



Agribusiness and Economics Research Unit

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Consumer preferences and willingness-to-pay for sustainable wine products: Incentives for improving environmental management practice for New Zealand winegrowers

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Abstract

This research report builds upon previous research conducted by the Agribusiness and Economics Research Unit (Tait, Rutherford, Driver, Li, Saunders and Dalziel, 2018), funded by the Our Land and Water (OLW) National Science Challenge. The report further analyses the results of a survey of US (California) wine consumers to assess the impact of demographic, behavioural and psychographic segments on the purchase of sustainable New Zealand sauvignon blanc wine. The results show greater consumption of sustainable New Zealand sauvignon blanc by younger consumers, those with higher incomes, higher engagement with wine labels, and those with environmentally friendly attitudes and behaviours. These results suggest an opportunity to increase returns for New Zealand winegrowers by responding to demographic, behavioural and psychographic consumer signals, including clearer communication of sustainability credentials via the wine label, particularly for organic products. These findings may provide incentives for New Zealand winegrowers to improve current environmental management practices.



Acknowledgements

The author would like to acknowledge the main funding body for this research, the Our Land and Water National Science Challenge, without whom the development and publication of this report would not be possible. To view the results of this survey via our interactive online tool, please visit <https://www.sustainablewellbeing.nz/olw-wine>.

Chapter 1

Introduction

New Zealand is a developed country that is dependent on its agricultural exports. Through the course of New Zealand's production and trade history, wine has emerged as one of New Zealand's top export products. Initially intended to be sold primarily on the domestic market, policy changes in the 1980s allowing a greater volume of international wines to be imported into New Zealand saw a reduction in domestic market share for New Zealand winemakers (NZW, 2017). In response, an increasing focus was placed on exports for the continued success of New Zealand wine products (NZW, 2017; Stewart, 2010). Total wine production has increased significantly in New Zealand over this period, with 697 wineries and 699 growers producing approximately 301.7 million litres of wine in 2018. In addition, wine products represented a total export value of approximately NZ\$1.7 billion in 2018 (NZW, 2018).

The early domestic popularity of dry wines led to sauvignon blanc variety being the most extensively grown and produced wine of New Zealand (NZW, 2017). The sauvignon blanc cultivar currently comprises approximately 77 per cent of New Zealand white wine production, occupying approximately 61 per cent total New Zealand producing vineyard area (23,102 hectares) in 2018. In addition, approximately 220 million litres of sauvignon blanc wine was exported from New Zealand in 2018 with a total approximately value of NZ\$1.2 billion (NZW, 2018).

While New Zealand represented under 0.5 per cent of total global grapevine bearing area in 2014, it was the fifth-largest country internationally in terms of gross value of crop production in the same year (Anderson et al., 2017). The value of New Zealand's wine exports grew by approximately 72 per cent between 2015 and 2017, with leading export markets including the United States of America (1), the United Kingdom (2) and Australia (3) (NZW, 2017).

As previously stated, the US is currently New Zealand's largest export market for wine products by value. New Zealand wine exports to the US in year-ended June 2018 comprised a total value of approximately NZ\$522 million – significantly higher value compared with the second- and third-largest export markets for New Zealand wine (United Kingdom – approximately NZ\$387 million; Australia – approximately NZ\$367 million) (NZW, 2018). In addition, US wine drinkers typically consume 30 per cent imported wine products, with high frequency wine drinkers consuming a higher overall percentage of imported wines (WMC, 2017).

Aligned with this, consumers are increasingly aware of the environmental impacts of their product choices and may adapt their purchasing behaviour depending on their level of knowledge of environmental issues. In particular, US wine consumers' attitudes to and knowledge of environmental issues in wine production have been shown to influence their wine selection choices (Barber et al., 2009).

The adoption of practical environmental management solutions can be effective in improving production processes (Mozell and Thach, 2014). Case studies of sustainable wine production practices have been shown to produce multiple improvements, including positive economic, social and environmental outcomes (the triple-bottom line) and the establishment of a competitive advantage through reduced costs and increased consumer confidence (Borsellino et al., 2016; Gilinsky Jr et al., 2016).



Sustainable Winegrowing New Zealand (SWNZ) was established in 2002 following from a series of New Zealand wine industry sustainability initiatives first established in 1994 by the New Zealand Grapegrower Council and the Wine Institute of New Zealand. This included the adoption and application of sustainability certification standards for New Zealand's wineries, the effective area of which has grown in size from 85 per cent of total vineyard production area in 2009 to 98 per cent of total vineyard production area in 2018 (Dalziel et al., 2017; NZW, 2018). As outlined by the New Zealand Winegrowers Sustainability Policy, the SWNZ programme is instrumental in achieving the following objectives: enhancing sustainability of the New Zealand wine industry; supporting consumer perceptions; avoiding trade barriers, and; gaining production efficiencies (Dalziel et al., 2017). In order achieve these objectives, the gathering of market information regarding which segments of the population in important wine export markets to New Zealand are likely to buy sustainable wine products may be required.

Chapter 2

Literature Review

A commonly used method for defining target markets for export products is consumer segmentation. The consumer segmentation approach was first proposed by Smith (1956) for the purpose of firms to create alternative marketing strategies for different products and different types of consumers. There are four main types of consumer segmentation: geographic (the location of consumer group(s)), demographic (the structural attributes of consumer groups(s), such as age, gender and income), behavioural (previous or current consumer behaviour(s)) and psychographic (the values, attitudes and preferences of consumer group(s)) (Armstrong et al., 2012). Segmentation has also been suggested as a preferable approach to identifying and redirecting consumer preferences towards more environmentally friendly product choices (Barber et al., 2009; Poortinga and Darnton, 2016).

Multiple studies have used geographic segmentation to understand wine consumption behaviour, including US wine consumers. For example, Velikova et al. (2014) examined cross-cultural preferences in wine products (Rosé) between consumers in the US, France, New Zealand and the UK, finding differences in the perception of wine products in each region.

Demographic segmentation is often used in the literature and has been applied to US wine consumers, including aggregations by age, gender, education, income and ethnicity (Barber et al., 2006; Chang et al., 2016; Velikova and Dodd, 2016; WMC, 2017).

Studies examining wine preferences based on age segmentation and have shown mixed results, with some common themes emerging from the literature regarding the effect of age on wine selection. For example, studies have shown that younger wine drinkers (usually under the age of 30 years) are more likely and willing to engage in information searching to inform wine product selection, particularly interacting with wine product labels (Atkin and Thach, 2012; Barber et al., 2006; Barber et al., 2008; Thach and Olsen, 2006), generally prefer white over red whites (Barber et al., 2006; Olsen et al., 2007) and generally exhibit greater concern regarding the health implications of wine consumption (Chang et al., 2016; Olsen et al., 2007). Younger consumers have also shown greater concern regarding the environmental aspects of wine production (Thach and Olsen, 2006) and typically consume a higher volume of imported wine products than older wine consumers (WMC, 2017).

Several studies have shown mixed results regarding differences in wine preferences based on gender, with common themes including that male consumers tend to prefer red over white wines (Barber et al., 2006; WMC, 2017) and that different genders exhibit different motivations to purchase wine products generally (Kolyesnikova et al., 2009). However, other studies have shown little difference in gender regarding wine attitudes and preferences, with mixed results regarding which gender has higher engagement with wine products (Bruwer and Johnson, 2010; Chang et al., 2016; Forbes, 2012; Loureiro, 2003).

