
Apr	43.63	42.86	11.20	0.77	0.77	0.77	259.00	44.95	45.57	7.95	1.22	-	0.31	327.00
May	49.18	31.15	14.75	1.64	3.28	-	61.00	62.50	27.08	8.33	-	2.08	-	48.00
Jun	50.00	38.89	8.33	1.39	1.39	-	72.00	20.00	40.00	20.00	20.00	-	-	5.00
Jul	30.00	70.00	-	-	-	-	10.00	55.17	24.14	13.79	6.90	-	-	29.00
Aug	*	*	*	*	*	*	-	59.09	27.27	9.09	4.55	-	-	22.00
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	37.50	50.00	12.50	-	-	-	8.00	*	*	*	*	*	*	-
Nov	100.00	-	-	-	-	-	1.00	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	52.67%	39.79%	6.27%	0.45%	0.73%	0.09%	936.00	54.08%	31.49%	9.83%	4.14%	0.42%	0.04%	712.00
Percentage	<=10%		>10%					<=10%		>10%				
	92%		8%					86%		14%				

Table 30: Percentage of bruising in Shepard by month during 2008 and 2009

Month	2008							2009						
	Bruising							Bruising						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	40.00	60.00	-	-	-	-	5.00	80.00	20.00	-	-	-	-	5.00
Feb	83.91	13.79	2.30	-	-	-	87.00	69.23	25.64	5.13	-	-	-	39.00
Mar	66.90	29.17	3.70	-	-	0.23	432.00	70.26	26.72	3.02	-	-	-	232.00
Apr	59.30	32.95	6.59	1.16	-	-	258.00	68.83	28.40	2.78	-	-	-	324.00
May	57.38	36.07	6.56	-	-	-	61.00	75.00	25.00	-	-	-	-	48.00
Jun	56.34	38.03	5.63	-	-	-	71.00	100.00	-	-	-	-	-	5.00
Jul	55.56	44.44	-	-	-	-	9.00	79.31	20.69	-	-	-	-	29.00
Aug	*	*	*	*	*	*	-	81.82	18.18	-	-	-	-	22.00
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	57.14	42.86	-	-	-	-	7.00	*	*	*	*	*	*	-
Nov	100.00	-	-	-	-	-	1.00	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	64.06%	33.03%	2.75%	0.13%	0.00%	0.03%	931.00	78.06%	20.58%	1.37%	0.00%	0.00%	0.00%	704.00
Percentage	<=10%		>10%					<=10%		>10%				
	97%		3%					99%		1%				

Table 31: Percentage of body rots in Shepard by month during 2008 and 2009

Month	2008							2009						
	Body Rots							Body Rots						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	60.00	40.00	-	-	-	-	5.00	80.00	20.00	-	-	-	-	5.00
Feb	98.85	1.15	-	-	-	-	87.00	81.58	10.53	7.89	-	-	-	38.00
Mar	83.33	15.05	1.62	-	-	-	432.00	80.34	18.38	1.28	-	-	-	234.00
Apr	70.16	24.42	5.04	0.39	-	-	258.00	79.75	17.18	2.45	0.61	-	-	326.00
May	75.41	19.67	4.92	-	-	-	61.00	85.42	14.58	-	-	-	-	48.00
Jun	86.11	13.89	-	-	-	-	72.00	60.00	40.00	-	-	-	-	5.00
Jul	90.00	10.00	-	-	-	-	10.00	100.00	-	-	-	-	-	29.00
Aug	*	*	*	*	*	*	-	100.00	-	-	-	-	-	22.00
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	75.00	25.00	-	-	-	-	8.00	*	*	*	*	*	*	-
Nov	100.00	-	-	-	-	-	1.00	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	82.10%	16.58%	1.29%	0.04%	0.00%	0.00%	934.00	83.39%	15.08%	1.45%	0.08%	0.00%	0.00%	707.00
Percentage	<=10%		>10%					<=10%		>10%				
	99%		1%					98%		2%				

Table 32: Percentage of diffuse flesh discoloration in Shepard by month during 2008 and 2009

Month	2008							2009						
	Diffuse Flesh Discoloration							Diffuse Flesh Discoloration						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	5.00	100.00	-	-	-	-	-	5.00
Feb	97.70	2.30	-	-	-	-	87.00	100.00	-	-	-	-	-	39.00
Mar	95.61	3.70	0.69	-	-	-	433.00	93.64	6.36	-	-	-	-	236.00
Apr	95.37	4.25	0.39	-	-	-	259.00	96.49	2.56	0.64	0.32	-	-	313.00
May	95.08	1.64	3.28	-	-	-	61.00	100.00	-	-	-	-	-	48.00
Jun	100.00	-	-	-	-	-	71.00	100.00	-	-	-	-	-	5.00
Jul	60.00	40.00	-	-	-	-	10.00	89.66	6.90	3.45	-	-	-	29.00
Aug	*	*	*	*	*	*	-	100.00	-	-	-	-	-	22.00
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	100.00	-	-	-	-	-	8.00	*	*	*	*	*	*	-
Nov	100.00	-	-	-	-	-	1.00	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	93.75%	5.76%	0.48%	0.00%	0.00%	0.00%	935.00	97.47%	1.98%	0.51%	0.04%	0.00%	0.00%	697.00
Percentage	<=10%		>10%					<=10%		>10%				
	100%		0%					99%		1%				

Table 33: Percentage of other damage in Shepard by month during 2008 and 2009

Month	2008							2009						
	Other Defects							Other Defects						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	5.00	100.00	-	-	-	-	-	5.00
Feb	97.70	2.30	-	-	-	-	87.00	100.00	-	-	-	-	-	39.00
Mar	98.85	0.92	0.23	-	-	-	433.00	95.78	1.69	2.53	-	-	-	237.00
Apr	97.30	2.70	-	-	-	-	259.00	98.17	1.83	-	-	-	-	327.00
May	100.00	-	-	-	-	-	61.00	100.00	-	-	-	-	-	48.00
Jun	100.00	-	-	-	-	-	72.00	100.00	-	-	-	-	-	5.00
Jul	100.00	-	-	-	-	-	10.00	100.00	-	-	-	-	-	29.00
Aug	*	*	*	*	*	*	-	100.00	-	-	-	-	-	22.00
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	100.00	-	-	-	-	-	8.00	*	*	*	*	*	*	-
Nov	100.00	-	-	-	-	-	1.00	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	99%	1%	0%	0%	0%	0%	936.00	99%	0%	0%	0%	0%	0%	712.00
	<=10%		>10%					<=10%		>10%				
Percentage	100%		0%					100%		0%				

Table 34: Percentage of stem end rot in Shepard by month during 2008 and 2009

Month	2008							2009						
	Stem End Rot							Stem End Rot						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	60.00	40.00	-	-	-	-	5.00	80.00	20.00	-	-	-	-	5.00
Feb	89.66	10.34	-	-	-	-	87.00	82.05	15.38	2.56	-	-	-	39.00
Mar	88.22	11.32	0.46	-	-	-	433.00	76.69	21.61	1.69	-	-	-	236.00
Apr	82.63	17.37	-	-	-	-	259.00	85.93	13.76	0.31	-	-	-	327.00
May	73.77	24.59	1.64	-	-	-	61.00	79.17	16.67	4.17	-	-	-	48.00
Jun	87.50	12.50	-	-	-	-	72.00	60.00	-	20.00	20.00	-	-	5.00
Jul	90.00	10.00	-	-	-	-	10.00	75.86	13.79	6.90	3.45	-	-	29.00
Aug	*	*	*	*	*	*	-	63.64	31.82	4.55	-	-	-	22.00
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	87.50	12.50	-	-	-	-	8.00	*	*	*	*	*	*	-
Nov	100.00	-	-	-	-	-	1.00	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	84.36%	15.40%	0.23%	0.00%	0.00%	0.00%	936.00	75.42%	16.63%	5.02%	2.93%	0.00%	0.00%	711.00
	<=10%		>10%					<=10%		>10%				
Percentage	100%		0%					92%		8%				

Table 35: Percentage of vascular browning in Shepard by month during 2008 and 2009

Month	2008							2009						
	Vascular Browning							Vascular Browning						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	5.00	100.00	-	-	-	-	-	5.00
Feb	100.00	-	-	-	-	-	87.00	100.00	-	-	-	-	-	39.00
Mar	95.36	3.71	0.93	-	-	-	431.00	97.05	2.95	-	-	-	-	237.00
Apr	91.05	6.23	1.95	0.78	-	-	257.00	98.47	0.92	0.61	-	-	-	327.00
May	95.08	4.92	-	-	-	-	61.00	100.00	-	-	-	-	-	48.00
Jun	98.61	1.39	-	-	-	-	72.00	100.00	-	-	-	-	-	5.00
Jul	100.00	-	-	-	-	-	10.00	96.55	3.45	-	-	-	-	29.00
Aug	*	*	*	*	*	*	-	100.00	-	-	-	-	-	22.00
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	100.00	-	-	-	-	-	8.00	*	*	*	*	*	*	-
Nov	100.00	-	-	-	-	-	1.00	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	97.79%	1.80%	0.32%	0.09%	0.00%	0.00%	932.00	99.01%	0.91%	0.08%	0.00%	0.00%	0.00%	712.00
	<=10%		>10%					<=10%		>10%				
Percentage	100%		0%					100%		0%				

Table 36: Percentage of total damage in Shepard by month during 2010 and 2011.

