Horticulture Australia Limited

FINAL REPORT

Banana Enterprise Performance Comparison

(Project BA11026) Phase 3

Prepared by

CDI PINNACLE MANAGEMENT

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Purpose of Report:

The purpose of this project (HAL Project BA11026) is to undertake research and provide reports:

1. To provide a tool to banana growers to achieve Australian best practice,
2. To assist the Australia banana industry to identify how it performs (re financial and productivity) compared to other global competitors,
3. To assist Australian Banana Growers Council (ABGC) to compile data / information relating to specific aspects of banana production,
4. To provide a mechanism through which ABGC and R&D organizations are able to identify those areas where R&D investment is most needed,
5. To provide a tool to growers and industry to allow them to calculate the benefits (or otherwise) of R&D and grower initiated adjustments to business practices.

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1. Glossary of Terms

Term Used	Meaning
Average	The average value reported amongst all participants that contributed information used in this measure / descriptor
Carton, Carton Equivalent, 13Kg Equivalent	13 kilograms of fresh bananas packed and ready for market
Cash Profit	The profit achieved in a banana producing enterprise before paying tax, interest, finance costs, depreciation of plant and equipment and amortisation of other assets. Also equates to EBITDA herein.
Count / Count Size / Size	Count / Count Size / Size: Size of packed bananas is traditionally defined by industry into Jumbo (XXL) Extra Large (XL), Large (L), Medium (M), Small (S), and Other (Other 1, Other 2)
EBIT	Earnings Before Interest and Tax (Net Operating Profit+ Interest and Finance Costs)
EBITDA	Earnings Before Interest, Tax , Depreciation and Amortisation (EBIT + Depreciation and Amortisation) – Also sometimes termed 'Cash Profit'
Fixed Costs	In this analysis these are all the costs associated with growing and maintaining the orchard and all overhead costs. It excludes costs associated with picking, packing, transporting, marketing and ripening fruit for market sale.
Full Time Employee Equivalent / FTE / FTEs	Full Time Employee Equivalent. Treated as one full time employee working 38 hours per week for 52 weeks per year , that is 1976 hours = 1 FTE
Gross Sales Revenue	Gross sales achieved before any costs (before marketing fees, freight, PBR fees, brokerage etc. and all other costs)
Growing Costs, Overheads & Other Costs (Also called Fixed Costs in this Analysis)	All costs except costs referred to as To-Market Costs' (Below)
High / Highest	The highest value reported amongst all participants that contributed information used in this measure / descriptor
Indicative Pay Rate	Where pay details are not provided an hourly rate of $21 per hour plus Superannuation has been used.

Term Used	Meaning
Labour Day	The cost of one day of labour at the current standing or award rate employed in an enterprise. This measure is effectively the cost of an FTE unit (see above) divided by the number of work days in a standard year of paid effort (in this analysis = 260 days / FTE)
Low / Lowest	The lowest value reported amongst all participants that contributed information used in this measure / descriptor
Operating Costs (Excluding Interest, Tax, Depreciation and Amortisation	Total Costs excluding Interest, Tax, Depreciation and Amortisation
Pack Out	Term used in some areas of the fresh produce industry to describe or define the resulting mixture of sizes and quality produce that are sent to market after produce is cleaned, graded packed and shipped.
Producing Hectare	Hectare of planted trees that were harvested in the relevant financial year (period)
Rank	Rank 1 is the highest value recorded amongst participants, higher ranking numbers are the smallest numbers recorded for that measure / descriptor
Remainder	The remainder of the benchmarking participation group that did not achieve adequate Cash Profit (EBITDA) to be included in the Top 10 most profitable businesses measured by Cash Profit per Carton Equivalent
To-Market Costs (Also Called Variable Costs in this analysis)	Picking Labour, Packing Labour, Packaging Costs, Power and Gas Costs, Contract Packing Fees, Outgoing Freight Costs, Marketing and Ripening Costs.
Top 10	The top ten (10 performing businesses in the benchmarking participation group, ranked on the basis of Cash Profit (EBITDA) per Producing Hectare
Total Costs	All costs incurred (including marketing fees, freight, PBR fees, brokerage etc., interest [where provided], depreciation (where provided], amortisation (where provided] and all other costs)
Unallocated (Paid) Owners Labour Costs	Where owners are paid in the financial accounts of the business this labour has not been allocated to a function (e.g. pruning), and left unallocated - applying across the entire business.
Unpaid Owners Wages	Allocated cost to cover the time spent working in the business by family members who are not paid in the financial records of the business (Rate used is the same as rate for farm workers, $20 / hour)
Variable Costs	In this analysis these are the costs associated with picking, packing, packaging, contract packing fees, freight to market, marketing costs and fees and ripening costs and fees.

2. Media Summary

Over the five elapsed years in which this project was undertaken the Australian banana industry produced between 15 million cartons (13 Kg equivalent) per annum and 25 million cartons per annum from an average producing area of 9,700 hectares per annum. Approximately 8,800 full time employee equivalent units (FTES) were employed annually to achieve this.

Participants collectively accounted for approximately 30% of total national banana production over the period of the project. The average yield achieved per producing hectare for the participant group was 2,331 cartons equivalent (13 Kg) for an average Gross Sales Return of $22.34 per carton equivalent. After paying for marketing and ripening costs, the average Net Return to Producers[1] was $20.93.

Participants on average spent $21.40 in total operating costs to produce a carton equivalent of bananas. Total operating costs have shown an average increase per annum of 3.9% over the period of the project whilst producer's returns have shown an average increase of 2.6% per annum over the same period.

The most consistent measure to use in reporting average financial profit achieved by participants is Cash Profit. Cash Profit, equal to EBITDA (a measure used in financial circles) equates to Earnings Before Interest, Tax, Depreciation and Amortization (Cash Profit herein).

The average Cash Profit achieved per carton equivalent for project participants over multiple years has been demonstrated to be $2.27 per carton equivalent. However, the range of Cash Profit achieved across one hundred and fifty five (155) participants in three normal years is also important to note. Cash Profit ranged from a loss of (-$35.04) per carton equivalent to a profit of $13.15.

From Cash Profit participants must fund any external finance used in their business, replace and depreciate plant and equipment and deliver an acceptable return on the capital they have invested inland and water assets, plant and equipment and working capital.

Thirty two percent (32%) of the participants made operating losses per carton, twenty one percent (21%) achieved sub-average profits and 47% made profits per carton equivalent to or greater than the group average.

[1] After paying marketing and ripening costs.

The Top 10 most profitable businesses (measured per carton equivalent sold) have demonstrated substantial difference in their costs and achievements compared to the rest of the participants. The Top 10 have reported 23% greater yield, 21% lower total operating costs and Cash Profits of more than three times the remainder of the participant group.

These high achievers recorded selling more produce direct to supermarkets or via brokers, having higher use of external advisors to assist them in nutrition management, and having adopted more irrigation monitoring aides and technologies. They also irrigate more frequently than the remainder of the group. The Top 10 were spread across three regions (Cassowary Coast (8), New South Wales (1), and Atherton and Lakelands (1).

Some material differences were demonstrated between regions in respect to costs, returns and productivity. Conventional Cavendish banana producers in the 2013 financial year demonstrated that yield per producing hectare and cash profit per carton equivalent in the Atherton and Lakelands regions was lower than that achieved in the Cassowary Coast.

Key differences in cost structures between the two regions appeared in the cost of labour and freight costs (higher in Atherton and Lakelands) and in the cost of engaging contractors and marketing and ripening costs (lower in Atherton and Lakelands).

The New South Wales industry demonstrates some significant differences in what is common practice on farms, the scale of producing enterprises, yields and in the returns received by producers. Data reviewed in this project suggests that the New South Wales industry will continue to struggle to remain sustainable whilst it competes with tropical Cavendish producers, supplying similar products to similar customers.

A renewed effort appears needed for the New South Wales industry, focused on:

1. Market analysis and segmentation,
2. Product and supply chain differentiation, and
3. Specialization in order to deliver different products to different markets.

This may be similar in 'approach and mindset' to the activities that led the Western Australian industry in a somewhat different direction.

This project makes recommendations to:

1. Encourage and promote the dissemination of these findings and how they can assist individual enterprises to improve their business outcomes. Included in this is the encouragement of collaborative effort such as the adoption of 'best practice' groups and similar, by groups of like-minded producers
2. Leverage the accumulated body of knowledge and also the extensive data that now resides in the banana data base. The data is stored in a flexible way that enables currently collated information and additional information to be interrogated extensively.
3. In particular, to **re-design aspects of the processes developed to date**, so as an ongoing program can have more resource allocated to analysis and

interpretation, reporting and interaction with participants, and working with participants and industry. The objective being to maximize the implementation of improvement steps in banana producing enterprises.

4. Undertake future research and development focused on key differences demonstrated in this project between highly successful banana producing enterprises and those that have much opportunity for enterprise improvement, namely:

5. Managing to maximize Yield

6. Plant Nutrition and Plant Protection designed to maximize yield and pack out,

7. Managing Labour and Labour Costs including process review and re-engineering in key areas of on farm activity, and

8. Increase understanding and adoption of Decision Making Tools, aides and technologies and the benefits of professional external advice.

The participants in this project have been very forthcoming and open, entrusting the researchers with sensitive and personal information. Sincere thanks for their willingness to share information in order to learn, a trait that is not necessarily a traditional attribute amongst all businesses and industries.

3. Technical Summary

3.1 Participants and Three Normal Years

The Banana Enterprise Performance Comparison Project (BA 11026) spanned four financial years and attracted two hundred and eleven (211) banana producers as participants. The participants, representative of the overall producer population, provided data regarding the operational and financial performance of their banana producing enterprise in the financial years 2008-2009 (2009), 2009 – 2010 (2010), 2011-2012 (2012) and 2012-2013 (2013).

Information gathered from participants was analysed for the development of comparative analysis reports that were supplied back to participants to assist them to improve their enterprise' performance. Aggregated high level data was also used to more clearly define industry performance and industry wide averages and trends in the operation of banana producing enterprises.

The participants for this project were identified and engaged through several key mechanisms, including:

1. Articles and information were distributed to Australian banana producers in industry magazines and newsletters and the Australian Banana Growers Council (ABGC) advised all of their members of the program and invited them to participate.

2. Researchers collated lists, from multiple sources, of all known banana producers in each growing region,

3. CDI Pinnacle Management's records were accessed to identify all known banana producers as well as other rural producers that could assist with the identity of producers of bananas.

During the project term Cyclone Yasi severely impacted the Australian banana industry and caused material negative impacts for participants located in the affected growing regions. Yasi also resulted in abnormal positive impacts on participants in the rest of the industry, as the few that still had product benefited from short supply conditions on the domestic market. As a result data collected from 2012 proved to be outside of normal data for the industry and therefore excluded from the final, multiple year analysis.

The data from the remaining 'three normal years' has therefore been used as the basis for final analysis to identify and present key findings, parameters, trends, issues and opportunities for the industry arising from this research

3.2 The Australian Banana Industry in Three Normal Years

During the five elapsed years of this project the Australian banana industry recorded annual production volumes ranging from 15 million cartons equivalent (13 kg) to over 24 million cartons. Based on information gathered in this project this volume was produced from an average annual producing area of more than 9,700 hectares and required the efforts of an average 8,800 full time employee equivalent units of labour (FTEs) per annum.

3.3 Key Findings

Participants as % of Industry

The enterprises that enrolled in the program over the three normal years of the program represented an estimated 30% of the volume produced in the Australian industry in that period. The participants were representative of industry in terms of their distribution across growing regions, enterprise size categories and the types of ownership and management found in the industry.

Common industry practice is to consider parameters of performance, production volume and general descriptors of industry activity in terms of inputs and outcomes 'per carton'. More specifically a 13 kilogram carton equivalent (carton equivalents) is the primary basis used for discussion and description of findings in this report.

Productivity

The average yield achieved by project participants over three normal years was 2,331 carton equivalents per producing hectare with a median value of 2,263 cartons equivalent. Producing hectares excluded any planted area that was not harvested during each data collection period / year. The average annual yield from year to year ranged from 2,251 to 2,485 cartons equivalent per producing hectare.

Average Gross Sales Return

Participants achieved an average gross sales return or income per carton equivalent of $22.34 prior to paying for marketing and ripening fees, resulting in a net return (commonly termed return to producers), after incurring marketing and ripening fees, of $20.93 per carton equivalent.

Average Operating Costs

The annual average operating costs for participants was relatively stable, ranging from $19.11 to $21.40 per carton equivalent. Operating costs per carton equivalent have shown an average annual increase of 3.9% per annum while average net returns to producers have increased by less, being 2.62% per annum.

The average operating costs per carton equivalent recorded by participants of $20.07 per carton equivalent includes all costs excluding interest, other finance costs, depreciation and amortisation. The annual average operating costs ranged from $21.48 to $24.04 per carton equivalent.

Average Cash Profit

The resulting average Cash Profit or EBITDA (Earnings before Interest, Tax, Depreciation and Amortization) for participants was $2.27 with the annual Cash Profit ranging from $1.90 to $ 2.63. Average Cash Profit or EBITDA as a percentage of gross sales return averaged 10.16% over three normal years.

From this return, participating producers must pay for the cost of any external finance borrowed, depreciate and replace plant and equipment and achieve a return on capital invested in the enterprise. Capital invested includes capital invested in land and water assets, plant and equipment and working capital.

Major Cost Categories

The cost of labour and contract services accounted for 32% and 7% respectively (39% collectively) of total operating costs per carton equivalent for participants. Together with the cost of freight, packaging, chemicals and fertilizers, marketing and ripening fees and repairs and replacements these major cost categories accounted for 88% of total operating costs as outlined in Table 1.

Table 1: Importance of Major Cost Categories

	$	% of Total Income	% of Total Operating Costs
Employment Costs	6.52	28%	32%
Freight	3.47	15%	17%
Packaging & Pallets	2.21	10%	11%
Chemicals & Fertilizers	2.00	9%	10%
Marketing and Ripening Fees	1.46	6%	7%
Consultants and Contracting	1.31	6%	7%
Repairs & Replacements	0.87	4%	4%
Total Operating Costs	20.07	**78%**	**88%**

The yield achieved per producing hectare and the cost of labour and contracting employed in enterprises vary demonstrably across the participants. These two areas present themselves as a focus for further research and development for the industry.

Differences between Growing Regions

For reasons of consistency in light of changing industry dynamics, the 2013 data set was selected for considering differences between regions.

Results for the 2012-2013 (2013) year indicate that yields and cash profits on average were lower in the Atherton and Lakelands areas than in the Cassowary Coast.

Total operating costs were higher in Atherton and Lakelands. Labour costs and freight costs in particular were demonstrably higher whilst the cost of contracting and of marketing and ripening appeared lower in the Atherton and Lakelands regions.

Participants in New South Wales in 2013 produced on average less than half the yield per hectare of tropical Cavendish producers (conventional production). New South Wales participants also recorded an average price per carton that was approximately 30% lower than prices achieved by tropical Cavendish producers.

Some notable differences in common practice appear to between New South Wales producers and tropical Cavendish producers. These differences appear to materially impact comparisons between these two regions.

Yield is one area where further research and development may be productive in New South Wales. However New South Wales producers consistently describe difficulties in achieving full disposal of their current production at desirable prices.

It appears that this region will continue to struggle while ever it competes in the same markets and with similar products to the tropical producing regions. In essence New South Wales based banana producing enterprises have significantly adapted their business model to a set of market and industry conditions that appear notably adverse for them over the recent years.

Further adaptation appears warranted if this region is to continue to be home to a sustainable banana production sector, including:

1. Closer market analysis and a search for suitable ‘niche’ market segments,
2. Tailored differentiation of each of products, distribution channels and relationships with suitable end use segments, and
3. Commitment to delivering end user and consumer satisfaction in selected an newly defined market segments,

Separate analysis of the costs and returns and outcomes achieved in the Western Australian region is not included in this analysis. Given the small number of Western Australian participants it was considered inadvisable to publish differentiated findings related to that region.

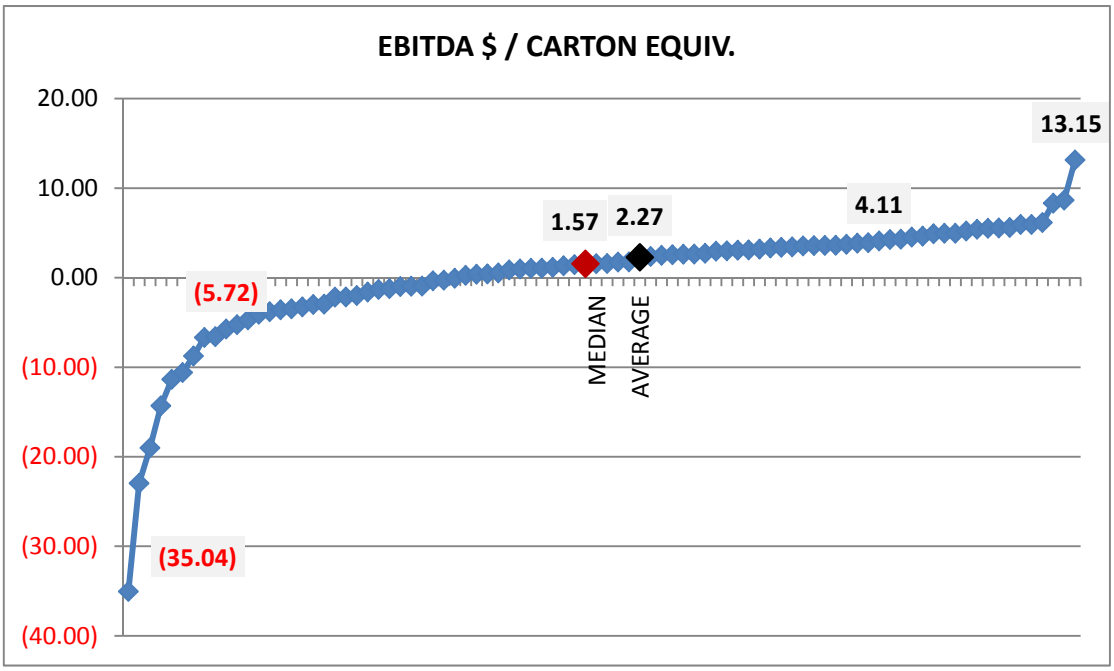
No producers from the Northern Territory participated in this program.

Wide Range of Outcomes amongst Participants

Reporting average outcomes for the range of measures identified must be accompanied by consideration of the range of outcomes that occur amongst the large number of participants

Section 6.4.1 outlines in some detail the wide range of cost and return outcomes for participants. In respect to the ultimate enterprise outcome, Cash Profit, participants' results across three normal years range from a loss of ($35.04) per carton equivalent, to a cash profit of $13.15, as illustrated in Figure 1.

Figure 1: Cash Profit (EBITDA) per Carton Equivalent – Range for Participants



For the three normal years under consideration:

1. 47% of participants achieved an average cash profit or better,
2. A further 21% achieved a sub-average cash profit, and
3. 32% of participants made losses per carton equivalent before paying for finance / interest or depreciation on plant and equipment.

3.4 Top 10 Most Profitable Enterprises

The Top 10 most profitable enterprises (as measured by cash profit achieved per carton equivalent sold) have demonstrated key differences between their operations and performance and that of the remainder of the participants.

The major areas of difference are outlined in Table 2.

Table 2: Main Differentiations – Top 10 Compared to Remainder

1. Top 10 averaged 42 producing hectares (range 11 to 90 hectares).
2. Were small family-owned enterprises (1 to 20 producing hectares) or mid-sized and / or diversified family-owned enterprises (21 to 130 producing hectares).
3. Included eight (8) enterprises from the Cassowary Coast, one (1) enterprise from New South Wales and one (1) enterprise from the Atherton and Lakelands region.
4. The Top 10 Demonstrated: a. Twenty three percent (23%) greater yield per producing hectare, b. Twenty one percent (21%) lower total operating costs per carton equivalent (equal to an average $4.38 / carton equivalent), c. An average $4.62 (252%) more Cash Profit (EBITDA) per carton equivalent.
5. The Top 10 Reported: a. Higher % of produce sold direct to supermarkets and via brokers (+84% variance), b. Greater utilization of paid external nutritional advise (+43% variance), c. Higher adoption of irrigation decision making technologies and fixed scheduling of irrigation (+88% variance), d. Higher frequency of irrigation (when irrigating)) (+37% variance), e. Greater use of contract spraying (including aerial spraying) (+195% variance).

3.5 Recommendations

3.5.1 DISSEMINATION AND UTILIZATION OF FINDINGS

It is recommended that the findings of this research and how it can be used to assist individual producers in their businesses be promoted at every opportunity. This could be achieved through the ongoing dissemination that occurs around this research **and** the interaction that occurs between the officers engaged at industry level and banana producers.

In some industries 'best practice groups' have formed and use data similar to the results of this research as the basis for sharing ideas and developing new approaches to solving on-farm problems. The software that has been developed and used to store this data is able to produce tailor made reports for these collaborative groups, presenting the group's information in a stand-alone comparative format.

3.5.2 LEVERAGING THE ACCUMULATED BODY OF KNOWLEDGE

A lot has been learnt from the completion of four years of data collection. This learning goes well beyond what has been learnt about the industry, its participant enterprises and trends. Much has also been learnt about how to collect, format and deliver data and information in the industry.

The collected data that is now retained in the banana data base is extensive. Key financial and operational data, (quantitative and qualitative) is now in one place regarding $600 million worth of bananas (at farm gate value) delivered to market in Australia.

A substantial knowledge base has been created and it is stored in a manner that enables it to be used far more widely.

Ongoing data collection, analysis, interpretation and delivery is recommended to assist banana producers to pursue a culture of continuous improvement Some of what has been learnt is about 'what not to do', and how to design and execute this type of program and activity in the industry.

Ongoing benchmarking can be designed to add even more value. Some of the areas where change is recommended include and are not limited to:

1. Working with a smaller number of participating enterprises, that are at least as representative of the industry as the previous groups
2. Develop processes, protocols, systems and communication (tools and interfaces) that enable the researchers to spend less of the allocated time and resource on collecting raw data, and more time and resource on Analysis,
3. Interpretation,
4. Secondary research and interaction with other researchers and knowledge sources to further define apparent relationships and correlations (between inputs / activities / decisions / practices and outcomes)
5. Interaction with participants
6. Reporting,
7. Implementation of findings and lessons inside participant businesses.

3.5.3 FUTURE RESEARCH AND DEVELOPMENT FOCUS

The Top 10 most profitable enterprises demonstrated significant differences in the key areas of:

1. Higher yields per producing hectare
2. Lower costs per carton equivalent sold,
3. Higher Cash Profit per carton equivalent sold.

The Top 10 also reported that they do things differently in some key areas that include:

1. How they market their produce
2. How much external advise they invest in, particularly regarding nutrition,
3. Greater propensity to invest in irrigation monitoring technologies such as Tensiometers, Enviroscan and similar,
4. More frequent irrigation timing when climatic conditions call for irrigation to be applied
5. Higher propensity to engage contract spraying services including aerial spraying

This analysis has also demonstrated that participants that achieved higher yields and cash profits did not necessarily invest more in the application of chemicals and fertilizers. It may be more about what is used than how much is expended in nutrition and plant protection.

Given these findings, it is reasonable to suggest that the most variable aspects of managing successful banana production enterprises ("enterprise management") as demonstrated in this project should be treated as focus areas for the areas future research and development investment, including:

1. Yield,
2. Nutrition and plant protection practices
3. Managing labour and labour costs, including process review and re-engineering in key operational areas, and
4. Understanding the benefits of adopting modern decision making aides / technologies, and the use of professional advice where it can add value to enterprise performance.

These recommendations may suggest a broader interpretation of research and development in horticultural industries for some, to include important aspects of enterprise management such as; management decision making, marketing and negotiating with chain partners, business relationship management, accessing and using external advice and information, and process review, analysis and re-engineering.

4. Introduction

During the five elapsed years during which this project was completed the Australian banana industry has recorded annual production volumes ranging from 15 million cartons equivalent (13 kg) to over 24 million cartons. Based on information gathered in this project the industry has produced this volume from an average annual producing area of more than 9,700 hectares and has employed on average approximately 8,800 full time employee equivalent units of labour (FTEs) per annum.

The principal objectives of this project (HAL Project BA11026) are:

1. To assist growers to achieve Australian best practice across the full spectrum of the production and marketing of bananas.

2. To assist the Australian banana industry to identify its attributes and performance relevant to achieving international best practice.

3. Compile a comprehensive understanding of the various production, packing and marketing practices in use by the Australian banana industry from 4 years of data collection.

4. To acquire detailed understanding of the management practices used by growers following Cyclone Yasi and understand any changes that these growers would make in the event of another cyclonic or severe weather event.

5. Evaluate linkages between production, packing, marketing and human management practices and the performance of banana producing enterprise.

6. To assist the ABGC to compile data / information relating to specific aspects of banana production that may be of interest to government agencies.

7. Provide where possible, comparisons of industry performance against the goals of the Australian Banana - 2009-2014 Strategic Plan.

8. Provide a tool to individuals and industry to identify the benefits (or otherwise) of R&D and grower initiated adjustments to business practices.