Some studies have used education level to segment US wine consumers. For example, a study undertaken by the Wine Market Council (2017) showed that high frequency wine drinkers most commonly had a postgraduate education (25 per cent), followed by college (24 per cent) and high school or less (24 per

cent) (WMC, 2017). In addition, a consumer's level of education has been shown to be positively associated with their attitudes to the healthiness of wine products, with those with higher education perceiving lower healthiness for wine products (Costanigro et al., 2014). However, the evidence is mixed, with some studies showing no clear relationship between education and wine attitudes and preferences (Bruwer and Johnson, 2010; Kelley et al., 2015).

Studies examining wine preferences using income segmentation are mixed, with some common themes emerging. For example, consumers with higher incomes have generally been shown to buy wine products more frequently, spend more on wine products on average and show higher satisfaction with wine prices (Loureiro, 2003; Thach and Olsen, 2015; WMC, 2017).

Behavioural segmentation is also commonly used in US wine consumer studies, including behaviours such as wine purchase frequency and usual spend (Barber et al., 2007; Loureiro, 2003; Thach and Olsen, 2015). For example, Thach and Olsen (2015) examined high frequency wine consumers based on their usual spend on wine products, finding differences in consumption between high and low spend consumers.

Psychographic segmentation has been applied in US wine consumer studies, including the attitudes, preferences of values of wine consumers, such as wine involvement¹, knowledge, loyalty and innovation (Pomarici et al., 2017). In recent years, this has included consumers' environmental consciousness as well as other attitudes, values and preferences in relation to wine products. For example, Barber et al. (2012) found that US wine consumers with a strong preference for environmentally friendly wine products also expressed strong values in relation to environmental issues.

Related to the above, there is a body of literature examining the influence of environmental attitudes and concerns on US consumer preferences for wine products. Olsen et al. (2012) found that US organic wine consumers tend to be more environmentally conscious and willing to pay a premium for such products. Previous studies have also shown US wine consumers to exhibit strong associations of product quality with the place of origin of a wine product, including the environmental aspects of production associated with product origin (Barber et al., 2010; Bruwer and Johnson, 2010). In addition, US consumers' environmental concerns regarding wine production have been shown to positively influence their behavioural intentions towards wine produced using environmentally friendly practices, specifically the intention to purchase and recommend organic wines to others, as well as willingness to pay more for organic wines (Bonn et al., 2016).

Sustainability certification and labelling schemes have emerged as a leading means of communicating the sustainability credentials of wine products to consumers (such as the USDA Organic label). In New Zealand, the primary sustainability certification scheme for wine products is facilitated by Sustainable Winegrowing New Zealand (SWNZ), which currently certifies 98 per cent of New Zealand's total vineyard area. This effectively means that the vast majority of New Zealand wine products are accredited for their sustainability status (SWNZ, 2018). This is significant, as previous research has shown that US wine consumers are more likely to pay a premium for wine products if they trust the producer or retailer selling the product, with consumers more like to pay a premium also demanding more information (Bonn et al., 2016; Locksin and Corsi, 2012). Participation in sustainability certification schemes that verify product

¹ *Involvement* refers to the importance and/or relevance of the product at the time of purchase – e.g. purchasing a bottle of wine for a special occasion such as a birthday (Barber et al., 2007).



claims is primarily intended to promote consumer trust for products with improved environmental performance (Chkanikova and Lehner, 2015).

Chapter 3

Methodology

3.1 Rationale

The wine market of California, USA was selected for a number of reasons. Firstly, considering the importance of the USA for New Zealand's wine exports, 12 per cent of total wine drinkers in the US are based in California – the highest percentage in the US, ahead of Florida (9 per cent) and Texas (8 per cent) (WMC, 2017). California is also the largest US state for wine production (representing 25 per cent of total US wineries by state). In addition, California was selected as a primary market by New Zealand winegrowers, who have based 3 out of 9 strategic US marketing locations in California (Tait et al., 2018).

The current study uses segmentation, including geographic (consumers in California, USA), demographic (age, gender, education, income), behavioural (usual sauvignon blanc consumption, purchase price and label interaction behaviour) and psychographic segmentation (environmental attitudes and the importance of environmental attributes in sauvignon blanc products) to examine Californian wine consumer preferences, as well as presents willingness-to-pay results for sustainable sauvignon blanc products. This study examined the wine variety sauvignon blanc as it is the top producing variety in New Zealand (77 per cent total national white wine production with 23,102 hectares total producing area in 2018) (NZW, 2018).

3.2 Method

The method for this study included a structured and self-administered online survey, conducted in California, USA in January 2018. The surveys were administered through Qualtrics, a web-based survey system, with a total sample size of 764 Californian sauvignon blanc consumers. Sampling involved the recruitment of participants from an online panel database of consumers provided by an international market research company. These panels are profiled, broadly recruited and frequently refreshed by the company, with respondents recruited via online marketing. The survey was developed by the Agribusiness and Economics Research Unit (AERU) at Lincoln University, drawing on existing literature, results from previous international consumer preference surveys, and a pilot survey of Californian consumers conducted in November 2017 (Tait et al., 2016).

The survey asked participants to rate on a 5-point Likert scale the frequency at which they had previously purchased one or a range of wine products with sustainability labels. Examples included USDA Organic, Sustainable Winegrowing New Zealand or Demeter Certified Biodynamic. Based on this, the dependent variable for the current study was constructed which expressed the highest frequency of consumption of a wine product with a sustainability label by each participant. For example, if a participant had stated that they purchased wines with the USDA Organic label "Always" (1) and wines with the Demeter Certified Biodynamic label "Sometimes" (3), the value included in the constructed variable would be 1 (Always), as 1 was the highest frequency of purchase for any sustainability labelled wine product for that participant.

For the current report, contingency tables (*cross-tabulation*) were generated using the IBM SPSS statistical computer application, comparing the constructed dependent variable with a range of

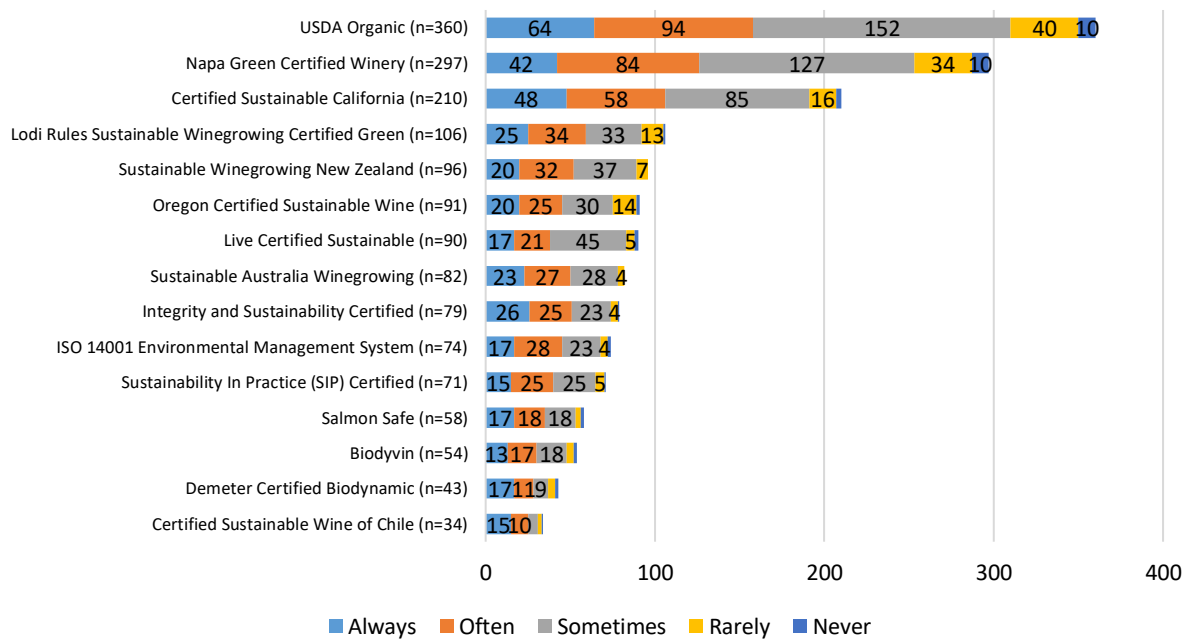
demographic, behavioural and psychographic variables. This included demographic (specifically age, gender, highest level of education and annual household income), behavioural (consumption, spend and label engagement) and psychographic variables (attitudes towards sustainable wine products). Contingency tables (or cross-tabulation) is a statistical technique that allows for the analysis of relationships between two variables, particularly to analyse the potential level of dependency between variables (Bhattacharyya and Johnson, 1977).

