

# **New Zealand Olive Grove Census 2014**

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## **Olives New Zealand – May 2014**

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Report prepared by Gayle Sheridan, Executive Officer



# New Zealand Olive Grove Census 2014

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## Executive Summary

Olives New Zealand conducted a major Grove Census in 2012 and this has been updated in 2014 to reflect 2013 changes, groves previously not included and additional data. The 2014 survey forms were sent out to a total of 165 grower members and responses were received from 100 members and 4 non-members. There are now 210 groves in the database, compared with 172 in 2012.

The grand total of live trees in the database is now 317,619 trees compared with 276,205 in 2012. The ten most planted varieties across the country in order are; Frantoio, Leccino, Barnea, Koroneiki, Manzanillo, Picual, Picholene, J5, Pendolino and Kalamata. Hawke's Bay has the largest number of trees followed by Auckland, Northland and then Wairarapa.

The most common grove size ranges between 501 and 1,000 trees. There are six super large commercial groves in New Zealand; Auckland, Hawke's Bay (3), Marlborough and Nelson. Northland has the largest number of groves followed by Wairarapa and then Kapiti. The most common grove matrix is 6x5. Approximately 31% of olive groves are irrigated. Approximately 16% have a spray program, the majority for Peacock Spot and Anthracnose. Some 18 olive groves reported to be organic. More than half of olive groves are located on flat land.

The most popular form of harvesting is using hand held harvesters followed by machine harvesting. The majority of olive groves produce olive oil with a number also producing table olives. The average oil yield across the country in 2013 was 11.7%, however there is significant variation across regions. From the supplied data on harvest tonnage, it is apparent that there is great potential to increase crop load.

There are 30 processing facilities in the database with eight different makes.

The Grove Census helps the olive industry understand how it is structured so that it can represent itself credibly and to undertake benchmarking. The data has provided input into national and international projects and research.

The Grove Census also enables growers to benchmark the performance of their grove against other groves in the same region and nationwide. Individual grove reports have been produced showing growers their yield and tonnage by variety compared to the regional and national averages.

The data in the Grove Census database has the potential to enable correlations to be drawn in a number of areas, for example on effectiveness of spray programs to harvest tonnage. To enable correlations to be meaningful a higher level of consistent contributions is necessary.

The Olive Grove Census is a 'work in progress' and is updated as more responses are received.

## Background

Olives New Zealand conducted a major Grove Census in 2012 and this has been updated in 2014 to reflect 2013 changes, groves previously not included and additional data (e.g. 2013 harvest data and yields, spray programs).

The reason Olives New Zealand undertook the 2012 survey was to develop a better understanding of the size and nature of the industry. It was intended to build on previous work<sup>1</sup> and would enable the organisation to effectively represent the olive industry in New Zealand. It would also allow the organisation to achieve greater credibility with Government and other organisations where it needs to represent the interests of growers and other industry participants. Since the 2012 Grove Census was published, other national and international organisations and researchers requested data on the New Zealand industry and now have requested updated data.

The information on individual businesses is kept confidential and only summary data is produced. A copy of the Grove Census form is attached as Appendix One.

The number of groves in the Census database has increased from 1712 groves in 2012 to 210 groves in 2014. These additional groves are spread across most regions. Similarly the number of trees in the Census database has increased from 276,205 in 2012 to 317,619 trees in 2014. The following chart shows the groves in the Census Database by region, 2014 compared to 2012. Note that two groves previously shown as Auckland were corrected to being Waiheke.

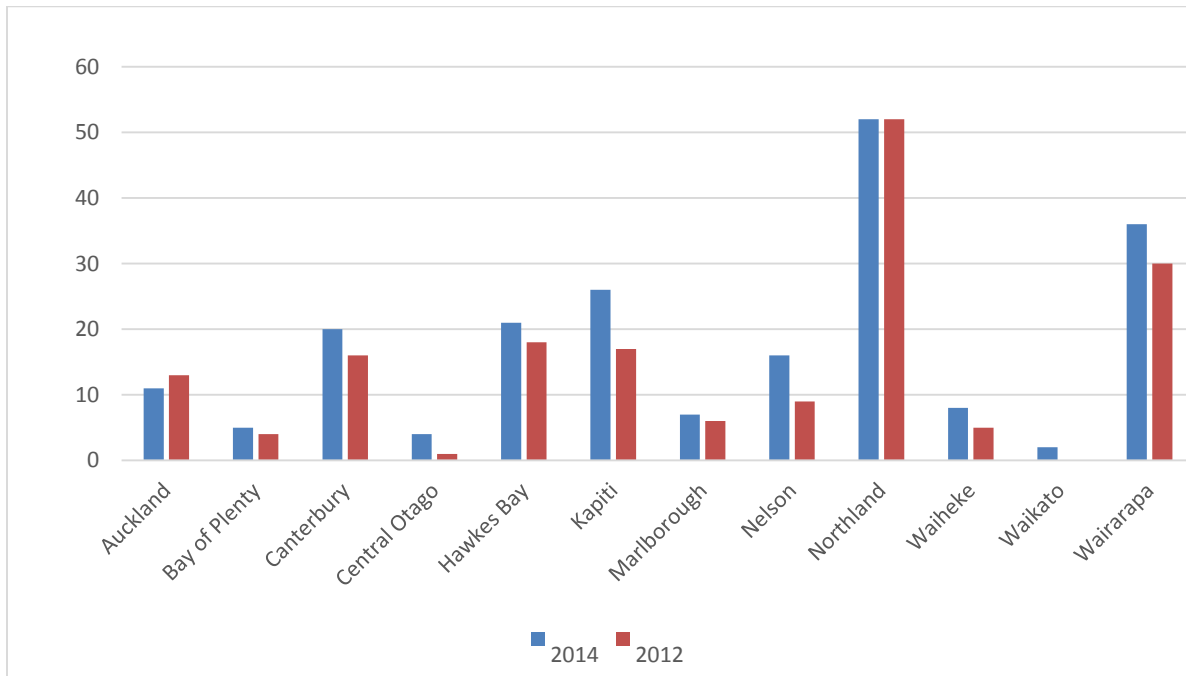


Figure 1 Groves in Census Database

This report is based on the responses received as at April 2014 and the data provided. Where appropriate, comparisons to the 2012 Grove Census and 2008 Grower Survey have been included.

<sup>1</sup> The previous research on the New Zealand olive industry was carried out on behalf of Olives New Zealand via a Grower Survey by Horticulture New Zealand in August 2008. This drew 199 responses; 167 members and 32 non-members or not known.

### Response Rate

The 2014 survey forms were sent out to a total of 165 grower members and responses were received from 100 members and 4 non-members. The number of responses compared to the number of survey forms sent to members is shown below.

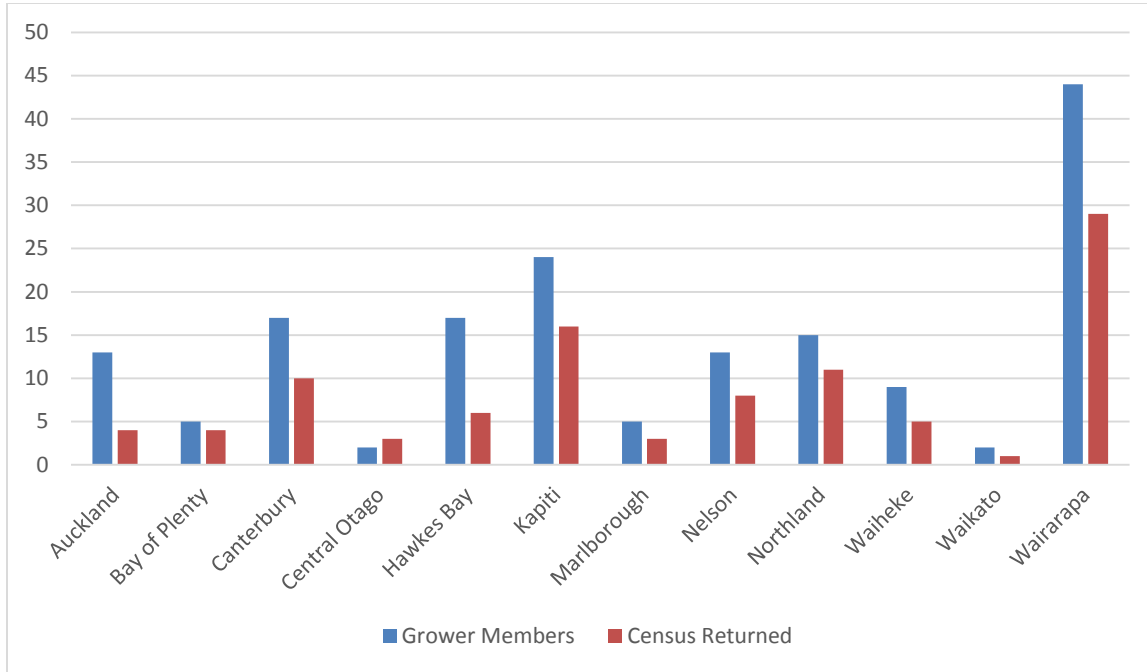


Figure 2 2014 Census Update Response Rate

The percentage of response rates across total current members was 60%, however two regions were significantly less than half, specifically Auckland and Hawke’s Bay. The percentage response rate is shown on the following chart.

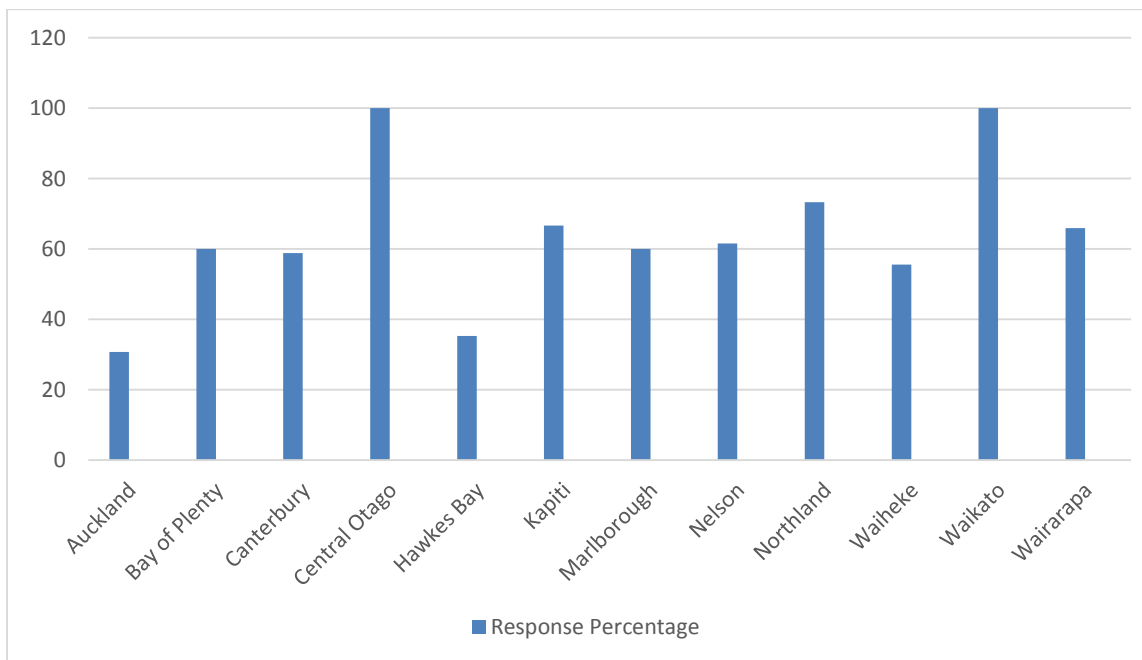
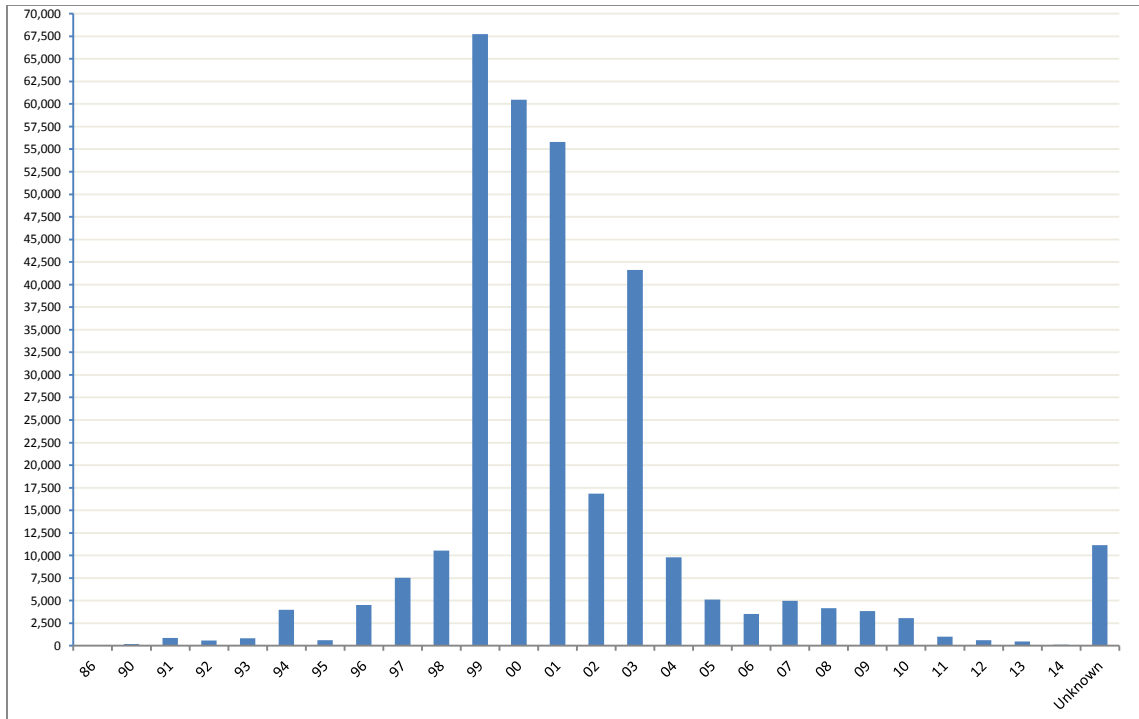


Figure 3 Percentage Response Rate from Grower Members

## Grove Information

### *Year Planted*

The oldest grove reported was established in 1986 in Hawke’s Bay. The date planted was unknown or not provided for approximately 3.5% of trees reported by growers. The number of trees planted from 1986 to 2014 is shown on the following chart.



**Figure 4 Trees Planted by Year**

The grand total of trees planted in the database is 320,027 (2012 was 276,205 and 2008 was 269,649). The chart shows that the greatest number of trees planted was 67,721 in 1999 followed by 60,471 in 2000 and 55,791 in 2001. Trees most recently planted in 2013 and 2014 included Nocellara, Leccino, Koroneiki, Frantoio and J5.

### *Trees Removed*

Growers also reported on trees removed since their initial grove data was provided. This has reduced the total number of live trees in the database from 320,027 to 317,619 trees. This updated tree data is used for all subsequent data shown in this report.

### *Most Planted Varietals*

The ten most planted varietals across the country in order are; Frantoio, Leccino, Barnea, Koroneiki, Manzanillo, Picual, Picholene, J5, Pendollino and Kalamata. These are the same top ten varietals as in 2008 and 2012 but in a slightly different order. Interestingly, as growers revisit their data there is increased accuracy which is reflected in changes to the number of trees and varietals of trees.

The following chart shows the top ten varieties in 2014.