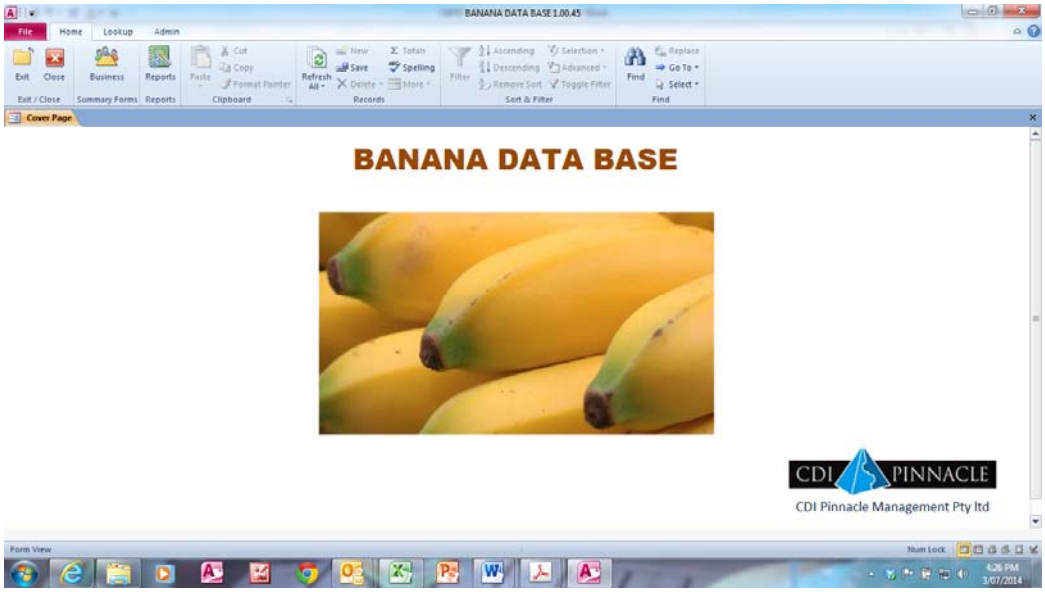
9. Provide recommendations to industry based on the analysis of qualitative and quantitative data collection and reporting for further industry R&D activities that will benefit the whole of the Australian banana industry.

10. Communicate findings to industry via regional presentations.

This is the final report for the project and outlines the findings of collecting data on operations, finance, practices and decisions making for over 200 Australian banana growing enterprises, over four financial years.

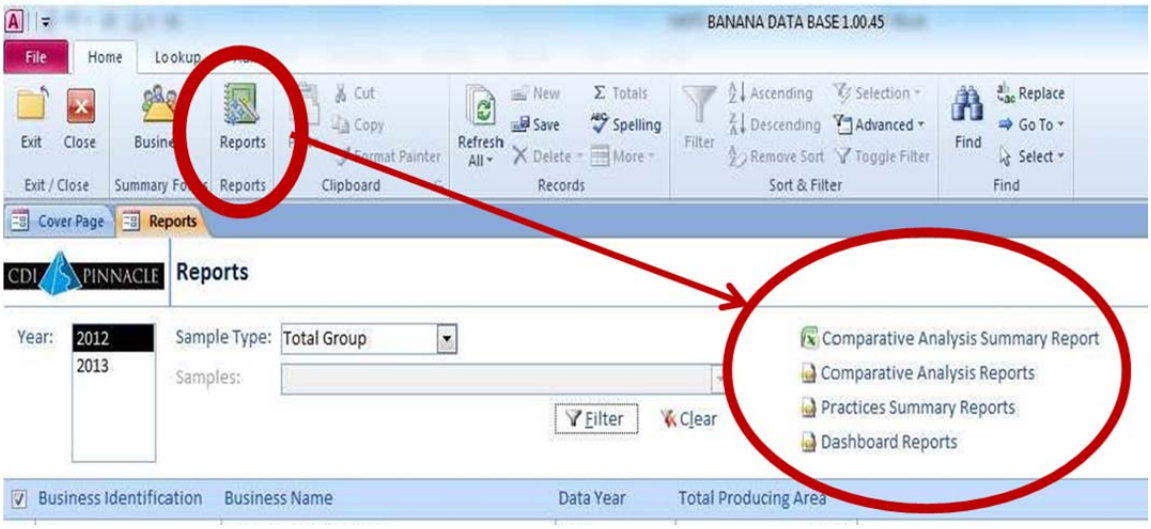
The collected information has been entered, stored and analysed using a database program developed by CDI Pinnacle Management Pty Ltd and a professional data base design engineering firm. This software has been developed with some clear goals in mind, particularly with respect to the flexibility the package delivers in how reports can be structured and created and how data can be analysed from multiple perspectives.

Figure 2: Banana Production Data Base



Further to the above, and as a direct result of the flexibility that has now been built into the software package, the package can deliver specific reports requested by some participants and those created and used extensively in the analysis phase. These include reports comparing the Top 10 group in isolation, the remainder in isolation, practices summary reports for sub-groups, and other reports that have assisted the analysis.

Figure 3: Software Reporting Functionality



This industry report has been structured with careful thought given to the amount of data that has been collected and analysed. The aim has been to make it a readily usable document that clearly informs of the activities and findings and the trends and issues identified without burying the reader in lengthy discourse and masses of data.

5. Materials and Methods

5.1 Program Overview

The Banana Enterprise Performance Comparison program has been undertaken over a total of four financial years (and five elapsed years). In each of the financial years data has been collected from a group of approximately 60 banana producers that are representative of the banana producers that are active in the Australian industry.

In order to identify and enrol a representative group every effort has been made to take into account the key variables that have been observed in the banana production sector including:

1. The main growing regions,
2. The size / scale of banana producing enterprises,
3. The types of ownership and management in banana producing enterprises,
4. The varieties grown in the Australian industry.

The resulting sample of banana producing enterprises enrolled in the program have represented an estimated 28% of the volume produced in the four financial years in which data was collected, as in Table 3.

Table 3: Industry Data and Participant Group Attributes

	2008 - 2009	2009 - 2010	2011 - 2012	2012 - 2013	Total (Four Financial Years)
Levy Collection [2]	3,460,000	4,261,588	5,593,029	5,304,001	18,618,618
Levy Rate ($ / Kg)[3]	0.017	0.017	0.017	0.017	0.017
Tonnes of Production	203,529,412	250,681,647	329,001,706	312,000,059	1,095,212,824
Cartons Equivalent (13 Kg) of Production	15,656,109	19,283,204	25,307,824	24,000,005	84,247,140
Cartons Per Week	*301,079*	*370,830*	*486,688*	*461,538*	*405,034*
Cartons Equivalent (13 Kg)[4] Produced by Program Participants	4,703,409	6,747,001	5,985,143	6,518,568	23,954,121
% of industry Production Captured in Program	30%	35%	24%	27%	28%

5.2 Program Participation

5.2.1 PARTICIPANTS IN EACH YEAR OF DATA COLLECTION

Data related to on farm operations and financial performance has been collected from a total of 211 participating enterprises (see Table 4) across the four financial years in which data has been collected. Researchers wish to acknowledge the time and effort contributed by each and every participant in the program.

Also and most importantly, researchers wish to thank participants for their trust and willingness to share sensitive information without which this program would not have been possible to undertake.

[2] Source: Banana Industry Annual Reports for each of four financial years

[3] Source: Banana Industry Annual Reports for each of four financial years

[4] CDI Pinnacle Management Research

Table 4: Participants in Each Year of Data Collection

	2009	2010	2012	2013	TOTAL
Total Participants	49	60	56	46	211
Hectares	2,089	2,983	3,188	2,623	10,883
Cartons	4,703,409	6,747,001	5,985,143	6,518,568	23,954,121
% of Industry Production Captured in Program	30%	35%	24%	27%	28%
Yield	2,252	2,262	1,877	2,485	2,201

5.2.2 THREE NORMAL YEARS

Following the collection of all of the data it became very evident that the data collected in the financial year ended June 30 2012 (2001-2012) showed significant impact from the occurrence of Cyclone Yasi in February 2011. Key impacts of Cyclone Yasi included:

1. Production out of the region that has traditionally been the largest producing area, the Cassowary Coast was well down on normal levels

2. Prices achieved for product sold in the first six (6) to eight (8) months of the 2011-2012 year, for those enterprises that had product, were significantly elevated above normal levels

3. Costs for that product that was produced in the Cassowary Coast was significantly higher than normal levels

4. Enterprises in all regions other than the Cassowary Coast recorded elevated profitability per unit of production, whilst enterprises in the Cassowary Coast region had low returns due to the impact of increased costs (from clean up and repair after Cyclone Yasi) and from decreased productivity per producing hectare, following the damage done by Cyclone Yasi.

In consultation with industry it was decided that the program data for 2011-2012 was at significant variance from a normal year of operations and should not be used for the analysis of normal operations, financial performance and enterprise outcomes in the industry. The three years of data collected for 2008 – 2009, 2009 – 2010, and 2012 – 2013 shall be used herein as a valid information platform from which to demonstrate results and draw meaningful conclusions.

The remainder of this report therefore uses the three 'normal years, of 2008-2009 (2009), 2009 – 2010 (2010) and 2012 – 2013 (2013) as the basis for analysis, results and meaningful conclusions.

Table 5 outlines the key data regarding the participating businesses in the three 'normal years' used in this report.

Table 5: Industry Data and Participant Group – Three Normal Years

	2009	2010	2013	Total 3 Normal Years
Levy Collection	3,460,000	4,261,588	5,304,001	13,025,589
Levy Rate ($ / Kg)	0.017	0.017	0.017	0.017
Tonnes of Production	203,529,412	250,681,647	312,000,059	766,211,118
Cartons Equivalent (13 Kg) of Production	15,656,109	19,283,204	24,000,005	58,939,317
Cartons Per Week	*301,079.01*	*370,830.84*	*461,538.55*	377,816
Cartons Equivalent (13 Kg) Produced by Program Participants	4,703,409	6,747,001	6,518,568	17,968,978
Total Participants	49	60	46	155
Hectares	2,089	2,983	2,623	7,695
Cartons Equivalent (13 Kg) Produced by Program Participants	4,703,409	6,747,001	6,518,568	17,968,978
% of Industry Volume Captured in Program	30%	35%	27%	30%

5.2.3 PARTICIPATION IN REGIONS

In Figure 4 the percentage (%) of participants that were engaged in each growing region is provided while Figure 5 provides the percentage (%) of producing area that those participants represented in each of the regions.

Figure 4: Percent of Participants in Growing Regions

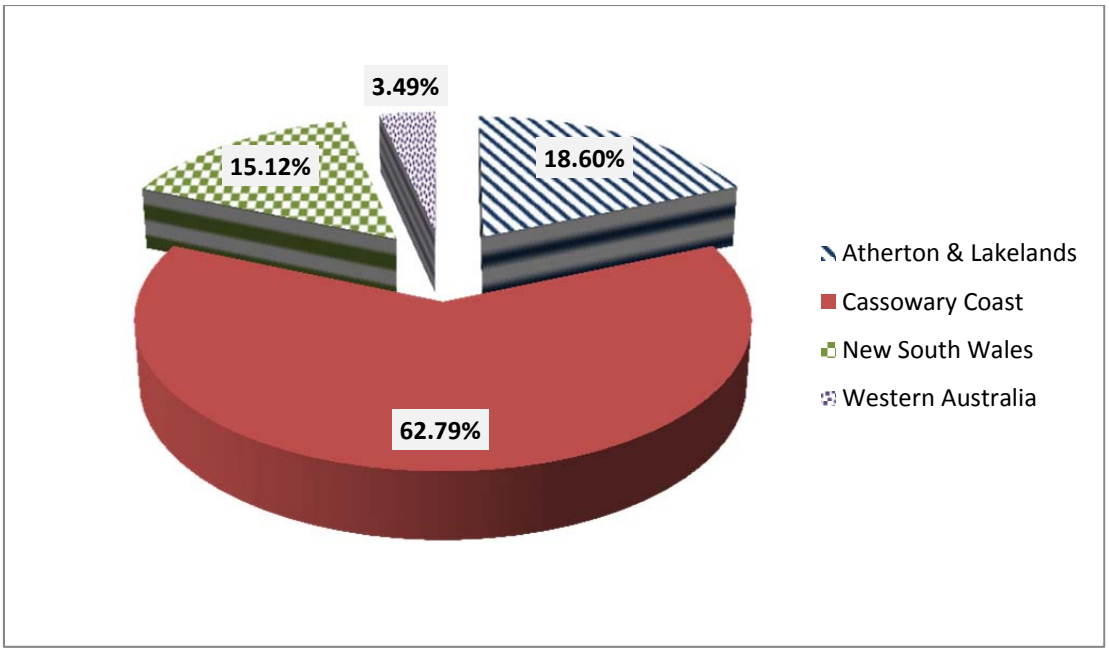
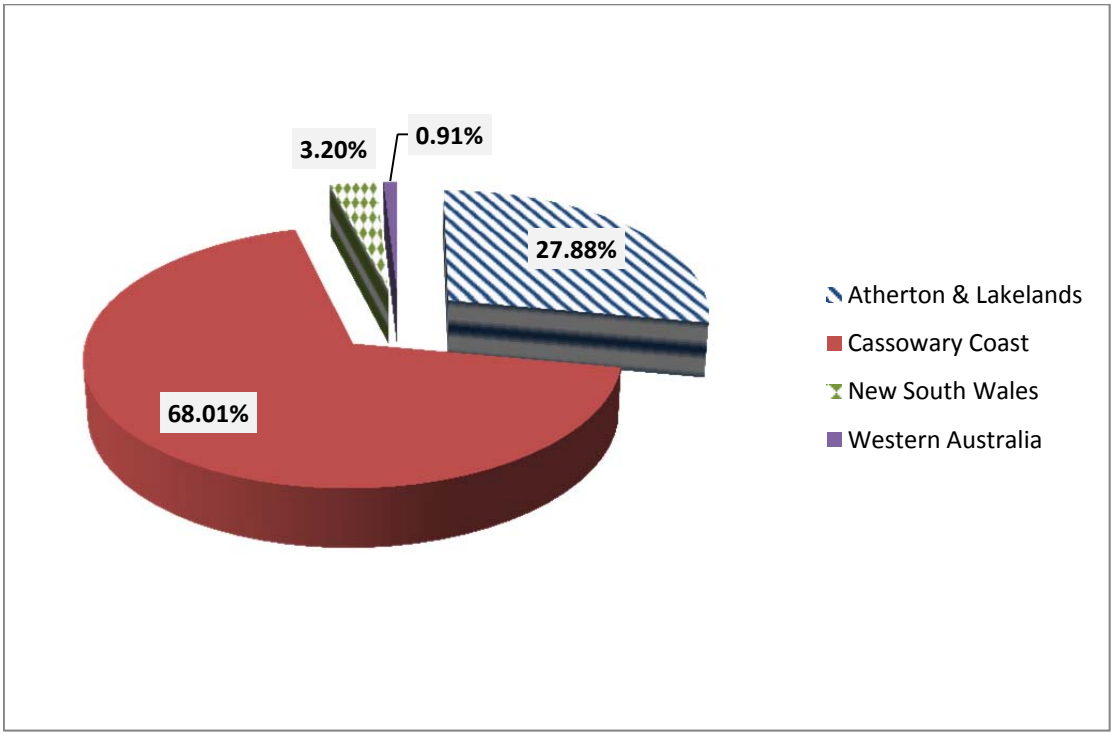


Figure 5: Percent of Producing Area in Growing Regions



5.2.4 SIZES OF PARTICIPANT ENTERPRISES

There is substantial diversity in the sizes of banana producing enterprises. The producers that enrolled in this program are also representative of the range of size of enterprise in the industry

In Figure 6 the percentage (%) of participants of differing size or scale categories is provided.

In Figure 7, the percentage (%) of the producing area that is managed by enterprises of different size or scale categories in each producing region is provided.

Figure 6: Percent of Participants in Enterprise Size Categories

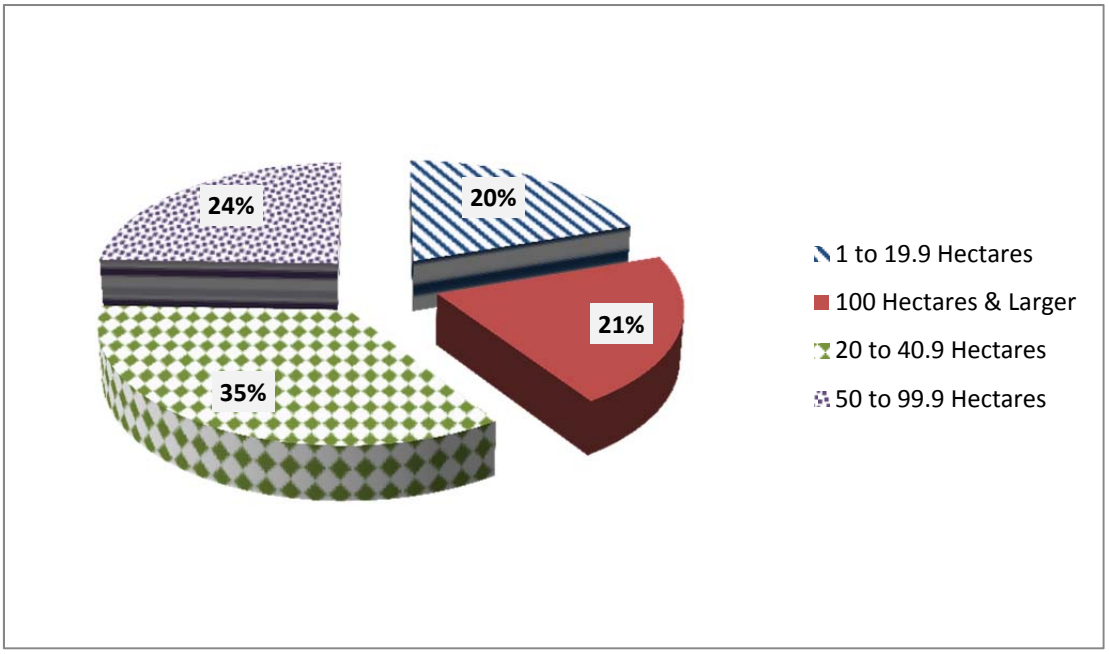
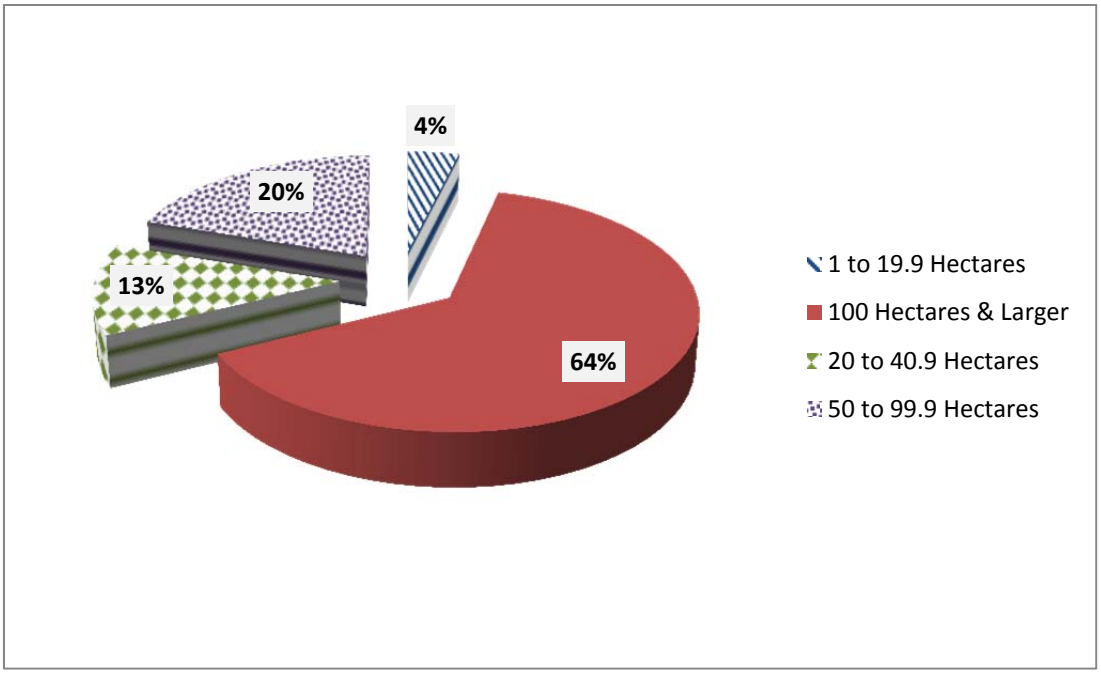


Figure 7: Percent of Producing Area in Enterprise Size Categories

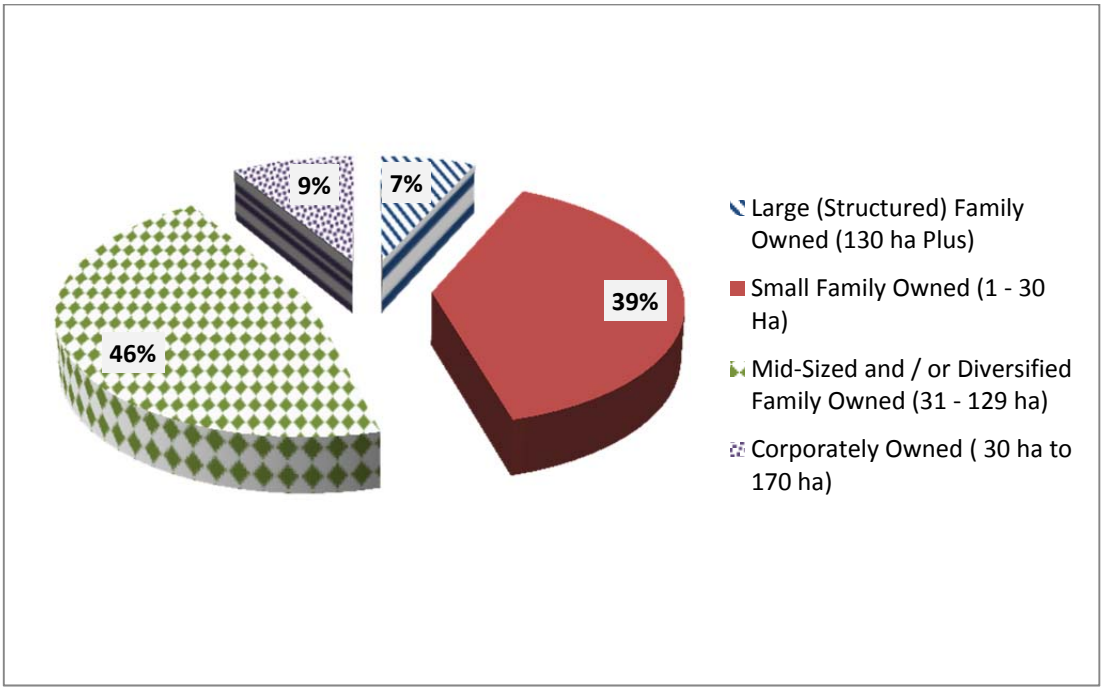


5.2.5 TYPES OF OWNERSHIP

The banana industry is also diverse in the types of operators that run enterprises. In Figure 8 the breakdown of the participating group into the four types of ownership is outlined.

1. Small family owned enterprises (1 – 30 producing hectares),
2. Mid-Sized and or diversified and family owned enterprises, (31 to 129 producing hectares),
3. Large structured and family owned enterprises, (130 producing hectares and larger), and
4. Corporately owned enterprises (30 to 170 producing hectares).

Figure 8: Percent of Participants in Ownership / Management Categories



5.3 Steps and Processes

The process steps taken to undertake the research, and to complete and deliver reports to participating producers, prepare reports and information for industry, and disseminate information to industry are summarised in Table 6.

Table 6: Method Steps and Processes

Process Steps	Frequency
Identification of Prospective Participants	Each Collection Cycle
Scoping / Content and Familiarity with Issues - Discussions with Project Reference Group and Selected Participants	Each Collection Cycle
Survey Instrument / Questionnaire Design, Testing and Refinement	Each Collection Cycle
Master Data Sheet Design	Each Collection Cycle

Process Steps	Frequency
Software Design - Data Entry	Each Collection Cycle
Recruiting Willing Participants	Each Collection Cycle
Set Up Visit Programs and On-Farm Visits	Each Collection Cycle
Undertake On-Farm Visits	Each Collection Cycle
Software Design - Reporting	Each Collection Cycle
Collate, Clean, Normalise & Cross Reference Gathered Information	Each Collection Cycle
Fill Gaps through Further Interaction with Participants	Each Collection Cycle
Prepare and Send Master Data Sheets to each Participant	Each Collection Cycle
Receive Verified Master Data Sheets from each Participant	Each Collection Cycle
Enter Data - From Master Data Sheets to Database	Each Collection Cycle
Run Test Reports and Cross Reference	Each Collection Cycle
Complete Additional Data Cleaning and Normalising as Needed	Each Collection Cycle
Update and Finalise Data in Database	Each Collection Cycle
Run Participant Reports	Each Collection Cycle
Review, Test, Check and Re-Clean / re-Normalise data as needed	Each Collection Cycle
Deliver Participant Reports	Each Collection Cycle
Follow Up to Ensure Reports Received	Each Collection Cycle
Interact with Participants as Required	Each Collection Cycle
Receive Feedback and Refinement from Project Reference Group / ABGC / HAL	At Industry Reporting Points
Deliver Final Industry Report	At Industry Reporting Points
Dissemination / Technology Transfer as Per Contract Undertakings	At Industry Reporting Points

There has been a large body of data collected from over 200 producers, from no less than four (4) growing regions, and over four separate financial years. The information provided by participants has been delivered in a multitude of forms and levels of detail.

Every attempt has been made to cross check and validate information as it has been transformed from raw data and notes into a form suitable for entry into a software database package. A particularly crucial step in this process is the effort applied to ensuring that the data from each participant is not entered into the specifically designed software until it is in a consistent format.

One example of this is the conversion of all harvest statistics to a common measure, in this industry that measure is 13 Kg carton equivalents. This requires all other forms of harvest data provided by any participant to be converted to this measure accurately. This process is also referred to herein as ‘cleaning and normalising’.