The following section presents the results of this analysis. Figures showing cross-tabulation results are used throughout, with the corresponding contingency tables presented in Appendix 1.

Chapter 4 Results and Discussion

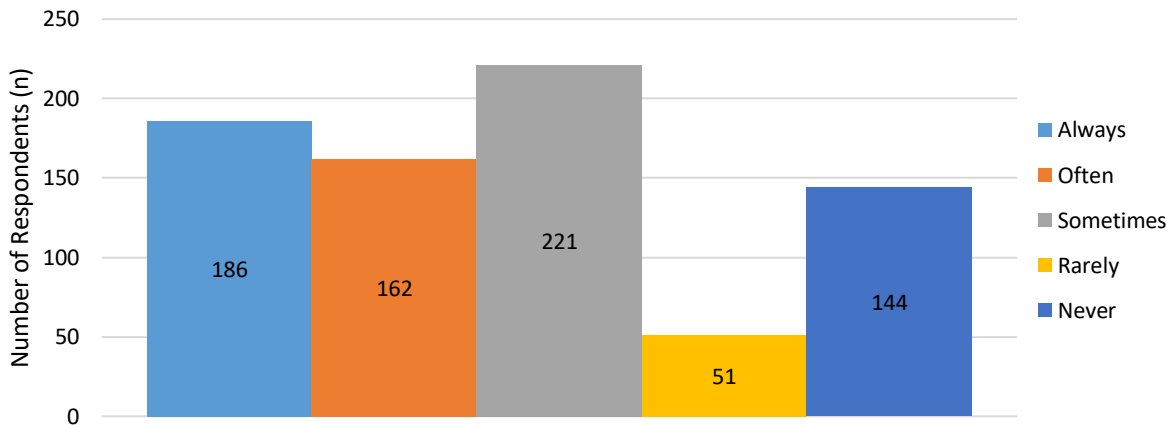
The current research was interested in examining the demographic, behavioural and psychographic determinants of sustainable wine purchasing behaviour (specifically sauvignon blanc). The dependent variable for analysis was the frequency at which participants purchased any sauvignon blanc products associated with a sustainability certification scheme (specifically the question “how often do you purchase Sauvignon Blanc with the following labels?”). Results containing all sustainable wine certification schemes are presented in Figure 4.1 below. This shows the highest overall response rate for USDA Organic certified sauvignon blanc (n=360), followed by Napa Green Certified Winery (n=297) and Certified Sustainable California (n=210).

Figure 4.1: Frequency of sustainable sauvignon blanc purchase by certification scheme



Data was then combined into a single variable showing participants’ highest frequency of purchase of any sustainability certified product across all schemes. For example, if a single participant indicated that they purchased USDA Organic certified products *always* (1) and Napa Green Certified Winery products *sometimes* (3), this would be coded as *always* (1) in the dataset. These combined results are shown in Figure 4.2 below. This shows a relatively even spread across all responses, with the highest responses shown for *sometimes* (n=221), *always* (n=186) and *often* (n=162).

Figure 4.2: Frequency of sustainable sauvignon blanc purchase (combined)



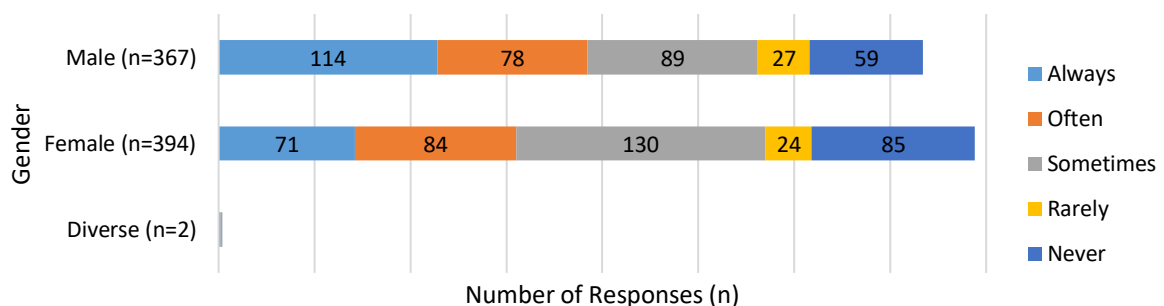
4.1 Demographic segmentation

The demographic profile of Californian sustainable sauvignon blanc consumers was assessed in the current study. This includes segmentation by gender, age, educational status and average annual household income. The results of these analyses are shown in the following sections below.

4.1.1 Gender

Figure 4.3 below shows the frequency of sustainable sauvignon blanc purchasing by gender. This shows the number of respondents of each gender (*Male, Female, Diverse*) that purchase sustainable sauvignon blanc products at different frequencies (*Always, Often, Sometimes, Rarely, Never*). In particular, Figure 4.3 shows a higher relative percentage of male participants purchase sustainable sauvignon blanc products (114 *always*, 78 *often*) compared with their female counterparts (71 *always*, 84 *often*).

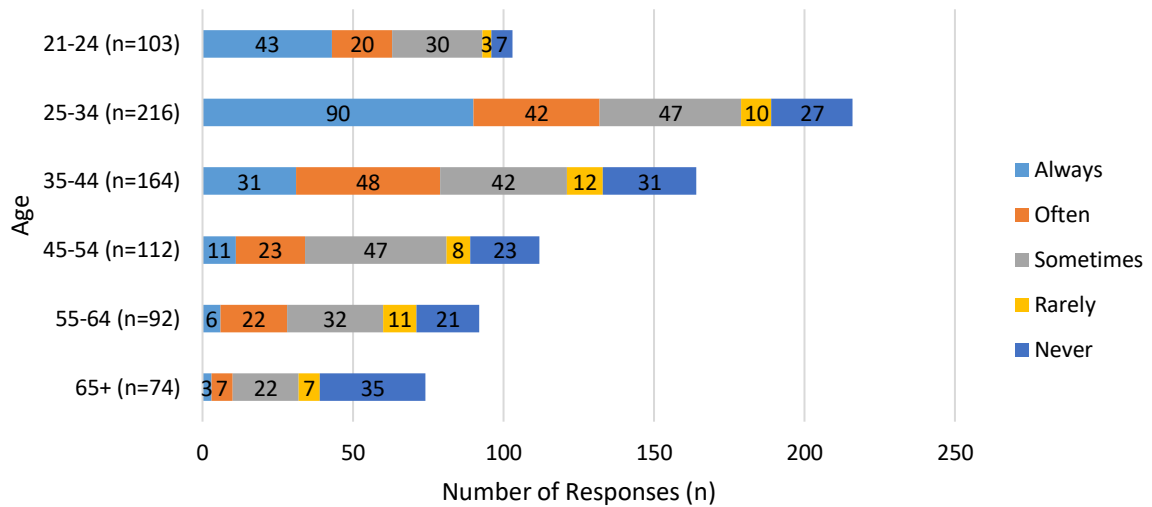
Figure 4.3: Frequency of sustainable sauvignon blanc purchase by gender