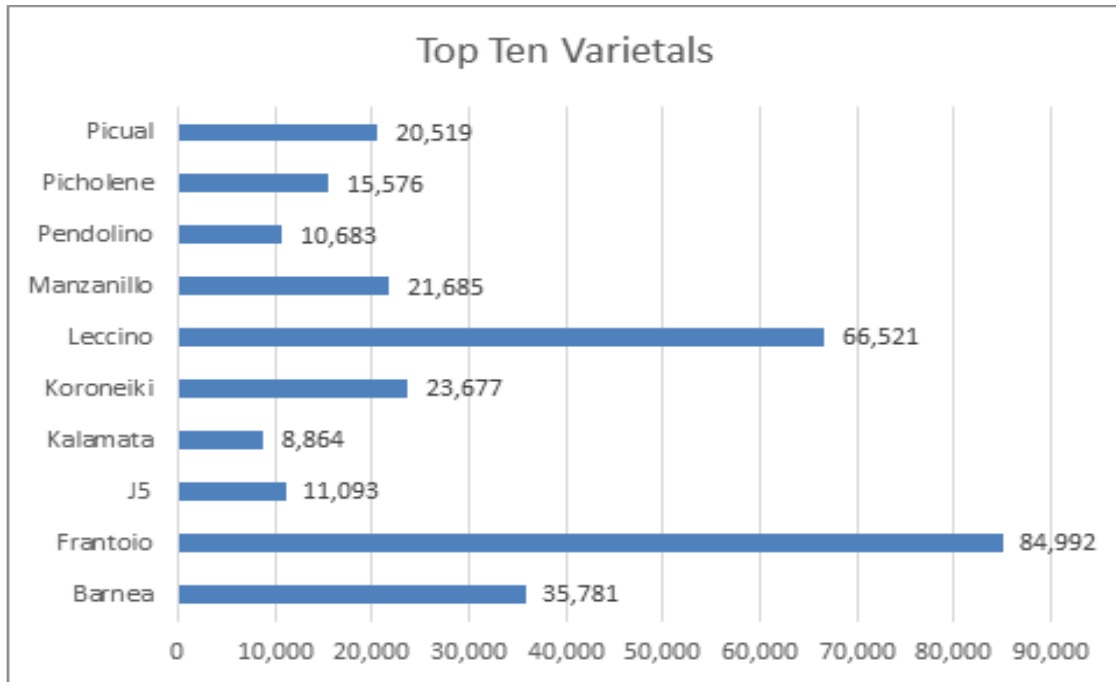


Figure 5 Top Ten Varietals 2014

The following chart shows the top ten varieties in 2014 compared with 2012 and 2008.

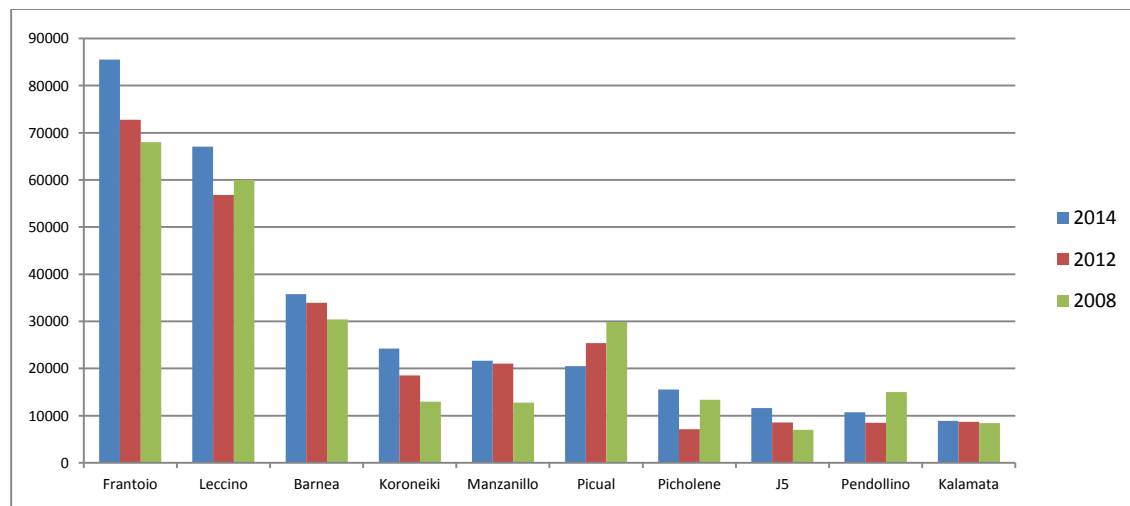


Figure 6 Top Ten Varietals 2014 – 2012 -2008

Frantoio is the most planted cultivar in all regions except; Auckland where Leccino is equal and Waikato where Koroneiki is the most planted.

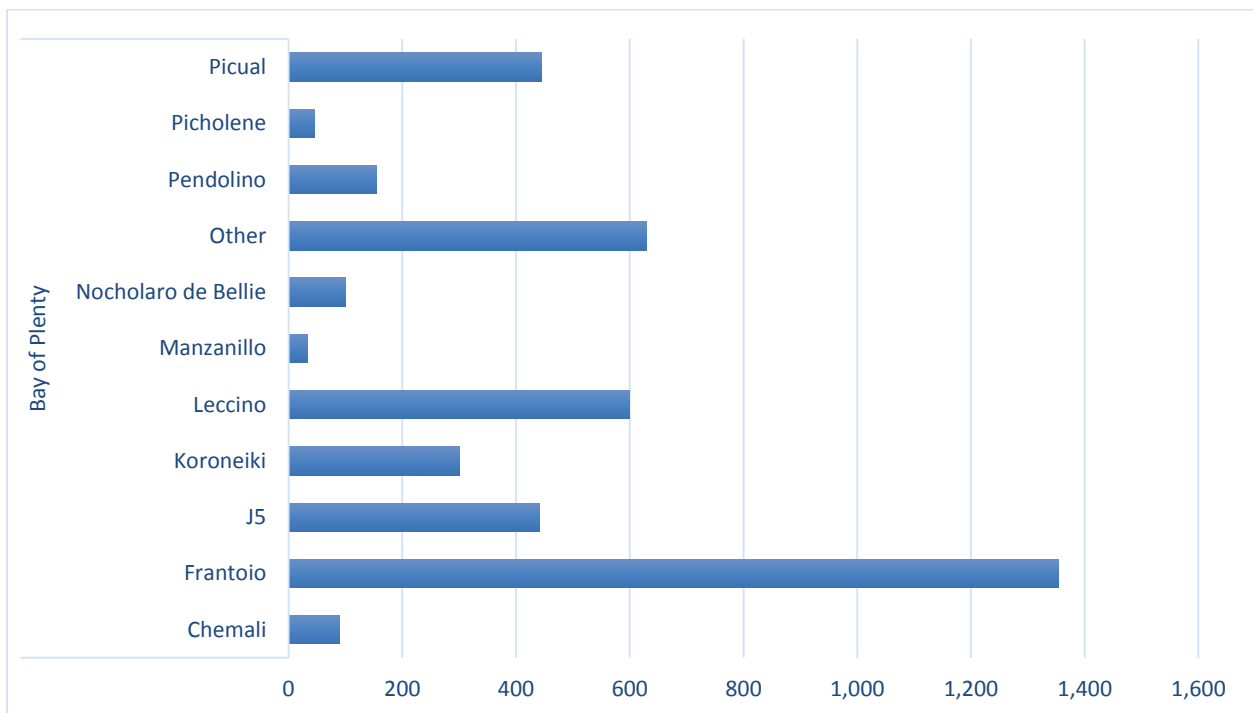
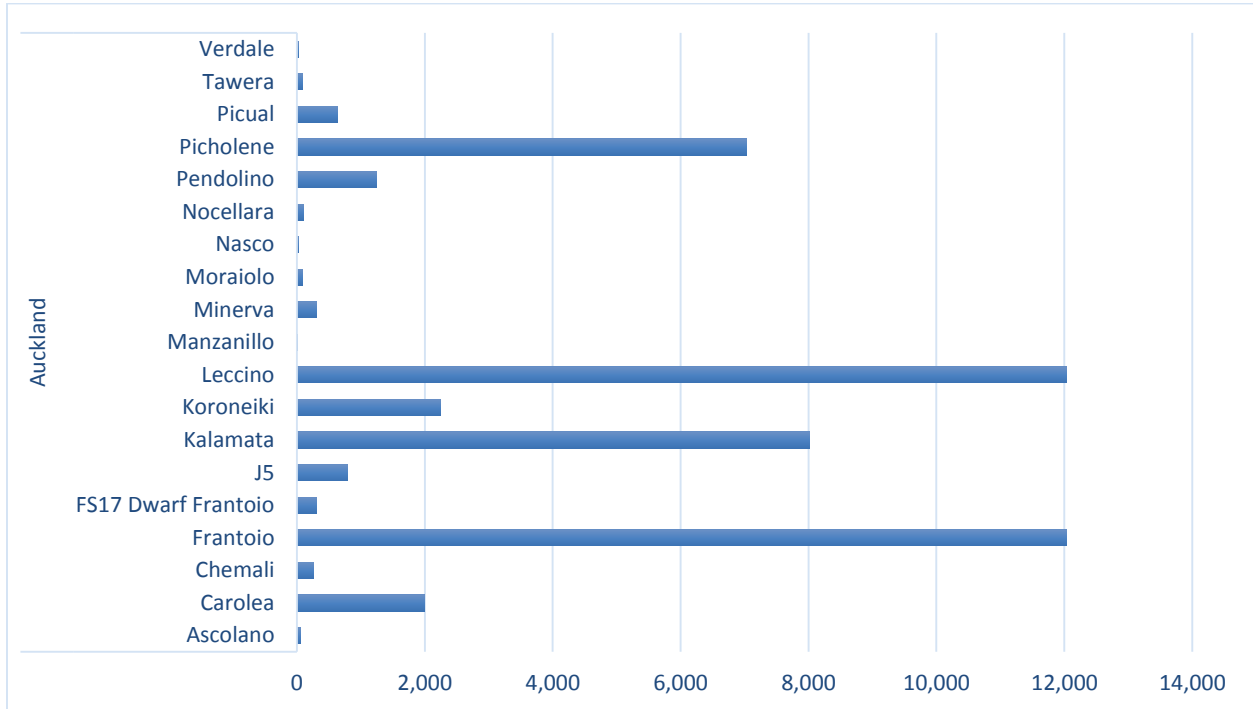
Appendix Two contains a list of all tree varieties and their numbers for 2014, 2012 and 2008.

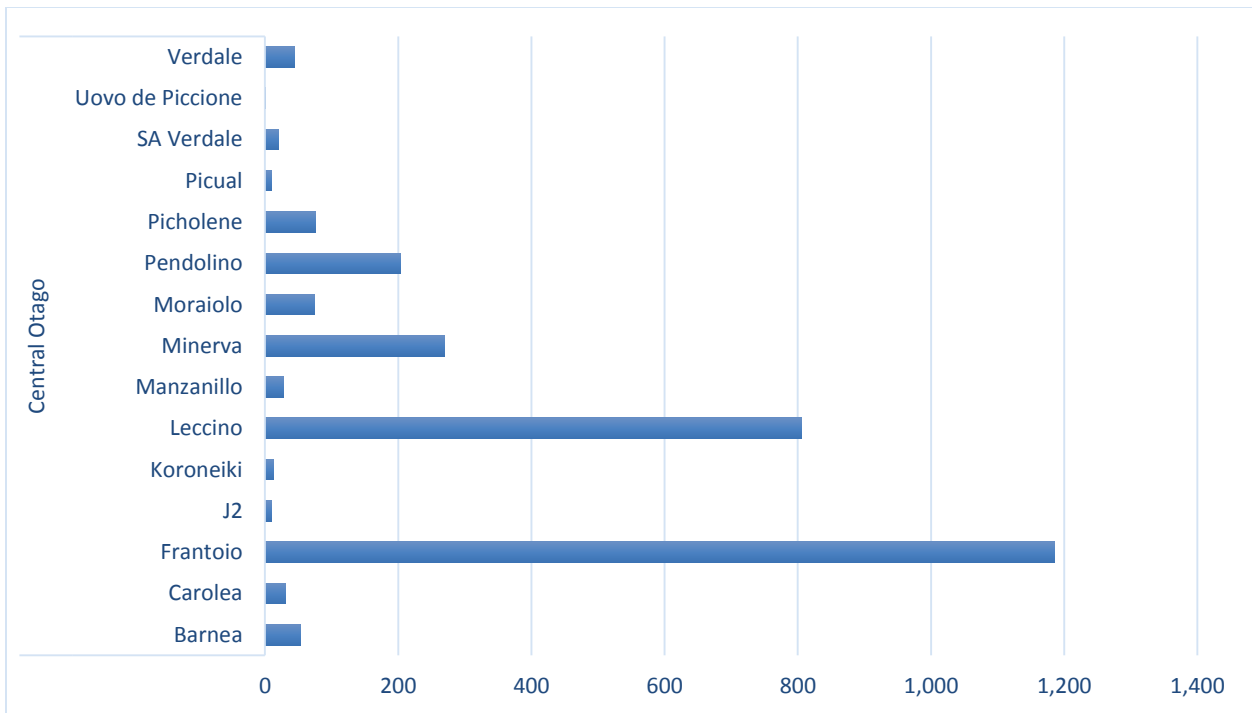
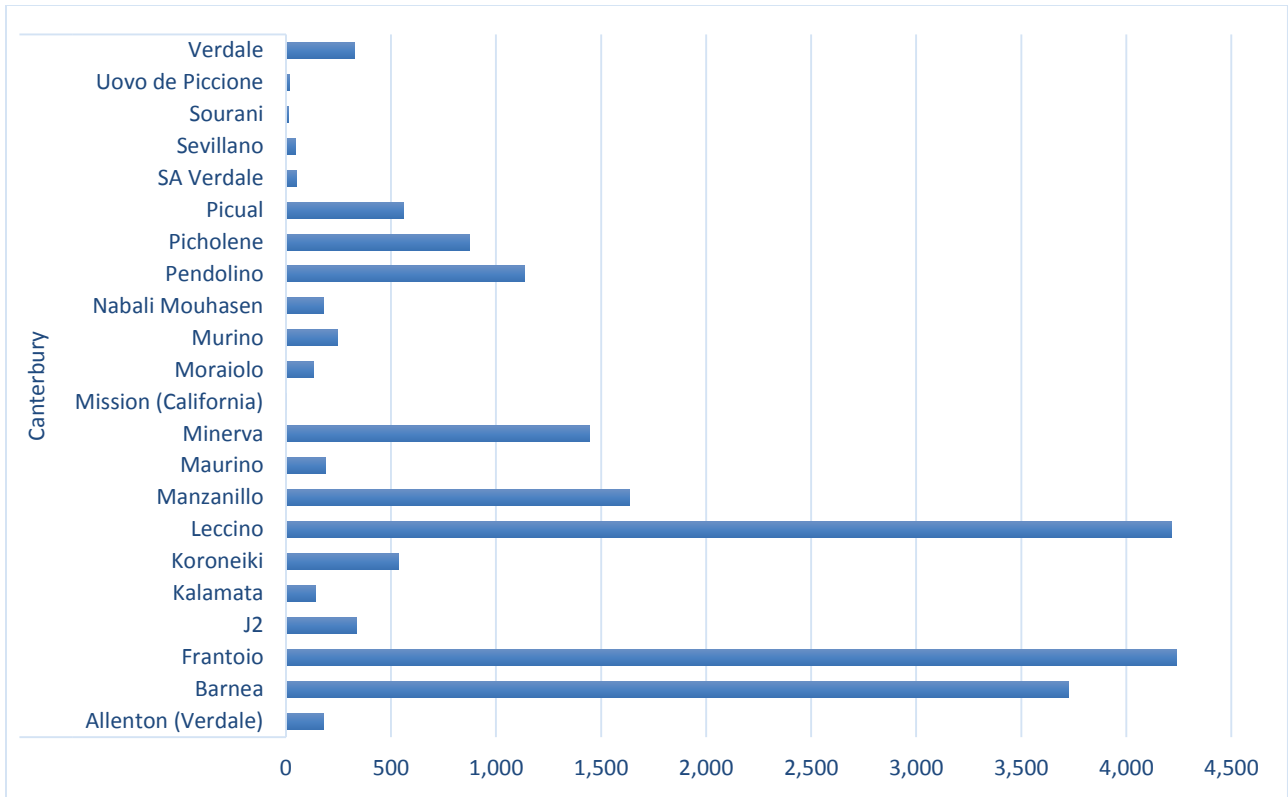