5.3.1 AN EVOLVING PROCESS

At the completion of each year of data collection, analysis and entry into the software package each of the key elements of the process have been reviewed and modified where deemed desirable. This has meant that at least the following elements of the process have been reviewed and modified or improved after each data collection year or cycle:

1. Data Checklists,
2. Master Data Sheets,
3. Software package, and
4. Design of Reports for delivery to participating enterprises.

The reports designed and delivered to participants have been reviewed and modified every year in the program to date. New reports have also been developed where it is considered that information can be delivered in more meaningful formats.

As one example, in the last cycle of data collection a Dash Board Report has been designed. This is a one page report that enables each participant to see a “Snapshot Comparison” of their business compared to the benchmarking group across five (5) key areas, being:

1. Productivity (per producing hectare),
2. Financial Performance,
3. Pack Out,
4. Labour Use Efficiency,
5. Key Costs Management.

6. Results

6.1 Structure of this Results Section

The information provided in this results section has been structured specifically to provide concise and accurate delivery of the key findings out of the information collected over three normal years from multiple regions.

The information is presented using key headings of:

1. Farm Productivity,
2. Quality and Pack Out,
3. Operating Costs and Returns,
4. Labour Use Efficiency,
5. Marketing and Management Practices,
6. Top 10 Performance,
7. Input – Output Correlations (for Tropical Cavendish Production).

There is a specific section dedicated to the performance of the Top 10 Most Profitable Businesses. However where ever possible the performance of the Top 10 is also included in each part of this Results Section, in comparison to the entire benchmarking group and to the remainder of the group (excluding the Top 10)

6.1.1 VARIETIES GROWN AND THE DATA PRESENTED.

The data presented in this section is data collated from production of all varieties including Cavendish, Lady Finger and all others where grown, unless otherwise stated. Analysis that identified that less than 5% of the total producing area captured in the benchmarking group data and less than 3% of the production captured in the benchmarking group data was related to a variety other than Cavendish. Including Lady Finger data with Cavendish where appropriate has shown no material impact in the measurement of key performance indicators in the data sets analysed.

However, in the section dedicated to investigating input – output correlations (Section 6.7) the data used is for Cavendish production data only.

6.2 Farm Productivity

6.2.1 AVERAGE AND MEDIAN VALUES FOR THREE NORMAL YEARS

The average production per producing hectare across the three normal years' data is provided in Table 7.

Table 7: Farm Productivity of Participant Group

	2009	2010	2013	Aggregate 3 Year Results			
				Group	Top 10	Remainder	Variance %
Average Tonnes / Ha	29	30	32	30	36	29	24%
Median Tonnes / Ha	30	31	32	29	36	29	24%
Average Carton / Ha	2,251	2,302	2,485	2,331	2,748	2,240	23%
Median Cartons / Ha	2,295	2,396	2,481	2,263	2,796	2,196	27%
Average Cartons / Acre	911	932	1,006	943	1,112	907	23%
Median Cartons / Acre	929	970	1,004	916	1,132	889	27%

6.2.2 KEY DATA ON FARM PRODUCTIVITY

1. The average yield per producing hectare for all participants across three normal years was 2,331 cartons (13 Kg cartons equivalent) per hectare (range 2,251 to 2,485 per hectare year to year) or 943 cartons per acre (range 911 to 1006 per acre year to year).

2. The TOP 10 businesses delivered an average of 508 cartons per hectare more yield per hectare than the remainder of the benchmarking group (23% variance between Top 10 and the remainder).

3. Median or mid-point values demonstrated for average production per hectare were 2,263 per hectare for the whole group, 2,796 for the Top 10, and 2,196 for the remainder (excluding Top 10).

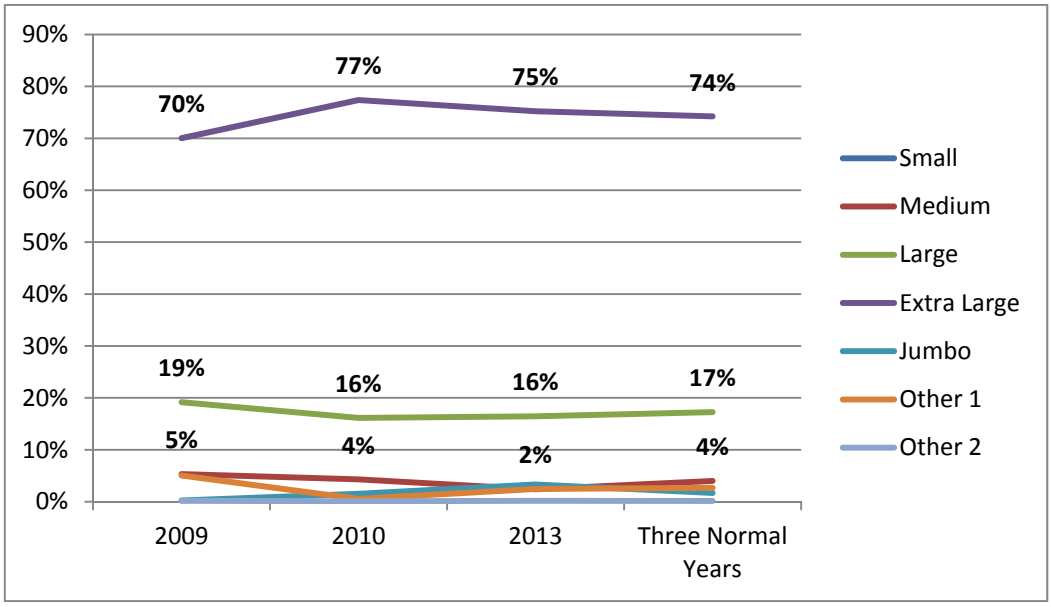
6.3 Quality and Pack Out

6.3.1 GRADE AND SIZE

The participants in this program have demonstrated a highly developed ability to deliver product to market that complies with the size and grade for which the major end user groups are paying a premium price per kilogram. The amount of product supplied by participants that was not of premium grade was negligible in almost all cases.

The average percentage of product that was sold each year as Extra Large has been consistently above 70% as illustrated in Figure 9.

Figure 9: Pack Out to Size Counts – Three Normal Years



Further to the above, other analysis of the data generated from the participant group has shown that the relationship between the pack out to size counts and Cash Profit achieved is not strongly direct 9 (or inverse).

Although individual enterprises that achieve below average levels of pack out to Extra Large may well benefit from improving this aspect of their business, this factor is not a high priority at industry level. It also suggests that the very direct commercial relationships between % packed into Extra Large and the aggregate price achieved has been a very effective market feedback mechanism and has significantly shaped producer practices and outcomes.

A corollary may also be that:

Should consumers demand smaller bananas, and major end users take that consumer message on board and adjust their pricing grids to encourage the delivery of smaller fruit, producers have the skills to respond very directly.

If current discussion about the demand for smaller fruit is an accurate reflection of consumer demand expectations, the impetus for affecting a change to supply of smaller fruit is soundly in the hands of major end users (e.g. major supermarkets)

6.4 Operating Costs and Returns

In Table 8 provides the collated information demonstrating overall costs and returns for the benchmarking group participants across three normal years' data.

Table 8: Costs and Returns for Participant Group

	2009	2010	2013	Aggregate 3 Year Results			
				Group	Top 10	Remainder	Variance %
Average Gross Return / Carton Equiv. (Before Paying Marketing and Ripening Costs	21.48	21.26	24.04	22.34	22.88	22.24	+ 3%
Average Farm Gate Return / Carton Equiv. (After Paying Marketing and Ripening Costs	20.45	20.23	21.96	20.93	21.58	20.32	+ 6%
Average Operating Costs / Carton Equiv.	19.53	19.11	21.40	20.07	16.43	20.80	(-21%)
Cash Profit / Carton Equiv. (Before Paying Finance and Depreciation)	1.90	2.15	2.63	2.27	6.45	1.44	+ 348%

6.4.1 KEY DATA ON OPERATING COSTS AND RETURNS

The average group outcomes for costs and returns demonstrated by participants are:

1. Gross Return per 13 Kg Carton Equiv. $22.34
2. Operating Costs per 13 Kg Carton Equiv. $20.07
3. Cash Profit (EBITDA) per 13Kg Carton Equiv. $ 2.27
4. Cash Profit per 13 Kg Carton Equiv. as % of Gross Income 10.16%

5. The Average Farm Gate Return demonstrated from three normal years' data was $20.93 per 13 Kg Carton Equivalent. This is the return that a large majority of producers physically see when they receive remittance reports from their marketers after the marketer has deducted the marketing fees and ripening fees from the gross / sales return.

6. The Top 10 have demonstrated similar gross and farm gate returns to the remainder of the group and a notably lower operating cost per 13Kg Carton Equivalent ($16.43 per carton equivalent compared to $20.80).

7. The Top 10 performing enterprises have demonstrated a Cash Profit (EBITDA) of $6.45, compared to $1.44 for the remainder of the benchmarking group (excluding the Top 10).

Care must be taken when reviewing and intepreting average costs and returns for particopants in any primary production sector. There is often a wide range of outcomes across operators in any rural industry.

This is the case for the participant group. In Figure 10, Figure 11 and Figure 12 the range of average results found across the total participant group is provided. The information is also summarised in Table 9..

Table 9: Range of Costs and Returns for Participant Group

	Average	Median value	Highest	Lowest
Gross Return ($ / Carton Equiv.)	22.34	21.33	48.04	8.38
Operating Costs ($ / Carton Equiv.)	20.07	20.45	63.23	8.88
EBITDA or Cash Profit ($ / Carton Equiv.)	2.27	1.57	13.15	(-35.04)

Figure 10: Range for Participants - Income per Carton Equivalent for Participants

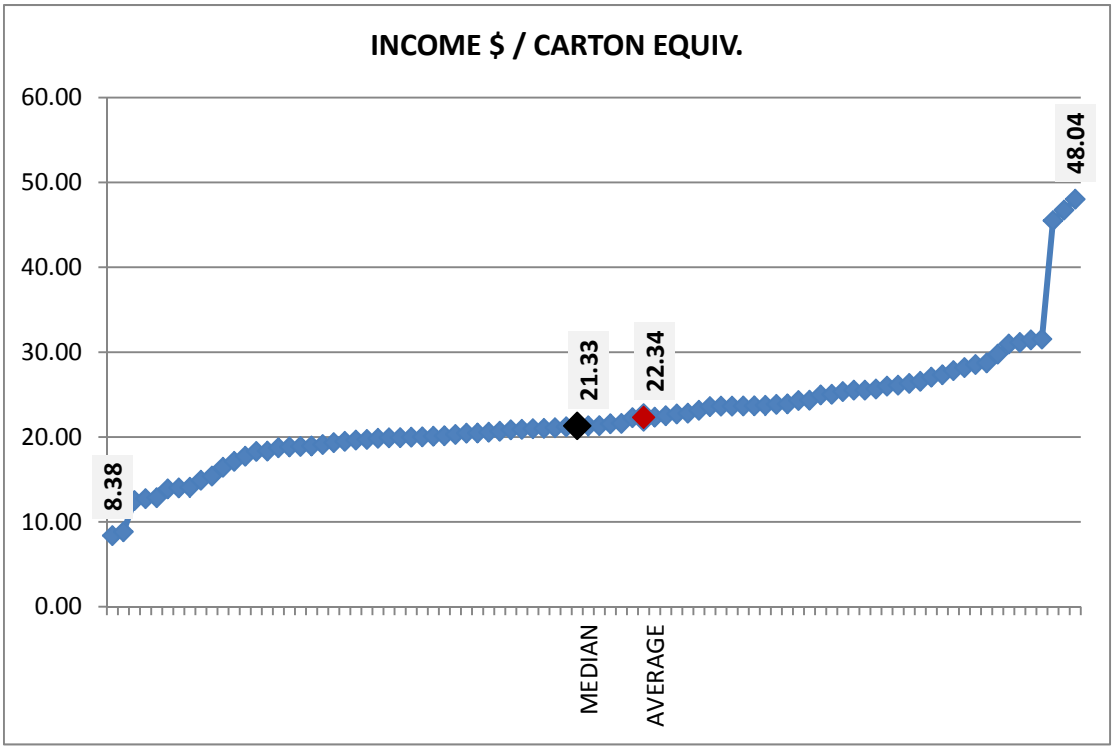


Figure 11: Range for Participants - Operating Costs per Carton Equivalent for Participants

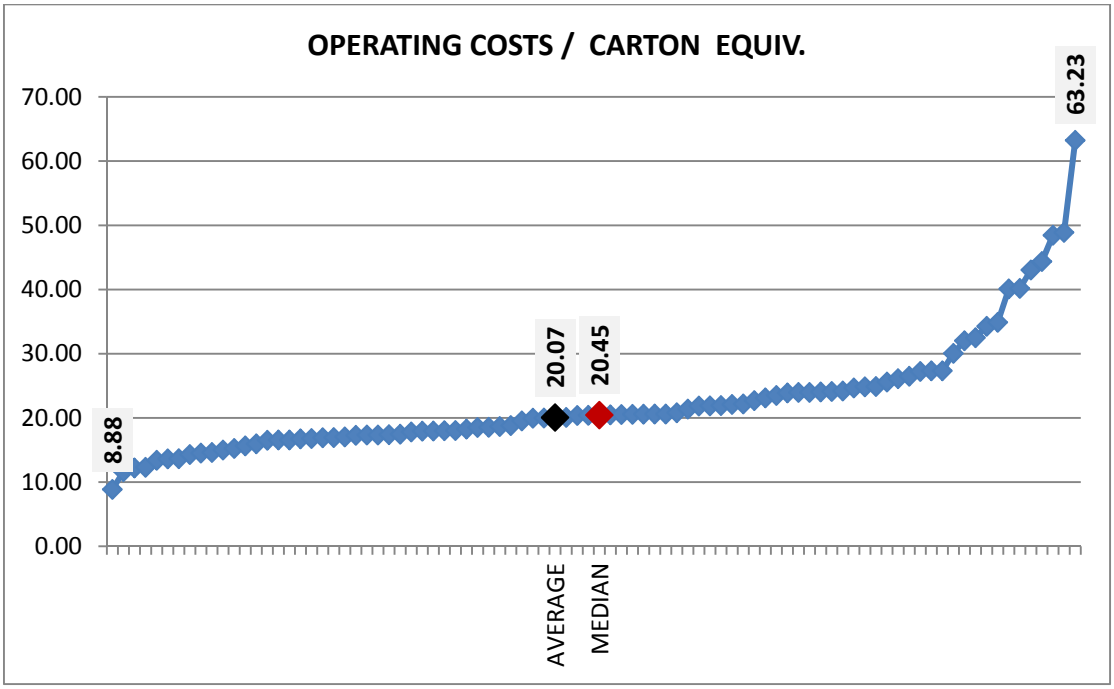
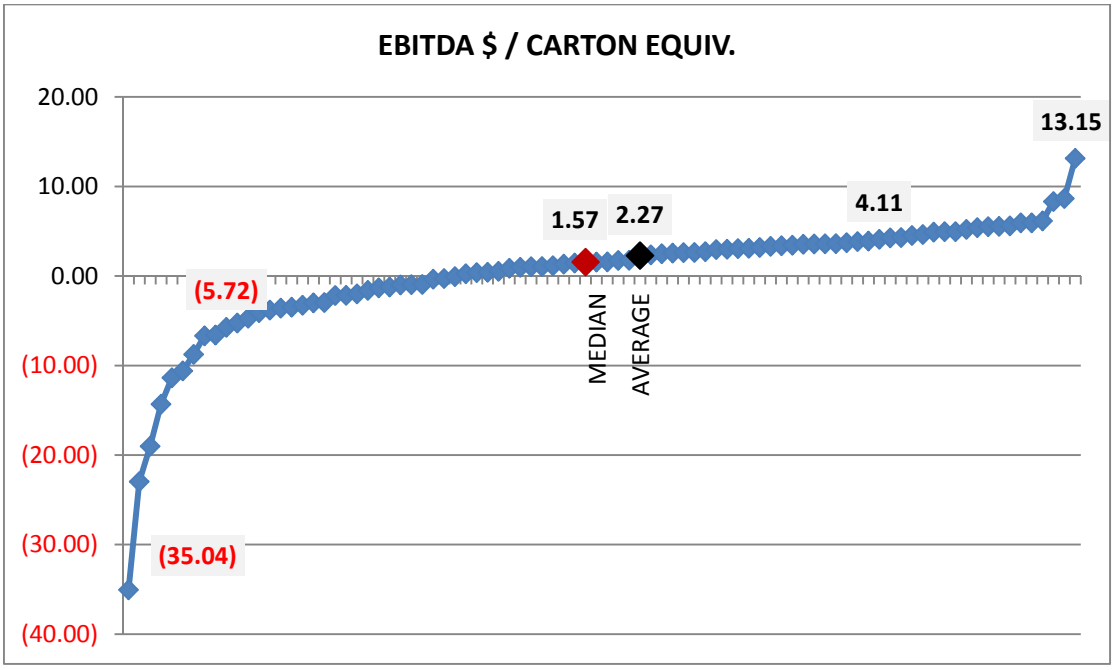


Figure 12: Range for Participants - Cash Profit (EBITDA) per Carton Equivalent for Participants



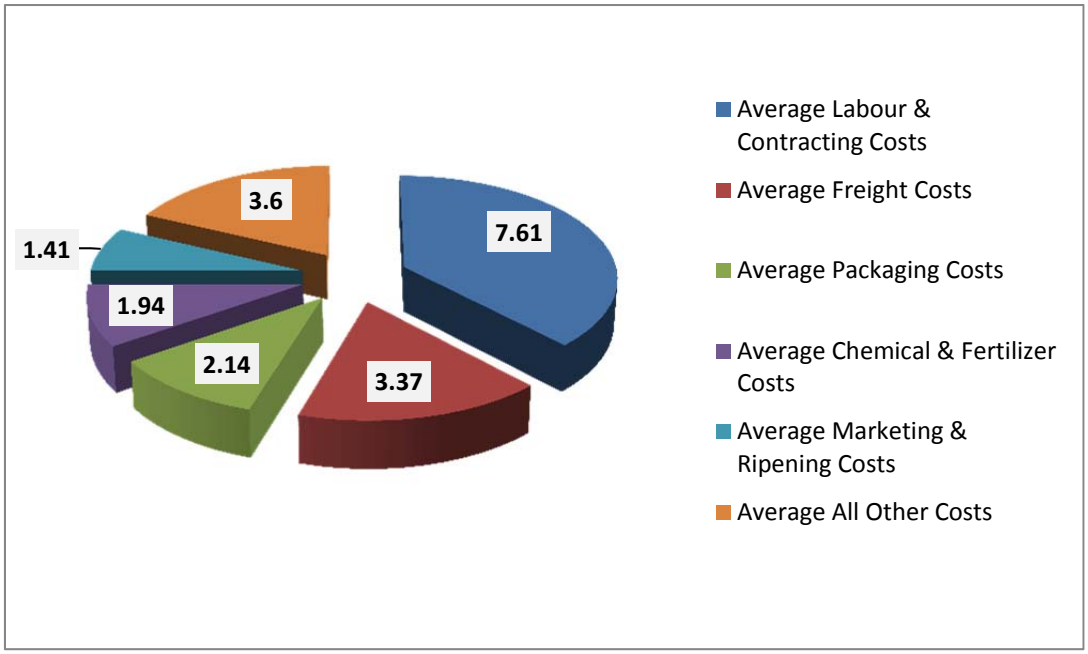
6.4.2 MAJOR COST CATEGORIES

The data collected and analysed in this program provided a very clear picture of where the majority of costs are incurred by participant banana producers. The top seven cost items or cost categories have accounted for 88 % of all operating costs incurred by participants. In Table 10 the group averages for major cost cetegories are outlined and grahically ilustrated in Figure 13.

Table 10: Importance of Major Cost Categories

	$	% of Total Income	% of Total Operating Costs
Employment Costs	6.52	28%	32%
Freight	3.47	15%	17%
Packaging & Pallets	2.21	10%	11%
Chemicals & Fertilizers	2.00	9%	10%
Marketing and Ripening Fees	1.46	6%	7%
Consultants and Contracting	1.31	6%	7%
Repairs & Replacements	0.87	4%	4%
Total Operating Costs	20.07	**78%**	**88%**

Figure 13: Major Cost Categories per Carton Equivalent for Participants



Far more detail about this finding is provided in Table 11.

Table 11 demonstrates the difference in these major cost areas between the Top 10 and the remainder of participants.

The Top 10 demonstrate 21% less labour and contracting cost and overall 18% less cost in the major cost categories, compared to the remainder of the participants. The criticality of effective labour and contracting management is clearly demonstrated.

Further discussion of the similarities and differences between the Top 10 and the remainder of the participants is provided in Section Section 6.7.

Table 11: Costs in Major Cost Categories for Participant Group

	2009 & 2010 Aggregated	2013	Aggregate 3 Year Results			
			Group	Top 10	Remainder	Variance %
Average Labour Costs / Carton Equiv.	6.02	6.88	6.33	4.93	6.58	-25%
Average Contracting Costs Including Contract Packing Where Used / Carton Equiv.	1.44	0.98	1.28	1.21	1.43	-15%
Average Labour & Contracting Cost / carton Equiv.	7.46	7.86	7.61	6.14	8.01	-23%
Average Freight Costs / Carton Equiv.	3.19	3.68	3.37	2.56	3.53	-27%
Average Packaging Costs / Carton Equiv.	2.03	2.34	2.14	2.31	2.11	9%
Average Chemical & Fertilizer Costs / Carton Equiv.	2.01	1.83	1.94	2.05	2.01	2%
Average Marketing & Ripening Costs / Carton equiv.	1.03	2.08	1.41	1.30	1.92	-32%
AVERAGE FOR 6 TOP COST ITEMS	15.72	17.79	16.47	14.36	17.58	-18%
Labour Costs as % of Total Operating Costs	31%	32%	31%	30%	32%	-5%
Labour & Contracting Costs as % of Total Operating Costs	39%	37%	38%	37%	38%	-3%
Top 6 Cost Items as % of Total Operating Costs	81%	83%	82%	87%	84%	3%

6.4.3 PROFITABILITY OF PARTICIPANTS ACROSS THREE NORMAL YEARS

Sixty eight percent (68%) of the participants across the three normal years reported a profitable banana producing operation (cash profit, EBITDA) prior to paying for tax, interest, depreciation and amortisation and prior to delivering a return on capital invested.

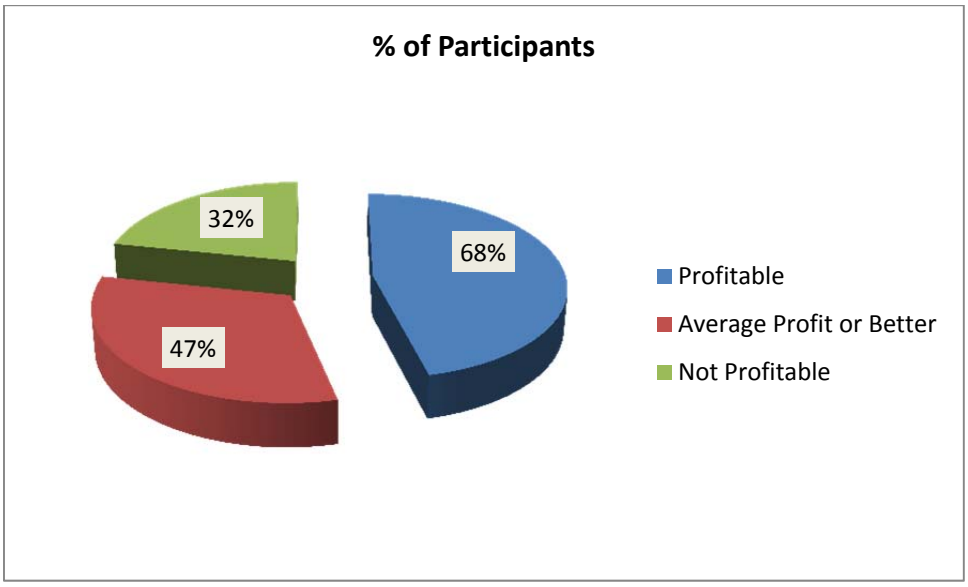
Forty Seven percent (47%) of all participants achieved a cash profit (EBITDA) that was equal to or greater than the average reported across the total benchmarking group and thirty two percent (32%) reported losses from banana production operations.

Table 12 and Figure 14 illustrate the level of profitability found amongst benchmarking participants.

Table 12: Percent of Participants that are Profitable

	2009	2010	2013	TOTAL	%
Total Participants	49	60	46	155	
Total Profitable	33	48	25	106	68%
Total Not Profitable	16	12	21	49	32%
Total 'Average Profit or Better'	24	30	19	73	47%

Figure 14: Percent of Participants that are Profitable



6.5 Labour Use Efficiency

The importance of labour costs in banana producing enterprises is very clearly demonstrated previously. Labour costs may be increased by the mix of labour employed on farm, such as how many personnel are engaged at management level verses those engaged on the 'shop floor'.

It also important to investigate the efficiency of labour used in banana production enterprises. For labour management to be efficient requires all labour (management and shop floor positions) to be used in combinations that improve the overall efficiency of labour employed.

There were a total of 2,942 Full Time Employee Equivalent units (FTEs) engaged in participant enterprises, across the three normal years.

An FTE *is the cost equivalent of employing one employee for an entire year (financial year in this instance). Assuming an average 38 hour week as per award conditions this further translates into 1,976 hours of labour per annum, or 260 standard labour days per annum. If the average rate paid in any single year is $21 per hour, this would then equate to $41,496 per annum plus 9.25% super contribution, or a total of $45,334 per annum.*

One simple method of assessing labour use efficiency is to calculate the average amount of produce that is handled in each enterprise per FTE. Table 13 informs that 17.95 million cartons equivalent were produced, packed and sold by the 2,942 FTE units. On average 6,795 cartons equivalent per FTE employed over a period of three normal years.