4.1.2 Age

Following gender, the influence of age on sustainable sauvignon blanc purchase was assessed. Figure 4.4 below shows the frequency of sustainable sauvignon blanc purchasing by age group. This clearly shows a higher tendency by younger participants to purchase sustainable sauvignon blanc products, particularly those in the age bracket 25-34 years (90 *always*).

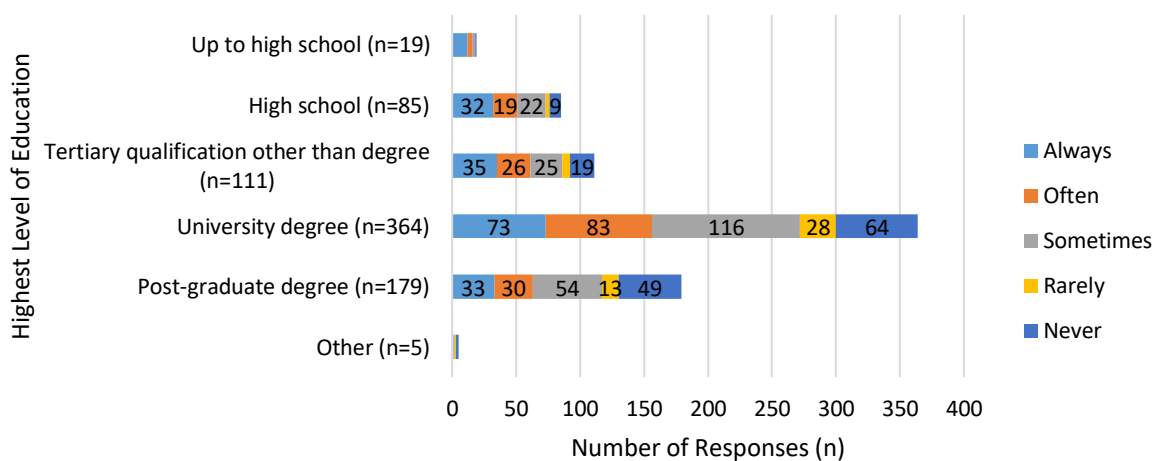
Figure 4.4: Frequency of sustainable sauvignon blanc purchase by age



4.1.3 Education

Following age, the influence of educational attainment on sustainable sauvignon blanc purchase was examined. Figure 4.5 below shows the frequency of sustainable sauvignon blanc purchase by the highest level of education of participants. This shows that those with higher education tend to purchase sustainable sauvignon blanc products more frequently than those with less education. In addition, participants with high school education show high proportional sustainable sauvignon blanc consumption. This considered, total *n* values for highest level of education categories were highest for *University degree*, with relatively smaller total responses for other education levels shown.

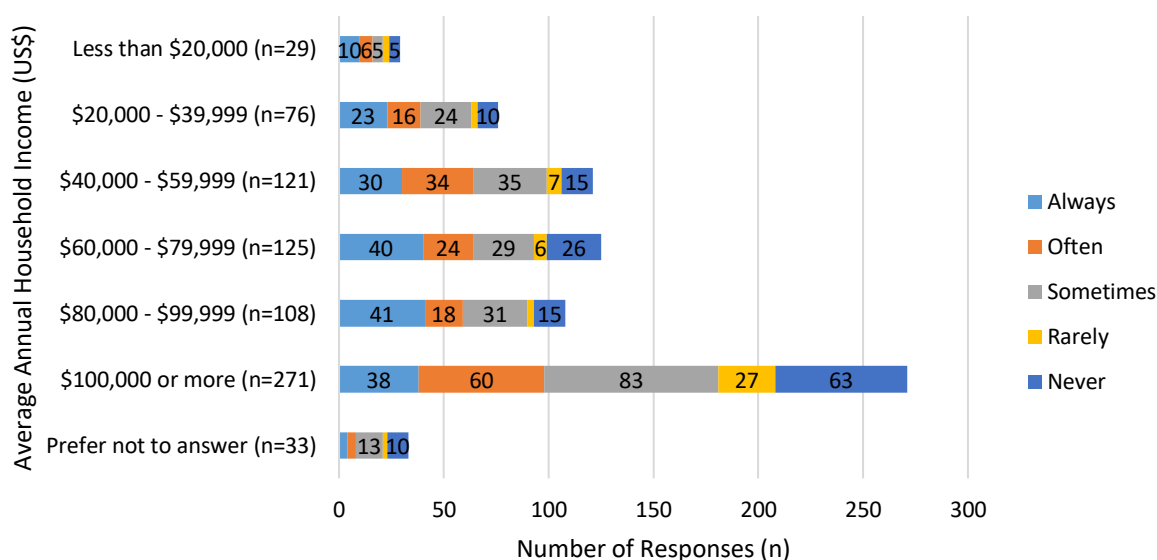
Figure 4.5: Frequency of sustainable sauvignon blanc purchase by highest level of education



4.1.4 Income

Following education status, the influence of respondents' average annual household income on sustainable sauvignon blanc purchase was examined. Figure 4.6 below shows the frequency of sustainable sauvignon purchasing undertaken by participants based on their average annual household income. This shows relatively even proportions of sustainable sauvignon blanc purchases across all income categories except those with average annual household incomes over \$100,000. In particular, the highest relative frequency of consumption of sustainable sauvignon blanc products was shown for those in the \$60,000-\$79,999 and \$80,000-\$99,999 income brackets, with the highest overall consumption of sustainable sauvignon blanc indicated by those with an average annual household income of \$100,000 or more.