Month	2010							2011						
	Total Damage							Total Damage						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	20.00	30.00	40.00	-	10.00	-	10.00	73.33	26.67	-	-	-	-	15.00
Feb	64.17	28.33	4.17	0.83	0.83	1.67	120.00	45.16	45.81	9.03	-	-	-	155.00
Mar	63.25	27.25	8.75	0.25	0.50	-	400.00	48.94	42.20	8.16	0.71	-	-	282.00
Apr	60.60	31.80	6.54	0.35	0.71	-	566.00	46.98	48.57	4.44	-	-	-	315.00
May	60.65	32.90	6.45	-	-	-	155.00	58.82	41.18	-	-	-	-	51.00
Jun	45.45	40.91	13.64	-	-	-	22.00	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	76.92	23.08	-	-	-	-	13.00	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	55.86%	30.61%	11.36%	0.21%	1.72%	0.24%	1,286.00	54.65%	40.88%	4.33%	0.14%	0.00%	0.00%	818.00
Percentage	<=10%		>10%				<=10%		>10%					
	86%		14%				96%		4%					

Table 37: Percentage of bruising in Shepard by month during 2010 and 2011

Month	2010							2011						
	Bruising							Bruising						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	50.00	40.00	10.00	-	-	-	10.00	86.67	13.33	-	-	-	-	15.00
Feb	77.50	17.50	2.50	0.83	0.83	0.83	120.00	60.65	34.19	5.16	-	-	-	155.00
Mar	82.00	16.50	1.50	-	-	-	400.00	75.80	19.22	3.91	1.07	-	-	281.00
Apr	72.08	24.73	2.65	0.53	-	-	566.00	70.16	27.94	1.90	-	-	-	315.00
May	81.29	17.42	1.29	-	-	-	155.00	100.00	-	-	-	-	-	51.00
Jun	72.73	22.73	4.55	-	-	-	22.00	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	100.00	-	-	-	-	-	13.00	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	76.51%	19.84%	3.21%	0.19%	0.12%	0.12%	1,286.00	78.65%	18.94%	2.20%	0.21%	0.00%	0.00%	817.00
Percentage	<=10%		>10%					<=10%		>10%				
	96%		4%					98%		2%				

Table 38: Percentage of body rots in Shepard by month during 2010 and 2011

Month	2010							2011						
	Body Rots							Body Rots						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	40.00	50.00	10.00	-	-	-	10.00	100.00	-	-	-	-	-	15.00
Feb	90.00	5.83	1.67	0.83	-	1.67	120.00	80.65	16.13	3.23	-	-	-	155.00
Mar	95.25	4.75	-	-	-	-	400.00	86.88	8.87	2.84	1.42	-	-	282.00
Apr	89.58	8.30	1.77	0.35	-	-	566.00	89.52	10.16	0.32	-	-	-	315.00
May	87.10	11.61	1.29	-	-	-	155.00	100.00	-	-	-	-	-	51.00
Jun	86.36	9.09	4.55	-	-	-	22.00	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	100.00	-	-	-	-	-	13.00	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	84.04%	12.80%	2.75%	0.17%	0.00%	0.24%	1,286.00	91.41%	7.03%	1.28%	0.28%	0.00%	0.00%	818.00
Percentage	<=10%		>10%				<=10%		>10%					
	97%		3%				98%		2%					

Table 39: Percentage of diffuse flesh discolouration in Shepard by month during 2010 and 2011

Month	2010							2011						
	Diffuse Flesh Discoloration							Diffuse Flesh Discoloration						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	10.00	86.67	13.33	-	-	-	-	15.00
Feb	90.00	9.17	-	-	-	0.83	120.00	94.84	3.23	0.65	1.29	-	-	155.00
Mar	89.75	9.75	0.50	-	-	-	400.00	98.22	1.42	0.36	-	-	-	281.00
Apr	94.17	5.48	0.18	0.18	-	-	566.00	98.10	1.27	0.63	-	-	-	315.00
May	98.06	1.94	-	-	-	-	155.00	100.00	-	-	-	-	-	51.00
Jun	90.91	9.09	-	-	-	-	22.00	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	100.00	-	-	-	-	-	13.00	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	94.70%	5.06%	0.10%	0.03%	0.00%	0.12%	1,286.00	95.56%	3.85%	0.33%	0.26%	0.00%	0.00%	817.00
Percentage	<=10%		>10%				<=10%		>10%					
	100%		0%				99%		1%					

Table 40: Percentage of other damage in Shepard by month during 2010 and 2011

Month	2010							2011						
	Other Defects							Other Defects						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	10.00	100.00	-	-	-	-	-	15.00
Feb	100.00	-	-	-	-	-	120.00	95.48	4.52	-	-	-	-	155.00
Mar	99.50	0.25	0.25	-	-	-	400.00	97.16	2.84	-	-	-	-	282.00
Apr	99.29	0.35	0.18	0.18	-	-	566.00	98.41	1.59	-	-	-	-	315.00
May	100.00	-	-	-	-	-	155.00	100.00	-	-	-	-	-	51.00
Jun	100.00	-	-	-	-	-	22.00	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	100.00	-	-	-	-	-	13.00	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	99.83%	0.09%	0.06%	0.03%	0.00%	0.00%	1,286.00	98.21%	1.79%	0.00%	0.00%	0.00%	0.00%	818.00
Percentage	<=10%		>10%					<=10%		>10%				
	100%		0%					100%		0%				

Table 41: Percentage of stem end rot in Shepard by month during 2010 and 2011

Month	2010							2011						
	Stem End Rot							Stem End Rot						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	60.00	30.00	10.00	-	-	-	10.00	93.33	6.67	-	-	-	-	15.00
Feb	84.17	14.17	0.83	0.83	-	-	120.00	82.58	15.48	1.94	-	-	-	155.00
Mar	83.00	16.25	0.75	-	-	-	400.00	88.65	8.87	2.48	-	-	-	282.00
Apr	80.39	18.55	1.06	-	-	-	566.00	91.43	8.25	0.32	-	-	-	315.00
May	90.97	9.03	-	-	-	-	155.00	100.00	-	-	-	-	-	51.00
Jun	81.82	18.18	-	-	-	-	22.00	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	100.00	-	-	-	-	-	13.00	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	82.91%	15.17%	1.81%	0.12%	0.00%	0.00%	1,286.00	91.20%	7.85%	0.95%	0.00%	0.00%	0.00%	818.00
	<=10%		>10%					<=10%		>10%				
Percentage	98%		2%					99%		1%				

Table 42: Percentage of vascular browning in Shepard by month during 2010 and 2011

Month	2010							2011						
	Vascular Browning							Vascular Browning						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	10.00	100.00	-	-	-	-	-	15.00
Feb	96.67	3.33	-	-	-	-	120.00	96.77	1.29	1.29	0.65	-	-	155.00
Mar	98.50	1.50	-	-	-	-	400.00	99.29	0.71	-	-	-	-	282.00
Apr	97.88	1.94	0.18	-	-	-	566.00	99.68	0.32	-	-	-	-	315.00
May	100.00	-	-	-	-	-	155.00	100.00	-	-	-	-	-	51.00
Jun	100.00	-	-	-	-	-	22.00	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	100.00	-	-	-	-	-	13.00	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	99.01%	0.97%	0.03%	0.00%	0.00%	0.00%	1,286.00	99.15%	0.46%	0.26%	0.13%	0.00%	0.00%	818.00
		<=10%		>10%				<=10%		>10%				
Percentage	100%		0%					100%		0%				

Table 43: Percentage of total damage in Shepard by month during 2012 and 2013.

Month	2012							2013						
	Total Damage							Total Damage						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Feb	73.71	22.07	4.23	-	-	-	95.00	70.80	18.80	4.20	2.10	2.10	2.10	48.00
Mar	64.31	28.84	4.99	0.43	1.06	0.43	479.00	59.50	28.70	11.10	0.70	-	-	296.00
Apr	59.81	35.31	3.63	1.22	-	-	249.00	60.60	29.50	8.30	0.70	0.40	0.50	566.00
May	40.40	48.08	7.71	3.86	-	-	52.00	69.50	20.30	4.70	-	-	5.50	128.00
Jun	50.00	42.90	7.10	-	-	-	14.00	69.20	23.10	7.70	-	-	-	13.00
Jul	*	*	*	*	*	*	-	55.60	44.40	-	-	-	-	9.00
Aug	*	*	*	*	*	*	-	33.30	53.30	13.30	-	-	-	15.00
Sep	*	*	*	*	*	*	-	78.60	21.40	-	-	-	-	14.00
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	57.64%	35.44%	5.53%	1.10%	0.21%	0.09%	889.00	61.70%	28.00%	8.40%	0.60%	0.30%	1.00%	1,089.00
Percentage	<=10%		>10%					<=10%		>10%				
	93%		7%					90%		10%				

Table 44: Percentage of bruising in Shepard by month during 2012 and 2013

Month	2012							2013						
	Bruising							Bruising						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Feb	87.35	12.65	-	-	-	-	95.00	85.40	10.40	4.20	-	-	-	48.00
Mar	77.24	20.48	2.29	-	-	-	479.00	73.30	26.70	-	-	-	-	296.00
Apr	77.90	20.89	0.40	0.81	-	-	249.00	70.10	26.30	2.70	0.50	-	0.40	566.00
May	65.39	32.69	1.92	-	-	-	52.00	85.90	10.90	3.10	-	-	-	128.00
Jun	50.00	50.00	-	-	-	-	14.00	76.90	23.10	-	-	-	-	13.00
Jul	*	*	*	*	*	*	-	66.70	33.30	-	-	-	-	9.00
Aug	*	*	*	*	*	*	-	40.00	60.00	-	-	-	-	15.00
Sep	*	*	*	*	*	*	-	85.70	14.30	-	-	-	-	14.00
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	71.58%	27.34%	0.92%	0.16%	0.00%	0.00%	889.00	73.40%	24.20%	1.90%	0.30%	0.00%	0.20%	1,089.00
Percentage	<=10%		>10%					<=10%		>10%				
	99%		1%					98%		2%				

Table 45: Percentage of body rots in Shepard by month during 2012 and 2013

Month	2012							2013						
	Body Rots							Body Rots						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Feb	97.91	1.04	1.04	-	-	-	95.00	95.80	4.20	-	-	-	-	48.00
Mar	94.37	5.41	0.21	-	-	-	479.00	96.30	3.70	-	-	-	-	296.00
Apr	95.59	2.81	0.80	0.81	-	-	249.00	95.60	4.40	-	-	-	-	566.00
May	92.30	5.76	1.94	-	-	-	52.00	99.20	0.80	-	-	-	-	128.00
Jun	100.00	-	-	-	-	-	14.00	100.00	-	-	-	-	-	13.00
Jul	*	*	*	*	*	*	-	100.00	-	-	-	-	-	9.00
Aug	*	*	*	*	*	*	-	93.30	6.70	-	-	-	-	15.00
Sep	*	*	*	*	*	*	-	100.00	-	-	-	-	-	14.00
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	96.03%	3.01%	0.80%	0.16%	0.00%	0.00%	889.00	96.30%	3.70%	0.00%	0.00%	0.00%	0.00%	1,089.00
Percentage	<=10%		>10%					<=10%		>10%				
	99%		1%					100%		0%				

Table 46: Percentage of diffuse flesh discolouration in Shepard by month during 2012 and 2013