However, using a measure like 6,795 cartons / FTE / annum is not all that practical as a tool for daily use in managing the efficiency of labour use. A more usable measure is:

Cartons Handled per Labour Day Employed'. This is in fact Cartons per FTE per annum divided by 260 labour days per FTE employed.

6.5.1 KEY DATA ON LABOUR USE EFFICIENCY

In Table 13 several measures of labour use efficiency have been calculated and presented for the three normal years under consideration herein. The highlights of this information include:

1. The average (for three normal years) number of cartons handled per Labour Day Employed for the benchmarking group was demonstrated to be 26 Carton Equivalents / Labour Day Employed
2. The Top 10 demonstrated an average of 36 cartons handled per labour day, being 47% more efficient than the remainder of the benchmarking group
3. The average (for three normal years) number of producing hectares managed for each FTE employed in the benchmarking group was demonstrated to be 2.94 Hectares / FTE Employed
4. The Top 10 demonstrated an average of 3.44 producing hectares managed per FTE, being 20% more efficient than the remainder of the benchmarking group.

In Figure 15 the range of labour use efficiency demonstrated by the benchmarking group is clearly shown.

Figure 15: Cartons Handled per Labour Day for Participants

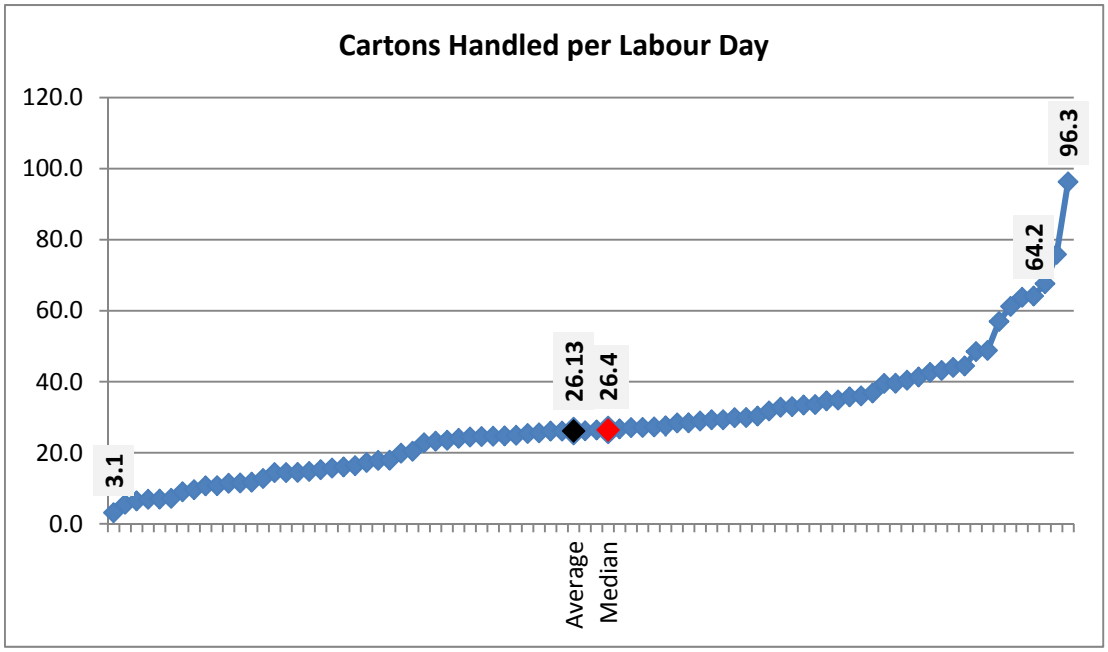


Table 13: Measures of Labour Use Efficiency for Participant Group

	2009	2010	2013	Aggregate 3 Year Results			
				Group	Top 10	Remainder	Variance %
Total Full Time Employee Equivalents (FTEs) Employed by the Group	661	972	991	2,642	316	2,326	
Total Cartons of Produce Handled by the Group	4,703,409	6,747,001	6,518,658	17,952,188	2,984,714	14,967,474	
Total Producing Hectares Managed by the Group	2,049	2,930	2,717	7,767	1,086	6,681	
Hectares Managed per FTE Employed	3.10	3.01	2.74	2.94	3.44	2.87	20%
Cartons Handled per FTE	7,116	6,941	6,578	6,795	9,445	6,435	47%
Cartons Handled per Total Labour Day Employed (1 FTE = 260 Labour Days)	27	27	25	26	36	25	47%

6.6 Marketing & Management Practices

Data was collected designed to identify key patterns and trends in how banana producers undertake some key tasks in the production packing and marketing of bananas.

In the 2008-2009 and 2009 - 2010 financial years this data was collected and collated in descriptive or qualitative formats that later proved to be unsuitable for use in data analysis.

In the latter two financial years, 2011-2012 and 2012-2013 these qualitative questions were redesigned into a format that was able to be used for the collation and analysis.

Table 14 provides a summary of the responses from all participants that contributed to this area of information gathering. Key findings are summarised as:

1. **Sources of Labour**: Participants are 56% reliant upon international workers and workers other than Australian or local employees and the main avenues for accessing labour used are from backpacker hostels /coordinators and 'walk up' or referral from continuing workers,
2. **Contracting**: Is utilized mostly for de-suckering (47%), bell injecting (27%), bagging (21%), spraying (including aerial spraying) (18%) and de-leafing (18%),
3. **Irrigation Decision Making:** is based on visual inspection or personal judgment for 59% of participants and a further 32% employ irrigation monitoring technologies including Tensiometers, neutron probes and Enviroscan equipment,
4. **Irrigation Frequency**: Fields / blocks are irrigated weekly or more frequently than weekly by 87% of the participants,
5. **Pest (Insect) Management**: Participants have indicated that:
6. 35% treated for Nematodes in 2011-2012 and 2012-2013, and
7. 100% treated for Weevil Borer, and 68% treated for Can Beetle (often by 'default' due to the use of chemicals that treat both Weevil Borer and Can Beetle,
8. **Nutritional Analysis**: 92% of participants undertake soil testing for nutritional decision making at least once every year (43% doing so at least twice per year) whereas leaf testing is less often used with 60% of participants using this technology at least once per year,
9. **Use of (paid) External Advise on Farms**: 635 of respondents report using paid external advise for nutrition program design and 26% report using paid external pest and disease scouts / bug checkers,
10. **Nurse Suckering or Crop Timing**: is practiced to some degree by 49% of the participants and the great majority of practitioners do so on less than 50% of their plantation each year,
11. **Packing Strategy:** 90% of participants pack their own produce on farm and the remainder (10%) use contract packers.

12. **Marketing Channel;** 18% of the produce sent to market by participants is sold directly to supermarkets , 24% is sold via brokers who commonly have a mode of operation that is transparent and equal to or similar to and 'agency' role and the remaining 58% of produce is delivered to market via wholesalers / merchants and other entities,

13. **Involvement in Marketing:** 69% of participants indicate that they have a low or medium level of involvement in the marketing of their produce and 31% appear highly involved in marketing.

Table 14: Summary Marketing and Management Practices Information

Item	% of Respondents
Origins of Farm Labour	
Local / Australian Workers	44.22%
International Workers / Backpackers	35.26%
Other (Including Miscoding)	20.52%
Sources of Farm Workers	
Labour Hire Co	2.38%
Backpacker Hostels or Coordinators	51.33%
Walk / Referral / Other	46.30%
Use of Contractors	
De-suckering	46.77%
Bell Injecting	27.42%
Bagging	20.97%
Spraying	17.74%
De-leafing	17.74%
Other	11.29%
Planting	6.45%
Harvesting	6.45%
Agronomic Services	0.00%
Method of Irrigation Monitoring (Scheduling)	
Visual / Judgement	59.16%
Tensiometers	14.08%
Neutron Probes	1.41%
Enviroscan	16.90%
Tensiometers, Nuetron probes, Enviroscan	32.39%
Fixed Scheduling	7.04%
Other	1.41%
Irrigation Intervals (When Irrigating)	

Item	% of Respondents
More than Once per Day	20.29%
Daily	24.64%
Every 2 Days	21.74%
Twice Weekly	20.29%
Irrigate More Frequently than Weekly	86.96%
Weekly	11.59%
Less Frequently Than Once Per Week	1.45%
Frequency of SOIL Nutrition Analysis	
Never	5.41%
Less Frequently Than Once Per Year	0.00%
Once Per Year	48.64%
Twice per Year	35.14%
More Than Twice per Year	8.11%
At Least Once per Year	91.89%
Other	2.70%
Frequency of LEAF Nutrition Analysis	
Never	27.03%
Less Frequently Than Once Per Year	8.11%
Once Per Year	29.72%
Twice per Year	13.51%
More Than Twice per Year	16.22%
At Least Once per Year	59.45%
Other	5.41%
Key Pest Management Issues	
Applied Nematode Treatment	35.19%
Applied Cane Beetle Treatment	68.52%
Applied Weevil Borer Treatment	100.00%
Use of External Advice	
Engaged Pest Scouts / Monitors / Pest Agronomist	25.93%
Engaged external Nutritional Advisor / Agronomist	62.96%
Engaged Other Types of Advice for Farm Practices	0.00%
Frequency of Bell Injection	
Every 7 Days	89.85%
Every 14 Days	2.90%

Item	% of Respondents
Every 21 Days	0.00%
Every 28 Days	0.00%
Never	7.25%
Other	0.00%
Interval Between Bell Injection and Bagging	
Every 7 Days	68.85%
Every 14 Days	24.59%
Every 21 Days	0.00%
Every 28 Days	0.00%
Never	4.92%
Other	1.64%
Practice and Scale of Nurse Suckering	
No Nurse Suckering Practiced	50.68%
Up to 20% of Producing Area	30.14%
21% to 40% of Producing Area	10.96%
41% to 50% of Producing Area	2.74%
51% to 75% of Producing Area	2.74%
76% to 100% of Producing Area	2.74%
Packing Strategy Adopted	
Use Own Pack House / In House Packing	89.55%
Use Contract Packing House	10.45%
Marketing Strategy	
Produce Marketing Channel Used	
Direct to Supermarkets	17.84%
Via Brokers	24.10%
Through Wholesalers	54.22%
Through Exporters or Direct to Export	0.00%
To Processors, Value Adders, Oil etc.	0.02%
Other	3.82%
Degree of Involvement / Skill In Marketing	
Low	33.80%
Medium	35.21%
High	30.99%

6.7 The "Top 10" Over Three Normal Years

The banana enterprise performance comparison project is very similar to what is termed a Performance Benchmarking Program.

Performance Benchmarking is simply described as:
"The process of gathering information about other companies in your industry that enables you to compare your performance against the performance of others / your peers, and for setting future goals and priorities in your business.

It is also closely related to the concept of 'best practice'. Both of these over-arching concepts are in reality tools that are used by enterprises in many industries to drive a process of **'continuous improvement'.**

To focus on continuous improvement one needs to have targets to aim for, these are considered "Best Practice" processes and outcomes, that in themselves keep shifting as even the best participants become better at what they do.

The outcomes and achievements of the most successful enterprises in the benchmarking group have been adopted as the "Best Practice" targets to improving performance.

The Top 10 most profitable (Cash Profit / EBITDA) per 13 kilogram carton equivalent have been analysed as a group. The Top 10 enterprises are all Cavendish banana growers and over three normal years these enterprises demonstrated:

1. An average of 42 producing hectares (median also 42 producing hectares) and ranged from 90 to 11 producing hectares,
2. All being categorized herein as either small family owned enterprises (1 to 20 producing hectares) or mid-sized and / or diversified family owned enterprises (21 to 130 producing hectares), and
3. Being made up of eight (8) enterprises from the Cassowary Coast region, one (1) enterprise from New South Wales and one (1) enterprise from the Atherton and Lakelands region.

6.7.1 KEY MEASURABLE DIFFERENCES BETWEEN TOP 10 AND REMAINDER

The most notable differences in key measurable areas of productivity and costs and returns are provided in Table 15. This analysis indicates that the Top 10 most profitable benchmarking participants, on a per carton equivalent basis demonstrate:

1. Twenty three percent (23%) greater yield per producing hectare compared to the remainder (equivalent to an average 500 cartons per hectare) over three normal years,
2. Twenty one percent (21%) lower total operating costs per carton equivalent (equal to an average $4.38 / carton equivalent) lower operating costs than the remainder over three normal years, and

3. An average $4.62 (252%) more Cash Profit (EBITDA) per carton equivalent than the remainder of the benchmarking group over three normal years.

Table 15: Most Notable Top 10 Attributes Compared to Remainder

Item	Top 10	Remainder	Variance % (Difference [%] Between Top 10 and Remainder
Yield (Carton Equivalents / Producing Ha	2,748	2,240	+ 23%
Total Operating Costs $ / carton Equivalent	16.43	20.81	- 21%
Cash Profit (EBITDA) $ / Carton Equivalent	6.45	1.83	+ 252%
Total Labour and Contracting Cost $ / Carton Equivalent	*6.15*	*8.69*	*- 29%*

The difference in the average cost profiles for the Top 10 and for the remainder of the benchmarking group is provided in Table 16.

Table 16: Top 10 - Detailed Differential Analysis of Key Outcomes

KPI Consolidation Group	Top 10	Remainder	Variance	Variance %	Total BM Group
Produce Sales	22.61	22.24	0.37	2%	22.63
Other Revenue	0.27	0.40	(0.13)	-32%	0.41
TOTAL INCOME	22.88	22.64	0.24	1%	23.04
Employment Costs	4.93	6.58	(1.65)	-25%	6.52
Freight	2.56	3.53	(0.97)	-27%	3.47
Packaging & Pallets	2.31	2.11	0.20	10%	2.21
Chemicals & Fertilizers	2.05	2.01	0.05	2%	2.00
Marketing and Ripening Fees	1.30	1.92	(0.62)	-32%	1.46
Consultants and Contracting	1.21	1.43	(0.23)	-16%	1.31
Repairs & Replacements	0.69	0.99	(0.30)	-30%	0.87
TOP 6 COST ITEMS	15.06	18.57	(3.51)	-19%	17.86
General	0.59	0.95	(0.36)	-38%	0.71
Rates, Levies Fees	0.32	0.41	(0.09)	-22%	0.67
Finance Costs	0.30	0.33	(0.03)	-9%	0.39
Dep. & Amort.	0.22	0.33	(0.10)	-31%	0.38
Fuel & Oil	0.21	0.21	0.00	1%	0.34
Power and Gas	0.13	0.21	(0.08)	-38%	0.31
Insurance	0.06	0.10	(0.04)	-37%	0.22
Motor Vehicles	0.05	0.10	(0.05)	-48%	0.20
Contract Packing Fees	0.00	0.08	(0.08)	-100%	0.10
Water	0.00	0.05	(0.05)	-99%	0.07
TOTAL COSTS	16.95	21.35	(4.39)	-21%	21.28
NET PROFIT	5.93	1.29	4.64	359%	1.76
FINANCE COSTS	0.30	0.33	(0.03)	-9%	0.34
EBIT	6.23	1.62	4.61	284%	2.10
DEPRECIATION & AMORTISATION	0.22	0.21	0.02	8%	
OPERATING COSTS	16.43	20.81	(4.38)	-21%	20.94
EBITDA	6.45	1.83	4.62	252%	2.10
13 KG Cartons Equivalent	2,984,714.08	14,967,474.31			17,952,188.38
Producing Hectares	1,085.96	6,681.19			7,767.00
Yield (Cartons per Hectare)	2,748.46	2,240.24	508.22	23%	2,311.34
Yield (Cartons per Acre)	1,112.26	906.93	205.34	23%	935.71
Total Labour and Contracting	6.15	8.69	(2.54)	-29%	7.84
Farm Gate Return (After Marketing & Ripening Costs)	21.31	21.20	0.10	0%	21.18

6.7.2 TOP 10 - MARKETING AND MANAGEMENT PRACTICES

As outlined in Table 17, there are several areas of marketing and management practices where differences have been identified between the Top 10 and the remainder of the group. The key areas are:

1. Higher % of produce sold direct to supermarkets and via brokers (+84% variance),
2. Greater utilization of paid external nutritional advise (+43% variance),
3. Higher adoption of irrigation decision making technologies and fixed scheduling of irrigation (+88% variance)
4. Higher frequency of irrigation (when irrigating))=(+37% variance)
5. Greater use of contract spraying (including aerial spraying) (+195% variance)
6. Greater use of soil and leaf testing for nutrition management.

Table 17: Major Differences in Practices – Top 10 and Remainder

	% of Respondents		
	Top 10	Remainder	Variance % Top 10 Compared to Remainder
Marketing Strategy			
% of Crop Sold Direct to Supermarkets	30.56%	16.06%	90.29%
% of Crop Sold Via Brokers	22.78%	24.28%	-6.18%
% of Crop Sold Direct to Supermarkets or Via Brokers	53.34%	40.34%	32.23%
Use of External Advice			
Engage external Nutritional Advisor / Agronomist	85.71%	59.57%	43.88%
Packing Strategy Adopted			
Use Own Pack House / In House Packing	100.00%	88.52%	12.97%
Method of Irrigation Decision Making			
% of Participants using Irrigation Monitoring Technology	44.45%	30.65%	45.02%
% of Participants using Fixed Irrigation Scheduling	22.22%	4.84%	359.09%
% of Participants using Monitoring Technology or Fixed Irrigation Scheduling	66.67%	35.49%	87.86%
Irrigation Intervals (When Irrigating)			
Irrigate At Least Every 2 Days when Irrigating	87.50%	63.93%	36.87%
Practice and Scale of Nurse Suckering			
Apply Nurse Suckering / Crop Management to At Least 20% of Plantation	33.33%	17.18%	
Use of Contractors			
Use of Contract Spraying	42.86%	14.55%	194.57%

	% of Respondents		
	Top 10	Remainder	Variance % Top 10 Compared to Remainder
Frequency of Soil Nutrition Analysis			
Once Per Year	0.00%	54.55%	-100.00%
Twice per Year	100.00%	27.27%	266.70%
Frequency of Leaf Nutrition Analysis			
Use Leaf Analysis Once or Twice per year or More Frequently	75.00%	57.58%	30.25%
Key Pest Management Issues			
Applied Nematode Treatment	57.14%	31.91%	79.07%
Applied Cane Beetle Treatment	85.71%	65.96%	29.94%
Applied Weevil Borer Treatment	100.00%	97.87%	2.18%

6.8 Input – Output Correlations (Tropical Cavendish Production)

Participants in a performance benchmarking program want to idenfity areas where their management practices and processes can be adapted so as to improve the financial outcomes of the enterprise. There are two levels / types of factors that have been considered in this analysis:

1. **Quantative:** Costs and inputs (i.e. quantifyable or measurable variables) that can be modified in order to improve the business performance of the enterprise. For example:

    a. Key cost categories whose further management can improe business performance outcomes

    b. Other directly measurable aspects of current performance that appear to be directly impacting business performance outcomes

2. **Qualitative:** Practices and processes (not necessarily able to be quantified in data sets) that appear to have significant impacts on business outcomes.

There are also substantial differences in the productivity and cost profile of cavendish banana production and lady finger banana production, in similar growing conditions. Significant differences also occur in costs and outputs from growing cavendish bananas in sub tropical and semi arid conditions

The following discussion therefore has been limited to considering the data generated from the to the production of cavendish bananas in tropical growing regions only.

6.8.1 ENTERPRISE IMPROVEMENT "BUCKET LIST"

here are several areas where material relationships appear to exist between costs and inputs, and business performance outcomes for participating enterprises in tropical cavendish banana production. We term these items "The Bucket List" for enterprise improvement (improved cash profit generation per carton equivalent produced and marketed).

The "Bucket List" of key quantative factors that appear most material in impacting business outcomes (and therefore appear the highest priority in looking for business improvement) are outlined in Table 18.

The fourth column (right hand side) of Table 18 also includes a subjective ranking of how much control exists of each factor, for farm managers or enterprise management.

Table 18: Tropical Cavendish Banana Production – 'Bucket List'

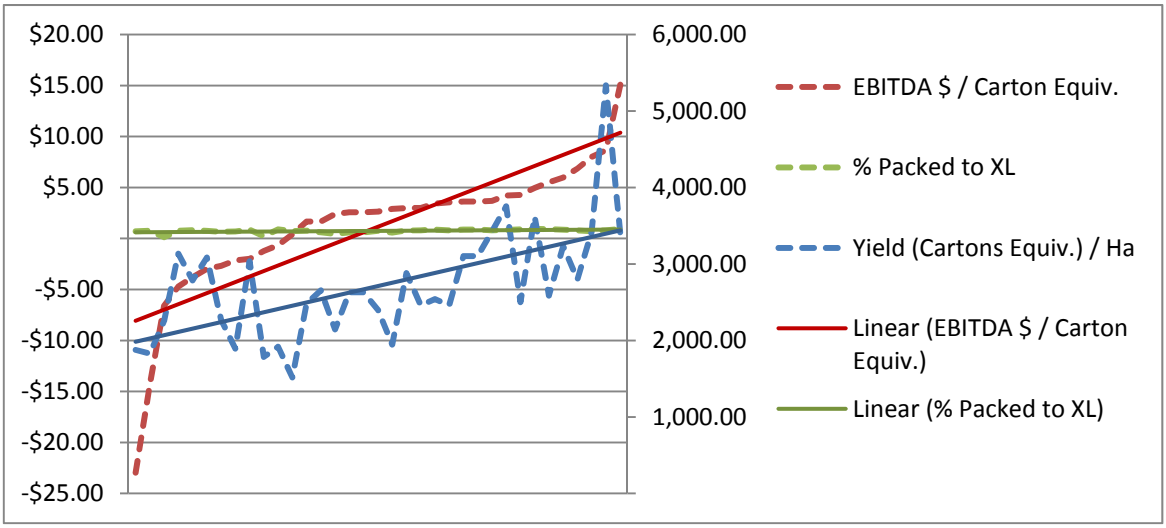
	Average	% of Total Costs $ / Carton Equiv.	Subjective Rank - Degree of Management Control
1. Yield (Cartons Equiv. per Producing Hectare)	2,331		1
2. Labour Costs $ per Carton Equiv.	6.52	31%	1
3. Freight Costs $ per Carton Equiv.	3.47	16%	2
4. Packaging Costs $ per Carton Equiv.	2.21	10%	2
5. Chemical & Fertilizer Costs $ per Carton Equiv.	2.00	9%	2
6. Marketing and Ripening Costs $ per Carton Equiv.	1.46	7%	2
7. Contracting & Consultant (Including Contract Packing Where Used) Costs $ per Carton Equiv.	1.41	7%	1
8. Repairs and Replacements	0.87	4%	1
TOTAL ABOVE COSTS	17.94	84%	

Some of the correlations or inter-relationships that become apparent from this analysis are outlined briefly in the following sub sections.

6.8.2 CASH PROFIT / CARTON EQUIV. AND YIELD AND FRUIT SIZE

1. Cash Profit appears to be directly related to yield per hectare
2. Cash Profit does not appear to be closely related to fruit size delivered to market (suggesting that participants have acquired skills in managing fruit size delivered to market)

Figure 16: Cash Profit (EBITDA) and Yield and Fruit Size

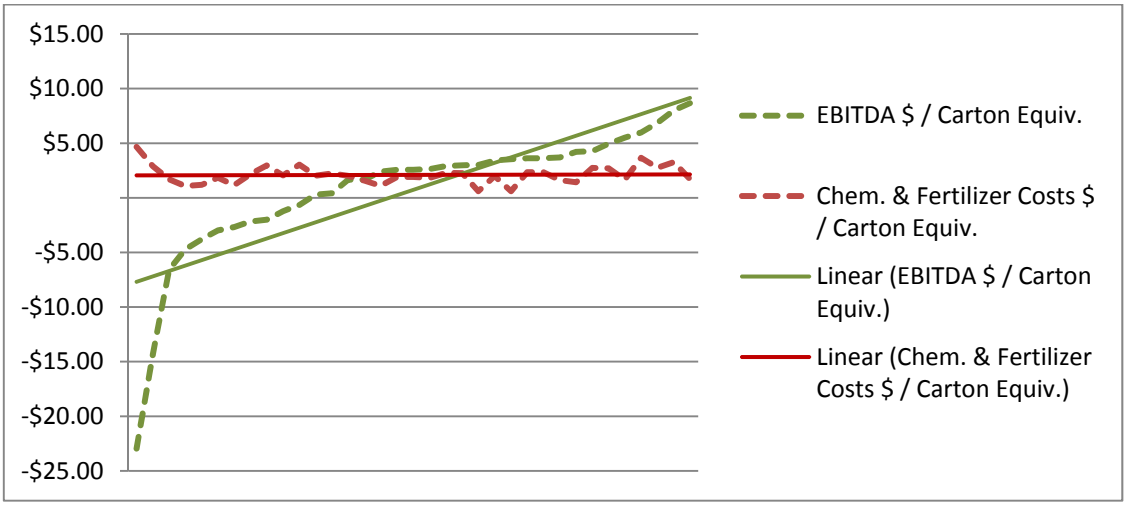


6.8.3 CASH PROFIT / CARTON EQUIV. AND CHEMICAL & FERTILIZER COSTS

1. Whilst yield does appear to be be a determinant of profitability, profitability does not demonstrate a direct relationship to the amount spent on nutrition and plant protection.

2. This suggests that effective nutrition management may be more closely ralated to what is used and applied than to the amount of spend incurred for nutrition and plant protection.