Figure 4.6: Frequency of sustainable sauvignon blanc purchase by level of average annual household income



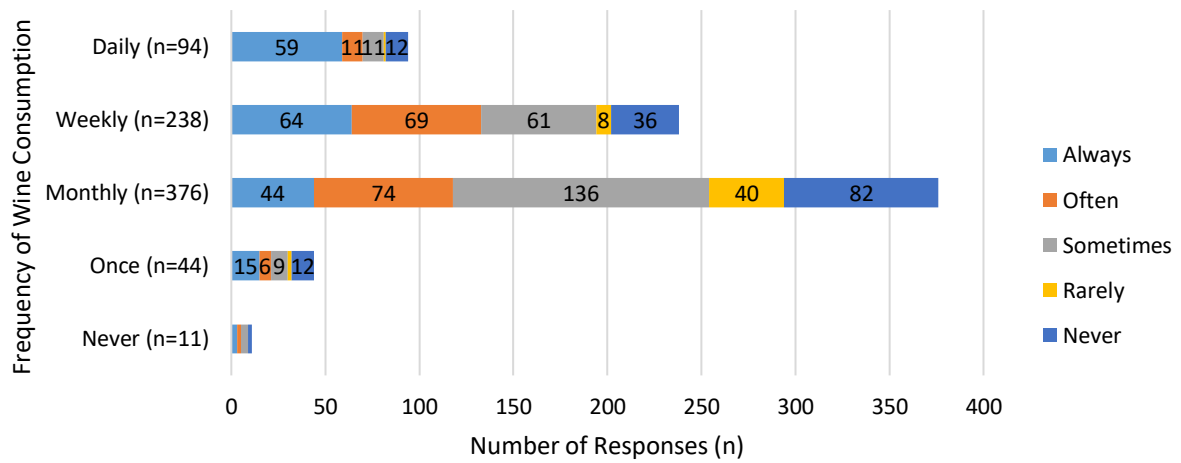
4.2 Behavioural segmentation

The behavioural profile of Californian sustainable sauvignon blanc consumers was examined in the current study. This includes segmentation by sauvignon blanc consumption frequency and usual purchase price (for usual personal consumption at home) as well as engagement with wine label information. The results of these analyses are shown in the following sections below.

4.2.1 Sauvignon Blanc consumption frequency

The relationship between the rate at which participants usually purchase sauvignon blanc for usual personal consumption at home and their frequency of sustainable sauvignon blanc purchasing was analysed. Figure 4.7 below shows the frequency of sustainable sauvignon blanc purchase by participants' overall frequency of sauvignon blanc consumption (usual personal consumption at home). This shows that those who normally consume sauvignon blanc more frequently also show generally higher proportional sustainable sauvignon blanc purchase.

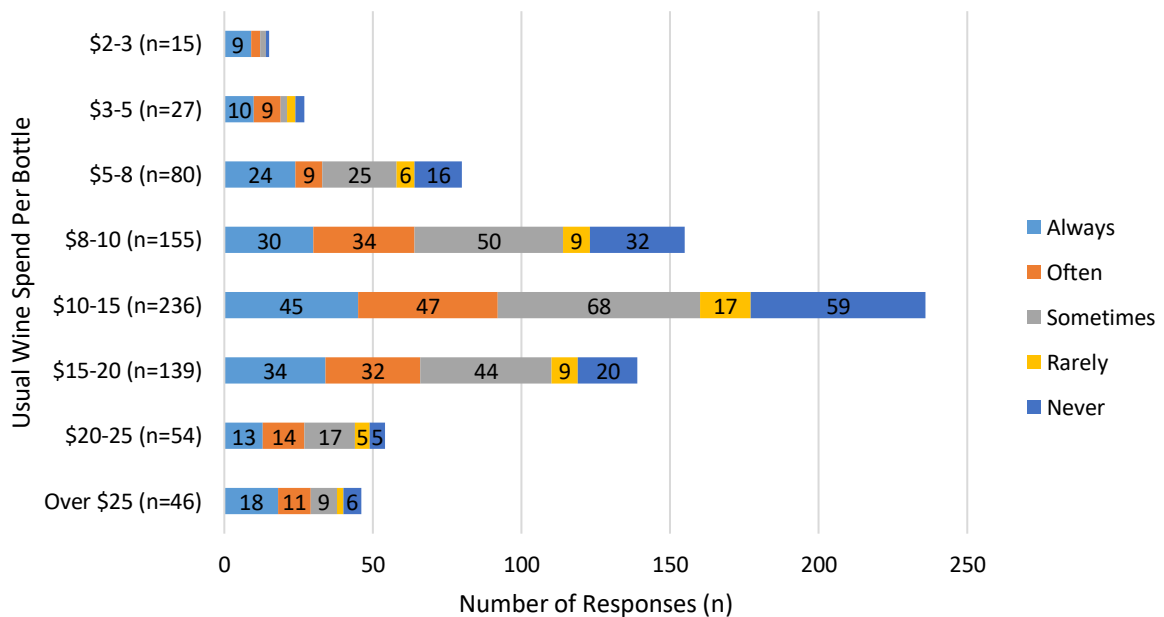
Figure 4.7: Frequency of sustainable sauvignon blanc purchase by frequency of sauvignon blanc consumption



4.2.2 Usual Sauvignon Blanc purchase spend

The relationship between the usual prices paid by participants for sauvignon blanc products and their frequency of sustainable sauvignon blanc purchasing was analysed. Figure 4.8 below shows the frequency of sustainable sauvignon blanc purchasing by the usual price paid by participants per bottle of sauvignon blanc for usual personal consumption at home. This shows that most participants purchase sauvignon blanc in the price range \$10-15 per bottle (n=236), followed by \$8-10 per bottle (n=155) and \$10-20 per bottle (n=139), with higher proportional frequency of purchase of sustainable sauvignon blanc shown for those who usually purchase higher priced sauvignon blanc products.

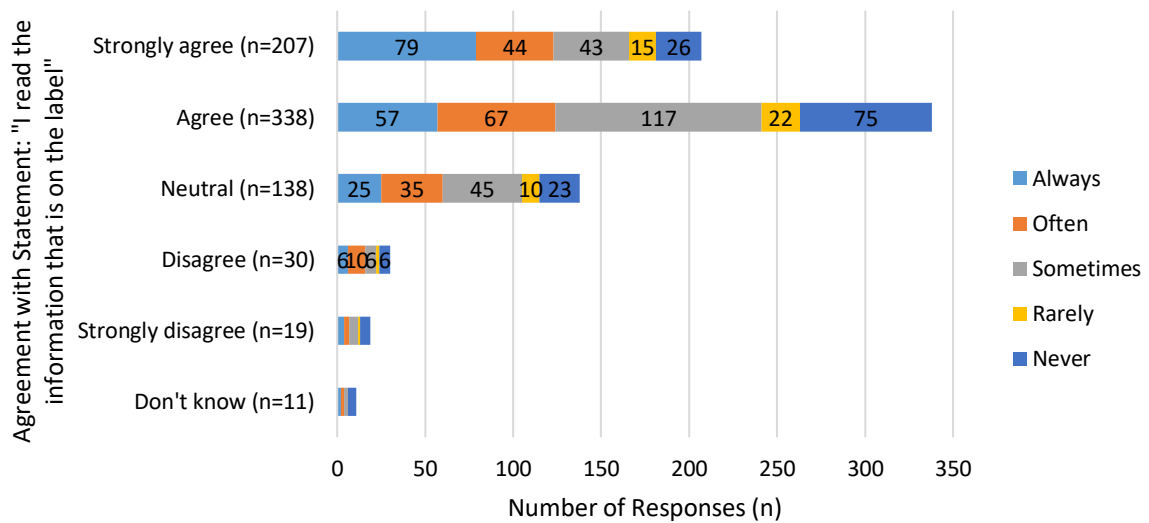
Figure 4.8: Frequency of sustainable sauvignon blanc purchase by usual sauvignon blanc purchase price



4.2.3 Product label engagement

The relationship between participants' engagement with wine labels and their frequency of sustainable sauvignon blanc purchasing was analysed. Figure 4.9 below shows the frequency of sustainable sauvignon blanc purchase by participants' agreement with the statement "I read the information that is on the label". This shows that most participants either agree (n=338) or strongly agree (n=207) that they read the information on wine product labels, with higher proportional sustainable sauvignon blanc purchase shown by those who read wine product labels.