Month	2012							2013						
	Diffuse Flesh Discoloration							Diffuse Flesh Discoloration						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Feb	94.76	5.24	-	-	-	-	95.00	89.60	6.30	-	2.10	-	2.10	48.00
Mar	92.91	4.58	1.87	-	0.21	-	479.00	87.50	12.20	0.30	-	-	-	296.00
Apr	90.37	9.63	-	-	-	0.51	249.00	92.40	7.20	0.40	-	-	-	566.00
May	86.54	13.46	-	-	-	-	52.00	91.40	3.10	-	-	0.80	4.70	128.00
Jun	85.70	14.30	-	-	-	-	14.00	84.60	15.40	-	-	-	-	13.00
Jul	*	*	*	*	*	*	-	88.90	11.10	-	-	-	-	9.00
Aug	*	*	*	*	*	*	-	66.70	33.30	-	-	-	-	15.00
Sep	*	*	*	*	*	*	-	85.70	14.30	-	-	-	-	14.00
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	90.06%	9.44%	0.37%	0.00%	0.04%	0.10%	889.00	90.30%	8.60%	0.30%	0.10%	0.10%	0.60%	1,089.00
Percentage	<=10%		>10%					<=10%		>10%				
	99%		1%					99%		1%				

Table 47: Percentage of other damage in Shepard by month during 2012 and 2013

Month	2012							2013						
	Other Defects							Other Defects						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Feb	100.00	-	-	-	-	-	95.00	97.90	2.10	-	-	-	-	48.00
Mar	98.32	1.68	-	-	-	-	479.00	99.30	0.70	-	-	-	-	296.00
Apr	98.40	1.20	0.39	-	-	-	249.00	96.10	3.90	-	-	-	-	566.00
May	96.16	3.84	-	-	-	-	52.00	100.00	-	-	-	-	-	128.00
Jun	100.00	-	-	-	-	-	14.00	100.00	-	-	-	-	-	13.00
Jul	*	*	*	*	*	*	-	100.00	-	-	-	-	-	9.00
Aug	*	*	*	*	*	*	-	100.00	-	-	-	-	-	15.00
Sep	*	*	*	*	*	*	-	100.00	-	-	-	-	-	14.00
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	98.58%	1.34%	0.08%	0.00%	0.00%	0.00%	889.00	97.70%	2.30%	0.00%	0.00%	0.00%	0.00%	1,089.00
	<=10%		>10%					<=10%		>10%				
Percentage	100%		0%					100%		0%				

Table 48: Percentage of stem end rot in Shepard by month during 2012 and 2013

Month	2012							2013						
	Stem End Rot							Stem End Rot						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Feb	87.37	9.47	3.17	-	-	-	95.00	87.50	10.40	2.10	-	-	-	48.00
Mar	85.79	13.56	0.62	-	-	-	479.00	82.10	16.60	1.40	-	-	-	296.00
Apr	83.51	16.49	-	-	-	-	249.00	86.60	13.40	-	-	-	-	566.00
May	78.84	19.23	-	1.94	-	-	52.00	86.70	13.30	-	-	-	-	128.00
Jun	100.00	-	-	-	-	-	14.00	84.60	15.40	-	-	-	-	13.00
Jul	*	*	*	*	*	*	-	100.00	-	-	-	-	-	9.00
Aug	*	*	*	*	*	*	-	100.00	-	-	-	-	-	15.00
Sep	*	*	*	*	*	*	-	100.00	-	-	-	-	-	14.00
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	87.10%	11.75%	0.76%	0.39%	0.00%	0.00%	889.00	85.90%	13.70%	0.50%	0.00%	0.00%	0.00%	1,089.00
	<=10%		>10%					<=10%		>10%				
Percentage	99%		1%					100%		1%				

Table 49: Percentage of vascular browning in Shepard by month during 2012 and 2013

Month	2012							2013						
	Vascular Browning							Vascular Browning						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Feb	97.88	2.12	-	-	-	-	95.00	100.00	-	-	-	-	-	48.00
Mar	97.28	2.30	-	-	0.20	0.20	479.00	90.50	9.50	-	-	-	-	296.00
Apr	97.99	2.01	-	-	-	-	249.00	95.40	4.60	-	-	-	-	566.00
May	92.32	5.78	-	1.94	-	-	52.00	96.90	3.10	-	-	-	-	128.00
Jun	85.70	14.30	-	-	-	-	14.00	100.00	-	-	-	-	-	13.00
Jul	*	*	*	*	*	*	-	77.80	22.20	-	-	-	-	9.00
Aug	*	*	*	*	*	*	-	73.30	26.70	-	-	-	-	15.00
Sep	*	*	*	*	*	*	-	100.00	-	-	-	-	-	14.00
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	94.23%	5.30%	0.00%	0.39%	0.04%	0.04%	889.00	94.10%	5.90%	0.00%	0.00%	0.00%	0.00%	1,089.00
	<=10%		>10%					<=10%		>10%				
Percentage	100%		0%					100%		0%				

Table 50: Percentage of total damage in Shepard by month during 2014 and 2015.

Month	2014							2015						
	Total Damage							Total Damage						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	2.00	*	*	*	*	*	*	-
Feb	79.41	17.65	-	2.94	-	-	34.00	*	*	*	*	*	*	-
Mar	81.71	11.43	2.29	1.71	1.71	1.14	175.00	58.40	24.20	12.80	0.70	3.40	0.70	149.00
Apr	73.43	18.81	6.27	0.60	0.90	-	335.00	62.40	21.60	8.20	1.60	3.10	3.10	255.00
May	66.13	19.35	9.68	3.23	1.61	-	62.00	65.80	12.50	9.20	5.00	3.30	4.20	120.00
Jun	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	75.49%	16.61%	5.10%	1.32%	1.15%	0.33%	608.00	62.20%	19.43%	10.07%	2.43%	3.27%	2.67%	524.00
Percentage	<=10%			>10%				<=10%			>10%			
	92%			8%				82%			18%			

Table 51: Percentage of bruising in Shepard by month during 2014 and 2015

Month	2014							2015						
	Bruising							Bruising						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	2.00	*	*	*	*	*	*	-
Feb	82.35	14.71	2.94	-	-	-	34.00	*	*	*	*	*	*	-
Mar	89.71	8.00	2.29	-	-	-	175.00	68.50	22.80	8.10	0.70	-	-	149.00
Apr	82.69	12.54	3.58	0.60	0.30	0.30	335.00	73.70	20.80	2.70	2.40	0.40	-	255.00
May	69.35	19.35	8.06	3.23	-	-	62.00	81.70	12.50	4.20	0.80	0.80	-	120.00
Jun	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	83.39%	12.01%	3.62%	0.66%	0.16%	0.16%	608.00	74.63%	18.70%	5.00%	1.30%	0.40%	0.00%	524.00
Percentage	<=10%			>10%				<=10%			>10%			
	95%			5%				93%			7%			

Table 52: Percentage of body rots in Shepard by month during 2014 and 2015

Month	2014							2015						
	Body Rots							Body Rots						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	2.00	*	*	*	*	*	*	-
Feb	94.12	2.94	-	2.94	-	-	34.00	*	*	*	*	*	*	-
Mar	93.14	6.29	0.57	-	-	-	175.00	94.00	5.40	0.70	-	-	-	149.00
Apr	95.52	4.48	-	-	-	-	335.00	95.30	4.30	0.40	-	-	-	255.00
May	93.55	6.45	-	-	-	-	62.00	89.20	8.30	1.70	0.80	-	-	120.00
Jun	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	94.57%	5.10%	0.16%	0.16%	0.00%	0.00%	608.00	92.83%	6.00%	0.93%	0.27%	0.00%	0.00%	524.00
Percentage	<=10%			>10%				<=10%			>10%			
	100%			0%				99%			1%			

Table 53: Percentage of diffuse flesh discoloration in Shepard by month during 2014 and 2015

Month	2014							2015						
	Diffuse Flesh Discoloration							Diffuse Flesh Discoloration						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	2.00	*	*	*	*	*	*	-
Feb	100.00	-	-	-	-	-	34.00	*	*	*	*	*	*	-
Mar	95.43	-	1.71	1.71	1.14	-	175.00	98.70	0.70	0.70	-	-	-	149.00
Apr	98.51	1.49	-	-	-	-	335.00	93.70	1.20	2.40	1.60	1.20	-	255.00
May	98.39	-	1.61	-	-	-	62.00	90.00	3.30	1.70	2.50	0.80	1.70	120.00
Jun	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	97.70%	0.82%	0.66%	0.49%	0.33%	0.00%	608.00	94.13%	1.73%	1.60%	1.37%	0.67%	0.57%	524.00
Percentage	<=10%			>10%				<=10%			>10%			
	99%			1%				96%			4%			

Table 54: Percentage of other damage in Shepard by month during 2014 and 2015

Month	2014							2015						
	Other Defects							Other Defects						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Jan	100.00	-	-	-	-	-	2.00	*	*	*	*	*	*	-
Feb	100.00	-	-	-	-	-	34.00	*	*	*	*	*	*	-
Mar	98.29	1.71	-	-	-	-	175.00	92.60	4.70	1.30	0.70	0.70	-	149.00
Apr	99.70	0.30	-	-	-	-	335.00	96.10	3.10	0.80	-	-	-	255.00
May	100.00	-	-	-	-	-	62.00	93.30	5.80	-	0.80	-	-	120.00
Jun	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	99.34%	0.66%	0.00%	0.00%	0.00%	0.00%	608.00	94.00%	4.53%	0.70%	0.50%	0.23%	0.00%	524.00
Percentage	<=10%		>10%					<=10%		>10%				
	100%		0%					99%		1%				

Table 55: Percentage of stem end rot in Shepard by month during 2014 and 2015

Month	2014							2015						
	Stem End Rot							Stem End Rot						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	2.00	*	*	*	*	*	*	-
Feb	91.18	8.82	-	-	-	-	34.00	*	*	*	*	*	*	-
Mar	96.57	3.43	-	-	-	-	175.00	93.30	5.40	1.30	-	-	-	149.00
Apr	91.34	8.36	0.30	-	-	-	335.00	94.90	4.70	0.40	-	-	-	255.00
May	100.00	-	-	-	-	-	62.00	89.20	9.20	1.70	-	-	-	120.00
Jun	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	93.75%	6.09%	0.16%	0.00%	0.00%	0.00%	608.00	92.47%	6.43%	1.13%	0.00%	0.00%	0.00%	524.00
	<=10%		>10%					<=10%		>10%				
Percentage	100%		0%					99%		1%				

Table 56: Percentage of vascular browning in Shepard by month during 2014 and 2015

Month	2014							2015						
	Vascular Browning							Vascular Browning						
	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL	0%	1-10%	11-25%	26-33%	34-50%	50%+	TOTAL
Month	%	%	%	%	%	%	Freq	%	%	%	%	%	%	Freq
Jan	100.00	-	-	-	-	-	2.00	*	*	*	*	*	*	-
Feb	100.00	-	-	-	-	-	34.00	*	*	*	*	*	*	-
Mar	98.86	1.14	-	-	-	-	175.00	98.00	0.70	-	-	1.30	-	149.00
Apr	99.70	0.30	-	-	-	-	335.00	94.90	2.00	1.60	0.40	-	1.20	255.00
May	100.00	-	-	-	-	-	62.00	93.30	2.50	1.70	-	1.70	0.80	120.00
Jun	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Jul	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Aug	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Sep	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Oct	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Nov	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Dec	*	*	*	*	*	*	-	*	*	*	*	*	*	-
Total	99.51%	0.49%	0.00%	0.00%	0.00%	0.00%	608.00	95.40%	1.73%	1.10%	0.13%	1.00%	0.67%	524.00
	<=10%		>10%					<=10%		>10%				
Percentage	100%		0%					97%		3%				