Figure 17: Cash Profit (EBITDA) and Chemical and Fertilizer Costs

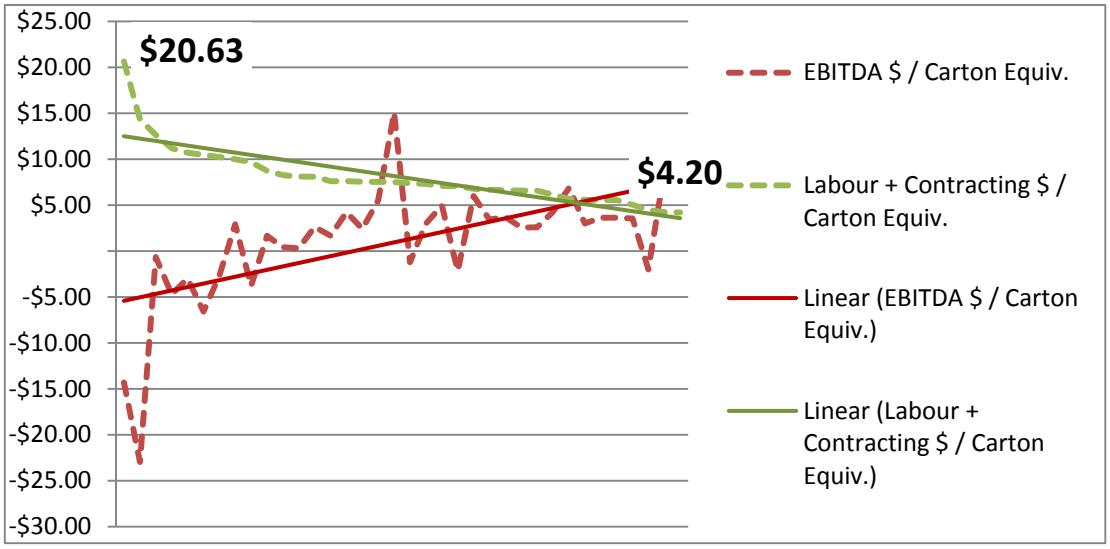


6.8.4 CASH PROFIT / CARTON EQUIV. AND LABOUR + CONTRACTING COSTS

1. Cash Profit appears to have a close inverse relationship with the amount spent on labour and contracting on farm,

2. This suggests that labour and contracting costs are important variables that are having an impact on profitability.

Figure 18: Cash Profit (EBITDA) and Labour + Contracting Costs

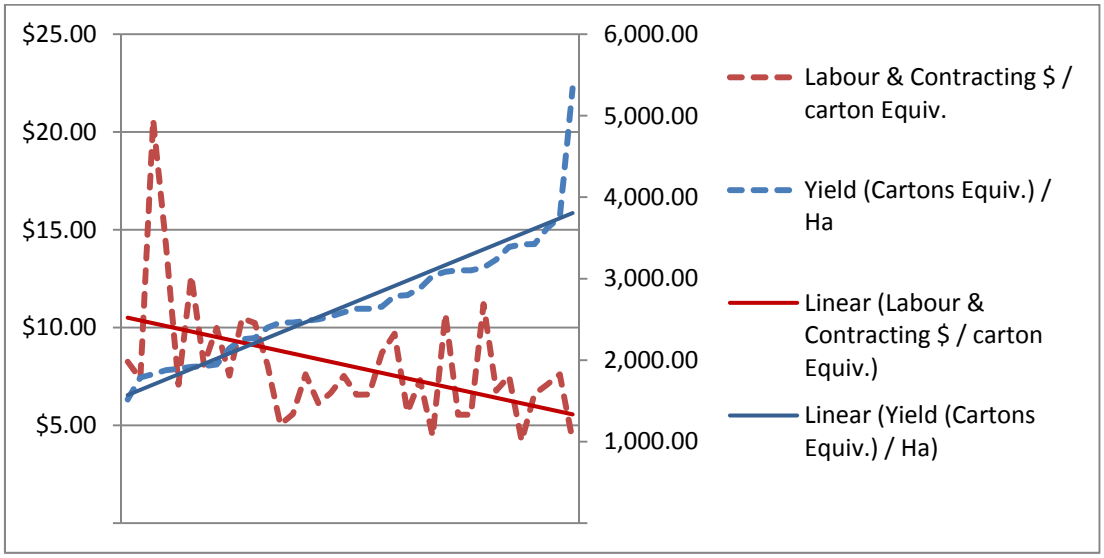


6.8.5 YIELD (CARTONS EQUIV. / HA) AND LABOUR COSTS

3. Labour Costs also appear to be closely and inversely related to yield per hectare,

4. Yield and labour costs are both important variables that are each having an impact on profitability for program participants

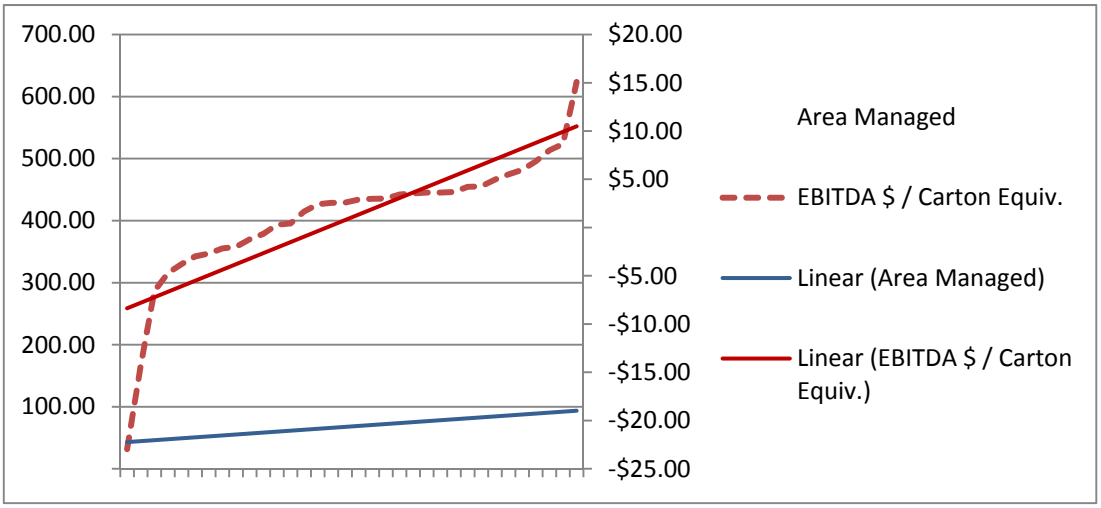
Figure 19: Yield per Hectare and Labour Costs



6.8.6 CASH PROFIT / CARTON EQUIV. AND PRODUCING AREA

1. The data does suggest that profitability improves in enterprises with larger total producing areas.

Figure 20: Cash Profit (EBITDA) and Producing Area Managed



6.8.7 BUCKET LIST AND CORRELATIONS - IN SUMMARY

The data collected from three normal years of operations for enterprises engaged in tropical banana production suggests that the most impactful areas, that are likely to improve business performance or outcomes are:

1. Managing to optimize yield per producing Hectare
2. Managing to minimize or at least reduce / optimize costs incurred for labour and contracting
3. Managing to minimize or at least reduce / optimize the remainder of the cost items outlined in Table 18 which, together with labour costs and contracting costs, account for 84% of the total costs per carton equivalent for participants in the benchmarking program.
4. Of the items listed in Table 18, those that appear most able to be controlled by farm management decisions alone include:
    a. Yield per producing hectare,
    b. Labour and contracting costs, and
    c. Repairs and replacements.
5. The remaining cost items in the 'Bucket List' are, to varying degrees, more complex to address, however remain important to consider.

For example: It may be logical to propose to import packaging at lower cost per unit. However this may cause a detrimental impact on freight costs, since freight operators utilize back-loads to growing areas for the shipping of packaging materials and) other key inputs.

Further discussion of both quantitative and qualitative factors that may have potential to improve business performance will be provided in Section 7.

6.9 Differences between Growing Regions

Following Cyclone Yasi there was a significant shift in the producing area established outside of the Cassowary Coast, namely the Atherton Tablelands and Lakelands regions. The notable shift in focus for production in the Atherton and Lakelands area was driven by two different types of producers, being:

1. Some producers from the Cassowary Coast moved some of their production to the Atherton and Lakelands region and in doing so transferred many years of banana production expertise to this nee area.

2. A number of local families, mainly in the Atherton Tablelands region, decided to begin producing bananas.

There were also a number of established banana producers in the Atherton Tablelands region that saw an opportunity to divest of their banana producing enterprises following the occurrence of Yasi, and sold. These sales were mainly to other established producers in the region.

The mix of producers located in the Atherton and Lakelands regions post Yasi are significantly different to that found prior to Yasi. It is also difficult to compare regions without differentiating between varieties grown and the different production regimes adopted.

Given these material changes to industry make up and dynamics the discussion in this section is based on the results for the 2012-2013 (20130) financial year, for conventional Cavendish banana production only. It therefore also excludes, alternate production regimes such as organic and eco-aligned production systems.

Table 19: Costs, Returns & Productivity by Region in 2013 (Conventional Cavendish)

	UNITS	NEW SOUTH WALES	ATHERTON & LAKELANDS	CASSOWARY COAST
Total 13 Kg Cartons Equivalent Harvested per Producing Hectare	Kgs / Ha	1,107.79	2,554.88	2,667.57
Average Price Achieved $ / 13 KG Carton	$ / 13 Kg	$17.77	$25.32	$23.19
Total Operating Costs (Excluding Interest and Depreciation)	$ / 13 Kg	$22.10	$22.89	$19.69
Average EBITDA per 13 KG Carton Equivalent Sold	$ / 13 Kg Carton	-$4.33	$2.43	$3.50
Cartons Handled Per Total Labour Day Employed	Cartons / Lab. Day	14	23	30

Table 20: Major Cost Categories by Region in 2013 (Conventional Cavendish)

	UNITS	NEW SOUTH WALES	ATHERTON & LAKELANDS	CASSOWARY COAST
Total Labour Costs	$ / 13 Kg Carton Sold	$12.45	$7.61	$5.75
Freight Costs	$ / 13 Kg Carton Sold	$0.43	$5.21	$2.69
Packaging Costs	$ / 13 Kg Carton Sold	$2.95	$2.36	$2.33
Chemical and Fertiliser Costs	$ / 13 Kg Carton Sold	$0.92	$1.83	$1.79
Marketing and Ripening Costs	$ / 13 Kg Carton Sold	$1.46	$1.84	$2.23
Consultants And Contractor Fees (Including Contract packing Fees)	$ / 13 Kg Carton Sold	$0.00	$0.49	$1.89
Repairs & Replacements	$ / 13 Kg Carton Sold	$1.34	$0.87	$0.73

6.9.1 ATHERTON AND LAKELANDS V CASSOWARY COAST

In Table 19 the major differences between the regions in 2013 are outlined. Yields and cash profits on average were lower in the Atherton and Lakelands areas and the total operating costs were higher in that region.

Investigation of the major cost categories in Table 20 also illustrates that the main areas where costs in the Atherton and Lakelands regions were higher than in the Cassowary Coast were labour costs and freight costs. The cost of contracting and marketing and ripening costs appeared lower in the Atherton and Lakelands regions.

Researchers did note that there were a number of participating enterprises in the Atherton Tablelands in particular that experienced significantly higher labour costs than anticipated in the 2013 year.

6.9.2 NEW SOUTH WALES V TROPICAL CAVENDISH PRODUCTION

As also outlined in Table 19 and Table 20 the New South Wales region in 2013 produced on average less than half the yield per hectare than tropical Cavendish producers (conventional production). New South Wales producers also experienced an average price per carton equivalent approximately 30% lower than prices achieved by tropical Cavendish producers

Yields and prices in New South Wales have both been consistently lower across all years of this program. However some of the reasons for the lower prices achieved are due to the significant proportions that some producers sell to alternative markets, in formats that do not include normal packaging costs, marketing and ripening costs or freight costs.

New South Wales producers use a far greater proportion of unpaid family labour in their day to day activities than their tropical counterparts.

In order to apply consistency to data across participants, unpaid family labour costs are estimated and added back into the costs of production in this program, even though they are predominantly unpaid. On a cash flow basis the high cost of labour and the low sales returns include a significant component of non-cash labour cost.

Yield in New South Wales is an area where further research and development may be productive. **However** a note of caution - New South Wales producers also consistently describe difficulties in achieving full disposal of current production and acceptable prices.

This part of the industry is likely to struggle while ever it competes in the same markets and with similar products as the tropical producing regions.

New South Wales banana producers appear to have significantly adapted their business model to a set of market and industry conditions that appear notably adverse for them in recent years. Those conditions include:

1. A major difference in scale and negotiating position in their respective supply chains, between producers in this region and tropical Cavendish producers, with the intrinsic effects of this directing them into a very different production mind set, and

2. Climatic conditions that appear likely to be impacting productivity compared to tropical Cavendish producers,

However, further adaptation appears warranted for this region to continue to be home to a sustainable banana production sector including:

1. Closer market analysis and a search for suitable 'niche' market segments,

2. Tailored differentiation of each of products, distribution channels and relationships with suitable end use segments, and

3. Commitment to delivering end user and consumer satisfaction in selected an newly defined market segments,

…seem integral to this.

This may well be similar in 'approach and mind set' to the direction that appears to now be driving the Western Australian industry.

6.9.3 WESTERN AUSTRALIA AND NORTHERN TERRITORY

Separate analysis of the costs and returns and outcomes achieved in the Western Australian region is not included in this analysis. There were a small number of participants that participated in this program across multiple years and it was considered that publishing differentiated findings related to that region would risk the confidentiality of participants and their sensitive information. Personal one-on-one discussions with Western Australian participants have been adopted as the preferred communication mechanism.

No producers from the Northern Territory participated in this program.

Further summary information about the differences in key performance measures (KPIs) between regions including all participants is provided in the Appendices.

7. Discussion

7.1 Achievement of Project Objectives

The objectives of this project as outlined in the contract (and listed in concise form), are provided in Table 21 along with responses describing how the project has delivered to these objectives.

Table 21: Project Objectives and Delivery

Objective	Delivery
To assist growers to achieve Australian best practice across the full spectrum of the production and marketing of bananas.	Participating producers have received four sets of data and reports that each clearly identify their performance and compare it to the performance of all participants. Those that have interacted with the researchers have used the information for the purpose of improving their performance, base d on their historic performance and rank.
To assist the Australian banana industry to identify its attributes and performance relevant to achieving international best practice.	This has not been achieved to the knowledge of the researchers. Researchers are not aware of any attempt having been made by the industry to use the information collated and delivered to enter dialogue with similar industries in other countries.
Compile a comprehensive understanding of the various production, packing and marketing practices in use by the Australian banana industry from 4 years of data collection.	A comprehensive understanding has been compiled and this has been used to undertake continual changes and improvements to the way data is collected, analysed, and reported to participants and to industry. The data now residing in the software package is a comprehensive history of the operational and financial inputs and outputs, and the common management practices, associated with over $600m worth of bananas as valued at the farm gate. This data also represents approximately 30% of the production of the Australian banana industry over the four years of data collection.
To acquire detailed understanding of the management practices used by growers following Cyclone Yasi and understand any changes that these growers would make in the event of another cyclonic or severe weather event.	A notable shift in the attitude of many producers to some specific practices such as nurse suckering and timing the harvesting of their crop was reported in the year immediately following Cyclone Yasi. It was also notable that some of the renewed interest in these practices did wain in the following year

Objective	Delivery
Evaluate linkages between production, packing, marketing and human management practices and the performance of banana producing enterprise.	The data and its analysis have enabled investigation of both quantitative and qualitative factors that appear to define (to varying degrees) direct or inverse relationships between costs and inputs and management practices and the performance of banana producing enterprises. This area of analysis has been limited to enterprises engaged in the production of tropical Cavendish bananas due to the dominance of this variety in the industry and also in order to contain such analysis to a consistent / homogenous comparative group.
To assist the ABGC to compile data / information relating to specific aspects of banana production that may be of interest to government agencies.	Resulting from this program and further economic analysis completed by the researchers on behalf of the industry, valuable information has been disseminated and used by ABGC in is interaction with its various stakeholder groups. Researchers are not informed specifically whether this information has been used to further inform and discuss with government agencies.
Provide where possible, comparisons of industry performance against the goals of the Australian Banana - 2009-2014 Strategic Plan.	Objective 2 of the Banana Strategic Investment Plan (February 2012) is the area where this research is best able to provide feedback about industry performance compared to the plan. It is difficult to advise the progress of industry compared to the plan due to the fact that the Strategic Plan (2012 – 2014) does not include base line data at the commencement of the planning period, nor does it define a metric with which progress against expectations can be measured <u>However this program has defined that:</u> Production levels, measured as the number of cartons produced per producing hectare for program participants increased by 10% (2,252 cartons / ha to 2,485) between 2008-2009 and 2012-2013. The cost of producing a 13 Kg carton equivalent of bananas or participants has increased by approximately 9.5% in the same period. Cartons handled per standard Labour Day employed for participants has decreased by approximately 7% in the same period – a measure of the efficiency of labour use at the enterprise level. *Caution. There are many variables including significant shifts in where the product is grown (for just one example), that would need to be fully understood prior to treating these observations as true measures of relevance to production efficiency.*
Provide a tool to individuals and industry to identify the benefits (or otherwise) of R&D and grower initiated adjustments to business practices.	Data collated and analysed in this program indicate that several aspects of managing and operating a banana production enterprise deserve focus in future research and development priorities. For one example: the criticality of managing labour and contracting costs, and maximising or optimising yield per hectare. These areas warrant strong focus in future research and development planning.
Provide recommendations to industry	The key findings as discussed elsewhere in this report do suggest there

Objective	Delivery
based on the analysis of qualitative and quantitative data collection and reporting for further industry R&D activities that will benefit the whole of the Australian banana industry.	are key areas of the operation and management of banana producing enterprises where controllable variables are significantly impacting enterprise performance. Recommendations herein also articulate areas of importance for future research and development.
Communicate findings to industry via regional presentations.	Communication / dissemination of the key findings from this research have been completed at several points during the delivery of the program. Local Grower association meetings, bi-annual banana conferences, and the Banana Roadshow (2014) have all been utilised for this purpose. Further, presentations to the ABGC board and to groups of producers during data collection and time in industry have also been used for this purpose.

7.2 Discussion of Key Findings

Further discussion is provided in this section in relation to areas of the results where significant issues and opportunities appear to be demonstrated by the data.

7.2.1 PRODUCTIVITY PER PRODUCING HECTARE

Average annual productivity for the participant group, as measured by the number of 13Kg carton equivalents produced per producing hectare, ranged from 2,252 cartons / ha to 2,485 cartons / ha during the five elapsed years of the program. This is an increase of 10% over the elapsed timeframe.

This elapsed period covers the year immediately after Cyclone Yasi and also the final year of the program (2012-2013) when yields showed substantive increases. In both years, in very different ways, production volumes appear to have been impacted. Firstly by the occurrence of Cyclone Yasi (during 2011-2012) and then (positively) by the later impacts of recovery processes on the next year's harvest for some participants (during 2012-2013).

The range of yields achieved over the program years varied significantly. In the three normal years of data collection yields ranged from 5,400 cartons equivalent per hectare (an enterprise that was positively impacted in 2012-2013 by the recovery strategies put in place following Cyclone Yasi) to 340 cartons equivalent per hectare (for an organic producer in a sub-tropical area).

Within tropical Cavendish producers (using conventional production regimes) the range was from 5,400 cartons equivalent per hectare to 1,500 cartons equivalent per hectare, with the average achieved being 3,084.

The very direct (albeit obvious) correlation demonstrated between productivity and profitability suggests ongoing and perhaps renewed focus and priority on productivity management in future research and development strategies

7.2.2 OPERATING COSTS

The average annual operating costs incurred over three normal years to produce a 13 Kg carton equivalent of bananas were $20.07 per carton. Operating costs per carton equivalent for enterprises ranged from $63 to $8.88 per carton.

A notable occurrence is the increase in operating costs in the main growing region, Cassowary Coast in the year immediately following Cyclone Yasi (2011-2012). This was driven by two and possibly three key factors; reduced productivity per hectare, increased costs in repairs and maintenance and general expenditure, and possibly the 'lag time' that occurs while staffing levels are being reduced after an abnormal event such as Cyclone Yasi negatively impacts throughput in key tasks such as harvesting and packing operations.

The largest cost items across all participants, accounting for 84% of total costs, are (in declining order of percentage of total costs):

1. Labour and Contracting Costs
2. Freight Costs
3. Packaging Costs
4. Chemical and Fertilizer Costs,
5. Marketing and Ripening Costs, and
6. Repairs and Replacements.

Labour and contracting costs alone account for 31% of total costs per carton equivalent and 37% of total operating costs per carton equivalent. Several avenues of analysis undertaken on this data confirm the direct impact that labour and contracting costs have on profitability.

Labour and contracting costs and **productivity per hectare** appear, from the data collected and analysed, to be of the highest priority in terms of improving the performance of enterprises. Accordingly they are productive focus areas for further research and development and industry improvement.

7.2.3 LABOUR USE EFFICIENCY

Labour use efficiency amongst participants engaged in Cavendish production averaged 26 Cartons per Labour Day Employed and ranged from a high of 75 cartons to 3 cartons per Labour Day Employed (after excluding enterprises that utilized contract packers)

The Top 10 averaged 36 Cartons per Labour Day Employed whilst the remainder of the participants averaged 25 cartons per Labour Day Employed. This further reflects the opportunity that appears to exist for improving labour management in the industry.

7.2.4 MARKETING AND MANAGEMENT PRACTICES

There are two key areas where the adoption of decision making aids, advice and technologies appears to be lower than expected, being:

1. Methods of irrigation decision making, and
2. The use of professional external on-farm advisors

The Top 10 have demonstrated a higher level of uptake in these areas than the remainder of the participant group. Similarly irrigating at least weekly, or more frequently, is practiced by 87% of participants, whilst the Top 10 have higher adoption levels

43% of all produce sold by participants is sold either direct to supermarkets (18%) or via brokers (24%), with the remainder being distributed via wholesalers or other less direct means.

In comparison, the Top 10 is marketing almost twice as much of their crop direct to supermarkets.

These findings suggest some renewed research and development priority be applied to understanding and adoption of on-farm decision making technologies and external sources of information.

These findings may also suggest the need for a greater understanding of, and involvement in the marketing of produce by producers.

7.3 Key Lessons from Top 10 Performers

The key areas of difference that the data has demonstrated between the inputs and farm and management practices, and outcomes for the Top 10 most profitable enterprises (over three normal years) compared to the remainder of the participating group are summarised in Table 22.

Table 22: Key Differences – Top 10 and the Remainder

Area of Interest	Key Points of Difference For Top 10
Yield per Producing Hectare	Average 23% greater yield per producing hectare.
Price per Carton Equivalent Sold	No notable difference.
Labour & Contracting Costs	Average 25% lower labour & contracting costs per carton equivalent.
Freight Costs	Average 27% lower freight costs per carton equivalent.
Packaging Costs	No notable difference.
Chemical and Fertilizer Costs	No notable difference.
Marketing and Ripening Costs	32% lower marketing and ripening costs per carton equivalent.
Other Costs	Power and Gas, Insurance, and Motor Vehicle Costs notably lower.
Total Operating Costs	Average 21% lower Total Operating Costs per carton equivalent.
Cash Profit (EBITDA)	Average 3.5 times more Cash Profit per carton equivalent.
Labour Use Efficiency	47% higher labour use efficiency as measured by cartons equivalent handled per FTE / annum or per Labour Day Employed
Marketing Strategy	Greater proportion of volume sold direct to supermarkets or via brokers.
Use of External Advice	Greater use of paid external advice on plant nutrition.
Packing Strategy	All operated their own packing facilities.
Irrigation Decision Making	Greater use irrigation monitoring technology or fixed scheduling and less reliance on judgement / visual inspection.
Irrigation Frequency	Apply irrigation more frequently (when irrigating)
Nurse Suckering / Crop Timing	Greater Adoption of Nurse Suckering / Crop Timing
Nutrition Decision Making	Greater use of nutrition monitoring through soil or leaf testing

8. Technology Transfer

8.1 Interaction with Participating Producers

Two hundred and eleven (211) banana producing enterprises that have participated in this program over a five year elapsed time frame. Data collection and reporting back to participants has occurred in four separate batches of communication, each being at the completion of the collection of data from participants in a financial year.

On each occasion that reports have been disseminated to participants each participant has received a report package that includes at least:

1. Comparative Analysis Report for the Enterprise compared to the Total Participant Group
2. Comparative Analysis Report for the Enterprise compared to a relevant sub-group. Relevant subgroups include:
    a. Compared to Participants in a growing region
    b. Compared to Participants in a relevant Enterprise Size Category
    c. A sub-group designed specifically for a Special Purpose Report as requested by one or more participants
3. Practices Summary Report summarizing the findings across the whole participant group (or a sub-group if so requested by one or more participants) from the qualitative survey, also so called the management practices section of the survey scope.

Comparative analysis reports provide direct and quantitative feedback on both financial and non-financial aspects of enterprise performance including:

1. Enterprise Value / Result
2. Group or Sub Group Average Value / Result
3. Highest Value / Result in Group or Sub Group
4. Lowest Value / Result in Group or Sub Group
5. Enterprise rank in group or Sub Group.

The most recently improved formats for these comparative analysis reports deliver the above information for over ninety (90) different Key Performance Measures.

Sample reports for the major report formats used have been included in the Appendices.

Additional to the above some new report formats have been developed as part of the evolving process undertaken in this program. Two examples of these new / additional report formats are:

1. Multicolumn Comparative Reports for self-defined sub-groups such as corporate operators with one or more farms / enterprises enrolled in the program or 'best practice groups' that decide to work collaboratively together
2. Dash Board Reports, that enable a one page snap shot view of an enterprise compared to the whole participant group or sub-groups as may be relevant.