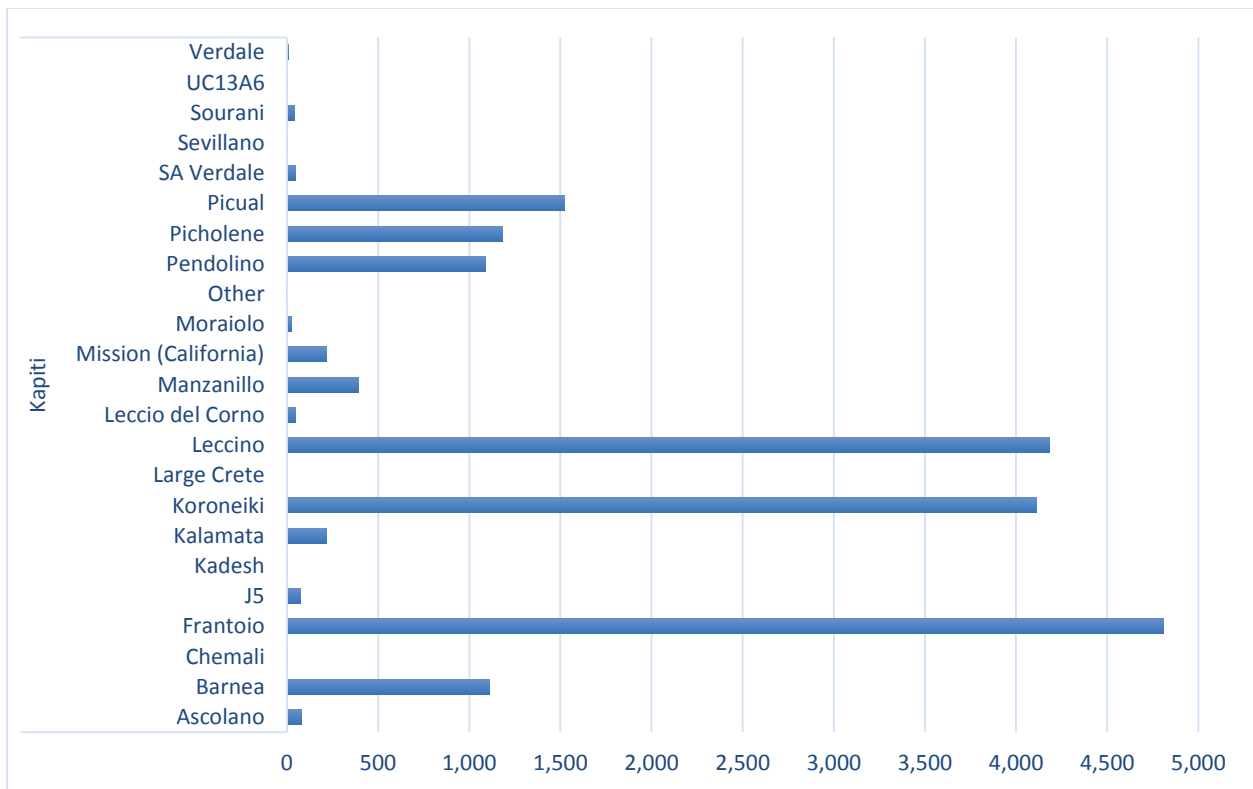
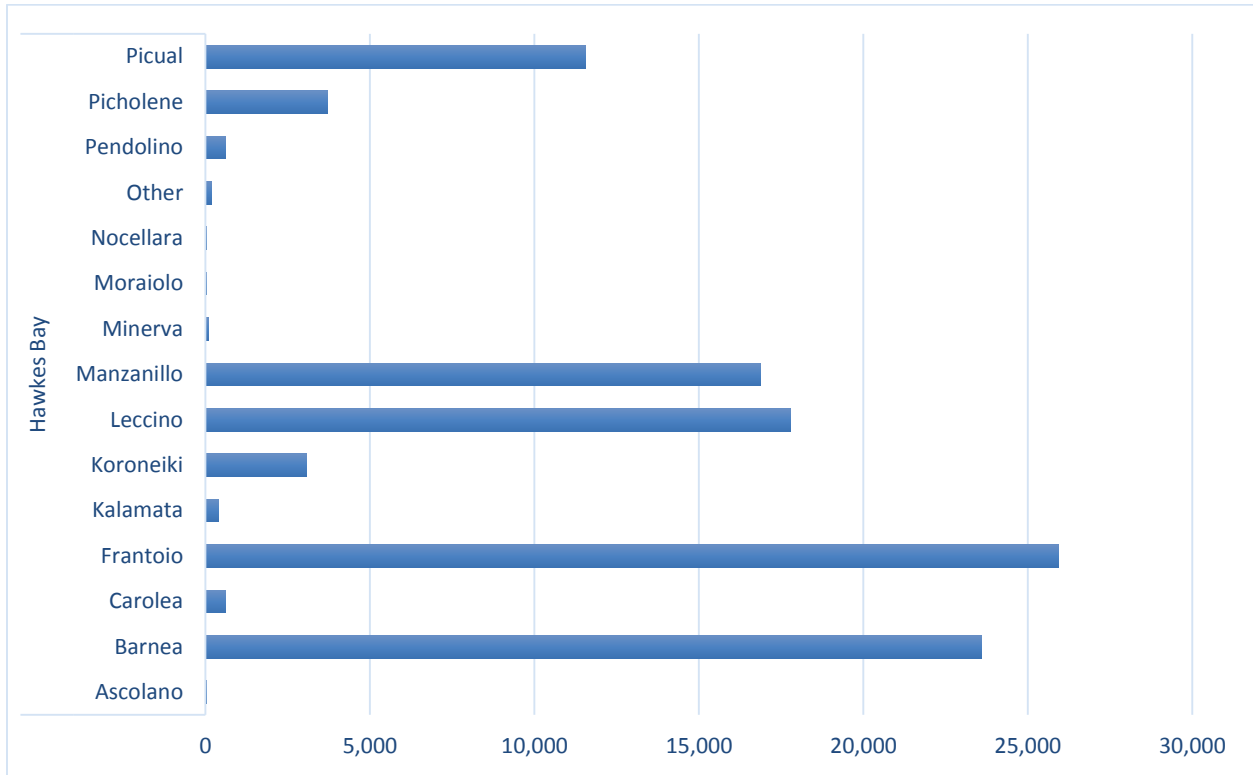
*Tree Varietals Planted by Region*

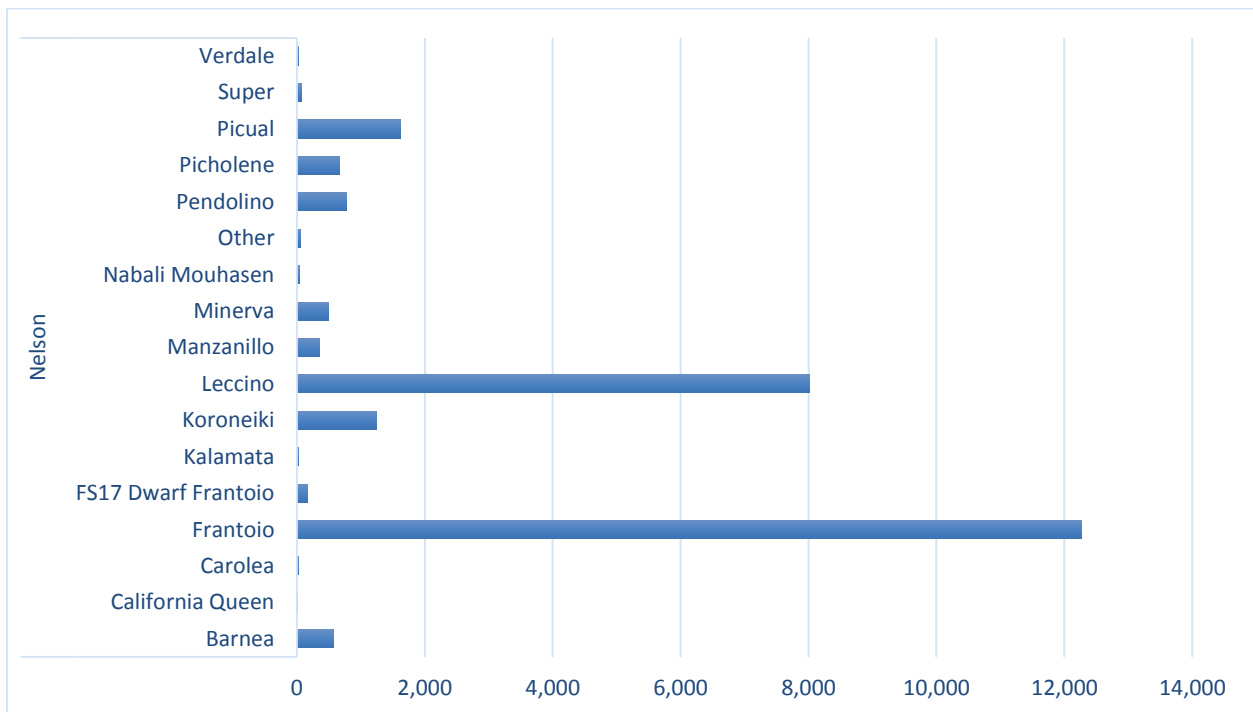
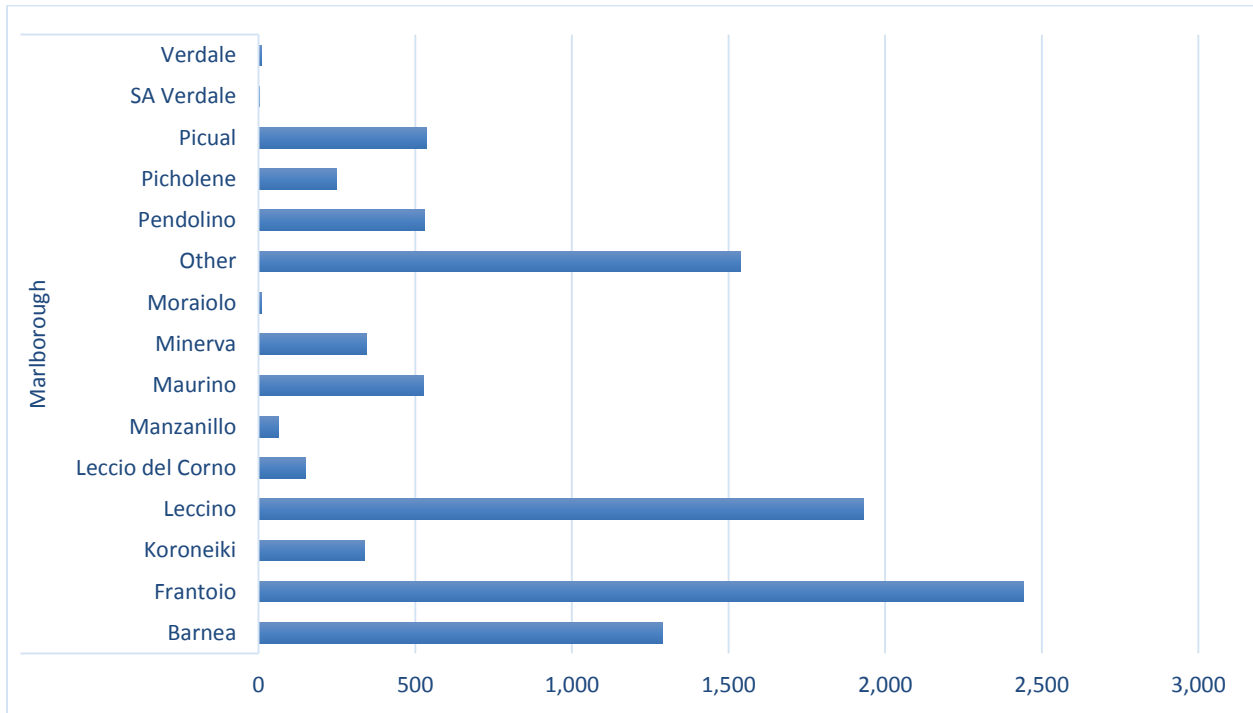
The following charts show the statistics for tree varietals by region.

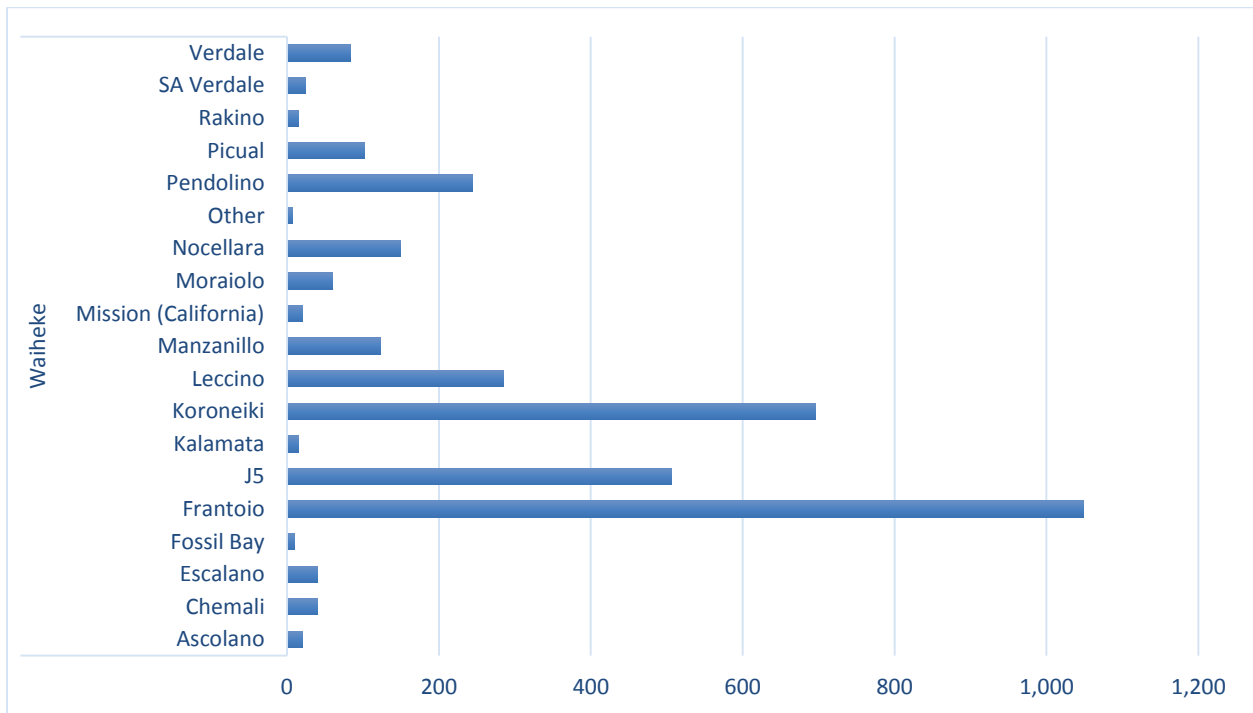
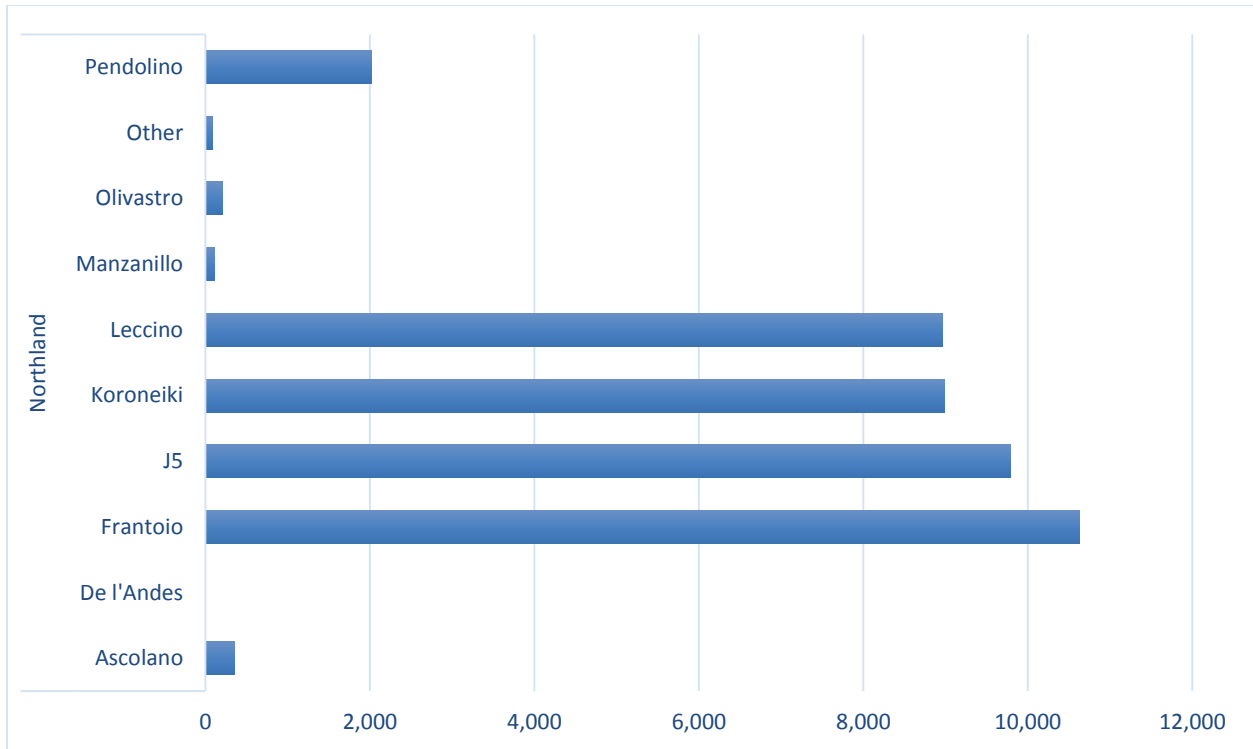
**Figure 7 Trees Varietals Planted by Region**