APPENDIX 6: INCIDENCE OF FRUIT DAMAGE BY VARIETY DETAILS

The following graphs are additional to those presented in Section 5.1.2 . They provide more detailed information on the retail performance of Hass and Shepard over the period 2008 -2105:

- Hass – Total Damage by Month - 2008 – 2015 (Figure 1)
- Hass – Total Damage by Year (by Month) – 2008 - 2015 (Figure 2)
- Shepard - Total Damage by Month - 2008 – 2015 (Figure 3)
- Shepard- Total Damage by Year (by Month) – 2008 - 2015 (Figure 4)

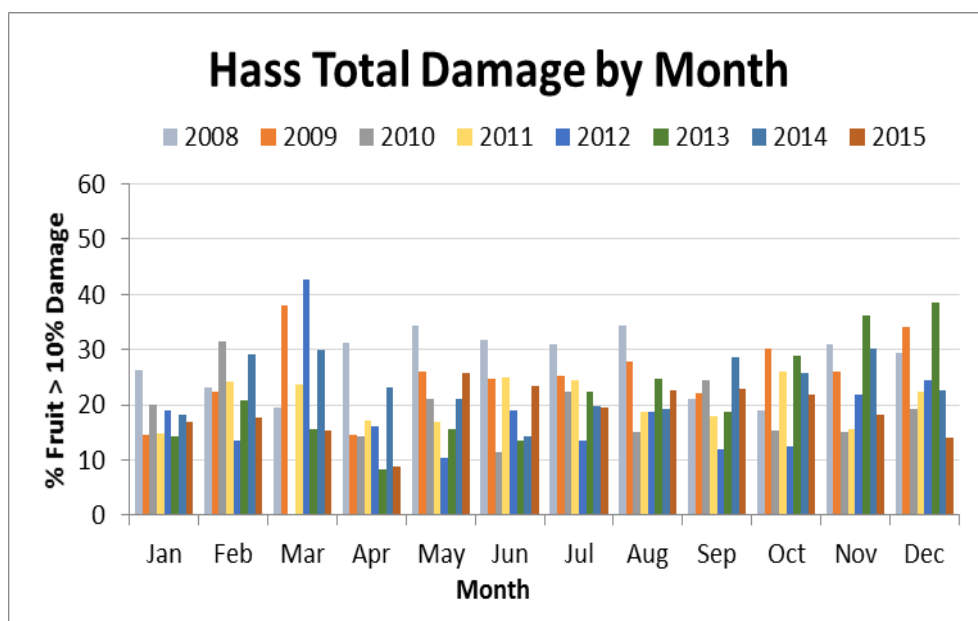


Figure 1: Hass Total Damage – by Month for Years 2008 – 2015

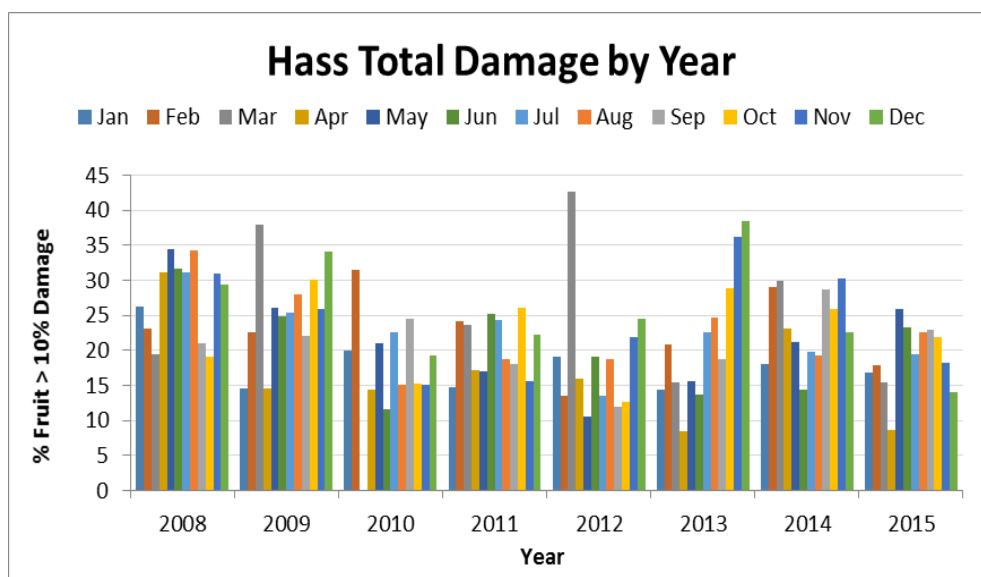


Figure 2: Hass Total Damage – by Year (by Month) - January 2008 – December 2015

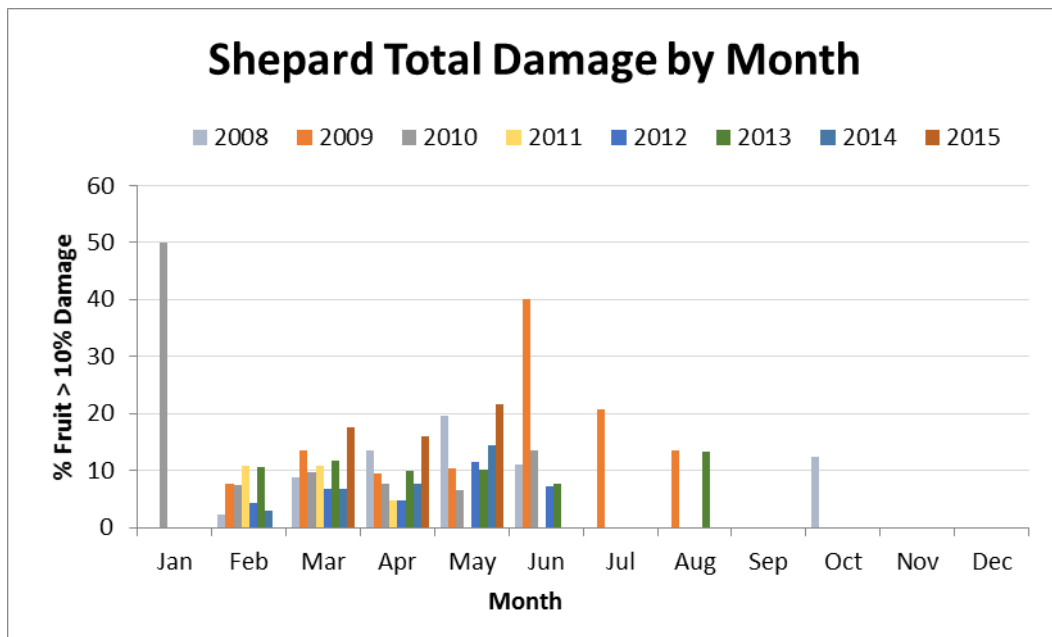


Figure 3: Shepard Total Damage – by Month for Years 2008 – 2015
 (note: Total damage recorded in January 2010 is based on a very small sample size)

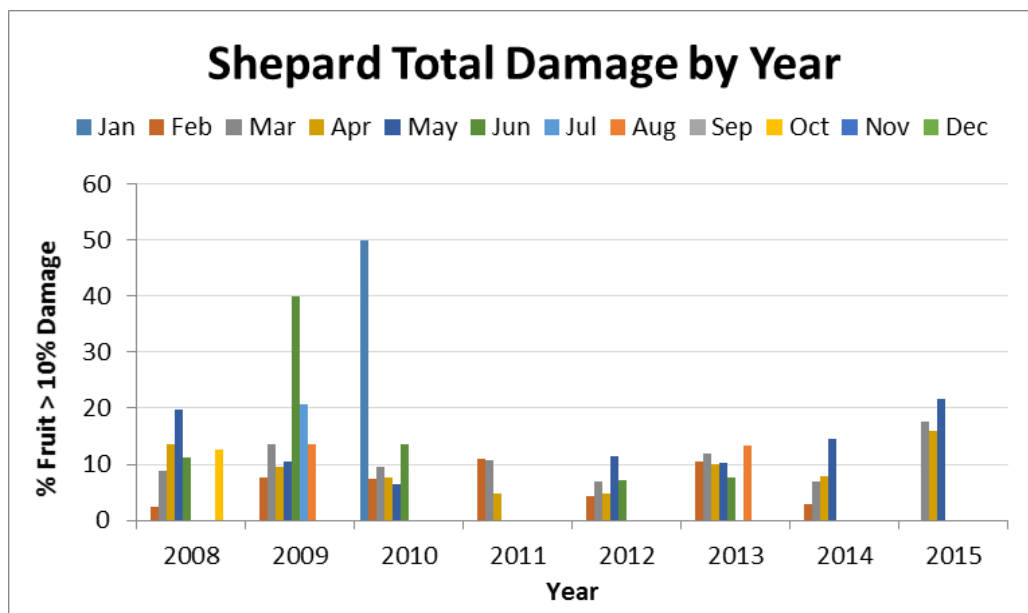


Figure 4: Shepard Total Damage – by Year (by Month) - January 2008 – December 2015
 (note: Total damage recorded in June 2009 & January 2010 is based on a very small sample size)