A proportion of the participants 10% to 12% in each year, have requested individual feedback on their comparative analysis reports, to understand the impact of the findings for their enterprise. These discussions have been undertaken and have assisted participants to determine how they can make changes to on-farm practices and decisions to improve the performance of their enterprise or enterprises.

The resulting actions taken by participants include and are not limited to:

1. Modifying labour management and labour use strategies on farm
2. Modifying farm practices that can impact yield
3. Interacting with and negotiating financiers
4. Identifying areas of their cost management and management decision making, beyond labour costs that can benefit from changes and improvements.

Aspects of farm operations including; freight strategy, marketing channel and marketing partner reviews, insurance cover reviews, changes to in field practices that impact quality and pack out, and others have been catalyzed by this process for different enterprises.

Numerous participants have also held telephone and email communications with the researchers, seeking input and insight from their participation in the program.

8.2 Dissemination to All Banana Industry Participants

8.2.1 REGION OR LOCAL GROWERS ASSOCIATION MEETING PRESENTATIONS

1. Presentations have been made at regional meetings, most commonly organized through Local Grower Associations, throughout the four years of the project time frame.
2. A Presentation was delivered at the Banana Industry Congress, in 2011, and the researchers have been asked and will deliver a presentation at the Banana Industry Congress in 2015 on the ley findings of this program
3. Project outlines have been included to the Banana Industry Annual Report in each year that the program has been being undertaken

8.3 Other Dissemination and Communication

1. Presentations have been delivered to the Board of the ABGC on numerous occasions during the time frame of the project,
2. Calls, emails and requests for information about the progress and findings of the program have been fielded by the researchers on numerous occasions during the program time frame. In each instance information has been supplied to parties such as government agencies and advisors working on behalf of the banana industry.
3. No information has been supplied to any third party without prior seeking and obtaining permission and also guidance as to the level of information to provide from either the ABGC or HAL.

9. Recommendations

9.1 Dissemination and Collaborative Groups

It is recommended that the findings of this research and how it can be used to assist individual producers in their businesses be promoted at every opportunity. This could be achieved through the ongoing dissemination that occurs around this research **and** the interaction that occurs between the officers engaged at industry level and banana producers.

In some industries 'best practice groups' have formed and use data similar to the results of this research as the basis for sharing ideas and developing new approaches to solving on-farm problems. The software that has been developed and used to store this data is able to produce tailor made reports for these collaborative groups that presents the group's information in a stand-alone comparative format.

It is also possible to produce reports that compare one or more of these groups with the aggregate results for a Top 10 group or another specifically defined sub-group.

9.2 Ongoing Benchmarking in the Banana Industry

A lot has been learnt from the completion of four years of data collection, analysis, interpretation and reporting in this program. The learning is not limited to what has been learnt about the industry, its participant enterprises and the trends, issues and key success factors of operating a successful banana producing enterprise.

Much has also been learnt about how to collect, format and deliver data and information in the industry.

The data that is now retained in the banana data base is extensive. Key financial and operational data is collated that defines the delivery of more than $600 million of bananas (at farm gate value) to market in Australia, over four financial years.

This resource is extremely valuable and may well be a greater information resource about an industry and its commercial imperatives than any other horticultural sector. This resource has greater value and capacity to deliver learning and insights than what it has been utilised for, to

date. It is a substantial knowledge base, retained in a manner that enables it to be used far more comprehensively.

Ongoing data collection, analysis, interpretation and delivery will assist banana producers to pursue a culture of continuous improvement. Some of the lessons learnt to date have also been about 'what not to do', and how to design and execute this type of program and activity in the industry. With those lessons in hand, ongoing benchmarking activities can be designed to add even more value. Some of the areas where change is recommended include and are not limited to:

1. Work with a smaller number of participating enterprises, that are at least as representative of the industry as the previous groups
2. Develop processes, protocols, systems and communication (tools and interfaces) that enable the researchers to spend less of the allocated time and resource on collecting raw data, and more time and resource on:
    a. Analysis,
    b. Interpretation,
    c. Secondary research and interaction with other researchers and knowledge sources to further define apparent relationships and correlations (between inputs / activities / decisions / practices and outcomes)
    d. Interaction with participants
    e. Reporting,
    f. Implementation of findings and lessons inside participant businesses.
3. Encouraging (where appropriate and sought) best practice group activities or similar, where producers share information and ideas for mutual benefit
4. Communication and dissemination resulting in industry improvement (through improving enterprise performance and targeted future R&D).

9.3 Future Research and Development Focus

This project has provided insight into some key differences between the Top 10 group and the remainder of the participant group. Table 23 summarises those differences.

The Top 10 most profitable enterprises demonstrated significant differences in the key areas of:

1. Higher yields per producing hectare
2. Lower costs per carton equivalent sold,
3. Higher Cash Profit per carton equivalent sold.

The Top 10 also have reported that they do things differently in some key areas that include:

4. How they market their produce
5. How much external advise they invest in, particularly regarding nutrition,
6. Greater propensity to invest in irrigation monitoring technologies such as Tensiometers, Enviroscan and similar,
7. More frequent irrigation timing when climatic conditions call for irrigation to be applied
8. Higher propensity to engage contract spraying services including aerial spraying

Table 23: Some Key Differences between the Top 10 and the Remainder

1. Top 10 averaged 42 producing hectares (range 11 to 90 hectares).
2. Were small family-owned enterprises (1 to 20 producing hectares) or mid-sized and / or diversified family-owned enterprises (21 to 130 producing hectares).
3. Included eight (8) enterprises from the Cassowary Coast, one (1) enterprise from New South Wales and one (1) enterprise from the Atherton and Lakelands region.
4. The Top 10 Demonstrated: a. Twenty three percent (23%) greater yield per producing hectare, b. Twenty one percent (21%) lower total operating costs per carton equivalent (equal to an average $4.38 / carton equivalent), c. An average $4.62 (252%) more Cash Profit (EBITDA) per carton equivalent.
5. The Top 10 Reported: a. Higher % of produce sold direct to supermarkets and via brokers (+84% variance), b. Greater utilization of paid external nutritional advise (+43% variance), c. Higher adoption of irrigation decision making technologies and fixed scheduling of irrigation (+88% variance), d. Higher frequency of irrigation (when irrigating)) (+37% variance), e. Greater use of contract spraying (including aerial spraying) (+195% variance).

This data has also demonstrated that participants that achieved higher yields and cash profits did not necessarily invest more in chemicals and fertilizers. Indicating that it may be more about what is used than how much is expended in nutrition and plant protection.

Areas of research and development investment that may significantly benefit industry in future include a focus on the most variable aspects of managing successful banana production enterprises as demonstrated in this project. These include:

1. **Yield,**

2. **Nutrition and plant protection practices**

3. **Managing labour and labour costs, including process review and re-engineering in key operational areas, and**

4. **Understanding the benefits of adopting modern decision making aides / technologies, and the use of professional advice where it can add value to enterprise performance.**

10. Acknowledgements

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1. Members of the ABGC Board and Banana Industry Advisory Committee,
2. Management and staff of ABGC
3. Members of the Project Reference Group,
4. Many of the Directors of ABGC, supply chain participants, producers, government officers and industry advisors in their capacities as part of regional producer communities

The researchers also wish to acknowledge the willingness and openness of the producers that chose to participate in this project and join the enterprise performance comparison program. They have given freely of their time, their knowledge and their intellect and have willingly shared information, much of which is confidential and personal.

11. Bibliography

12. Appendices

12.1Sample Report – Dashboard Report

BANANA BENCHMARKING DASHBOARD REPORT (2013) - Total Group - Z Sample 1

Your Key Data	Unit	Your Value	Group Average	Group Median (Mid Value)	Highest in Group	Lowest in Group	Your Rank in Group	Number in Group
Producing Hectares	Hectares	0.00						
13 KG Carton Equivalents sold	13 KG Equivalents	0.00						
Total Produce Sales $ Received	$	$0.00						
Total Operating Costs $ Incurred	$	$0.00						
EBITDA (Cash Profit) $ Achieved	$	$0.00						

Outcomes (KPIs)	Unit	Your Value	Group Average	Group Median (Mid Value)	Highest in Group	Lowest in Group	Your Rank in Group	Number in Group
Yield per Producing Hectare	13 KG Cartons / Ha	0.00	2,399.55	2,461.48	5,394.60	0.03	49	49
Yield per Producing Acre	13 KG Cartons / Acre	0.00	971.07	996.13	2,183.12	0.01	49	49
Average Gross Sales Value per Carton	$ / 13 KG Carton	$0.00	$23.59	$22.52	$45.50	$12.47	49	49
Average Net Return per Carton (After Deducting Marketing & Ripening $)	$ / 13 KG Carton	$0.00	$21.51	$20.31	$40.95	$12.21	49	49
Average Operating Costs per Carton	$ / 13 KG Carton	$0.00	$21.92	$22.02	$63.88	$12.68	49	49
Cash Profit (EBITDA) per carton	$ / 13 KG Carton	$0.00	$3.50	$3.42	$15.08	-$4.71	46	49
% Packed to XL Size	% of Harvest	0.00%	75.22%	78.97%	94.16%	45.50%	49	49

Key Costs and Labour Use (KPIs)	Unit	Your Value	Group Average	Group Median (Mid Value)	Highest in Group	Lowest in Group	Your Rank in Group	Number in Group
Cartons Sold / Picking and Packing Labour Day Incurred	13 KG Cartons / L.day	0.00	51.13	45.95	197.21	14.32	49	49
Cartons Sold / Total Labour Day Incurred	13 KG Cartons / L.Day	0.00	25.36	26.25	83.83	5.67	49	49
Total Labour $ / Carton	$ / 13 KG Carton	$0.00	$7.93	$6.64	$30.78	$2.08	49	49
1. Total Labour + Contracting $ / Carton	$ / 13 KG Carton	$0.00	$8.09	$7.61	$35.31	$4.20	49	49
2. Marketing and Ripening $ / Carton	$ / 13 KG Carton	$0.00	$2.08	$2.09	$4.55	$0.26	49	49
3. Freight $ / Carton	$ / 13 KG Carton	$0.00	$3.68	$3.31	$7.57	$0.37	49	49
4. Packaging $ / Carton	$ / 13 KG Carton	$0.00	$2.34	$2.44	$5.52	$1.19	49	49
5. Chemicals and Fertilizer $ / Carton	$ / 13 KG Carton	$0.00	$1.83	$2.01	$6.46	$0.52	49	49

12.2Sample Report – Comparative Analysis Report

Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

Z Sample 1					800		
	Unit	Your Value	Group Average	Group High	Group Low	Your Rank in Group	Total Number in Group (Count)
1. ENTERPRISE INFORMATION							
Total Producing Hectares	Ha	0.00					
Total Immature (Plant Crop not Harvested) Hectares	Ha	0.00					
Total Hectares Planted (Producing and Immature)	Ha	0.00					
Total KGS Harvested, Packed and Sold	Kgs	0.00					
Total KGS Sold as Juice, Oil, Processing	Kgs	0.00					
Total KGS Harvested	Kgs	0.00					
Total Cartons (13 Kg Carton Equivalent) Harvested Packed and Sold	13 Kg Cartons	0.00					
Total KGS Harvested per Producing Hectare	**Kgs / Ha**	**0.00**	**28,867.51**	**69,368.72**	**6,952.82**	**16**	**16**
Total 13 KG Cartons(Equivalent) Harvested per Producing Hectare	**13 Kg Cartons / Ha**	**0.00**	**2,220.58**	**5,336.06**	**534.83**	**16**	**16**
Average Price Achieved $ / 13 KG Equivalent of Market Fruit	**$ / 13 Kg**	**$0.00**	**$25.13**	**$42.12**	**$12.47**	**16**	**16**
Total Costs per 13 KG Carton Equivalent Sold	**$ / 13 Kg Carton Sold**	**$0.00**	**$24.56**	**$63.88**	**$14.65**	**16**	**16**
Average EBITDA per 13 KG Carton Equivalent Sold	**$ / 13 Kg Carton Sold**	**$0.00**	**$1.87**	**$10.34**	**-$35.04**	**5**	**16**
% of Market Fruit Sold as XLarge %	**%**	**0.00%**	**81.12%**	**90.22%**	**4.49%**	**16**	**16**
2. BUSINESS SCALE AND OUTCOMES							
Gross Sales Revenue (Before Marketing & Ripening Costs) $	$	$0.00	$4,436,162.00				
Total Costs	$	$0.00	$4,191,021.87				
NET PROFIT BEFORE TAX	$	$0.00	$245,140.13				
EBIT $	$	$0.00	$286,137.02				
Total Operating Costs (Excluding Interest and Depreciation)	$	$0.00	$4,116,231.54				
EBITDA $	$	$0.00	$319,930.46				
Operating Costs as % of Gross Sales Revenue	%	0.00%	92.79%	234.05%	63.42%	16	16

Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

Z Sample 1					800		
	Unit	Your Value	Group Average	Group High	Group Low	Your Rank in Group	Total Number in Group (Count)
3. PACK OUT							
% of market Fruit Sold as Jumbo %	%	0.00%	5.28%	69.55%	0.04%	16	16
% of market Fruit Sold as XLarge %	%	0.00%	81.12%	90.22%	4.49%	16	16
% of market Fruit Sold as Large %	%	0.00%	3.38%	95.46%	7.13%	16	16
% of market Fruit Sold as Medium %	%	0.00%	0.80%	7.83%	0.00%	16	16
% of market Fruit Sold as Small %	%	0.00%	0.00%	0.05%	0.05%	16	16
% of market Fruit Sold as Other 1 %	%	0.00%	0.93%	16.33%	0.04%	16	16
% of market Fruit Sold as Other 2 %	%	0.00%	0.34%	2.88%	0.09%	16	16
4. SELECTED LABOUR USE MEASURES							
Total FTEs Employed / Producing Ha	FTE / Ha	0.00	0.41	0.64	0.17	16	16
Total Producing Hectares Managed per FTE	Ha / FTE	0.00	2.44	5.88	1.56	16	16
Gross Sales Revenue Achieved Per Total FTE	$ / FTE	$0.00	$140,794.22	$273,644.84	$47,457.23	16	16
EBITDA Achieved Per Total FTE	$ / FTE	$0.00	$10,153.90	$100,089.06	-$80,717.38	5	16
5. INDICATOR COST CENTRES							
Chemicals & Fertilizers as % of Gross Sales Revenue (Before Marketing and Ripening Costs are Deducted)	%	0.00%	7.32%	28.38%	3.73%	16	16
Employment and Contracting Costs as % of Gross Sales Revenue (Before Marketing and Ripening Costs are Deducted)	%	0.00%	34.51%	125.26%	17.88%	16	16
6. PROFITABILITY PER PRODUCING HA							
Total Sales Revenue	$ / Producing Ha	$0.00	$57,716.96	$126,332.70	$15,076.96	16	16
Total Costs	$ / Producing Ha	$0.00	$54,527.55	$84,358.49	$25,609.84		
Net Profit (Before Tax)	$ / Producing Ha	$0.00	$3,189.41	$44,010.43	-$46,992.10		
EBIT	$ / Producing Ha	$0.00	$3,722.80	$46,207.78	-$46,629.17		
Total Operating Costs (Excluding Interest and Depreciation)	$ / Producing Ha	$0.00	$53,554.49	$84,321.96	$23,784.73	16	16
EBITDA	$ / Producing Ha	$0.00	$4,162.48	$46,207.78	-$43,086.38	5	16
Total Farm Gate Operating Revenue (After Freight, Marketing, Ripening Costs Deducted) (FARM GATE CASH REVENUE)	$ / Producing Ha	$0.00	$42,078.80	$96,716.58	$11,176.57		
Total Farm Gate Operating Costs (Excl. Freight, Marketing, Ripening Costs Deducted)(FARM GATE CASH COST)	$ / Producing Ha	$0.00	$37,916.33	$62,887.10	$19,288.49		

Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

Z Sample 1					800		
	Unit	Your Value	Group Average	Group High	Group Low	Your Rank in Group	Total Number in Group (Count)
7. COSTS PER PRODUCING HA							
General Expenses	$ / Producing Ha	$0.00	$3,342.93	$13,094.10	$309.09	16	16
Consultants And Contractor Fees	$ / Producing Ha	$0.00	$1,201.34	$7,801.76	$339.57	16	16
Contract Packing Fees	$ / Producing Ha	$0.00	$233.44	$3,731.02	$2,051.28	16	16
Chemical and Fertiliser Costs	$ / Producing Ha	$0.00	$4,225.36	$9,151.03	$829.34	16	16
Power & Gas Costs	$ / Producing Ha	$0.00	$728.13	$1,918.06	$54.55	16	16
Freight Costs	$ / Producing Ha	$0.00	$11,196.78	$20,277.91	$2,144.90	16	16
Fuel & Oil Costs	$ / Producing Ha	$0.00	$1,107.62	$2,705.45	$635.03	16	16
Marketing & Ripening Costs	$ / Producing Ha	$0.00	$4,441.38	$9,338.22	$786.55	16	16
Packaging and Pallet Costs	$ / Producing Ha	$0.00	$5,254.57	$13,031.89	$1,298.74	16	16
Employment / Labour Costs	$ / Producing Ha	$0.00	$18,480.52	$29,929.59	$8,167.08	16	16
Water Costs	$ / Producing Ha	$0.00	$277.84	$1,192.03	$40.29	16	16
Insurance Costs	$ / Producing Ha	$0.00	$222.92	$1,141.84	$34.87	16	16
Finance Costs	$ / Producing Ha	$0.00	$533.39	$9,543.64	$1.06	16	16
Depreciation and Amortisation Costs	$ / Producing Ha	$0.00	$439.67	$5,129.32	$345.48	16	16
Rates Levies, Licenses, Memberships, Registrations	$ / Producing Ha	$0.00	$666.93	$2,026.84	$30.70	16	16
Motor Vehicles	$ / Producing Ha	$0.00	$114.05	$1,818.18	$12.27	16	16
Repairs & Replacements	$ / Producing Ha	$0.00	$2,060.65	$5,038.96	$333.01	16	16
Royalties & PVR Costs	$ / Producing Ha	$0.00	$0.00	$0.00	$0.00	16	16
8. DIFFERENTIATED LABOUR COSTS PER PRODUCING HA							
Total Labour Costs	$ / Producing Ha	$0.00	$18,480.52	$29,929.59	$8,167.08	16	16
Unallocated Owners Labour Costs	$ / Producing Ha	$0.00	$432.69	$3,963.64	$463.12	16	16
General / Farm Labour Costs	$ / Producing Ha	$0.00	$5,691.54	$9,901.37	$1,431.03	16	16
Pruning Labour Costs	$ / Producing Ha	$0.00	$0.00	$0.00	$0.00	16	16
Picking Labour Costs	$ / Producing Ha	$0.00	$3,469.39	$9,933.95	$1,317.84	16	16
Packing Labour Costs	$ / Producing Ha	$0.00	$6,355.38	$10,392.24	$1,976.76	16	16
Admin. / Other / Marketing Labour Costs	$ / Producing Ha	$0.00	$661.30	$2,240.33	$483.64	16	16

Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

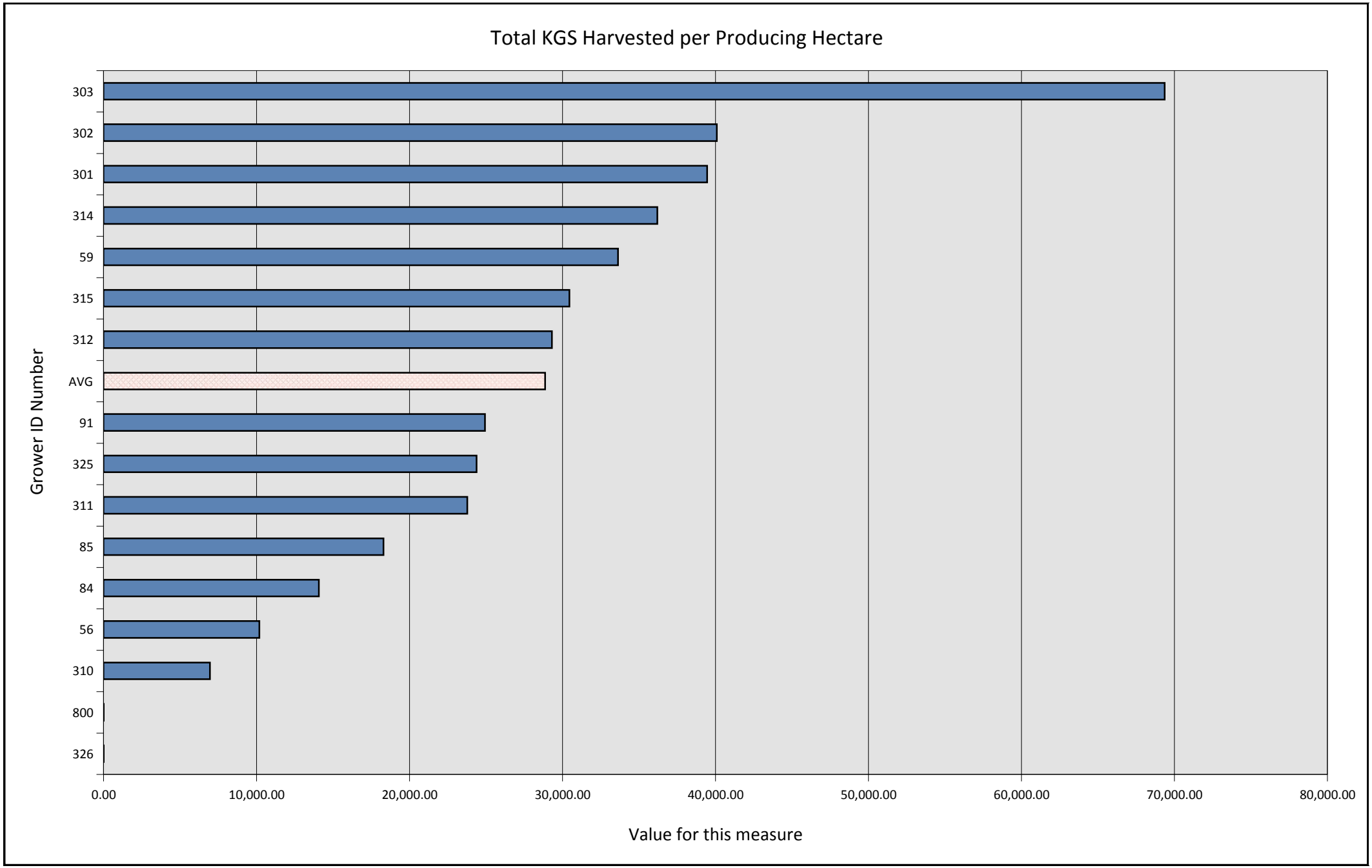
Z Sample 1					800		
	Unit	Your Value	Group Average	Group High	Group Low	Your Rank in Group	Total Number in Group (Count)
9. PROFITABILITY PER 13 Kg CARTON EQUIVALENT							
Total Sales Revenue	$ / 13 Kg Carton Sold	$0.00	$25.99	$42.35	$12.52	16	16
Total Costs	$ / 13 Kg Carton Sold	$0.00	$24.56	$63.88	$14.65	16	16
Net Profit Before Tax	$ / 13 Kg Carton Sold	$0.00	$1.44	$10.34	-$35.69	5	16
EBIT	$ / 13 Kg Carton Sold	$0.00	$1.68	$10.34	-$35.69	5	16
Total Operating Costs (Excluding Interest and Depreciation)	$ / 13 Kg Carton Sold	$0.00	$24.12	$63.23	$14.52	16	16
EBITDA	$ / 13 Kg Carton Sold	$0.00	$1.87	$10.34	-$35.04	5	16
Total Operating Costs as % of Gross Sales Revenue	%	0.00%	92.79%	234.05%	63.42%	16	16
EBITDA as % of Gross Sales Revenue	%	0.00%	7.21%	36.58%	-134.05%	5	16
Total Farm Gate Operating Revenue (FARM GATE CASH REVENUE)	$ / 13 Kg Carton Sold	$0.00	$18.95	$30.40	$10.39	16	16
Total Farm Gate Operating Costs (FARM GATE CASH COSTS)	$ / 13 Kg Carton Sold	$0.00	$17.07	$55.94	$9.47	16	16
10. GROWING COSTS, OVERHEADS, OTHER COSTS PER 13 Kg CARTON EQUIVALENT							
General Expenses	$ / 13 Kg Carton Sold	$0.00	$1.51	$10.79	$0.22	16	16
Consultants And Contractor Fees	$ / 13 Kg Carton Sold	$0.00	$0.54	$6.32	$0.13	16	16
Chemical and Fertiliser Costs	$ / 13 Kg Carton Sold	$0.00	$1.90	$6.46	$1.06	16	16
Fuel & Oil Costs	$ / 13 Kg Carton Sold	$0.00	$0.50	$2.50	$0.14	16	16
Employment / Labour Costs	$ / 13 Kg Carton Sold	$0.00	$3.90	$22.83	$1.20	16	16
Water Costs	$ / 13 Kg Carton Sold	$0.00	$0.13	$0.64	$0.02	16	16
Insurance Costs	$ / 13 Kg Carton Sold	$0.00	$0.10	$0.40	$0.01	16	16
Finance Costs	$ / 13 Kg Carton Sold	$0.00	$0.24	$4.07	$0.00	16	16
Depreciation and Amortisation Costs	$ / 13 Kg Carton Sold	$0.00	$0.20	$2.80	$0.28	16	16
Rates, Levies, Licenses, Memberships, Registrations	$ / 13 Kg Carton Sold	$0.00	$0.30	$0.66	$0.06	16	16
Motor Vehicles	$ / 13 Kg Carton Sold	$0.00	$0.05	$1.68	$0.01	16	16
Repairs & Replacements	$ / 13 Kg Carton Sold	$0.00	$0.93	$2.40	$0.18	16	16
Royalties & PVR Costs	$ / 13 Kg Carton Sold	$0.00	$0.00	$0.00	$0.00	16	16
TOTAL GROWING, OVERHEADS AND OTHER COSTS	$ / 13 Kg Carton Sold	$0.00	$10.29	$48.00	$4.68	16	16

Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

Z Sample 1							800
	Unit	Your Value	Group Average	Group High	Group Low	Your Rank in Group	Total Number in Group (Count)
11. "TO-MARKET" COSTS (PICK, PACK, FREIGHT & MARKETING) PER 13 Kg CARTON EQUIVALENT							
Picking Labour	$ / 13 Kg Carton Sold	$0.00	$1.56	$5.19	$0.74	16	16
Packing Labour	$ / 13 Kg Carton Sold	$0.00	$2.86	$5.89	$0.74	16	16
Packaging Costs	$ / 13 Kg Carton Sold	$0.00	$2.37	$4.79	$1.92	16	16
Power and Gas Costs	$ / 13 Kg Carton Sold	$0.00	$0.33	$1.05	$0.05	16	16
Contract Packing Costs	$ / 13 Kg Carton Sold	$0.00	$0.11	$1.95	$1.09	16	16
Freight Costs	$ / 13 Kg Carton Sold	$0.00	$5.04	$7.57	$1.87	16	16
Marketing and Ripening Costs	$ / 13 Kg Carton Sold	$0.00	$2.00	$4.38	$0.26	16	16
TOTAL TO-MARKET COSTS	$ / 13 Kg Carton Sold	$0.00	$14.27	$21.65	$6.03	16	16
12. DIFFERENTIATED LABOUR COSTS PER 13 Kg CARTON EQUIVALENT							
Total Labour Costs	$ / 13 Kg Carton Sold	$0.00	$8.32	$28.99	$2.69		
Unallocated Owners Labour Costs	$ / 13 Kg Carton Sold	$0.00	$0.19	$3.66	$0.18	16	16
General / Farm Labour Costs	$ / 13 Kg Carton Sold	$0.00	$2.56	$14.29	$0.76	16	16
Pruning Labour Costs	$ / 13 Kg Carton Sold	$0.00	$0.00	$0.00	$0.00	16	16
Picking Labour Costs	$ / 13 Kg Carton Sold	$0.00	$1.56	$5.19	$0.74	16	16
Packing Labour Costs	$ / 13 Kg Carton Sold	$0.00	$2.86	$5.89	$0.74	16	16
Admin / Other / Marketing Labour Costs	$ / 13 Kg Carton Sold	$0.00	$0.30	$4.19	$0.32	16	16
Total Labour and Contracting / Consulting Costs	$ / 13 Kg Carton Sold	$0.00	$8.97	$35.31	$4.23	16	16

Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

Z Sample 1	800



Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

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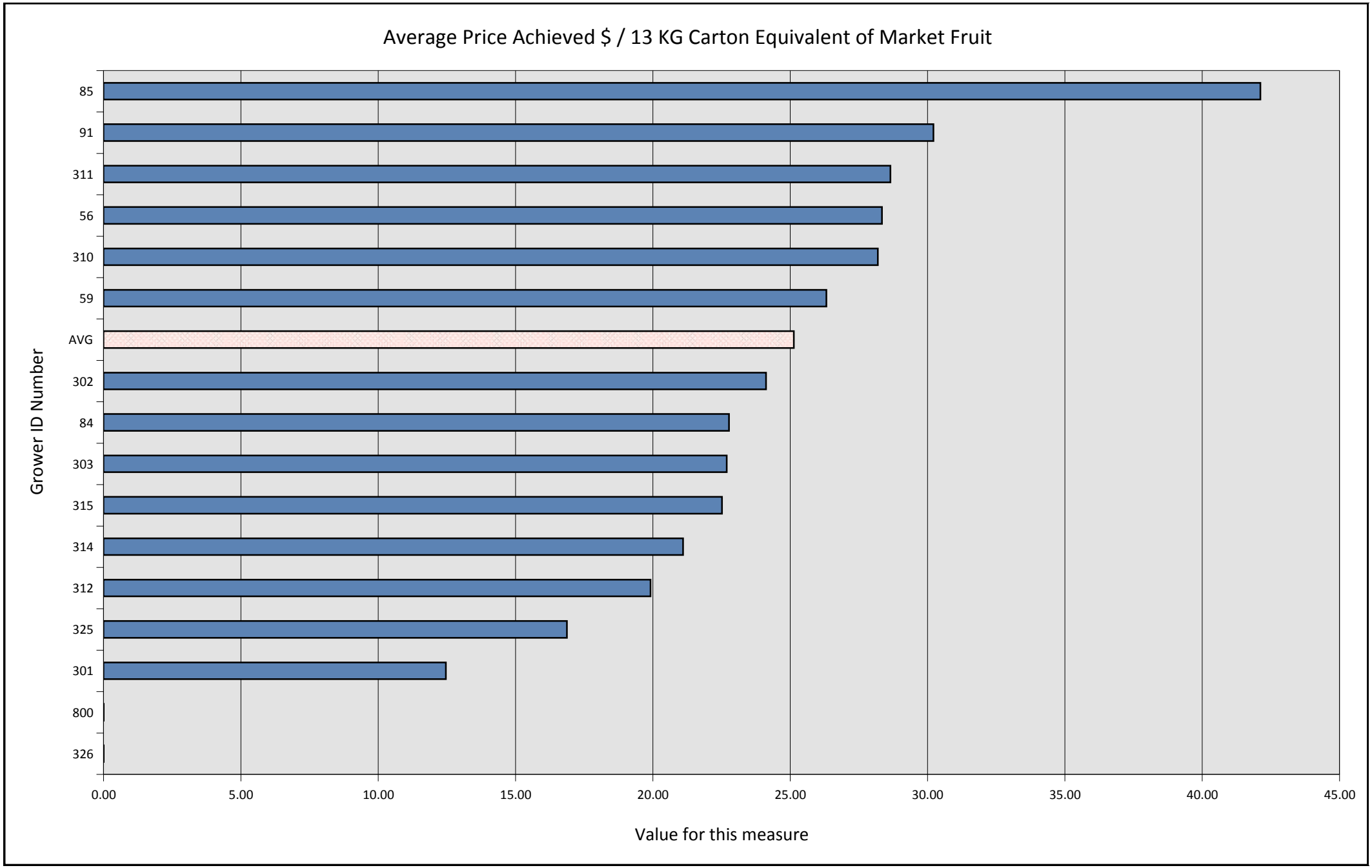

Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

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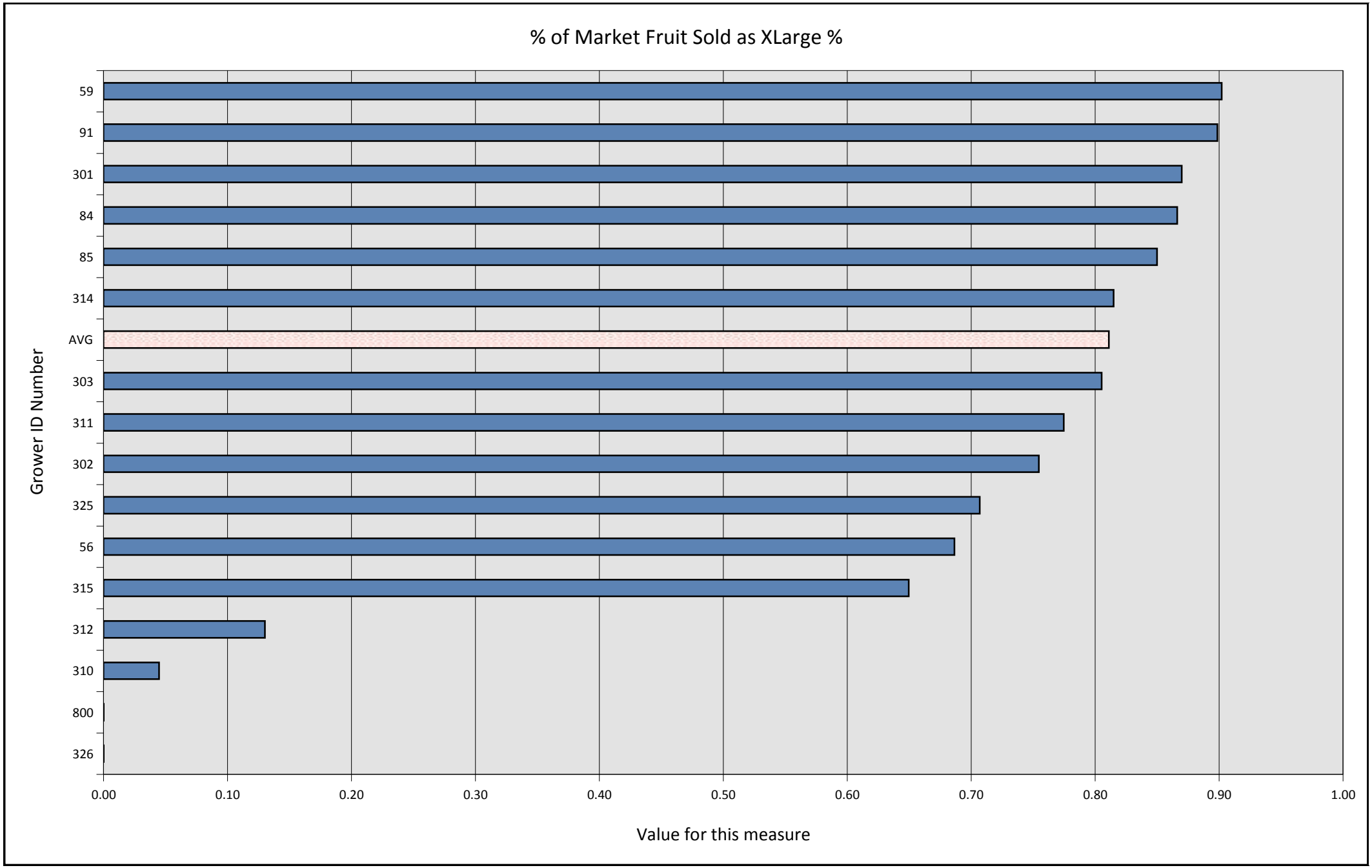
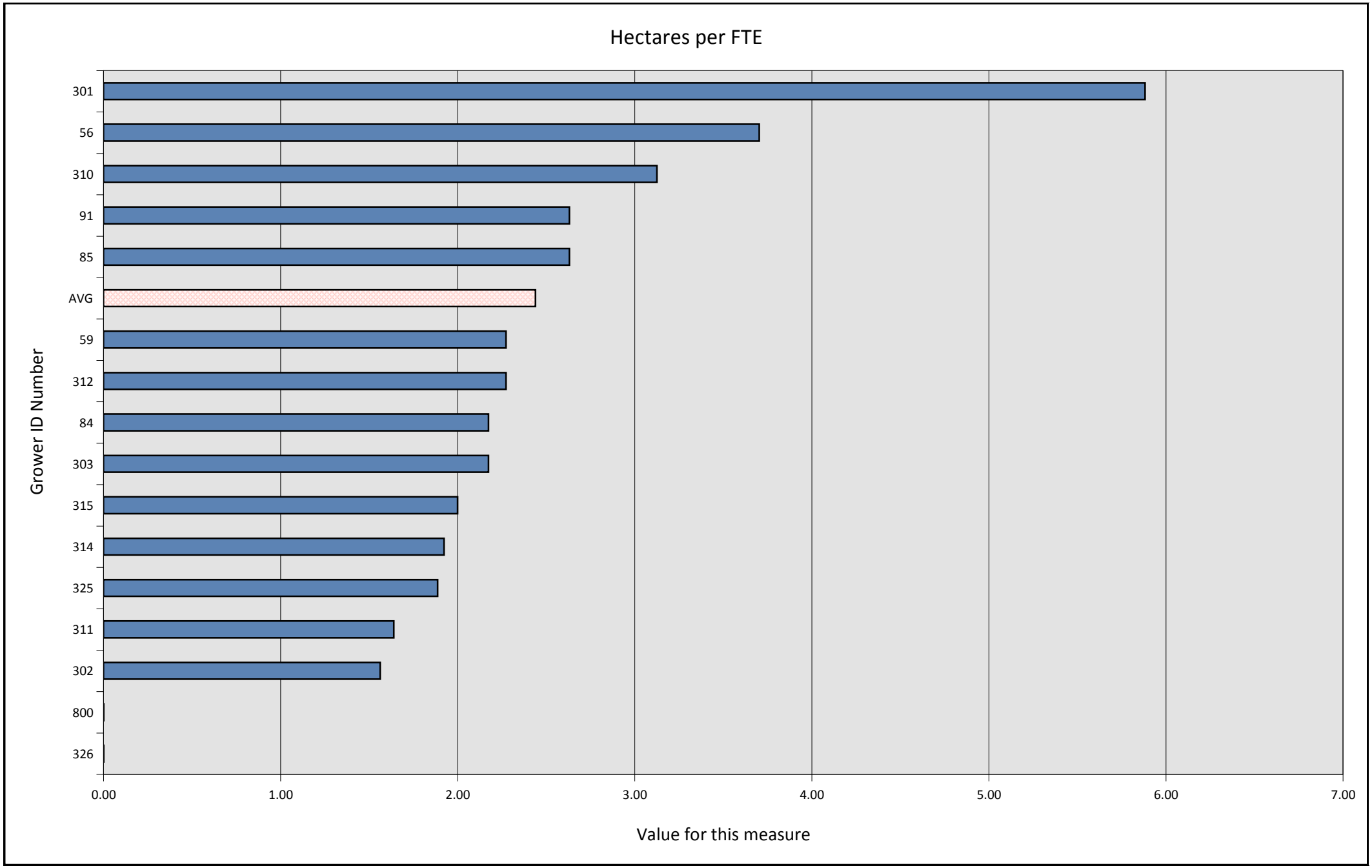


Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

Z Sample 1	800



Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

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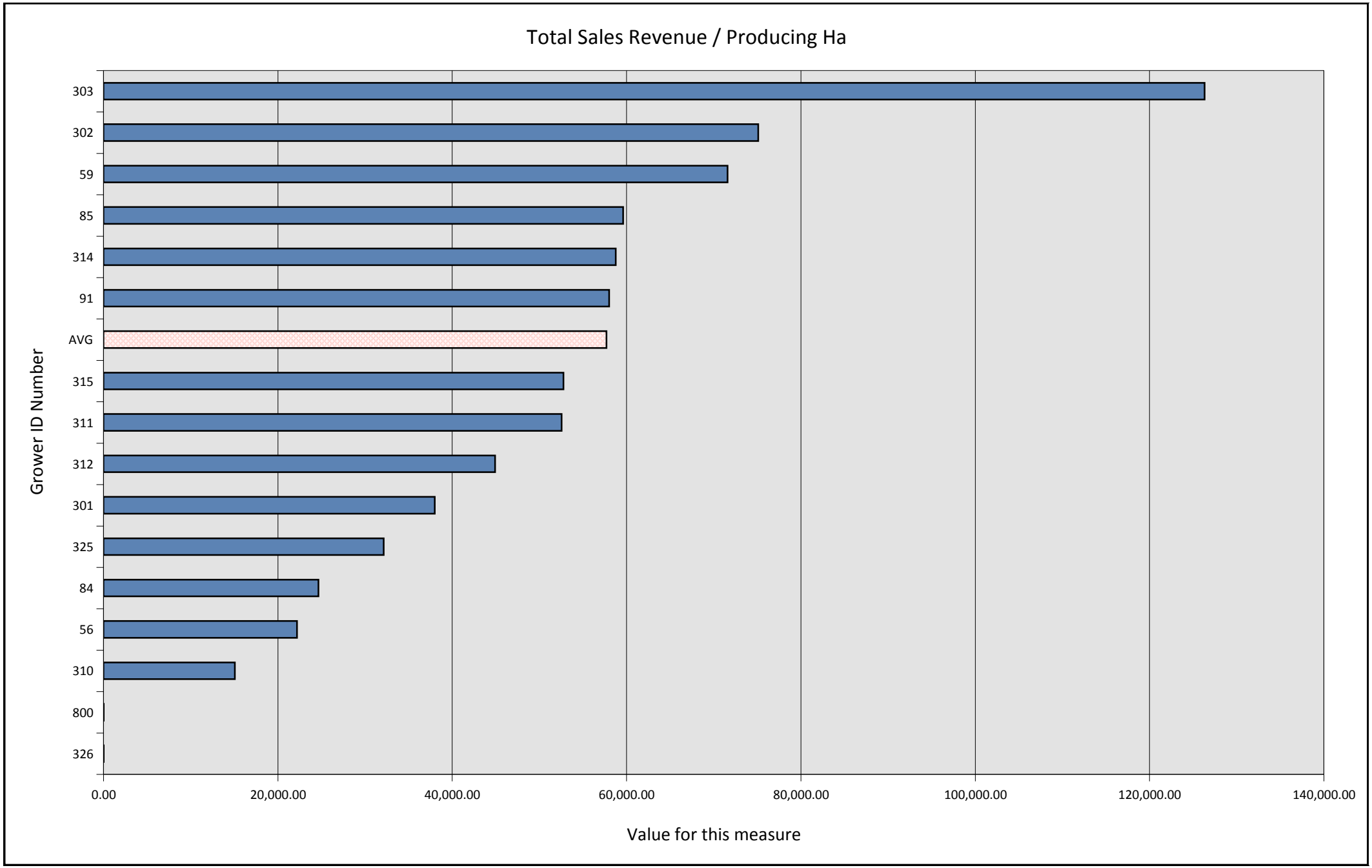

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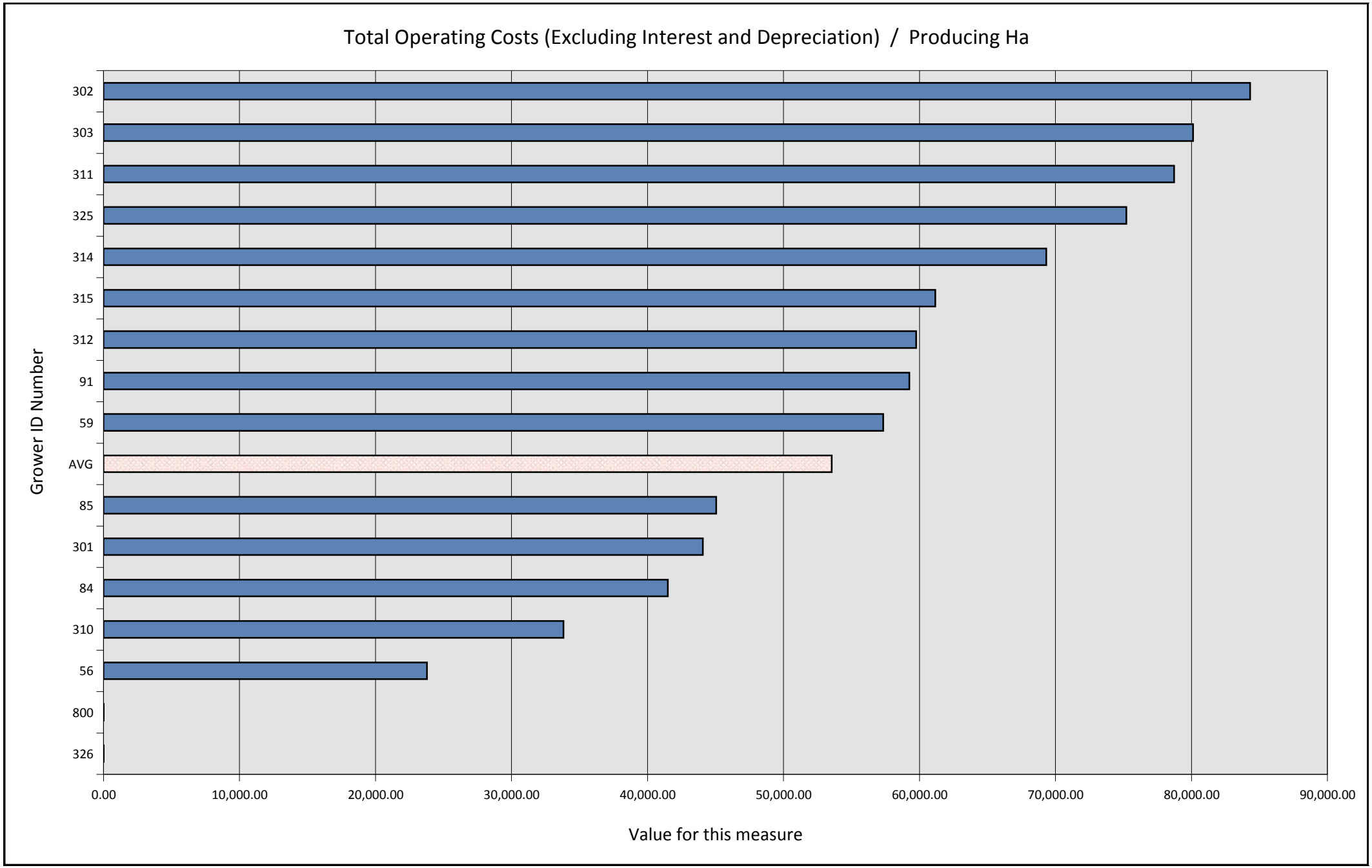

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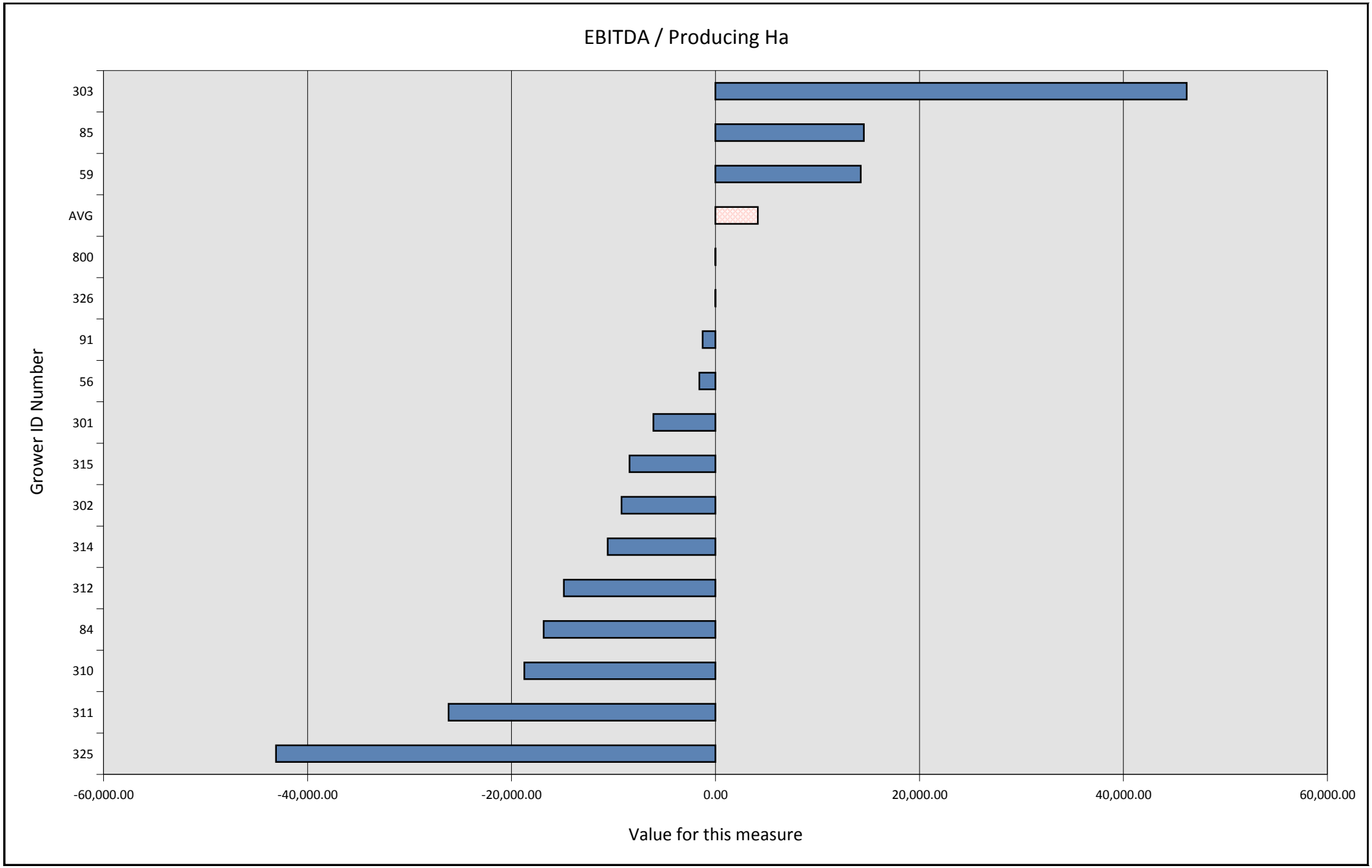