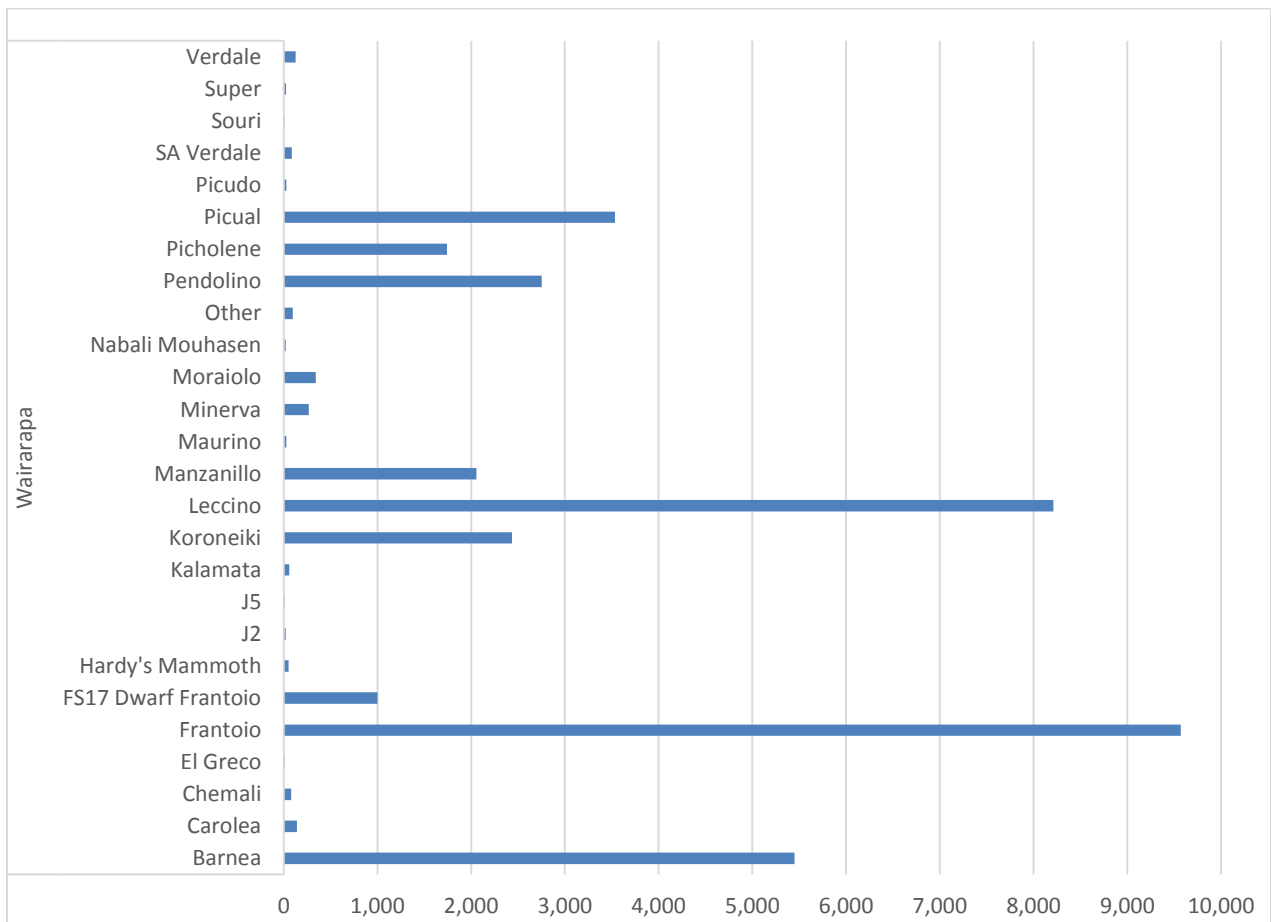
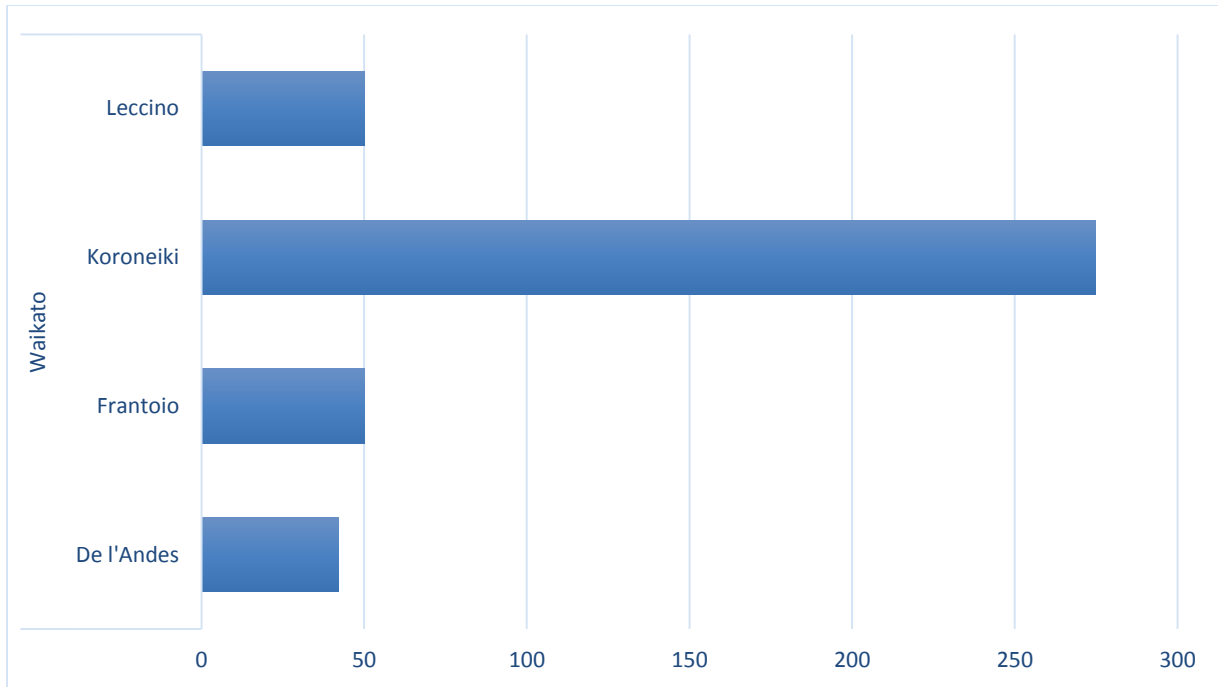






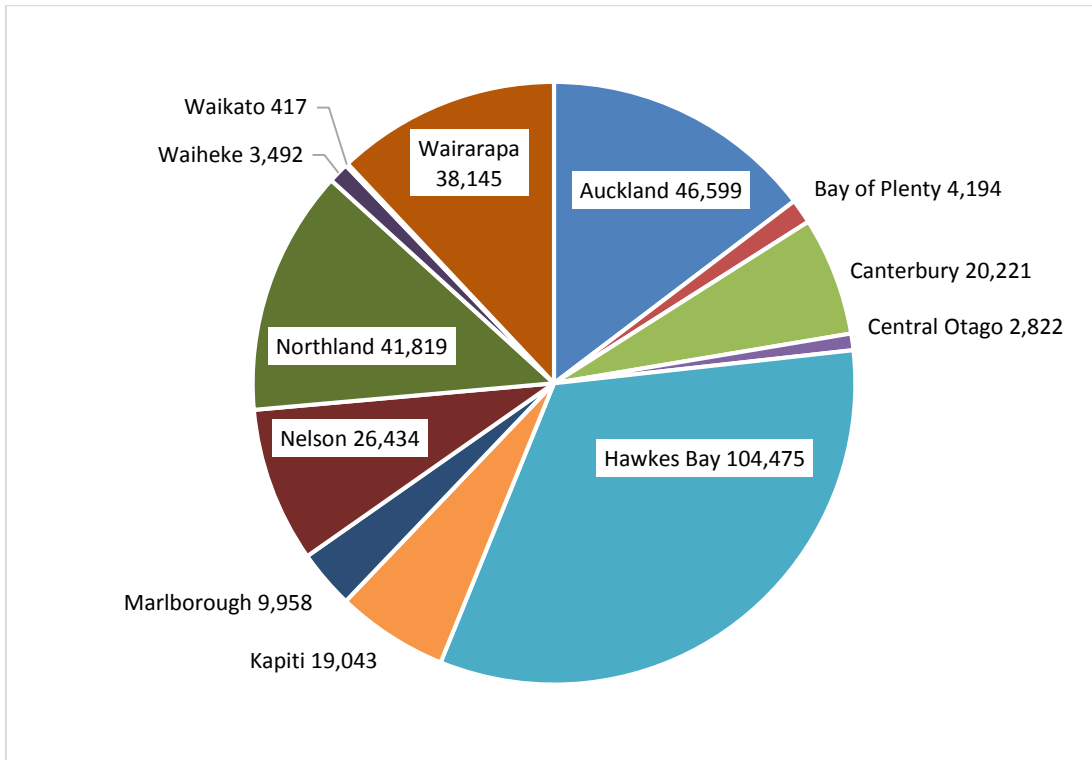






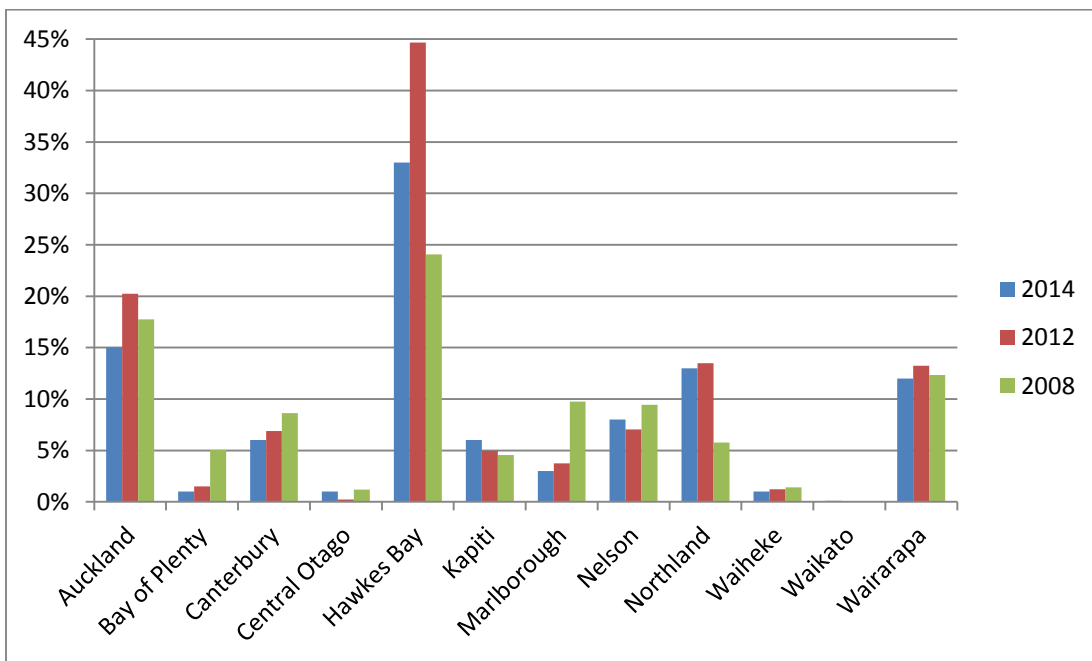
*Total Trees by Region*

Hawke's Bay has the largest number of trees, followed by Auckland, Northland and then Wairarapa. The following chart shows the total number of trees by region.



**Figure 8 Total Trees by Region**

The percentage breakdown of trees by region is as follows for 2014 compared to 2012 and 2008.



**Figure 9 Percentage of Trees by Region**

Grove Size

The most common grove size ranges between 501 and 1,000 trees. The regions that have super large commercial groves in excess of 5,000 trees are Auckland, Hawke’s Bay, Marlborough and Nelson. Each of these regions has one very large commercial grove with the exception of Hawke’s Bay which has three. The following chart shows by region the number of groves by size.