Figure 4.9: Frequency of sustainable sauvignon blanc purchase by those who read the information on the label



4.3 Psychographic segmentation

The psychographic profile of Californian sustainable sauvignon blanc consumers was of key interest in the current study. This includes segmentation by participants' environmental awareness and attitudes, importance of environmental product attributes and associations of environmental attributes with high quality products. The results of these analyses are shown in the following sections below.

4.3.1 Environmental awareness

The relationship between participants' attitudes to environmental issues and frequency of sustainable sauvignon blanc purchasing behaviour was analysed. Figure 4.10 below shows the frequency of sustainable sauvignon blanc purchase by agreement with the statement: "I would like to have more information about sustainably produced wines". This shows that most participants either partly agreed (n=233) or agreed (n=225) that they would like to have more information about sustainably produced wines, with higher proportional sustainable sauvignon blanc purchase shown for those with higher agreement with this statement.

Figure 4.10: Frequency of sustainable sauvignon blanc purchase by agreement with statements regarding environmental awareness: “I would like to have more information about sustainably produced wines”

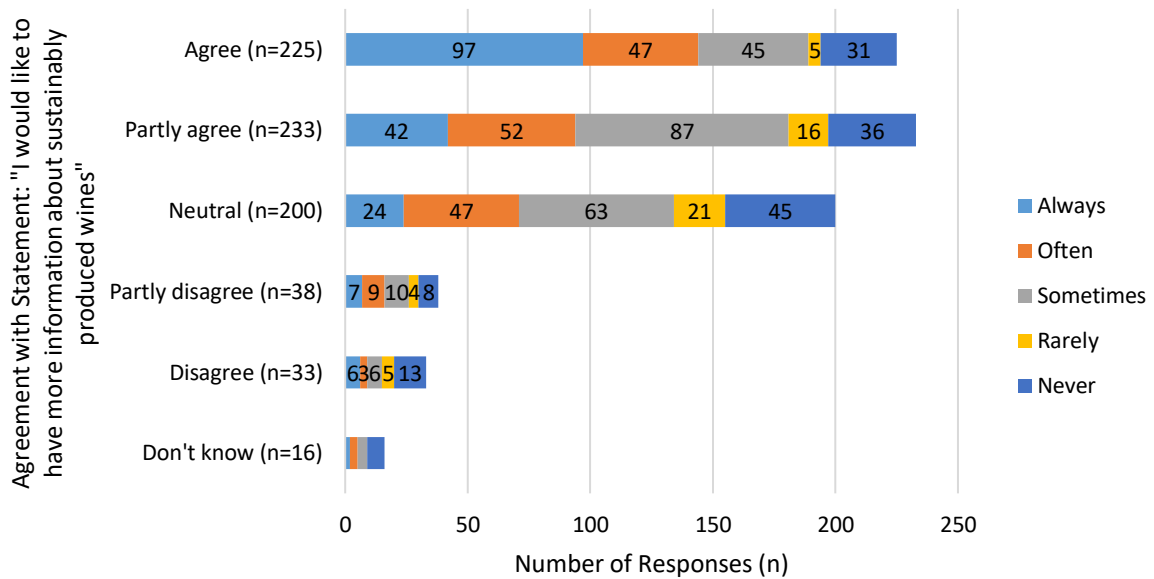


Figure 4.11 below shows the frequency of sustainable sauvignon blanc purchase by agreement with the statement “the environmental impact of wine is well managed”. This shows that most participants indicated either neutral (n=232) or partial agreement (n=231) with this statement. In addition, higher proportional rates of sustainable sauvignon blanc purchase were shown for those who agreed with this statement.

Figure 4.11: Frequency of sustainable sauvignon blanc purchase by agreement with statements regarding environmental awareness: “The environmental impact of wine is well managed”

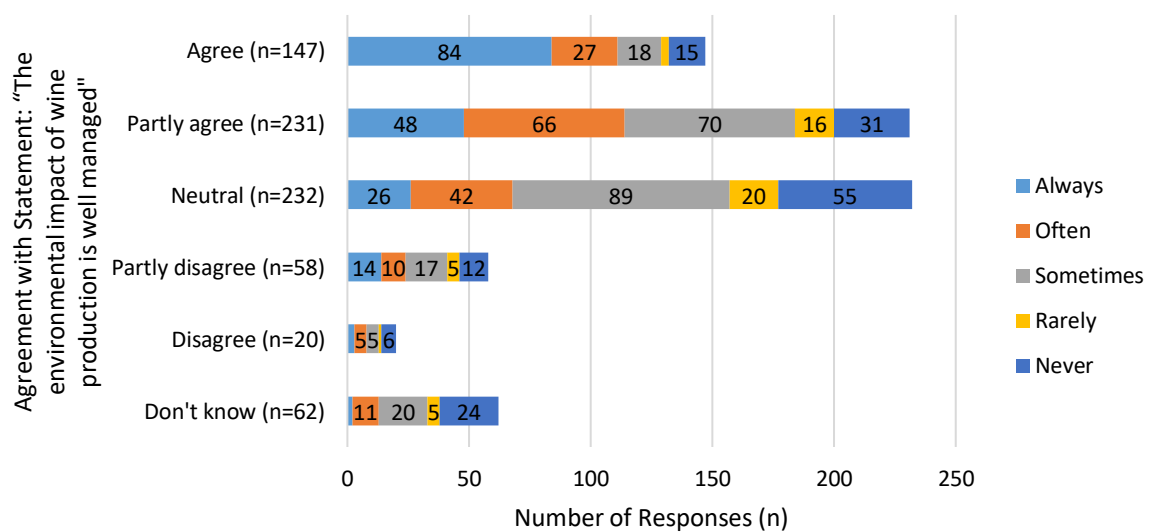


Figure 4.12 shows the frequency of sustainable sauvignon blanc purchase by agreement with the statement “sustainable wine labelling certification is a guarantee of high product quality”. This shows higher proportional sustainable sauvignon blanc purchase by those who indicated higher agreement. However, most participants indicated either neutral (n=228) or partial agreement (n=219) with this statement.

Figure 4.12: Frequency of sustainable sauvignon blanc purchase by agreement with statements regarding environmental awareness: “Sustainable wine labelling certification is a guarantee of high product quality”