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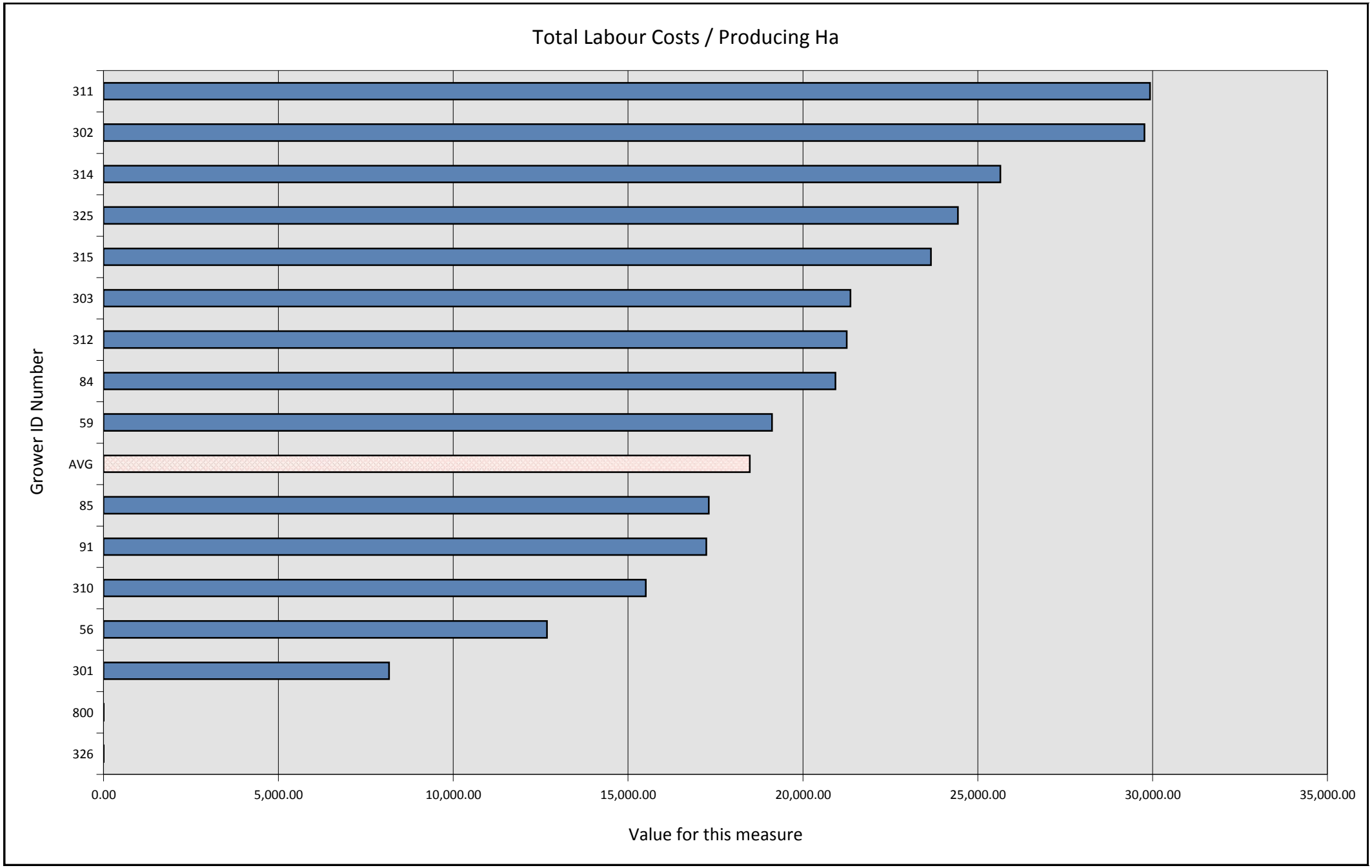

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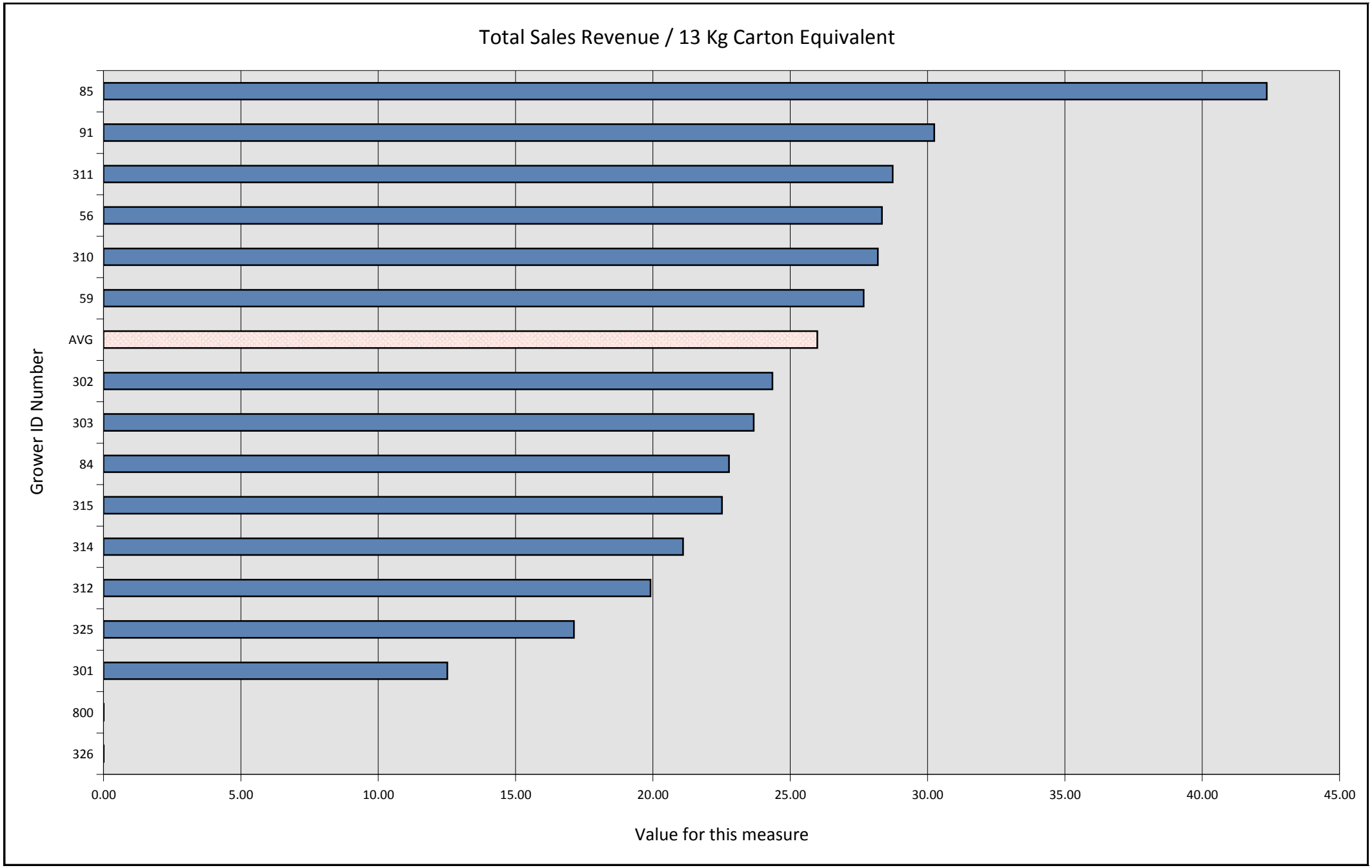

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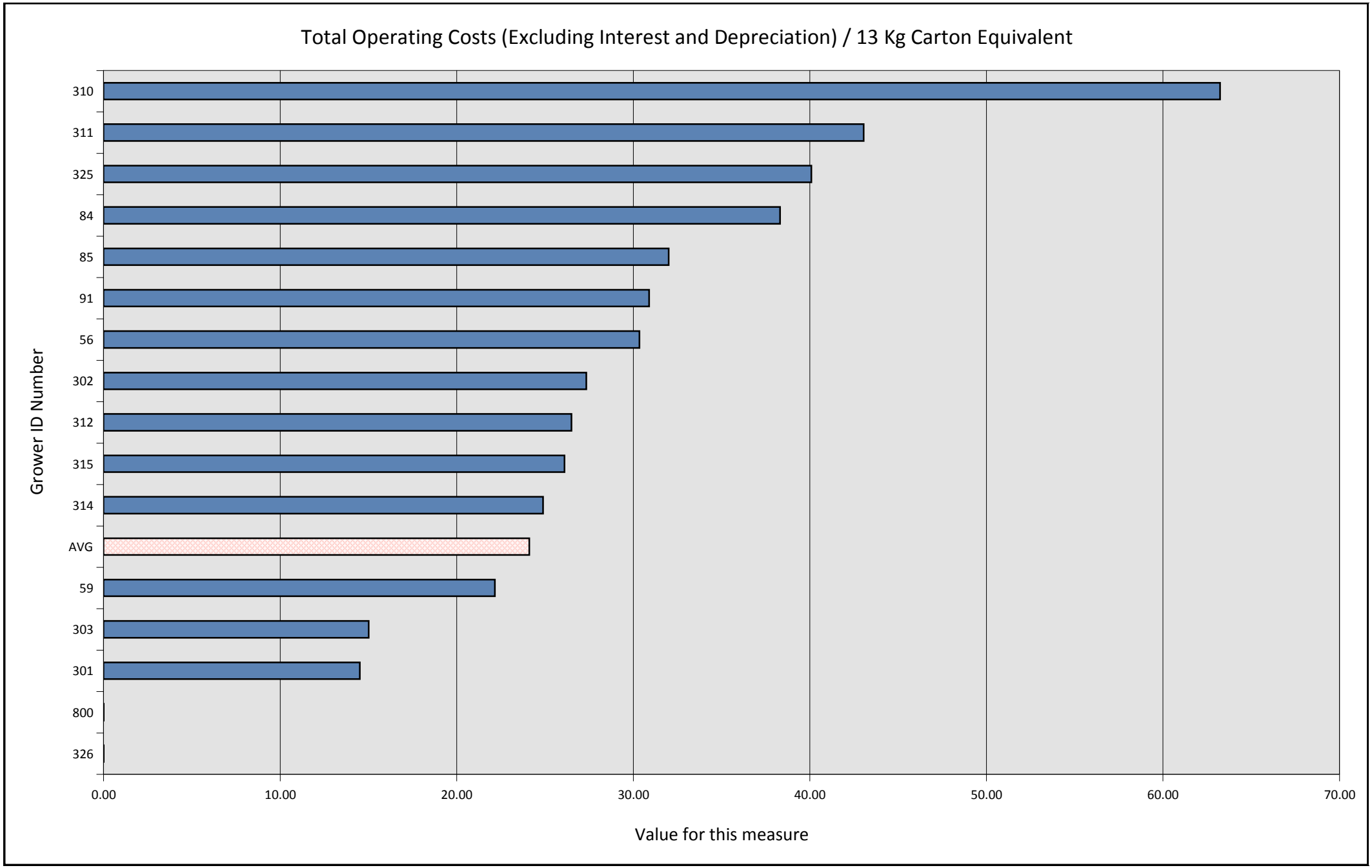

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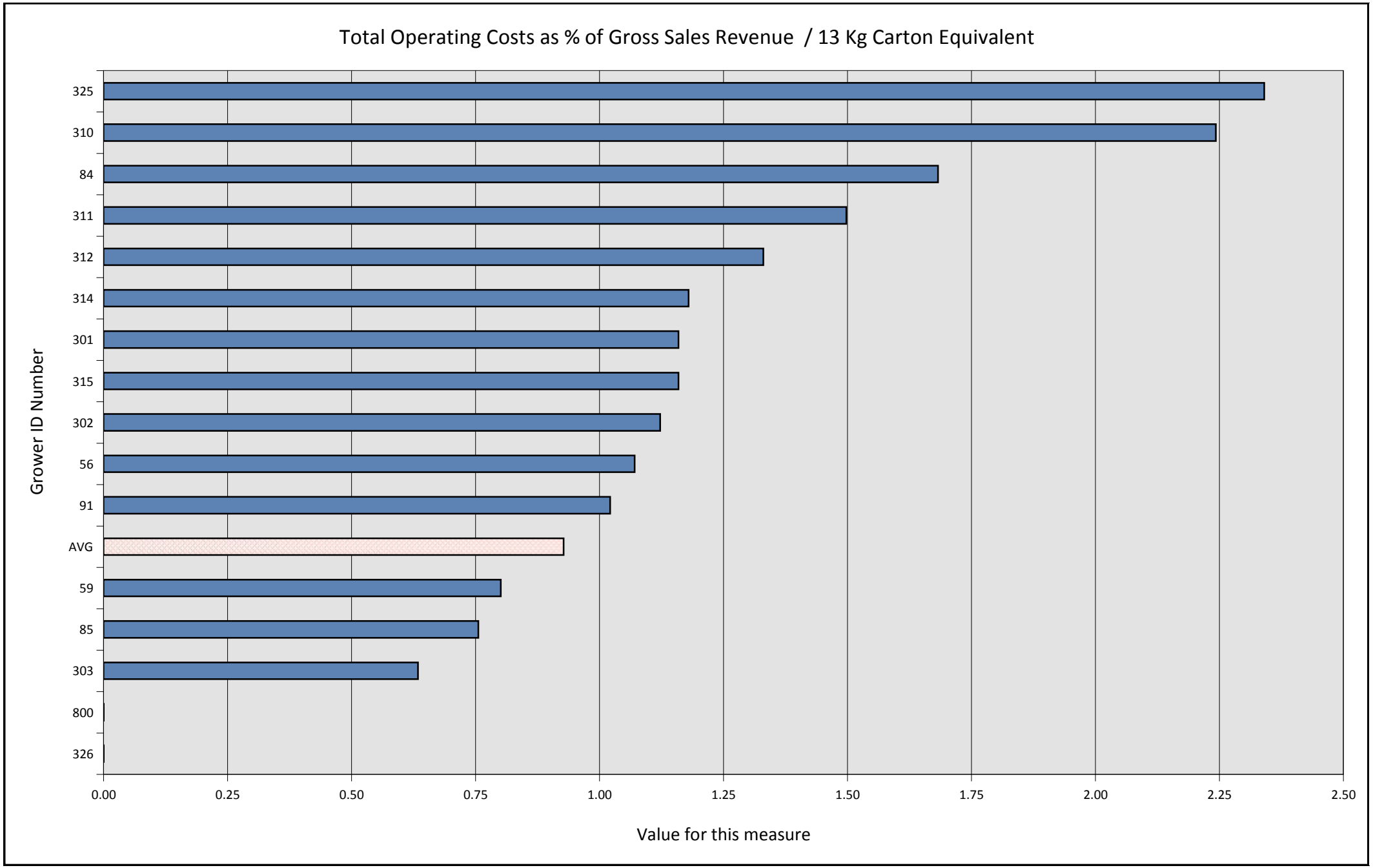

Comparative Analysis Report (2013)-Z Sample 1 ID 800-Same Region-Atherton Tablelands and Lakelands

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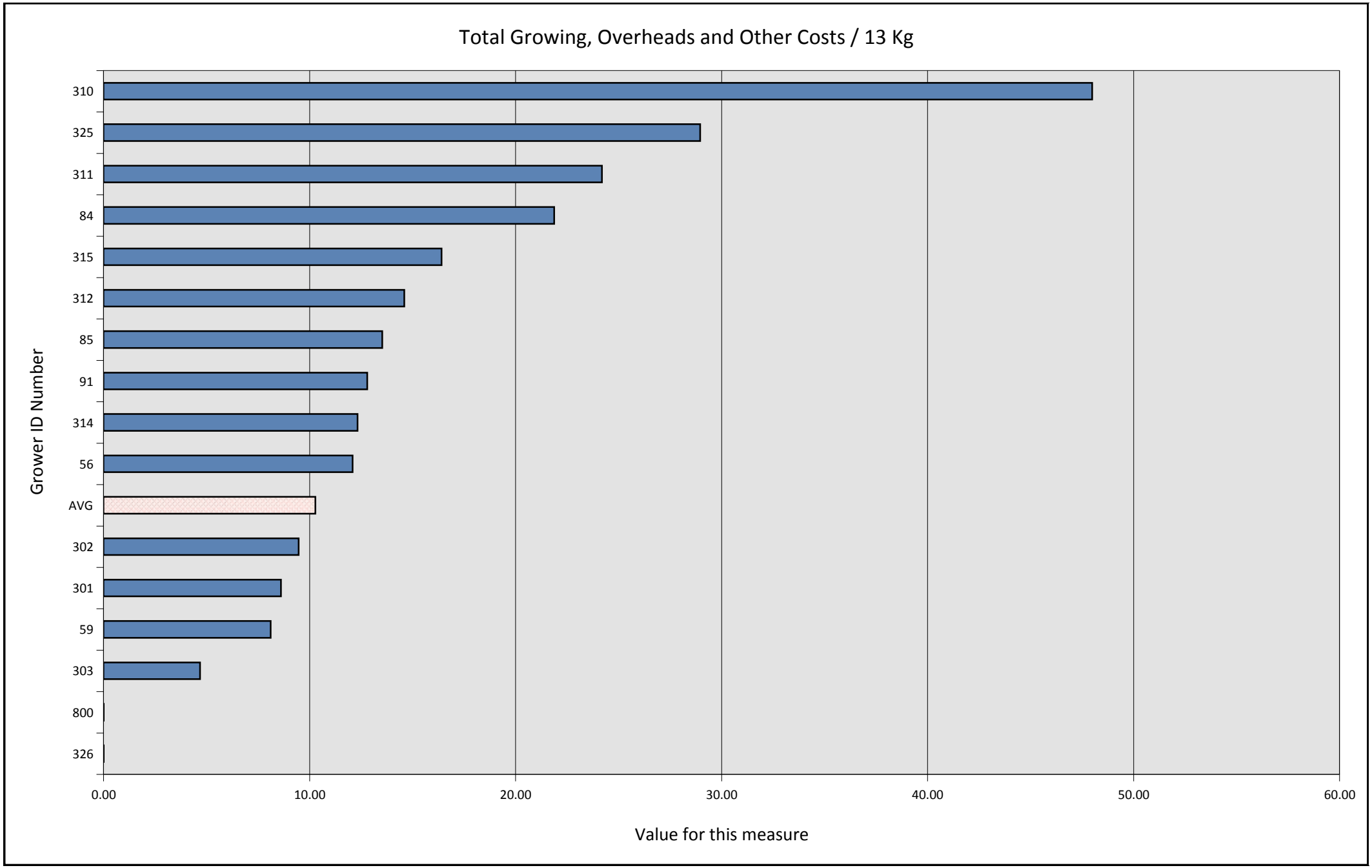

12.3Sample Report – Practices Summary Report

	Measure	TOP 10	REMAINDER	VARIANCE
Origins of Farm Labour				
Local / Australian Workers	% of Total Labour	32.50%	45.40%	-28.41%
International Workers / Backpackers	% of Total Labour	31.66%	35.62%	-11.12%
Other	% of Total Labour	0.00%	0.00%	
Sources of Farm Workers				
Labour Hire Co	% of Total Labour	19.75%	0.64%	2985.94%
Backpacker Hostels or Coordinators	% of Total Labour	38.48%	52.61%	-26.86%
Walk / Referral / Other	% of Total Labour	41.76%	46.75%	-10.67%
Use of Contractors				
Planting	% of Respondents	0.00%	7.27%	-100.00%
Desuckering	% of Respondents	42.86%	47.27%	-9.33%
Bell Injecting	% of Respondents	28.57%	27.27%	4.77%
Spraying	% of Respondents	42.86%	14.55%	194.57%
Harvesting	% of Respondents	0.00%	7.27%	-100.00%
DeLeafing	% of Respondents	0.00%	20.00%	-100.00%
Bagging	% of Respondents	14.29%	21.82%	-34.51%
Agronomic Services	% of Respondents	0.00%	0.00%	
Other	% of Respondents	0.00%	12.73%	-100.00%
Method of Irrigation Monitoring (Scheduling)				
Visual / Judgement	% of Respondents	33.33%	62.90%	-47.01%
Tensiometers	% of Respondents	11.11%	14.52%	-23.48%
Neutron Probes	% of Respondents	0.00%	1.61%	-100.00%
Enviroscan	% of Respondents	33.34%	14.52%	129.61%
Fixed Scheduling	% of Respondents	22.22%	4.84%	359.09%
Other	% of Respondents	0.00%	1.61%	-100.00%
Irrigation Intervals (When Irrigating)				
More than Once per Day	% of Respondents	12.50%	21.31%	-41.34%
Daily	% of Respondents	37.50%	22.95%	63.40%
Every 2 Days	% of Respondents	37.50%	19.67%	90.65%
Twice Weekly	% of Respondents	0.00%	22.95%	-100.00%
Weekly	% of Respondents	12.50%	11.48%	8.89%
Less Frequently Than Once Per Week	% of Respondents	0.00%	1.64%	-100.00%
Frequency of SOIL Nutrition Analysis				
Never	% of Respondents	0.00%	6.06%	-100.00%
Less Frequently Than Once Per Year	% of Respondents	0.00%	0.00%	
Once Per Year	% of Respondents	0.00%	54.55%	-100.00%
Twice per Year	% of Respondents	100.00%	27.27%	266.70%
More Than Twice per Year	% of Respondents	0.00%	9.09%	-100.00%
Other	% of Respondents	0.00%	3.03%	-100.00%
Frequency of LEAF Nutrition Analysis				
Never	% of Respondents	25.00%	27.27%	-8.32%
Less Frequently Than Once Per Year	% of Respondents	0.00%	9.09%	-100.00%
Once Per Year	% of Respondents	0.00%	33.34%	-100.00%
Twice per Year	% of Respondents	75.00%	6.06%	1137.62%
More Than Twice per Year	% of Respondents	0.00%	18.18%	-100.00%
Other	% of Respondents	0.00%	6.06%	-100.00%
Key Pest Management Issues				
Applied Nematode Treatment	% of Respondents	57.14%	31.91%	79.07%
Applied Cane Beetle Treatment	% of Respondents	85.71%	65.96%	29.94%
Applied Weevil Borer Treatment	% of Respondents	114.29%	97.87%	16.78%

	Measure	TOP 10	REMAINDER	VARIANCE
Use of External Advice				
Engaged Pest Scouts / Monitors / Pest Agronomist	% of Respondents	0.00%	29.79%	-100.00%
Engage external Nutritional Advisor / Agronomist	% of Respondents	85.71%	59.57%	43.88%
Engaged Other Types of Advise for Farm Practices	% of Respondents	0.00%	0.00%	
Frequency of Bell Injection				
Every 7 Days	% of Respondents	100.00%	88.34%	13.20%
Every 14 Days	% of Respondents	0.00%	3.33%	-100.00%
Every 21 Days	% of Respondents	0.00%	0.00%	
Every 28 Days	% of Respondents	0.00%	0.00%	
Never	% of Respondents	0.00%	8.33%	-100.00%
Other	% of Respondents	0.00%	0.00%	
Interval Between Bell Injection and Bagging				
Every 7 Days	% of Respondents	57.14%	70.37%	-18.80%
Every 14 Days	% of Respondents	42.86%	22.22%	92.89%
Every 21 Days	% of Respondents	0.00%	0.00%	
Every 28 Days	% of Respondents	0.00%	0.00%	
Never	% of Respondents	0.00%	5.56%	-100.00%
Other	% of Respondents	0.00%	1.85%	-100.00%
Practice and Scale of Nurse Suckering				
No Nurse Suckering Practiced	% of Respondents	44.45%	51.57%	-13.81%
Up to 20% of Producing Area	% of Respondents	22.22%	31.25%	-28.90%
21% to 40% of Producing Area	% of Respondents	22.22%	9.38%	136.89%
41% to 50% of Producing Area	% of Respondents	0.00%	3.12%	-100.00%
51% to 75% of Producing Area	% of Respondents	0.00%	3.12%	-100.00%
76% to 100% of Producing Area	% of Respondents	11.11%	1.56%	612.18%
Packing Strategy Adopted				
Use Own Pack House / In House Packing	% of Respondents	100.00%	88.52%	12.97%
Use Contract Packing House	% of Respondents	0.00%	11.48%	-100.00%
Marketing Strategy				
Produce Marketing Channel Used				
Direct to Supermarkets	% of Respondents	30.56%	16.06%	90.29%
Via Brokers	% of Respondents	22.78%	24.28%	-6.18%
Through Wholesalers	% of Respondents	46.66%	55.29%	-15.61%
Through Exporters or Direct to Export	% of Respondents	0.00%	0.00%	
To Processors, Value Adders, Oil etc	% of Respondents	0.00%	0.02%	-100.00%
Other	% of Respondents	0.00%	4.35%	-100.00%

12.4KPI Outcomes by Region 2013

SOME KEY PERFORMANCE INDICATORS BY REGION - 2013

	MEASURE	TOTAL GROUP	ATHERTON AND LAKELAND	CASSOWARY COAST	NEW SOUTH WALES
PRODUCTIVITY AVERAGE					
Total KGS Harvested per Producing Hectare	Kgs / Ha	32,305.00	33,213.47	34,678.39	14,401.32
Total 13 KG Cartons(Equivalent) Harvested per Producing Hectare	13 Kg Cartons / Ha	2,485.00	2,554.88	2,667.57	1,107.79
AVERAGE PACK OUT TO XL					
% of Market Fruit Sold as XLarge %	%	76%	82%	74%	67%
PER PRODUCING HECTARE AVERAGE					
Total Sales Revenue	$ / hectare	60,159.05	64,694.16	61,873.55	19,685.04
Total Operating Costs (Excludes Interest & Depreciation)	$ / hectare	53,568.84	58,480.04	52,534.48	24,485.80
EBITDA	$ / hectare	6,590.22	6,214.12	9,339.07	(4,800.76)
PER CARTON SOLD AVERAGE					
Total Sales Revenue	$ / 13 Kg Carton Sold	24.04	24.34	23.07	17.60
Total Operating Costs (Excludes Interest & Depreciation)	$ / 13 Kg Carton Sold	21.40	22.89	19.69	22.10
EBITDA	$ / 13 Kg Carton Sold	2.66	2.43	3.50	(4.33)
LABOUR USE AVERAGE					
Total Labour Costs	$ / 13 Kg Carton Sold	6.94	7.61	5.75	12.45
Total Labour and Contracting / Consulting Costs	$ / 13 Kg Carton Sold	8.17	8.10	7.64	12.45
Cartons Handled per Total Labour Day Employed		25	23	30	14
Total Producing Hectares Managed per FTE	Ha / FTE	2.70	2.33	3.03	3.45