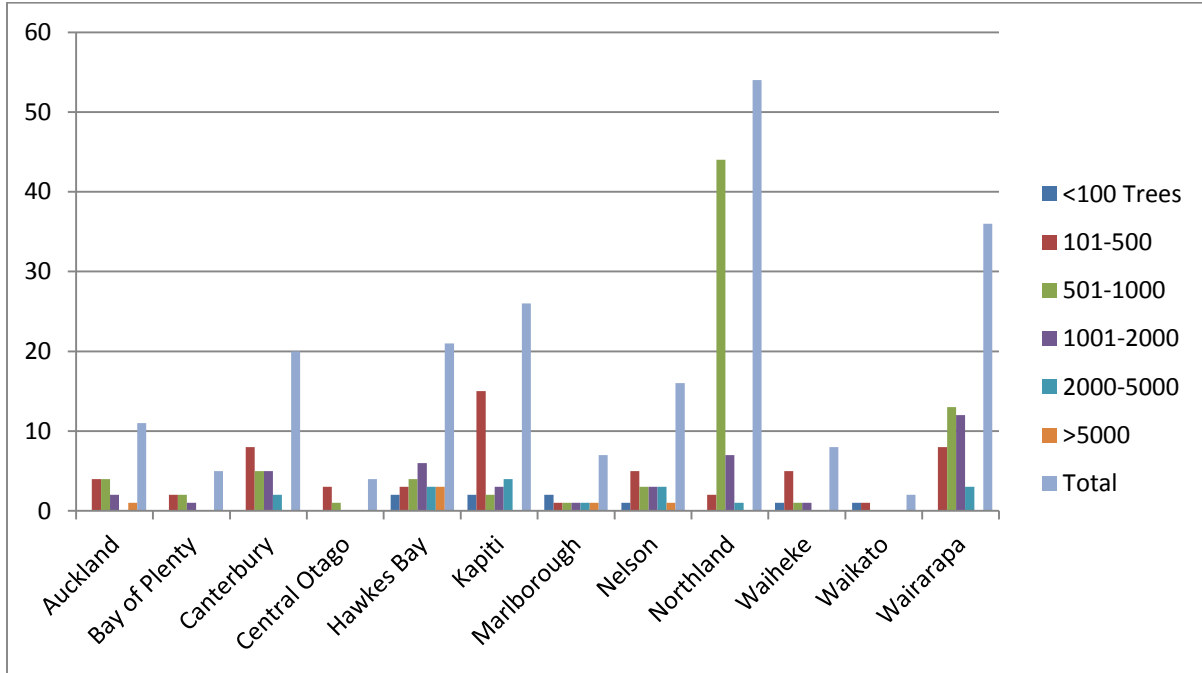


Figure 10 Grove Size by Number by Region

The chart also shows that Northland has by far the most groves with 54, followed by Wairarapa with 36 and Kapiti with 26.

The following chart shows the total number of groves by size.

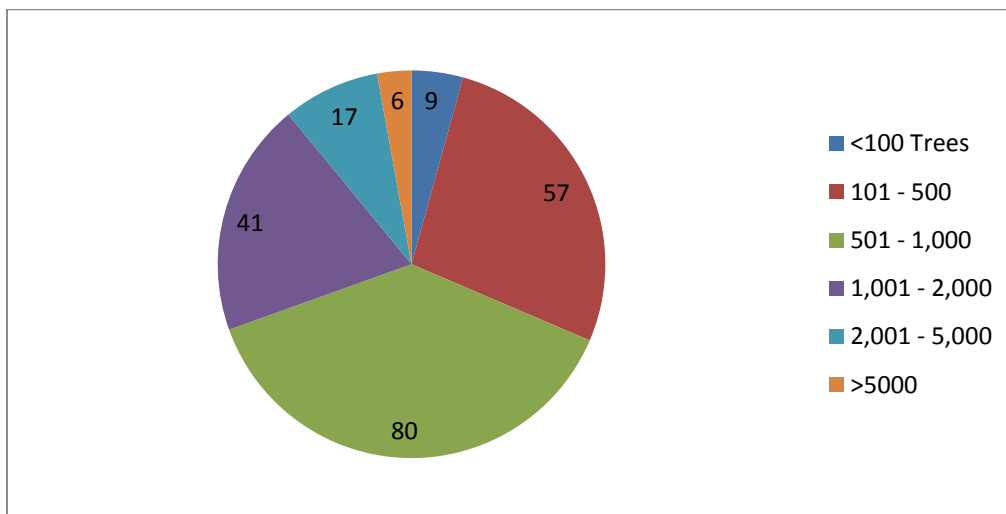


Figure 11 Number of Groves by Size



The majority of groves, 38%, have between 501 and 1,000 trees. The next range is 101 – 500 with 27% and then 1,001 – 2,000 with 20%.

The following chart shows the super large commercial groves by region.

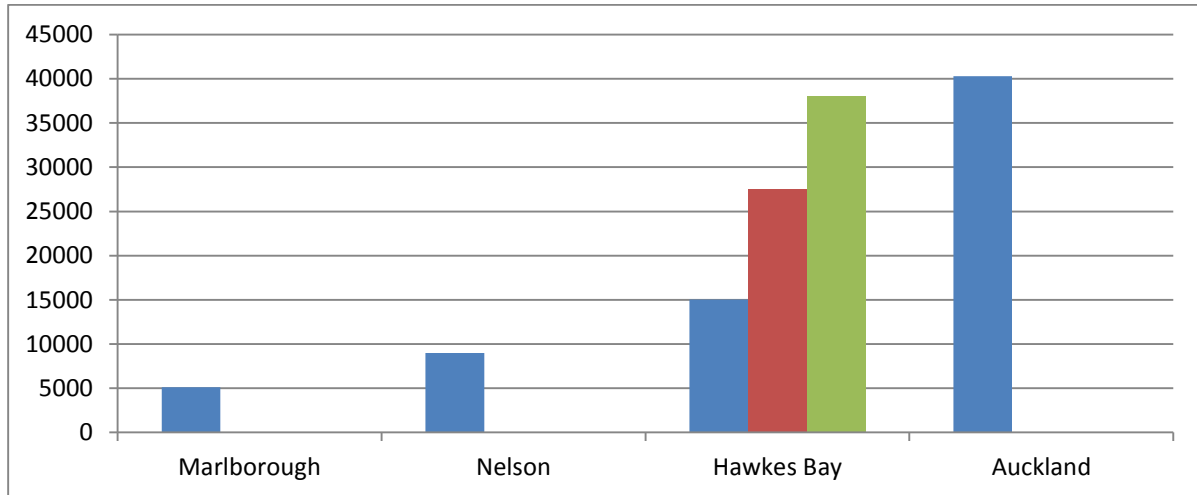


Figure 12 Large Commercial Groves

*Hectares Planted*

According to the Statistics New Zealand Survey, as at June 2013 there were 2,173 hectares planted in olive groves. Unfortunately only 22 of Census respondents completed this question with a total of 121 hectares. This is an insufficient response to produce any meaningful data.

*Grove Matrix*

For the 71 groves that supplied their grove matrix, the most common is 6x5 followed by 6x6 and then 6x4. The following chart shows the number of groves by grove matrix.

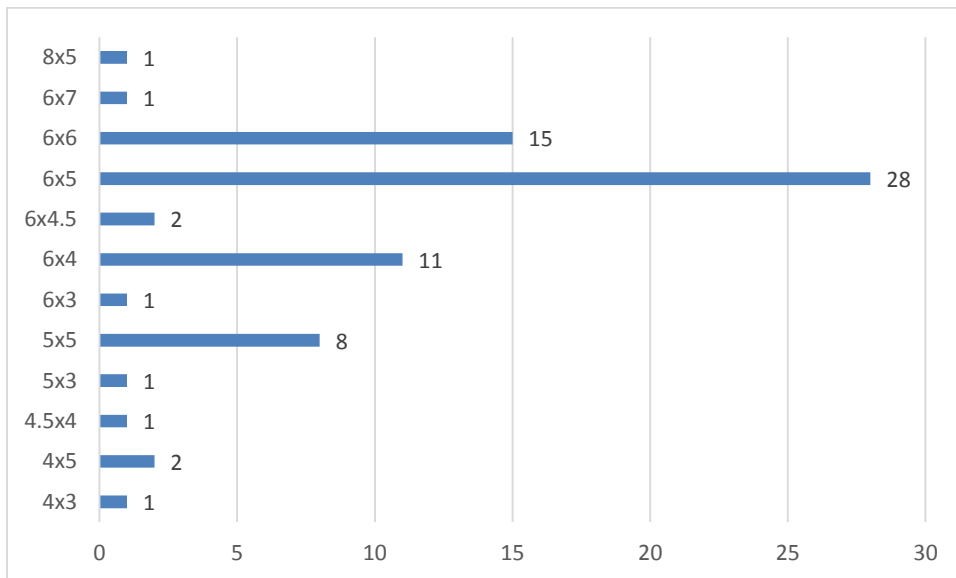
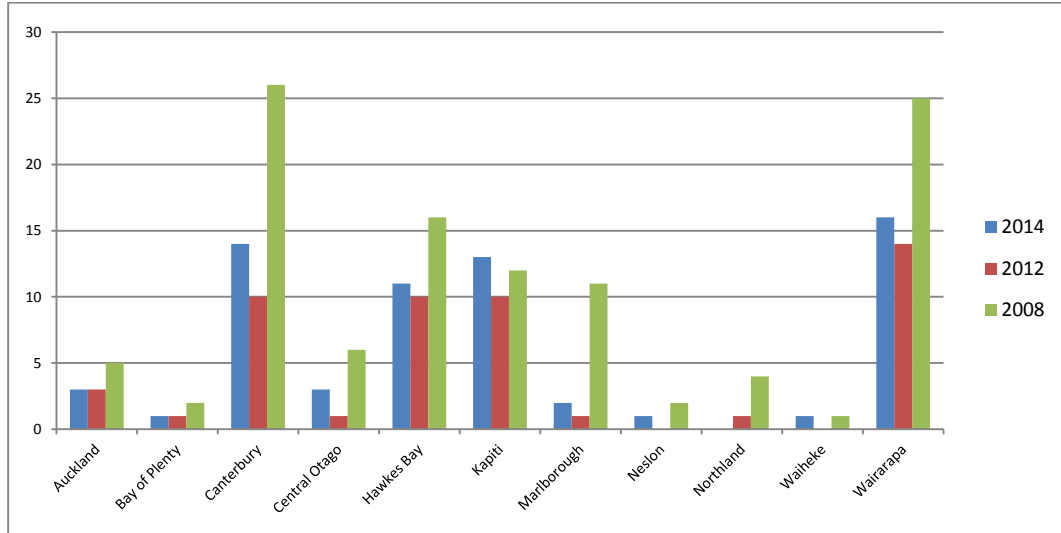


Figure 13 Number of Groves by Grove Matrix

*Irrigated*

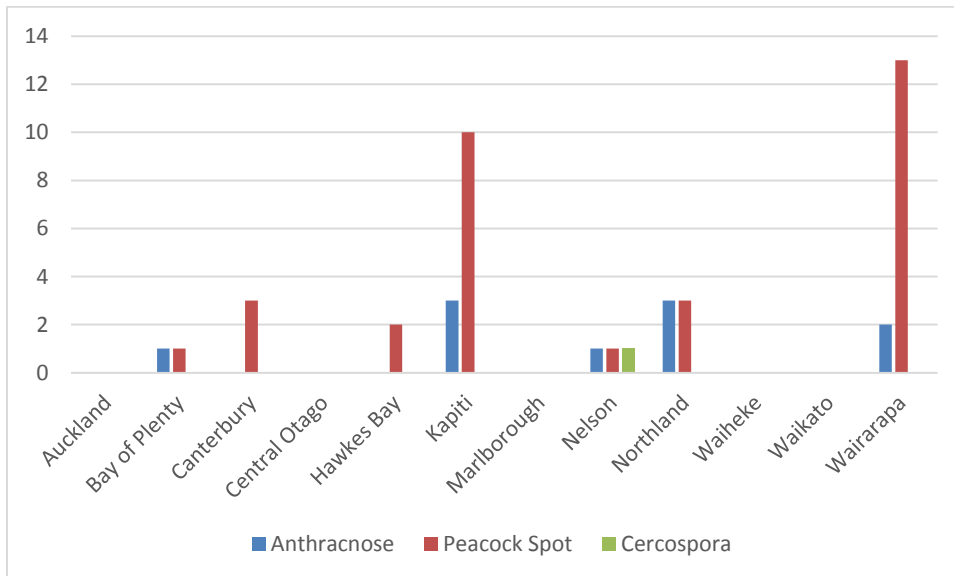
Approximately 31% of groves in the 2014 Census Database are reported to be irrigated, with 65 across the country compared with 40% in 2012 and 55% in the 2008 survey. Regions where half or more groves are irrigated are Canterbury, Central Otago, Hawke’s Bay and Kapiti. The following chart shows the number of irrigated groves in 2014 compared with 2012 and 2008, by region.



**Figure 14 Irrigated Groves**

*Spray Programs*

Approximately 16% of groves reported having a spray program, the majority for Peacock Spot and Anthracnose but one in Nelson for Cercosporiose. The following chart shows a breakdown of spray programs by region.



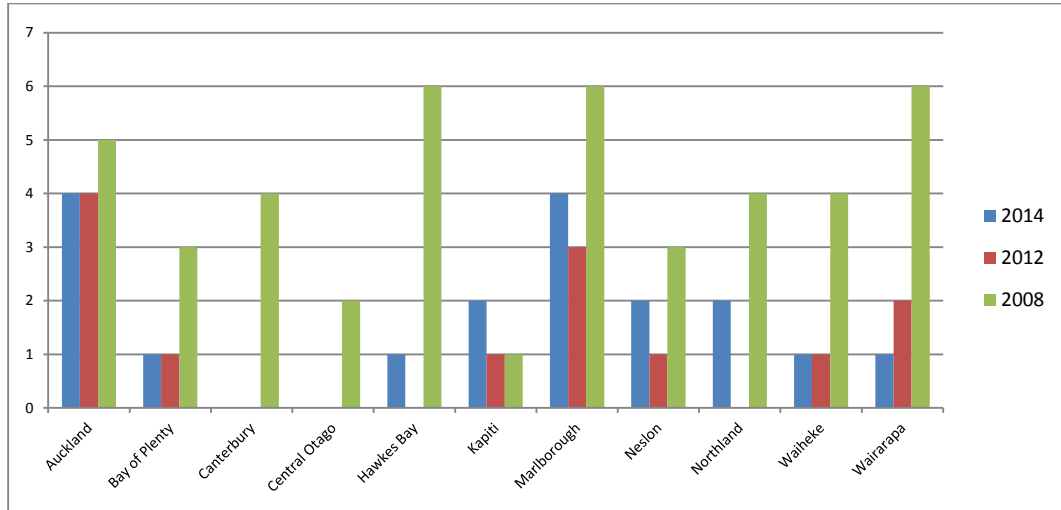
**Figure 15 Spray Programs by Region**

There are a variety of sprays used, although many of these have the same ingredients, as follows:

- |        |          |         |        |         |           |          |           |
|--------|----------|---------|--------|---------|-----------|----------|-----------|
| Balear | Copper   | Dithane | Ippon  | Lime    | Penncozeb | Spotless | Sulphur   |
| Boron  | Cuprofix | Dodine  | Kocide | Manzate | Phix      | Stroby   | VistaFlow |

*Organic*

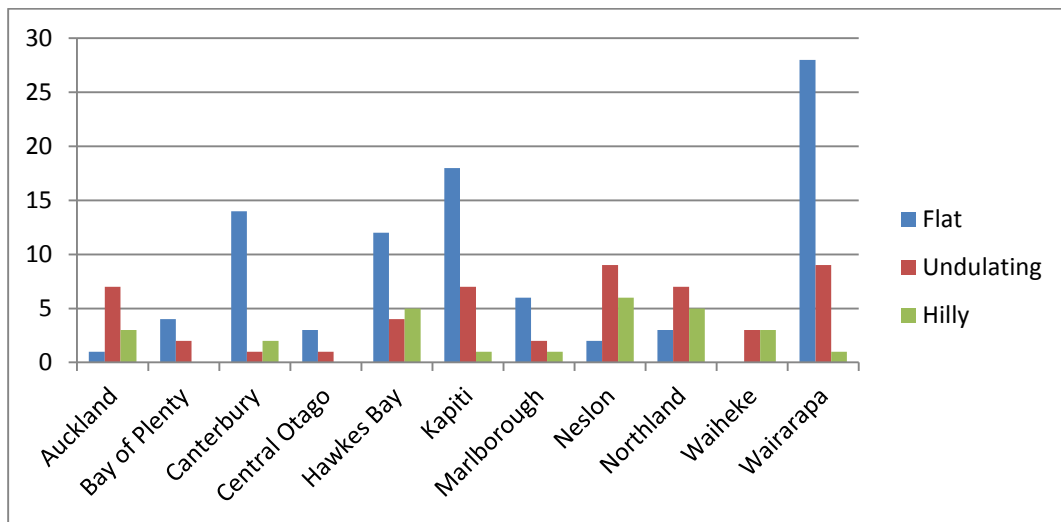
Only 18 respondent groves are organic, compared with 13 in 2012 and 44 in the 2008 survey. Three regions reported no organic groves in 2014 compared with four regions in 2012. All regions showed organic groves in 2008. The following chart shows the number of organic groves in 2014 compared with 2012 and 2008, by region.