APPENDIX 7: DRY MATTER CONTENT REPORT

Avocado Dry Matter Content Report

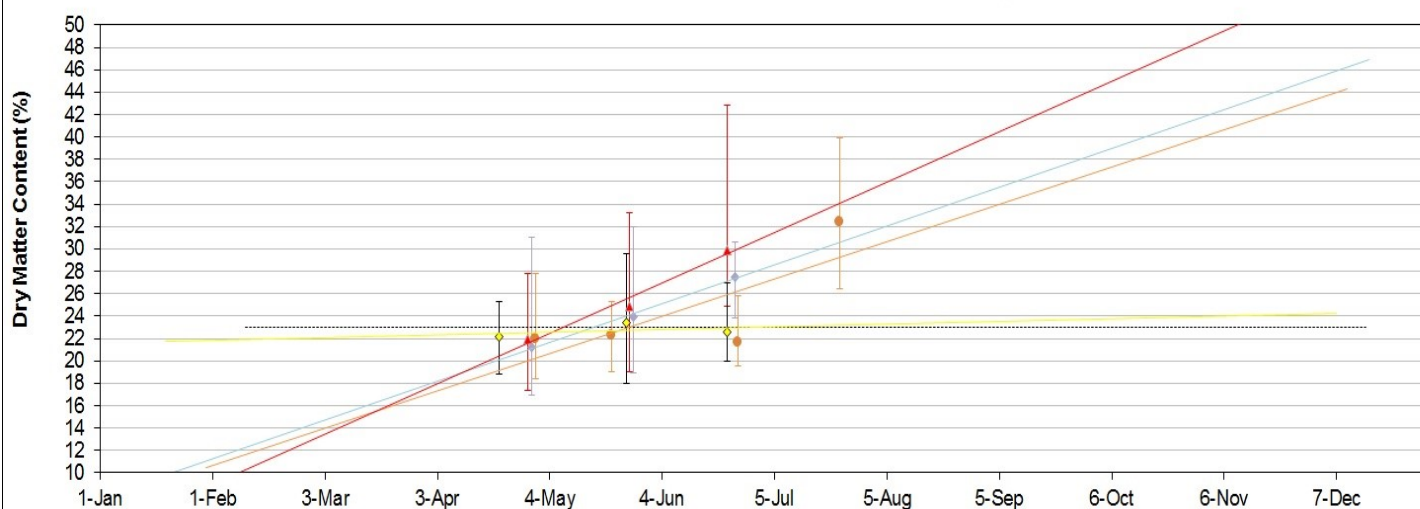
Fruit collected 14 December 2015

Dry Matter Intervals	Proportion of Fruit Tested for each Dry Matter Interval									
	NQ		CQ		SC	SQ	TNR	CNSW	TRI	WA
	Hass	Shepard	Hass	Shepard	Hass	Hass	Hass	Hass	Hass	Hass
<=18%					0%			0%		0%
18.1%-20.9%					0%			0%		0%
21%-22.9%					0%			0%		3%
23%-28%					0%			10%		27%
28.1%-40%					90%			90%		70%
>40%					10%			0%		0%

From Packed Date	Proportion of Fruit Tested by Age									
	NQ		CQ		SC	SQ	TNR	CNSW	TRI	WA
	Hass	Shepard	Hass	Shepard	Hass	Hass	Hass	Hass	Hass	Hass
<= 7 days					100%			34%		56%
8-14 days					0%			0%		33%
15-21 days					0%			0%		11%
22-29 days					0%			0%		0%
>29 days					0%			0%		0%
Not Recorded					0%			66%		0%

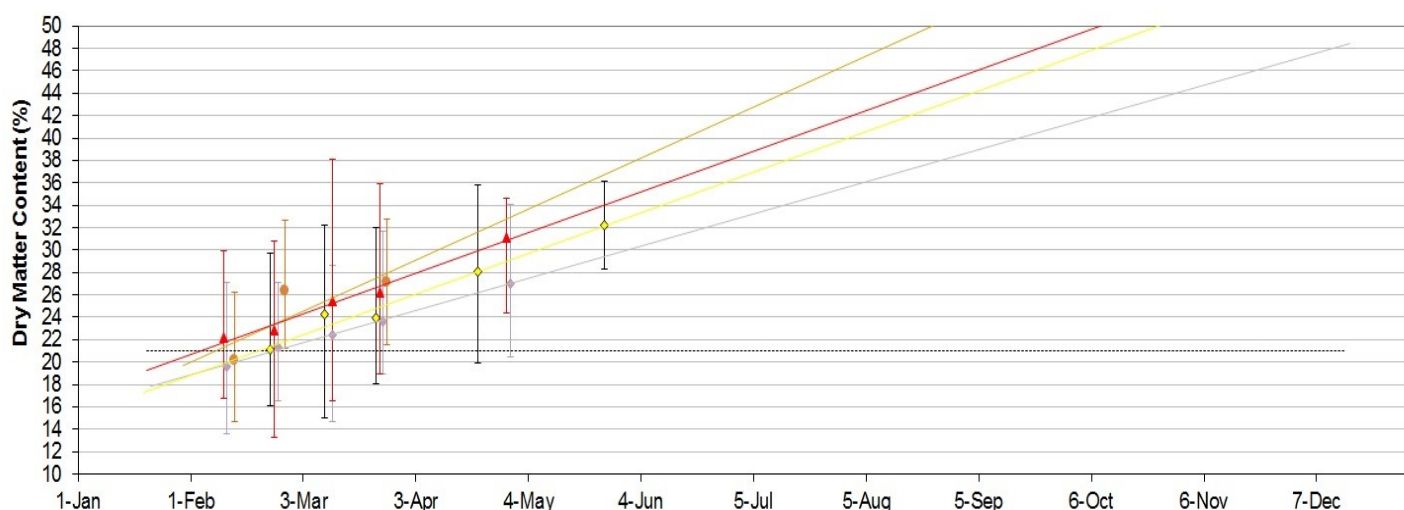
Average DM Content - North Qld (Hass) as of 14 December 2015

● 2012 ◆ 2013 ▲ 2014 ◆ 2015 DM Standard (H)

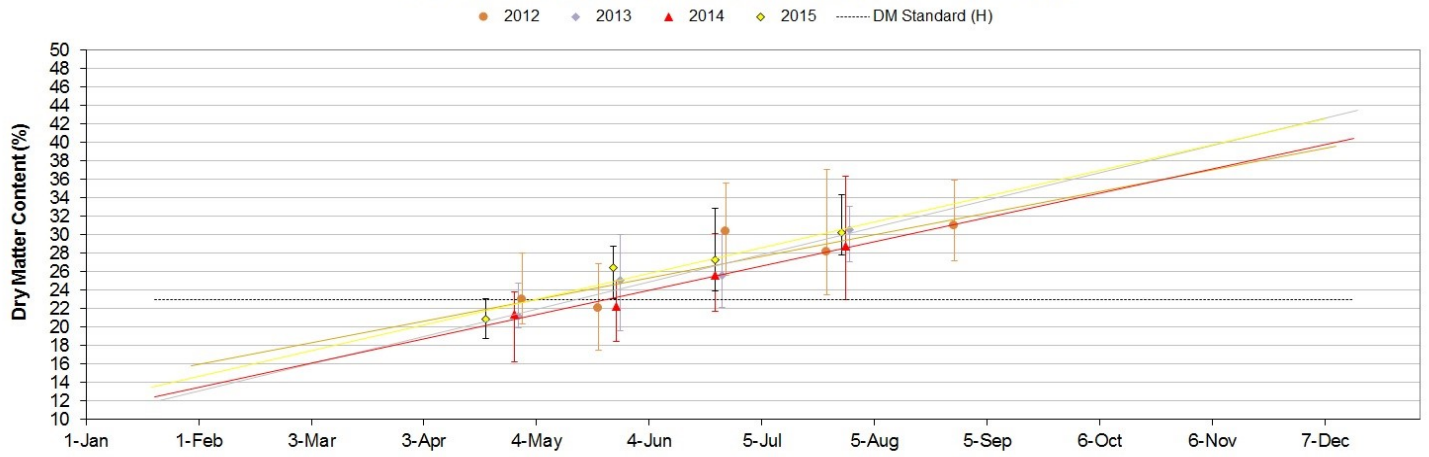


Average DM Content - North Qld (Shepard) as of 14 December 2015

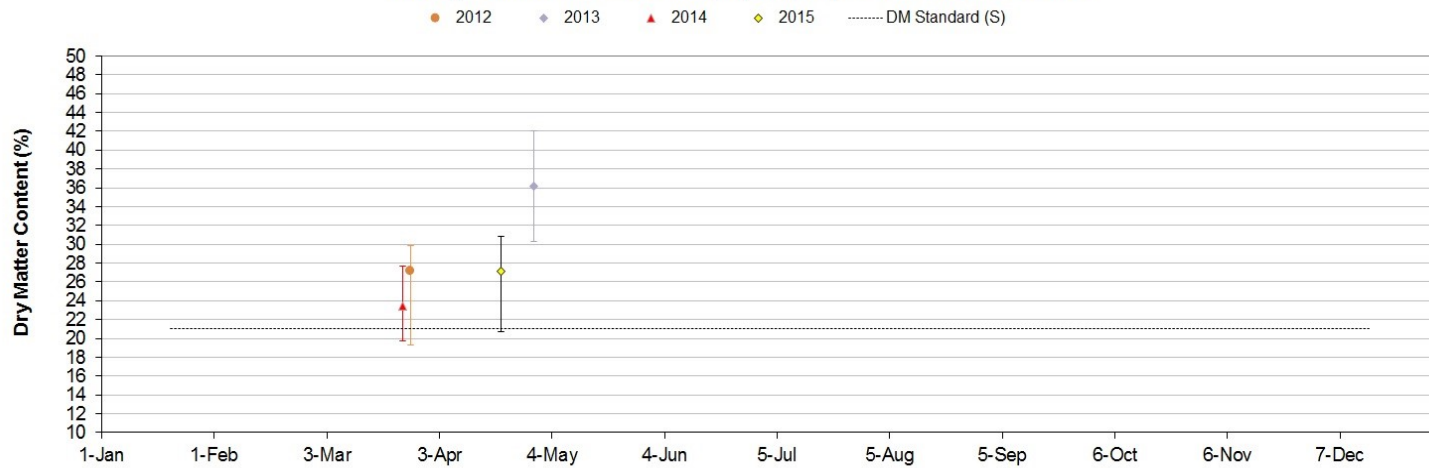
● 2012 ◆ 2013 ▲ 2014 ◆ 2015 DM Standard (S)