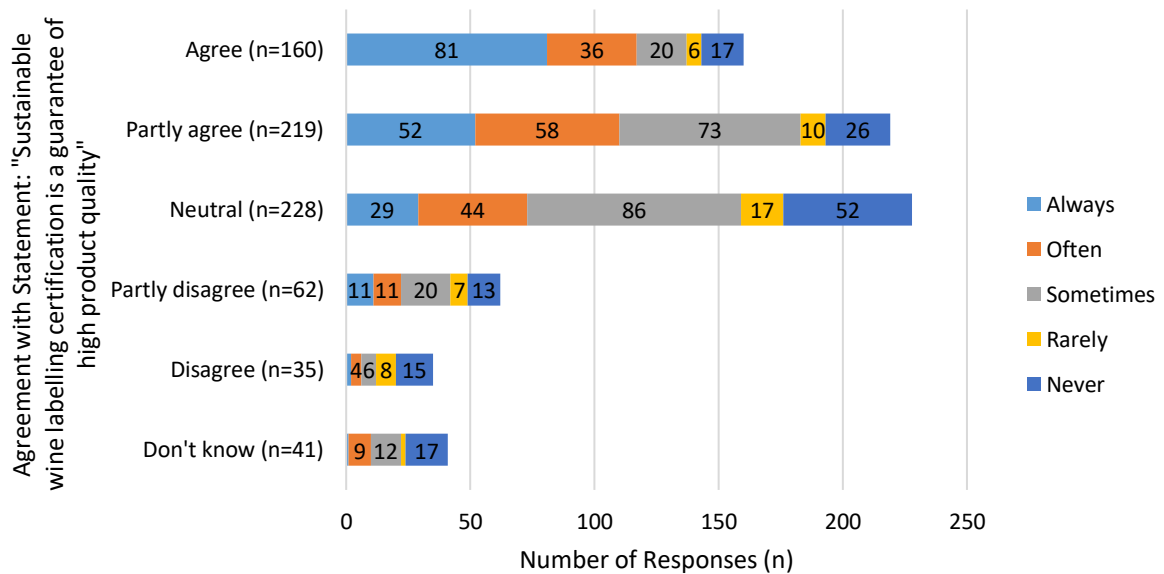


Figure 4.13 below shows the frequency of sustainable sauvignon blanc purchase by agreement with the statement “I feel that purchasing sustainable products helps protect the environment”. This shows that most participants either agreed (n=260) or partly agreed (n=248) with this statement, with higher proportional sustainable sauvignon blanc purchase shown by those with higher agreement.

Figure 4.13: Frequency of sustainable sauvignon blanc purchase by agreement with statements regarding environmental awareness: "I feel that purchasing sustainable products helps protect the environment"

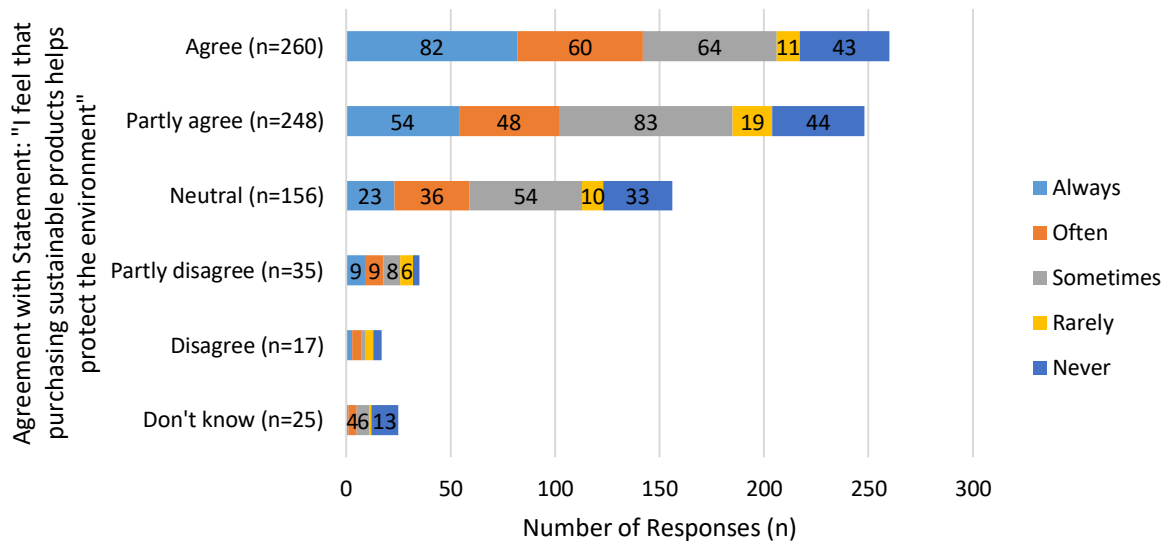
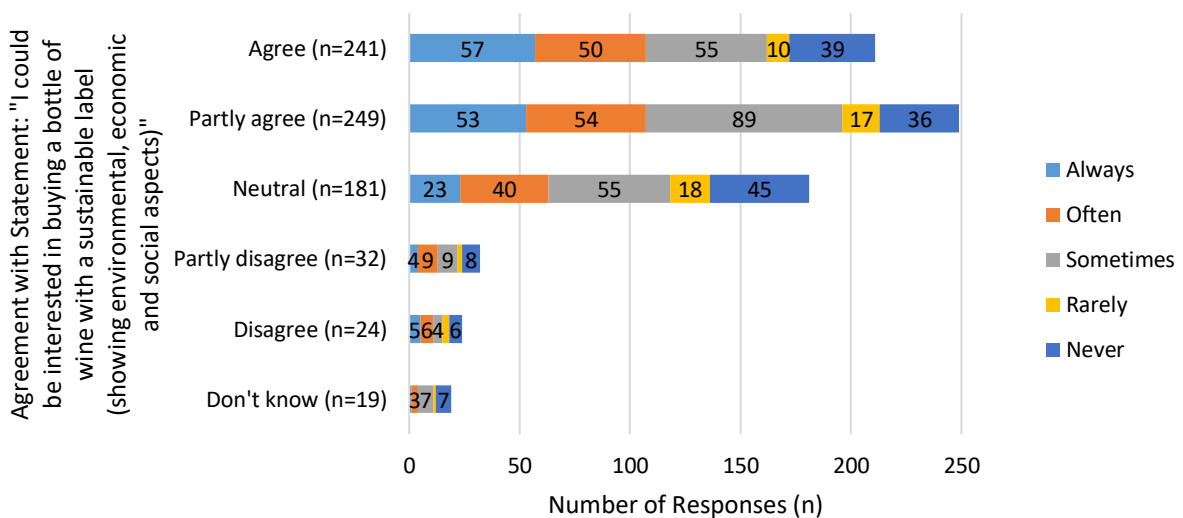


Figure 14.4 below shows the frequency of sustainable sauvignon blanc purchase by agreement with the statement "I could be interested in buying a bottle of wine with a sustainable label (showing environmental, economic and social aspects)". This showed that most participants either partly agreed (n=249) or agreed (n=241) with this statement, with higher proportional sustainable sauvignon blanc purchase shown by those who agreed.

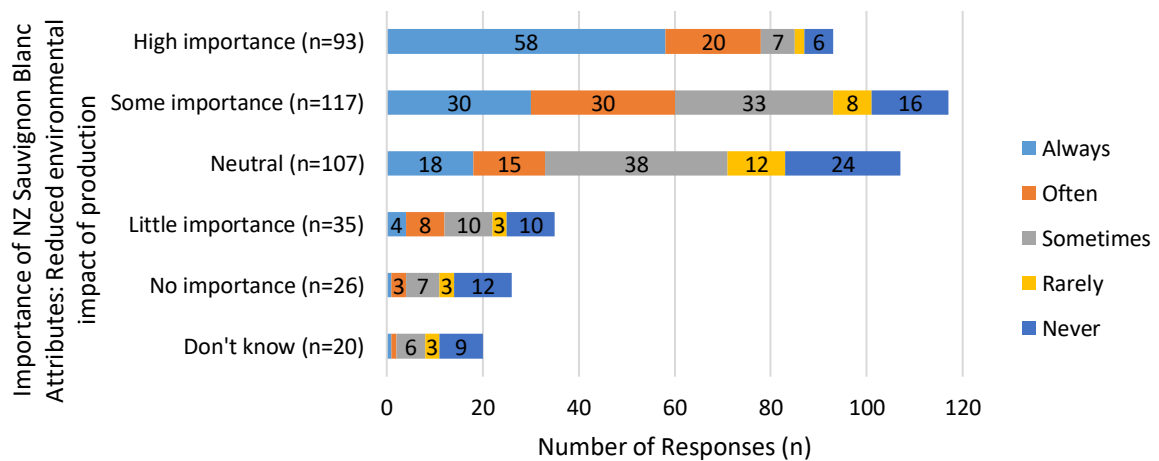
Figure 4.14: Frequency of sustainable sauvignon blanc purchase by agreement with statements regarding environmental awareness: "I could be interested in buying a bottle of wine with a sustainable label (showing environmental, economic and social aspects)"