**Figure 16 Organic Groves**

*Land Contour*

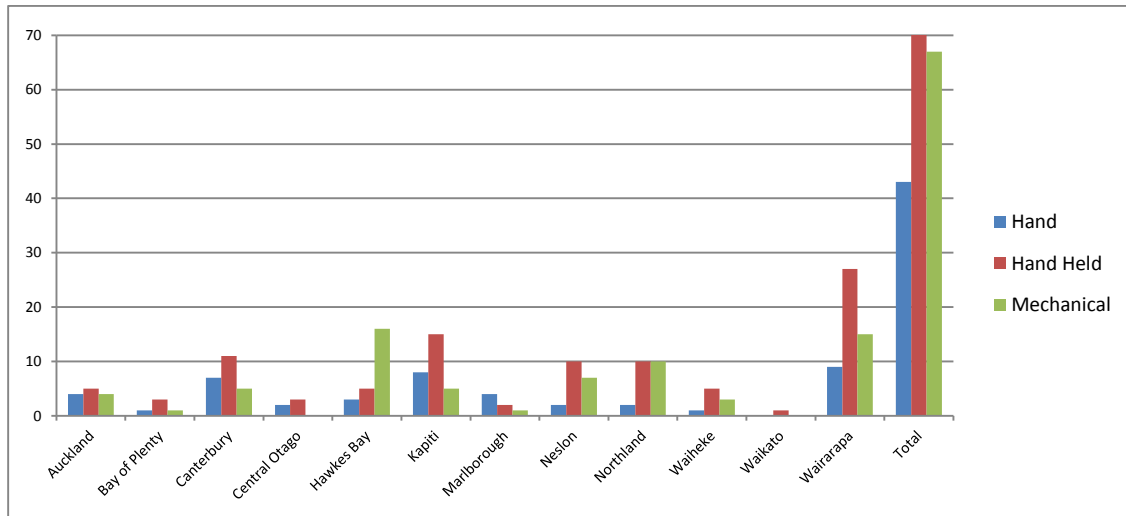
Slightly more than half of the olive groves (54%) are located on flat land, with 31% on undulating and 15% on hilly land. The following chart shows the land contour of olive groves by region.



**Figure 17 Land Contour by Region**

*Harvest Methods*

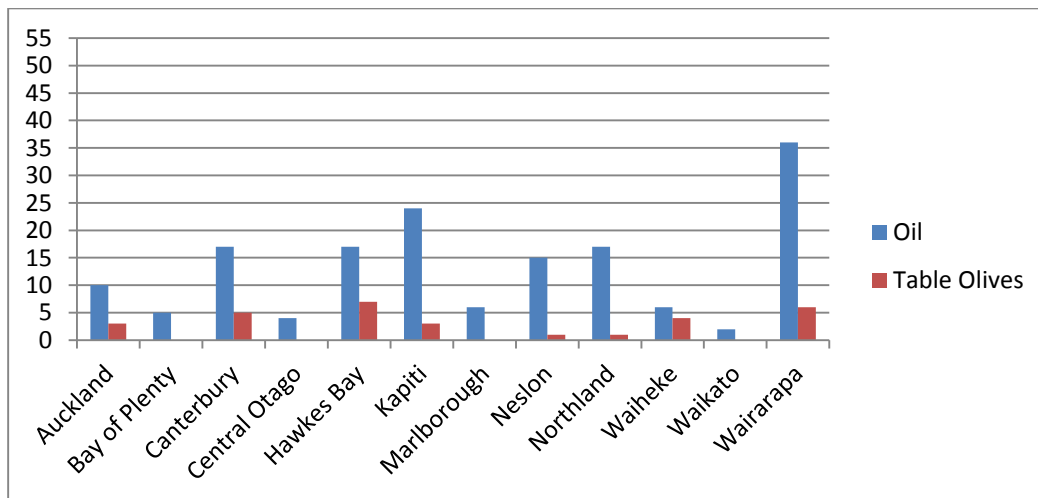
The most popular form of harvesting is hand held harvesters used by 46% of groves, ahead of machine harvesting with 32%. Some 20% of respondents use hand harvesting as well, and this may well be for table olives or very small groves. The following chart shows the harvest methods by region.



**Figure 18 Harvest Methods**

*Production Type*

Of the 210 groves, 159 reported harvesting for oil and 30 groves also harvested for table olives. The following chart shows the production type across the regions.



**Figure 19 Production Type by Region**

## 2013 Production Figures

### Oil Yield

The average oil yield reported for 2013 across the country was 11.7%. However, there was significant variation by region with the lowest being around 9.25% and the highest being 16.23%. The average oil yield by region is shown on the following chart.

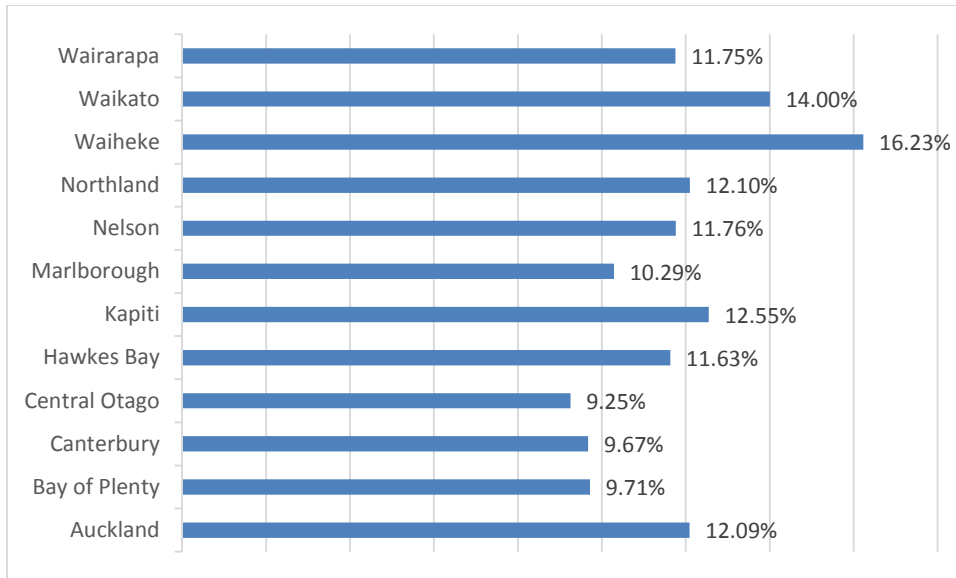


Figure 20 2013 Average Oil Yield by Region

The average oil yield between varietal also varied with lowest being Kalamata at 7.56% but a number of others being around 12.8%. The average oil yield by varietal is shown on the following chart.