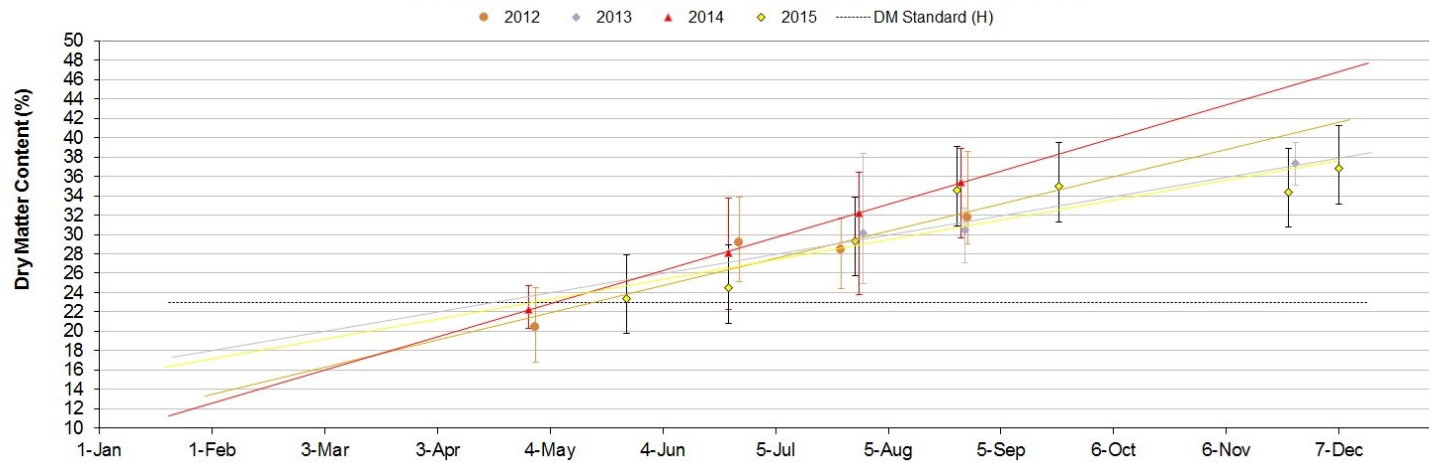
Average DM Content - Central Qld (Hass) as of 14 December 2015



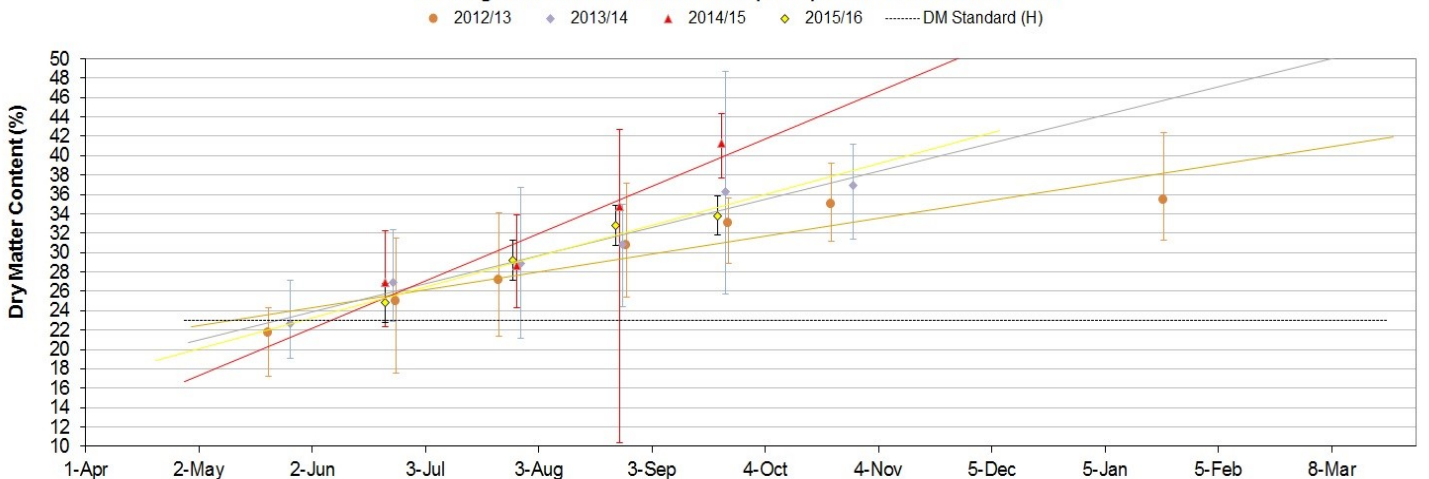
Average DM Content - Central Qld (Shepard) as of 14 December 2015



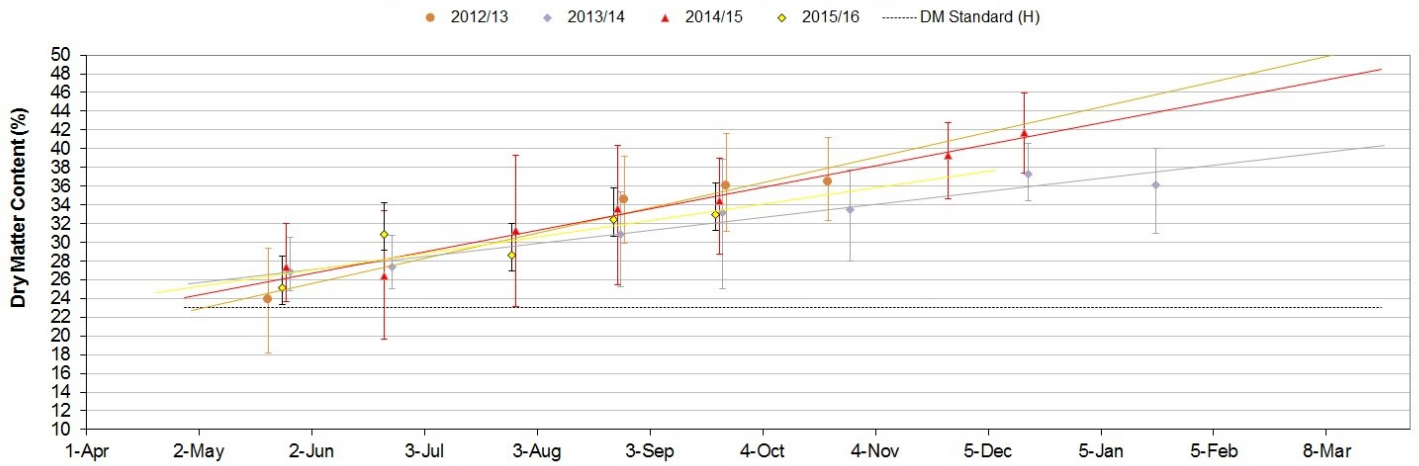
Average DM Content - Sunshine Coast (Hass) as of 14 December 2015



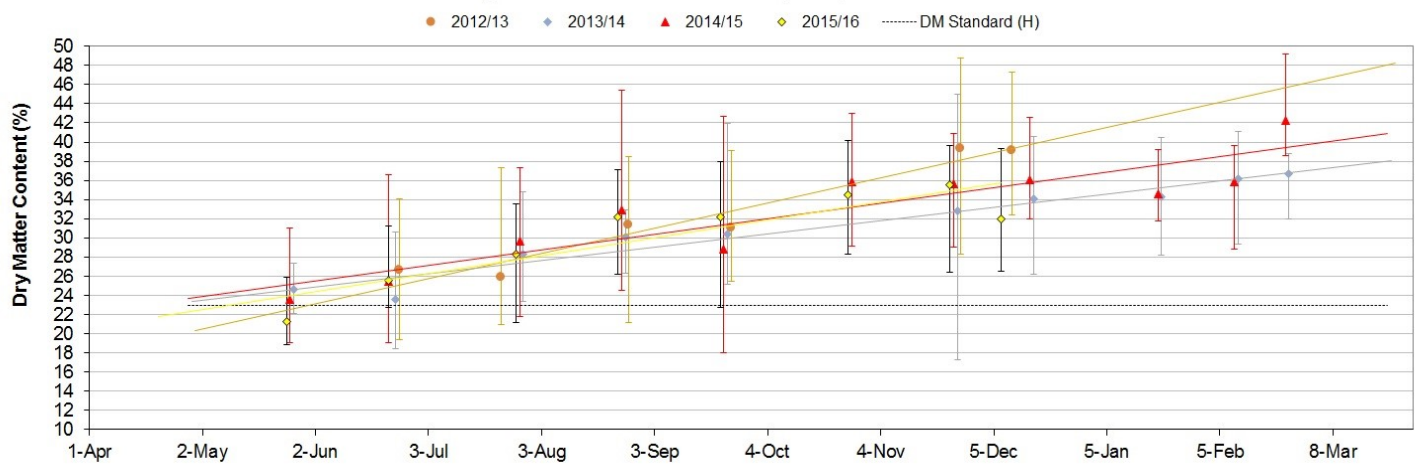
Average DM Content - South Qld (Hass) as of 14 December 2015



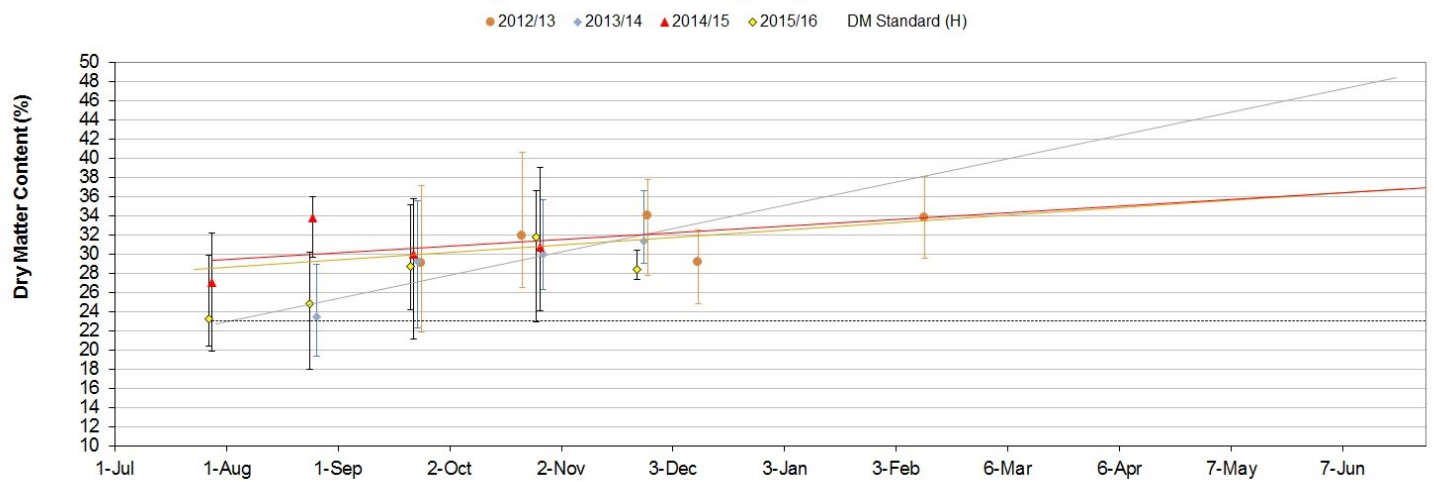
Average DM Content - Tamborine/Northern Rivers (Hass) as of 14 December 2015