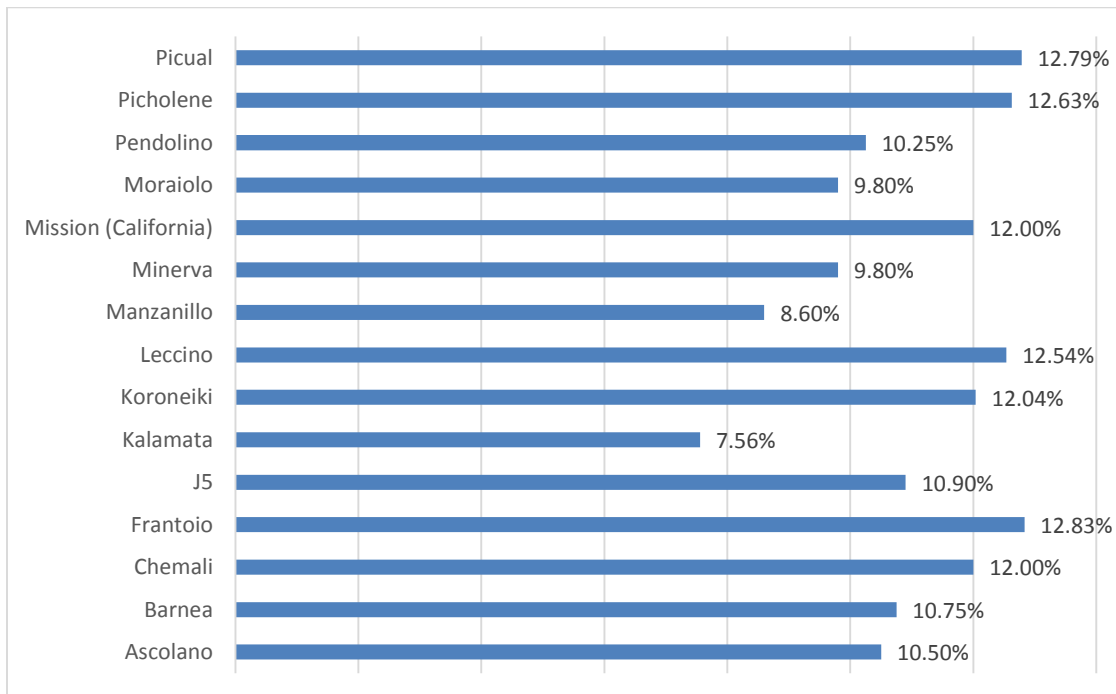
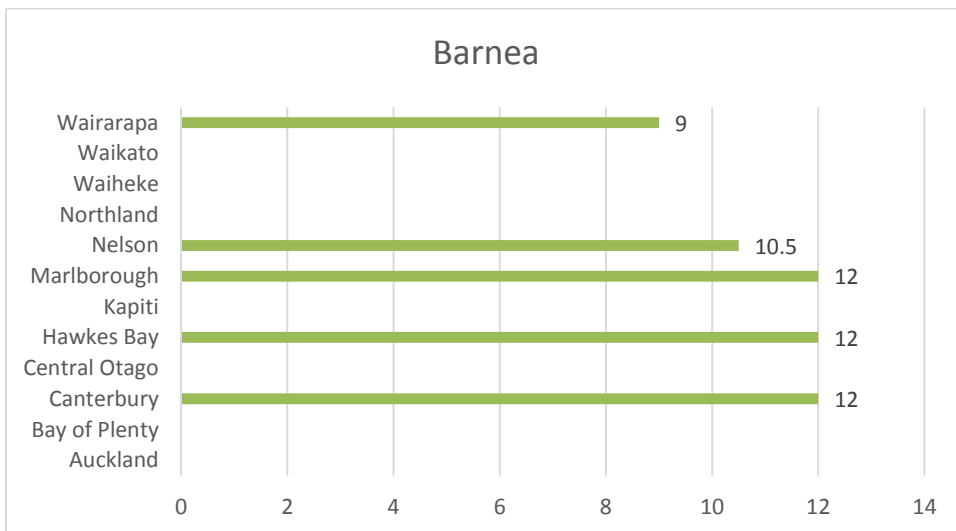
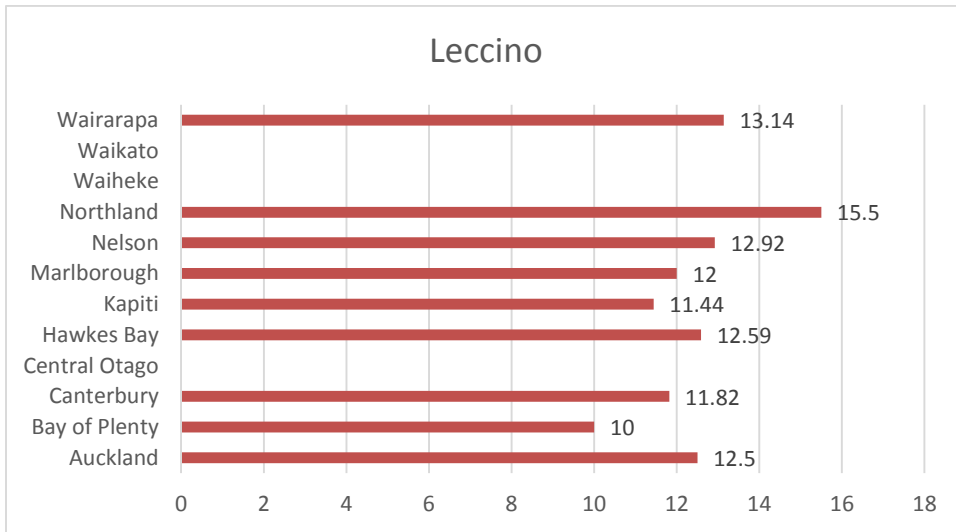
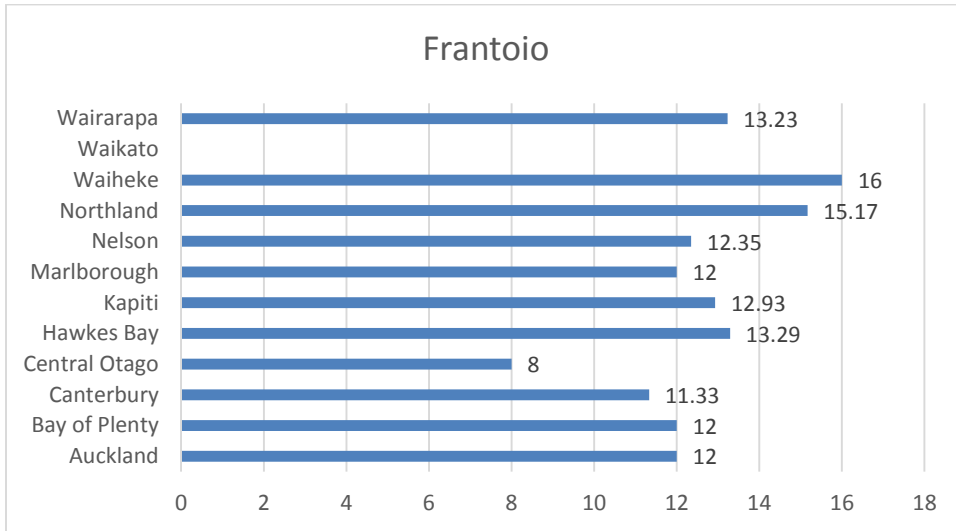
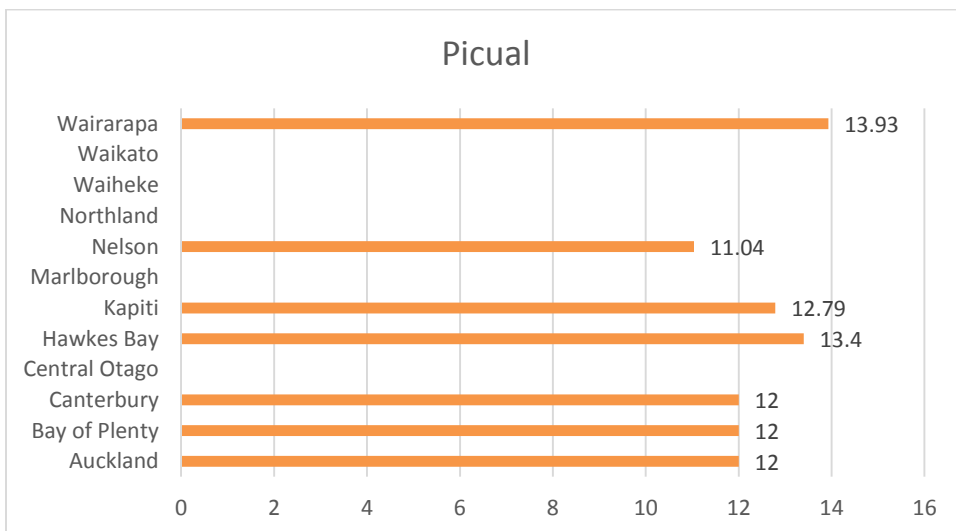
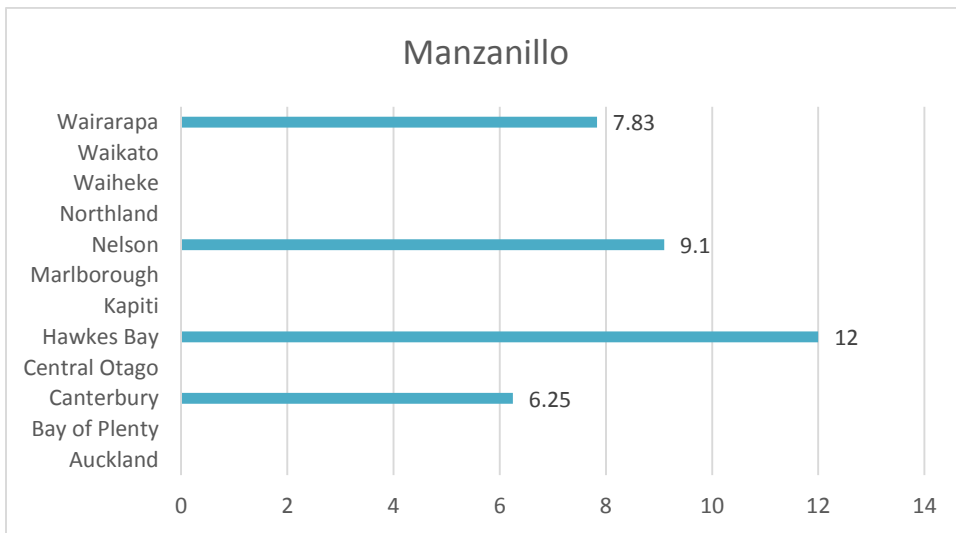
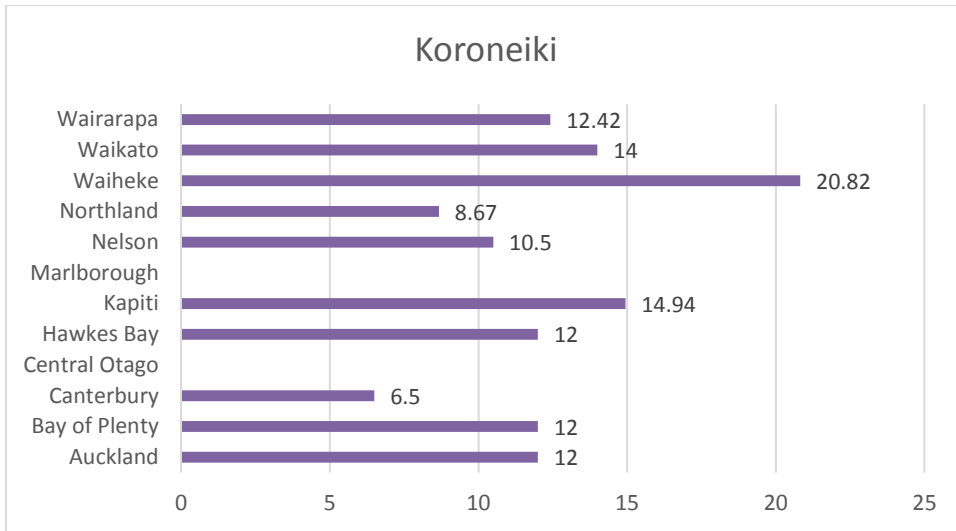
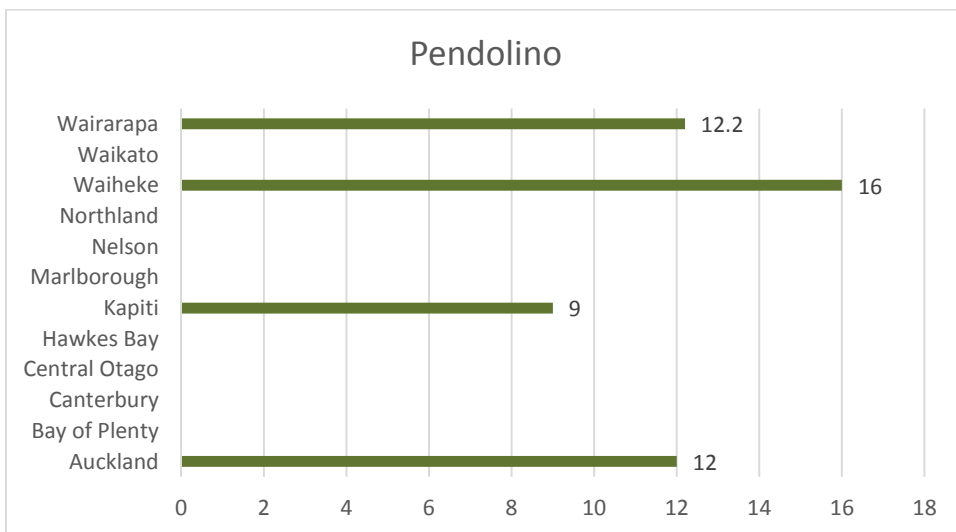
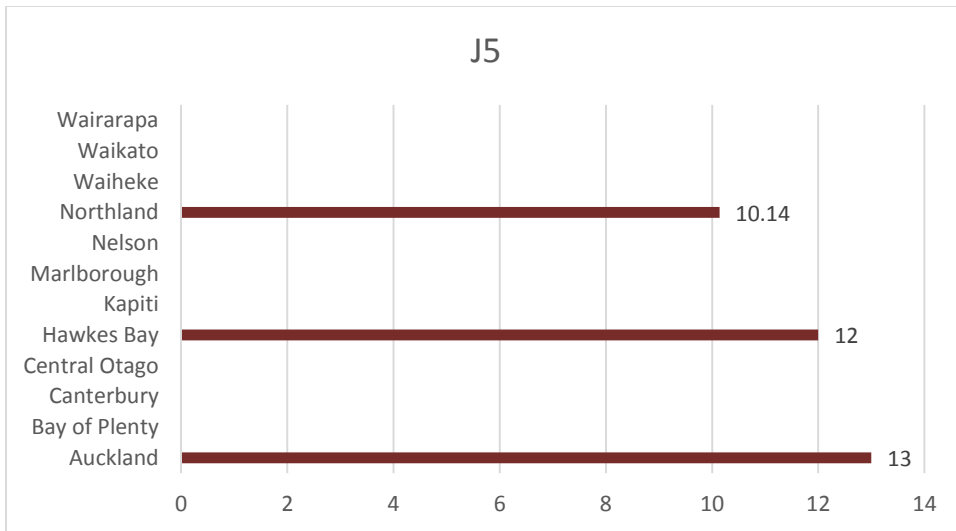
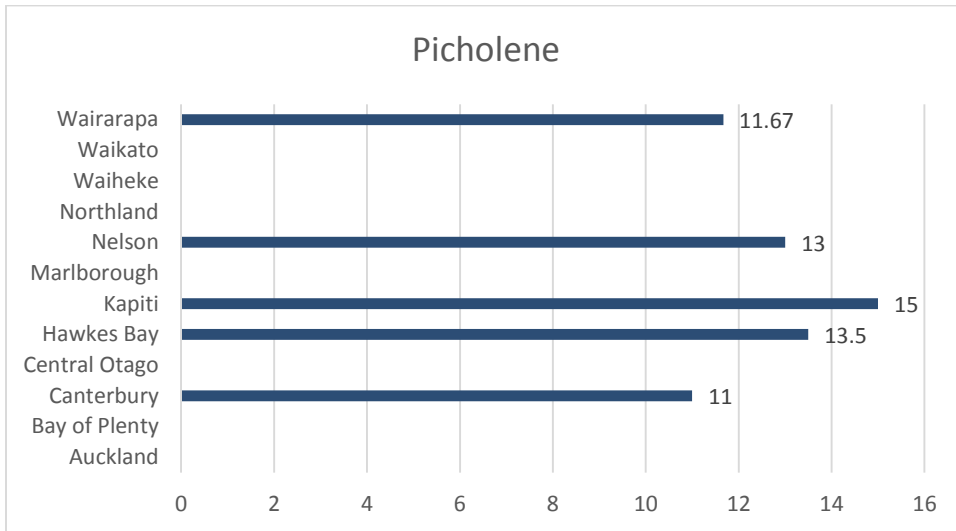


Figure 21 2013 Average Oil Yield by Varietal

The following charts show the average oil yield percentage by region for each of the top ten planted varieties.









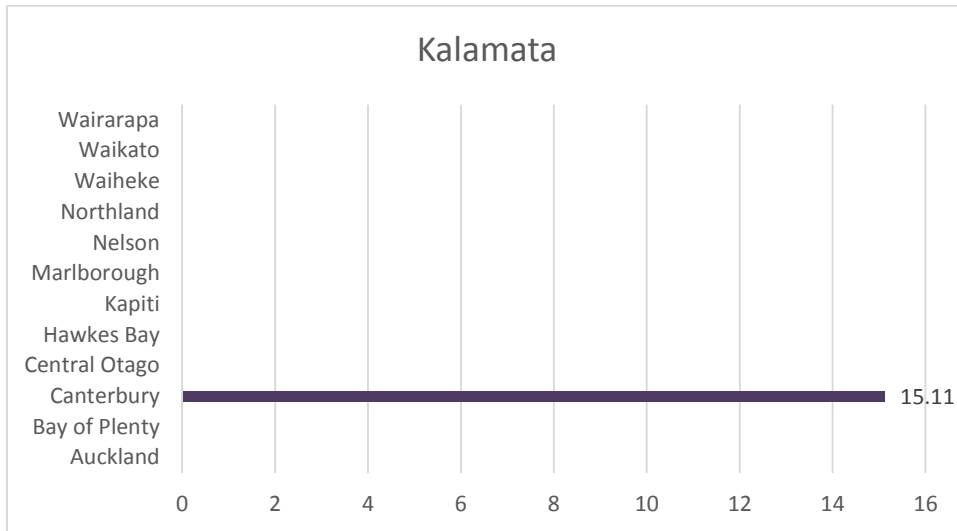


Figure 22 Top Ten Varietals - average percentage yield by region

*Tree Performance*

Unfortunately only 60 Grove Census forms contained harvest tonnage figures for the 2013 harvest year, totalling 154 tree tonnage figures. This limits the ability to produce meaningful data. Harvest tonnage had previously been supplied on the 2012 harvest year by 22 groves totalling 80. Tree performance on the data provided has been calculated by dividing the harvest tonnage by the number of trees of the relevant varietal held in the database for that grove. This assumes that all of the trees of that varietal have been harvested. The following chart shows tree performance for 2012 and 2013 based on harvest tonnage.

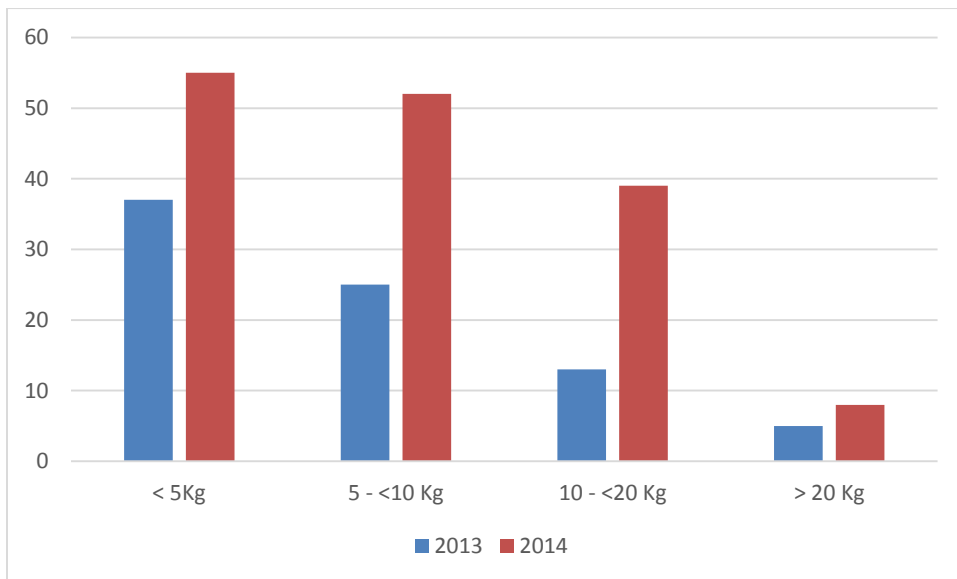


Figure 23 Tree Performance by Harvest Tonnage

It is apparent from the supplied data that there is substantial potential to increase crop load to a more acceptable level of at least 20kg per tree. Only 5% of trees in 2013 produced 20 Kg or more and only 6% in 2012. Based on the data provided, 66% of trees produced less than 10 Kg in 2013, and 77% in 2012. The varietals reporting more than 20 Kg per tree were Picual, Leccino and Pendolino in both 2012 and 2013, plus Mission (California) in 2013.

Because of the low response rate on tree performance, a calculation was carried out to estimate harvest tonnage on 2013 oils submitted for certification for which no harvest tonnage had been reported. This was based on litres declared, calculated at the national average yield of 12% to give a respective tonnage. Note this calculation could only be done on single varietals certified and not blends. This then gave a calculated harvest tonnage for 2013 of 186 as shown on the following chart.

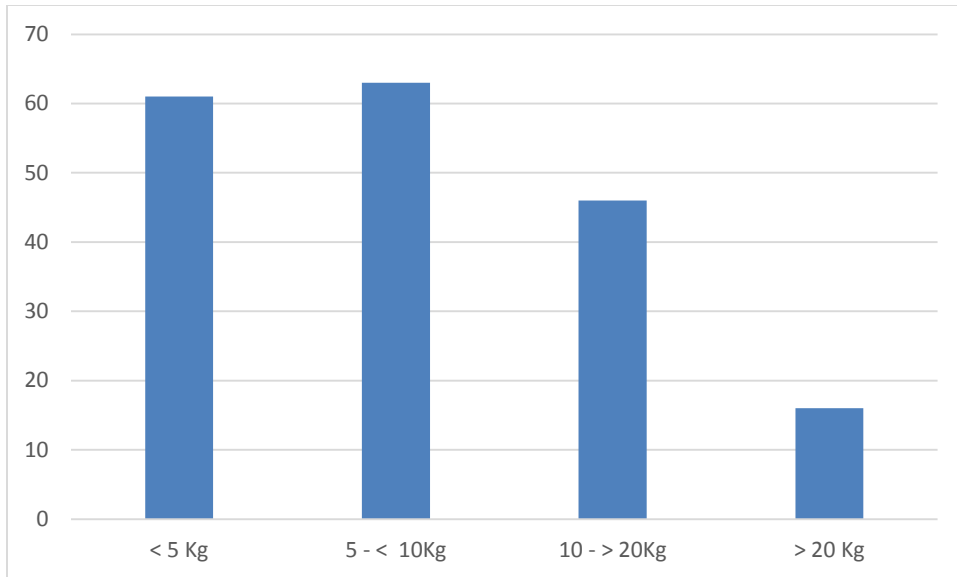


Figure 24 2013 Calculated Harvest Tonnage

This calculated harvest tonnage data showed a similar trend to reported data; 66% of trees produced less than 10 Kg in 2013 and slightly less than 9% produced 20 Kg or more. The varietals that produced more than 20 Kg were Picual, Leccino, Koroneiki, Pendolino, Mission (California) and Frantoio. The regions that produced more than 20 Kg per tree are shown on the following chart.

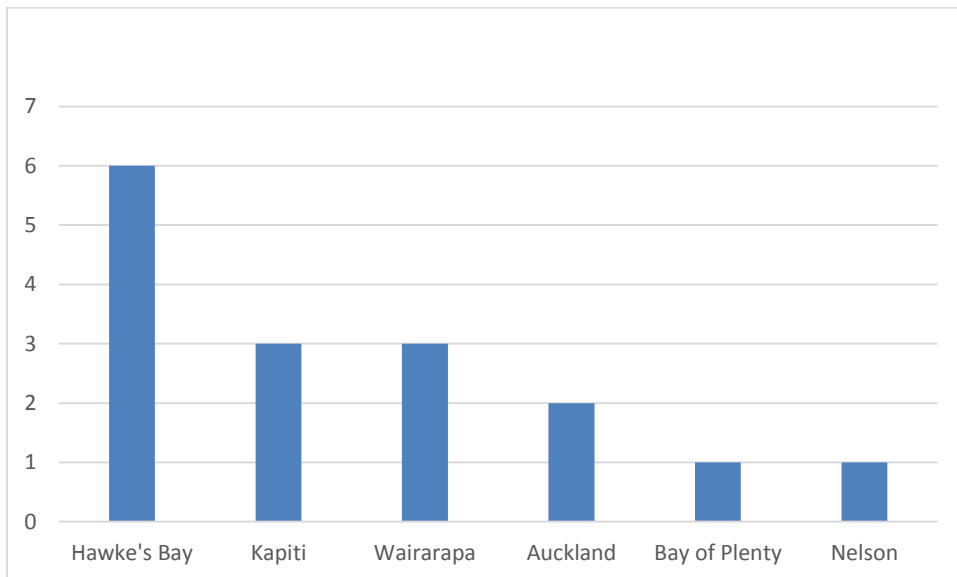


Figure 25 Regions with 2013 Harvest Tonnage Calculated at Greater than 20 Kg

Based on the harvest data provided, the following chart shows the average crop size by varietal for 2013.

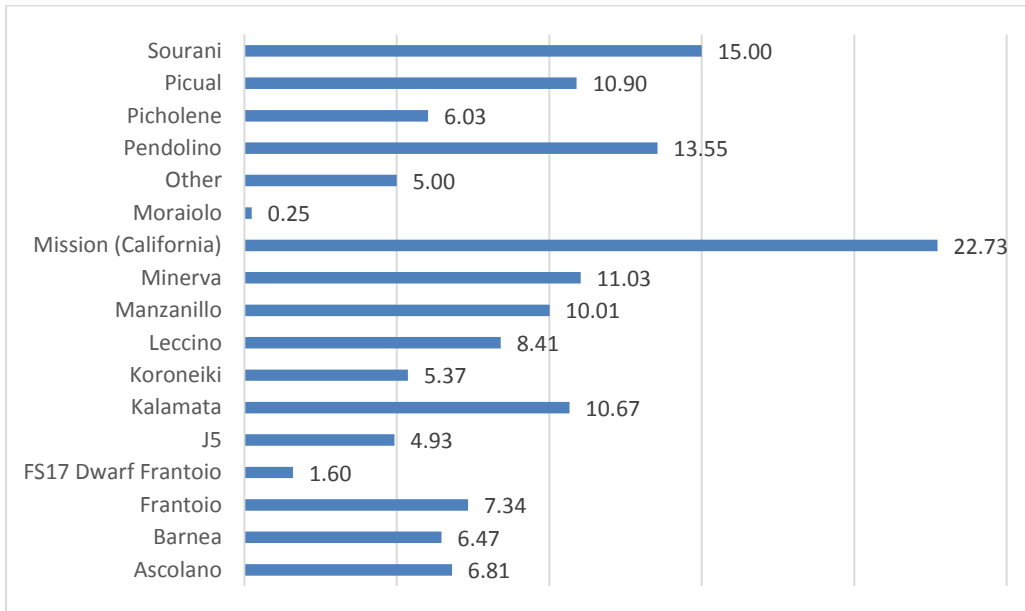


Figure 26 2013 Average Crop Size (Kgs) by Varietal

*Table Olives*

Data reported on table olive production totalled 7,449kg (7.449 tonnes) in 2014 as follows.

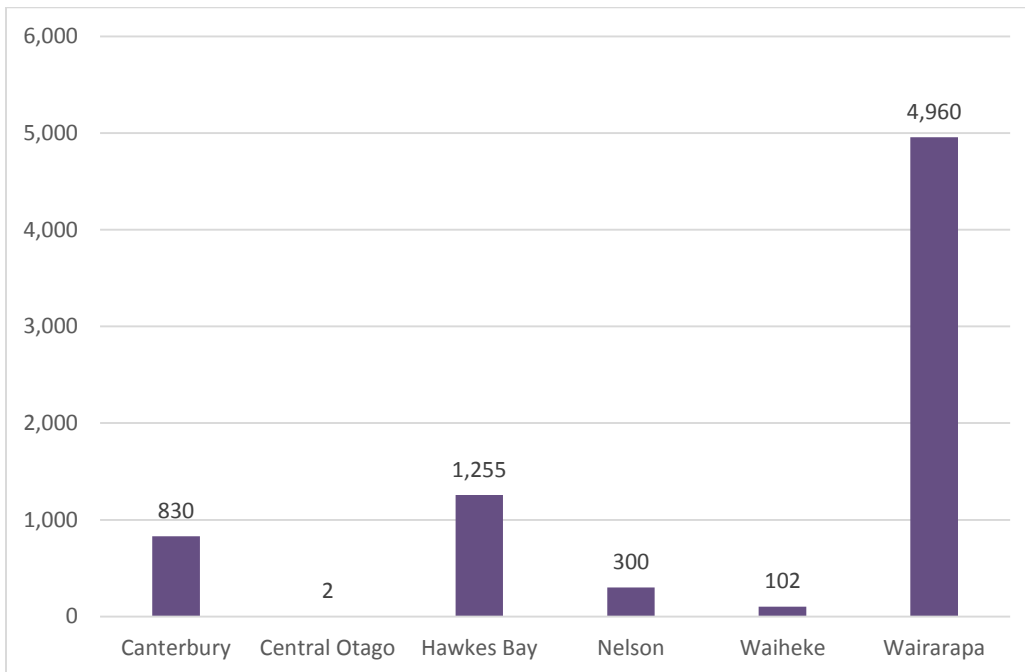


Figure 27 2013 Table Olive Production by Region

### Processing Facilities

There are 30 processing facilities in the Grove Census database with a total of 32 presses. There are eight makes of presses and the following chart shows the number of presses by make.

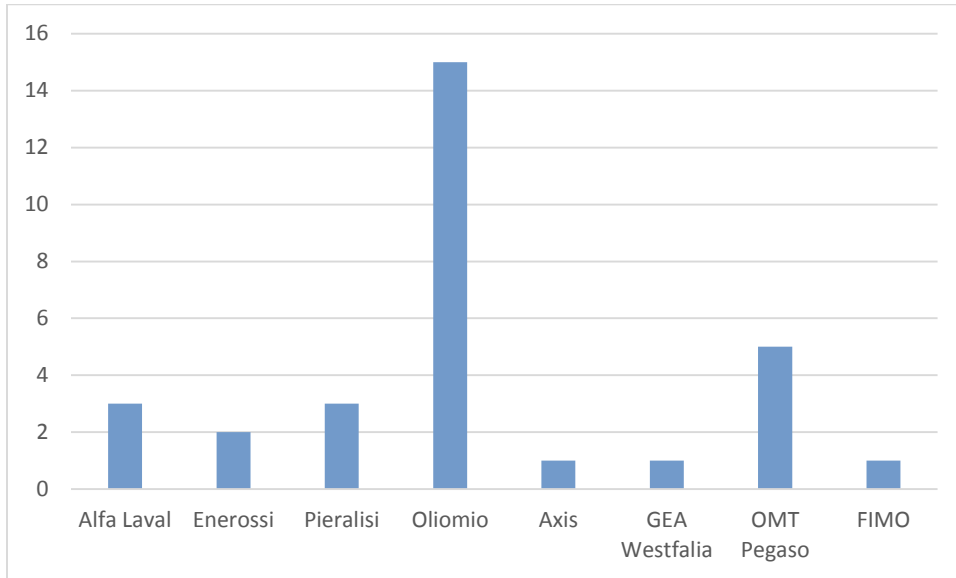


Figure 28 Total Presses by Make

Most regions with more than one press have a variety of makes. The following chart shows the number of presses by make by region.

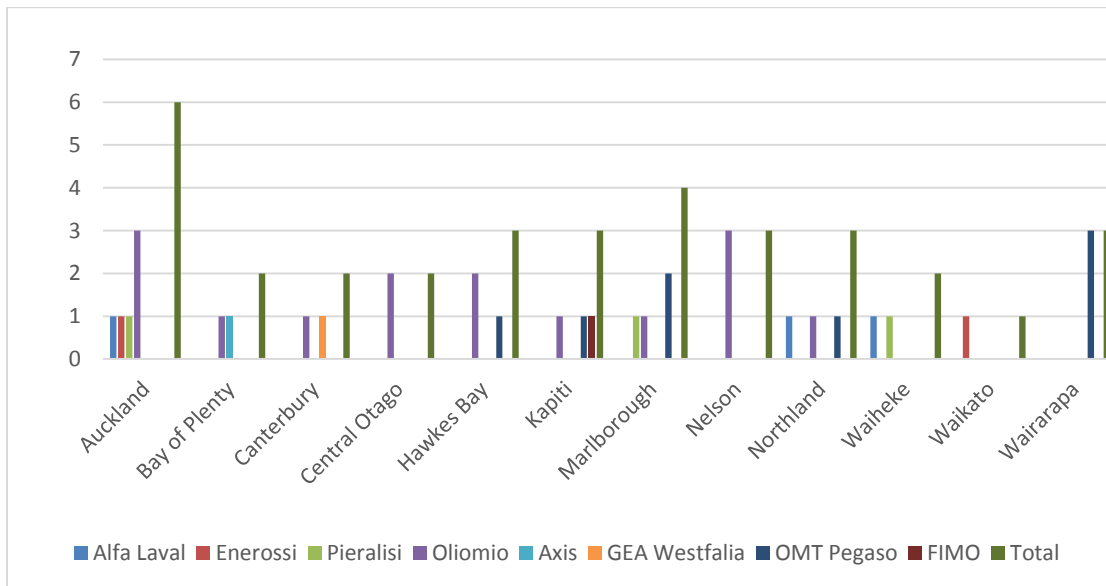


Figure 29 Press Makes by Region

The following chart shows the total processing capacity by region.

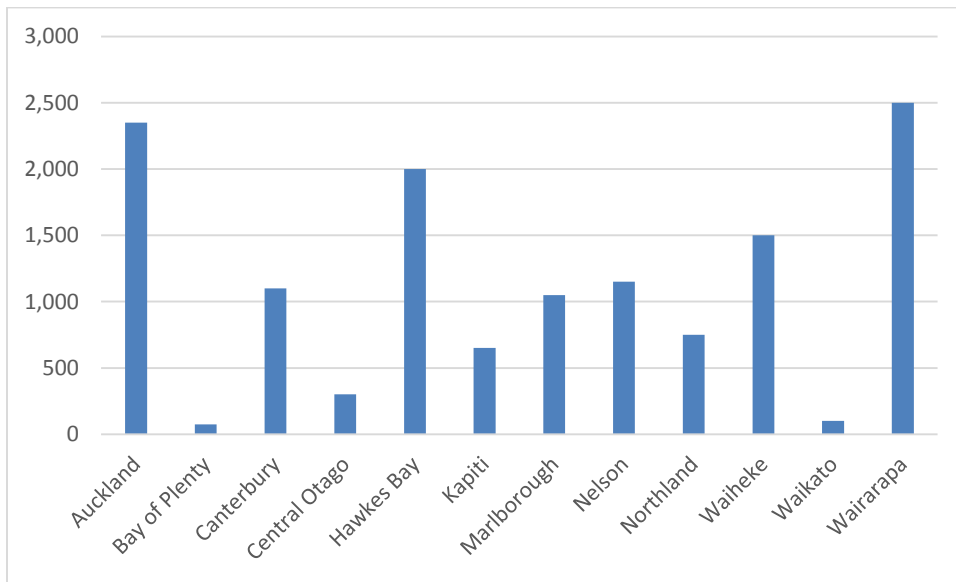


Figure 30 Processing Capacity by Region Kg per hour

## **Other Outcomes**

The New Zealand olive industry is better able to understand how it is structured to represent itself credibly to other bodies and to undertake benchmarking and for continuous improvement. The Grove Census has been reasonably successful in recording this information. The data on the size and makeup of the olive industry has thus provided input into national and international projects and research. These projects and research will, in time, provide feedback to the New Zealand industry on performance in a global market. The data also enables Olives New Zealand to report on the industry for access to research funding and projects.

The Grove Census enables growers to benchmark the performance of their groves against other groves within the same region and nationwide. Individual grove reports have been produced showing growers their yield and tonnage by variety compared to the regional and national averages. This will allow growers to make decisions about the future of trees that are not performing as well as other growers – remedy through pruning, fertilising, etc. or grafting or removing.

The Grove Census update also provided an opportunity to show members their information held on file. This resulted in many changes being notified as well as provision of missing information.

## **Future**

The data in the Grove Census database has the potential to enable correlations to be drawn in a number of areas, for example on effectiveness of spray programs to harvest tonnage and year on year. To enable correlations to be meaningful a higher level of consistent contributions is necessary.

Responses continue to be received by Olives New Zealand. The Olive Grove Census is therefore a 'work in progress' and will continue to be updated as more responses are received.

It is planned to update the database annually depending on the response rate.



## Appendix Two – Tree Varieties

<b>Variety</b>	<b>2014</b>	<b>2012</b>	<b>2008</b>
Allenton	180	180	
Ascolano	540		433
Barnea	35,781	33,937	30,415
Barouni			92
California Queen	2		
Calletier			10
Carolea	2,803	2,880	2,696
Chemali	471	356	413
De l'Andes	42	15	
El Greco	10	14	26
Escalano	40	40	
Fossil Bay	10	10	
Frantoio	85,557	72,751	68,021
FS17 Dwarf Frantoio	1,468	1,300	2,120
Hardy's Mammoth	51	51	81
J2	364	330	895
J5	11,618	8,590	6,997
Kadesh	2	2	7
Kalamata	8,864	8,687	8,452
Koroneiki	24,242	18,651	12,945
Large Crete		20	
Leccino	67,086	56,986	59,993
Leccio del Corno	200	150	143
Manzanillo	21,685	21,020	12,760
Maurino	743	703	363
Minerva	3,224	2,581	5,089
Mission (California)	245	25	155
Moraiolo	742	562	786
Murino	245		
Nabali Mouhasen	245	245	541
Nasco	23	23	
Nocellara	287	150	100
Nocholaro de Bellie	100	100	
Olivastro	200		159
Other	2,454	2,317	2,647
Pendolino	10,763	8,589	15,027
Picholene	15,576	7,138	13,367
Picual	20,519	25,424	29,841
Picudo	27		
Rakino	15	15	6
SA Verdale	233	211	628
Sevillano	47	47	53
Sourani	48	54	453
Souri	6	6	119
Super	100		
Tamaki			20
Tawera	85	85	
UC13A6	2	2	17
Uovo de Piccione	19	23	56
Verdale	655	1,077	790