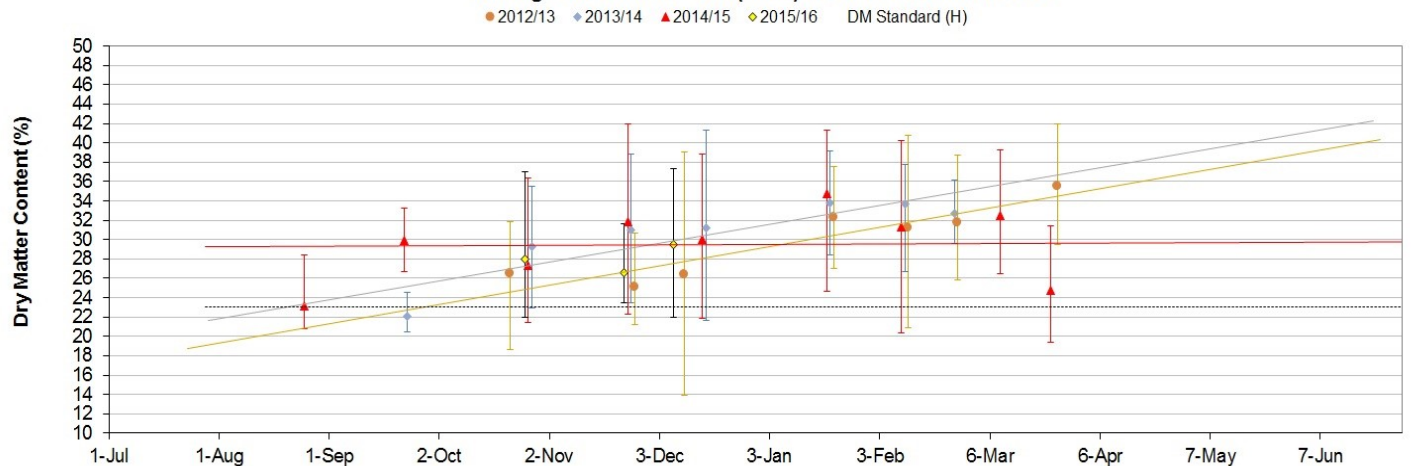
Average DM Content - Central NSW (Hass) as of 14 December 2015



Average DM Content - Tristate (Hass) as of 14 December 2015

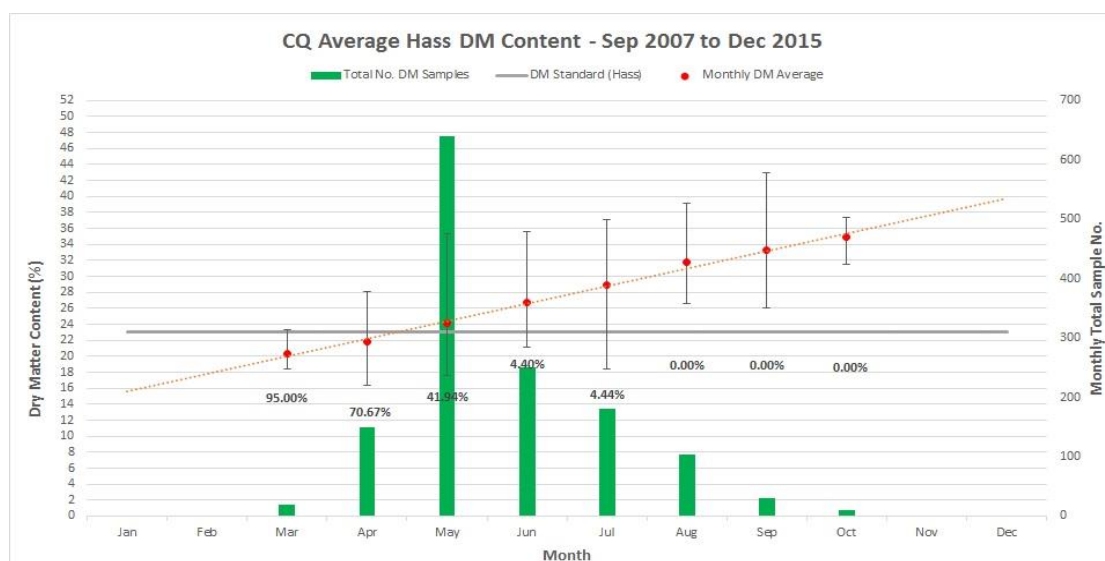
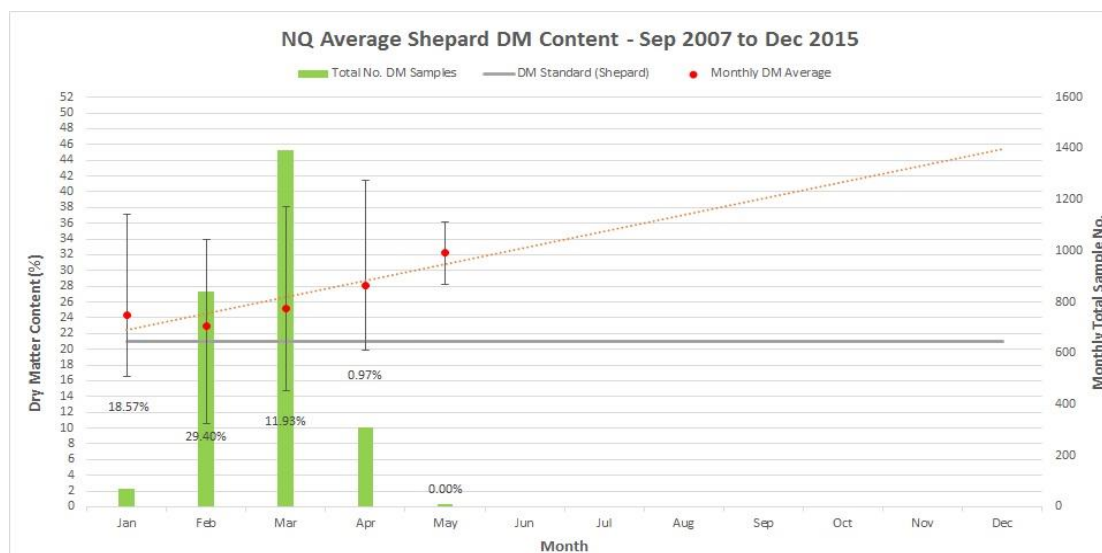
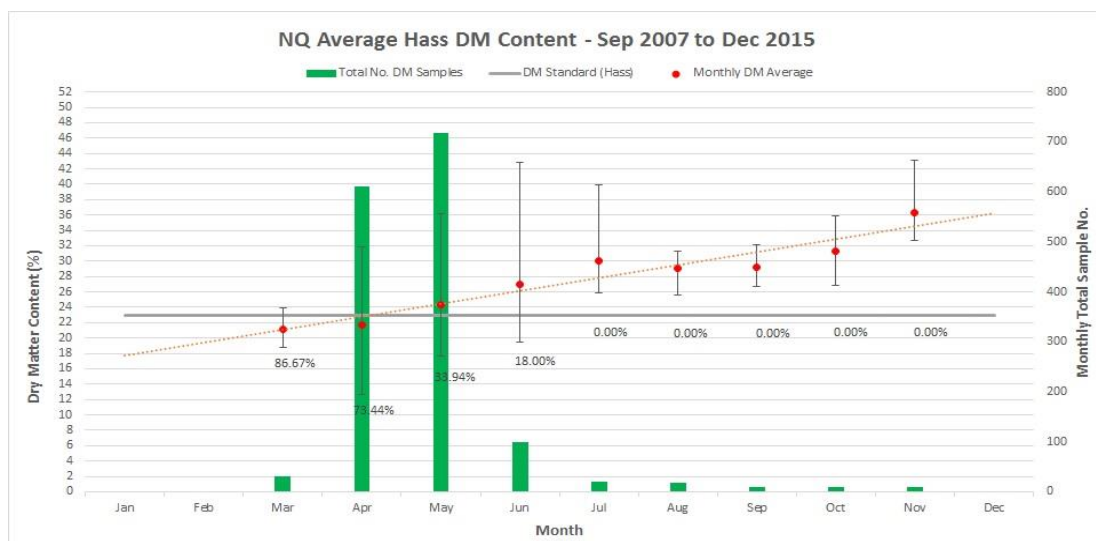


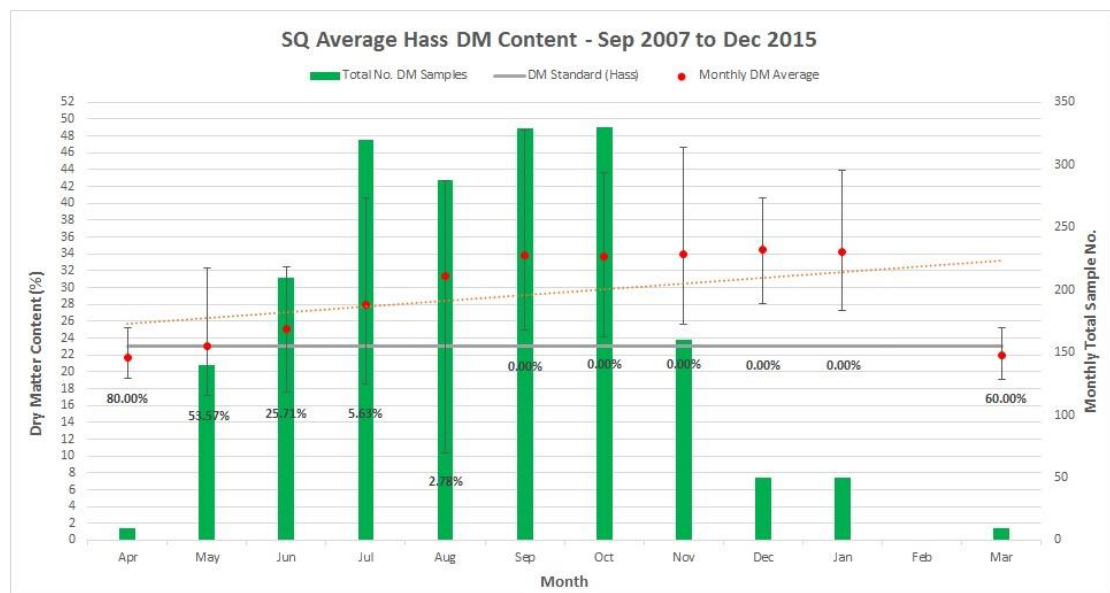
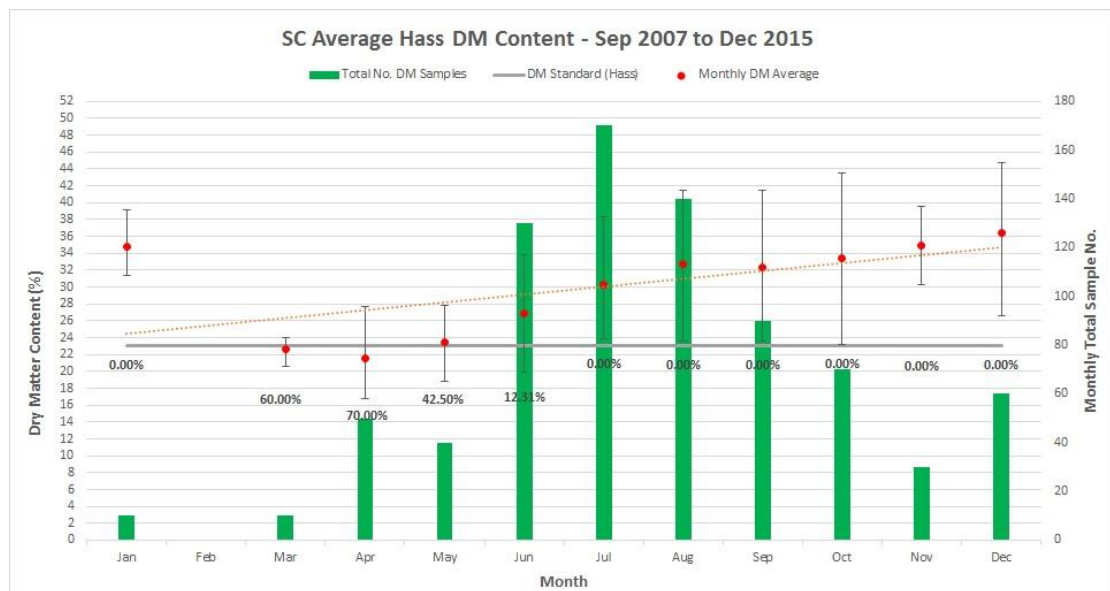
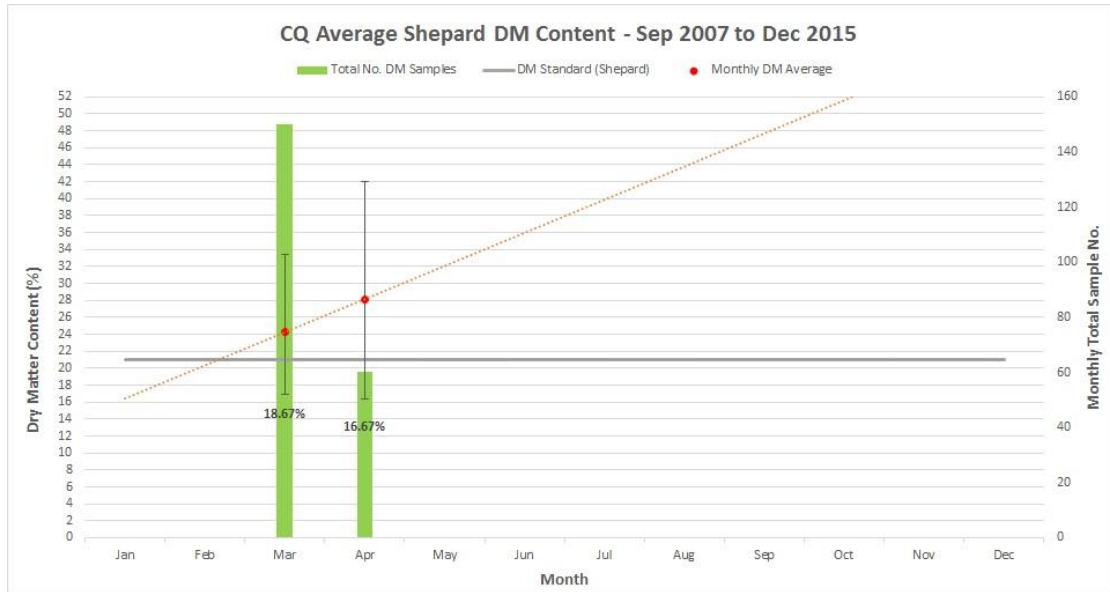
Average DM Content - WA (Hass) as of 14 December 2015

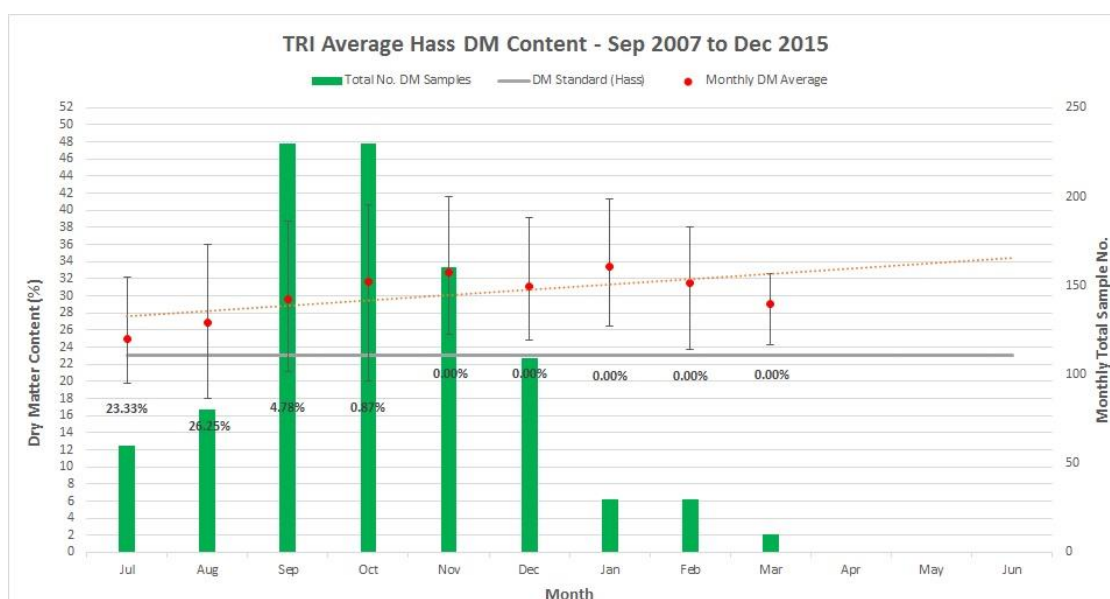
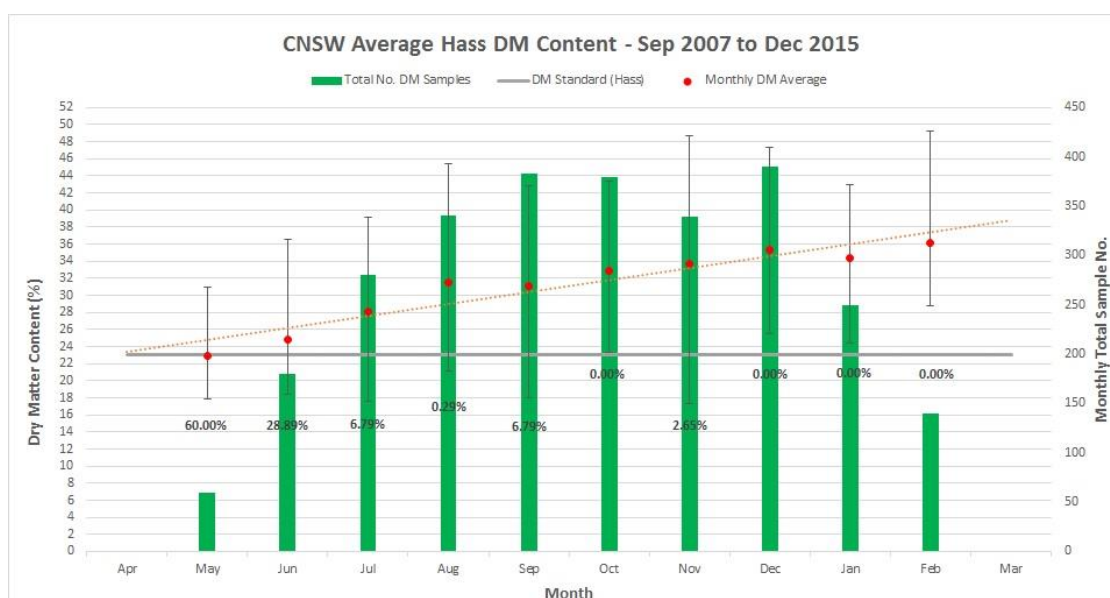
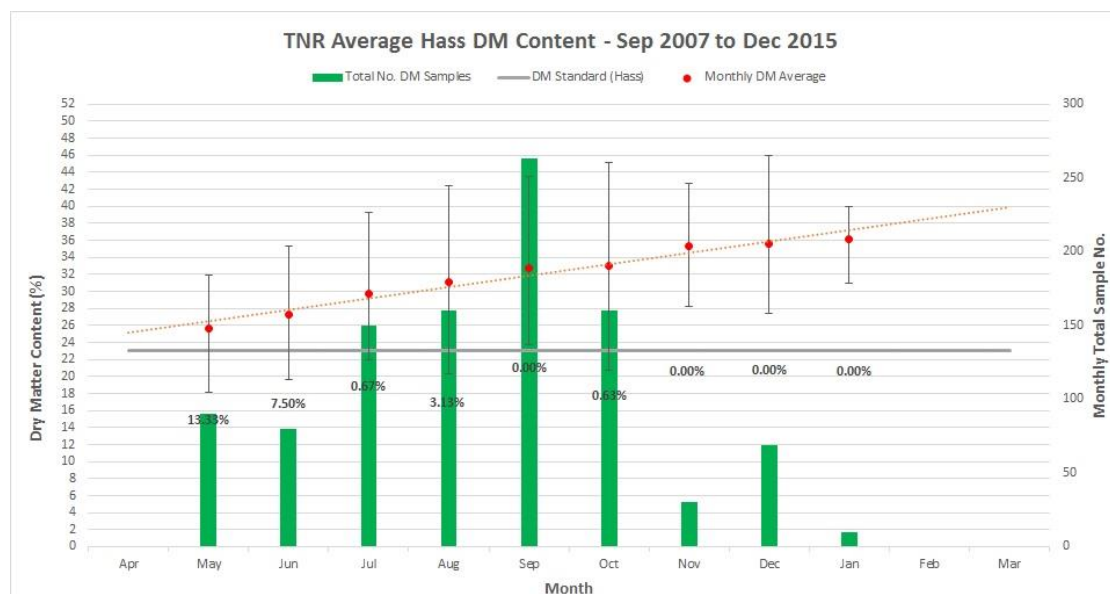


APPENDIX 8: DRY MATTER SUMMARY GRAPHS

Dry Matter Summary Graphs 2007-2015







WA Average Hass DM Content - Sep 2007 to Dec 2015