4.3.2 Importance of Environmental Attributes of New Zealand Sauvignon Blanc Products

The relationship between the importance that participants placed on the environmental performance of New Zealand sauvignon blanc products and their frequency of sustainable sauvignon blanc purchasing was analysed. Figure 4.15 below shows the frequency of sustainable sauvignon blanc purchase by participants who rated the importance of reduced environmental impact of production in deciding to purchase New Zealand sauvignon blanc products. In the logic of the survey, only participants who had stated that they had previously purchased New Zealand sauvignon blanc were shown the following question. Figure 4.15 shows that those who placed higher importance on New Zealand sauvignon blanc production having a reduced environmental impact also indicated a higher frequency of sustainable sauvignon blanc purchasing.

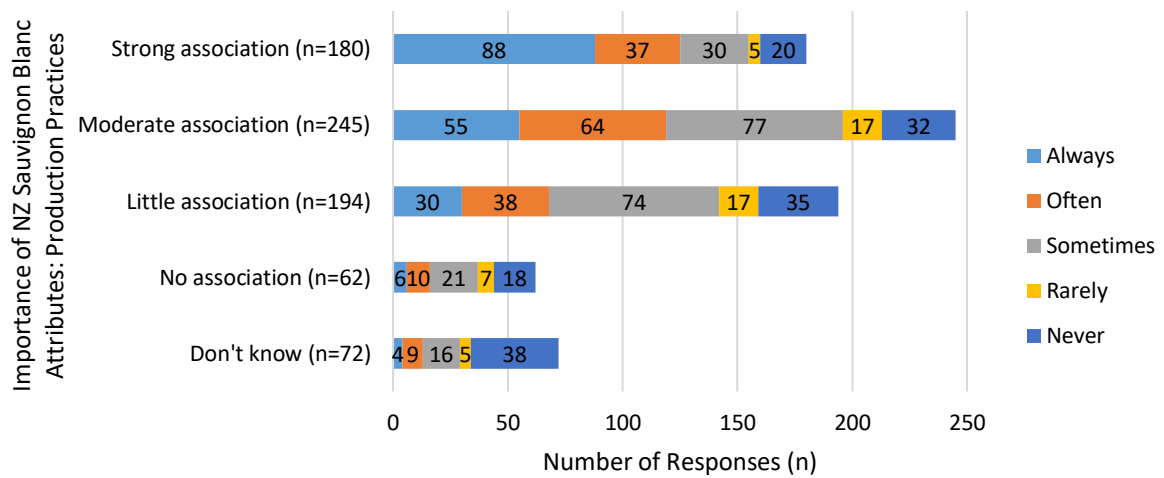
Figure 4.15: Frequency of sustainable sauvignon blanc purchase by importance of environmental wine product attributes



4.3.3 Associations with higher quality wine products

The relationship between participants' associations of environmental attributes with higher quality sauvignon blanc in relation to their frequency of purchase of sustainable sauvignon blanc was analysed. Figure 4.16 below shows the frequency of sustainable sauvignon blanc purchase by participants' associations of production practices with high quality sauvignon blanc products. This shows that most participants indicated a moderate association (n=245) of production practices with high quality sauvignon blanc products. In particular, a higher proportional frequency of sustainable sauvignon blanc purchase was indicated by those who showed higher associations between production practices and high quality sauvignon blanc products.

Figure 4.16: Frequency of sustainable sauvignon blanc purchase by association of environmental attributes with high quality sauvignon blanc products

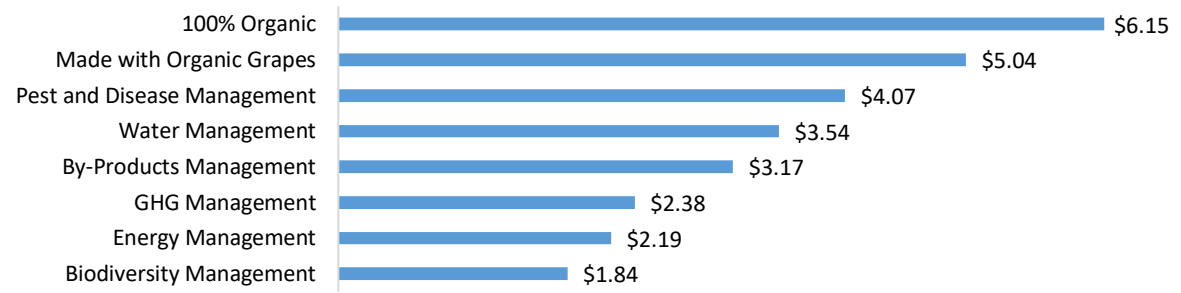


4.4 Willingness-to-pay for environmental attributes of New Zealand Sauvignon Blanc products

In addition to analysing consumer preferences, this study also examined consumers' willingness-to-pay (WTP) for the inclusion of environmental sustainability attributes in the wine products they buy. Estimates of WTP were obtained using a stated preference choice experiment method designed to identify and value consumer preferences for individual attributes that may not otherwise be observable in-market (Tait et al., 2018). This included the following attributes: *100% Organic*, *Biodiversity Management*, *By-Product Management*, *Energy Management*, *GHG Management*, *Made with Organic Grapes*, *Pest and Disease Management* and *Water Management*. Definitions of each of these attributes as shown to participants are presented in Appendix 2.

Results showing participants' median additional WTP for the inclusion of environmental attributes in New Zealand sauvignon blanc products is shown in Figure 4.17 below. This shows the highest median WTP for organic attributes, with participants indicating that they were willing to pay an additional \$6.15 for *100% Organic* sauvignon blanc, and an additional \$5.04 for sauvignon blanc that was *Made with Organic Grapes*. This was followed by an additional premium of \$4.07 for the use of integrated pest management methods in sauvignon blanc production (*Pest and Disease Management*).

Figure 4.17: Median WTP for environmental attributes in New Zealand sauvignon blanc products



Chapter 5

Discussion

The current study examined multiple sets of determinants of sustainable wine consumption in order to identify segments in the Californian wine market. Specifically, these included demographic, behavioural and psychographic determinants.

In relation to the effects of gender, the current study found slightly higher sustainable sauvignon blanc consumption by males. However, it is difficult to state the consistency of this finding with the overall literature given the mixed nature of prior findings (Bruwer and Johnson, 2010; Chang et al., 2016; Forbes, 2012; Loureiro, 2003). However, these results indicate that it may be useful to consider appealing to male over female and diverse consumers in marketing sustainable New Zealand sauvignon blanc products in California.

In relation to the effects of age, the current study found a higher rate of sustainable sauvignon blanc consumption by those in the age bracket of 25-34 years. This is consistent with previous findings showing younger wine consumers to exhibit higher concern regarding the environmental aspects of wine production (Thach and Olsen, 2006). These results indicate that it may be useful to consider appealing to younger consumers in marketing sustainable New Zealand sauvignon blanc products in California.

In relation to the effects of education, the current study found a higher number of those with higher education (graduate and postgraduate education) consume sustainable sauvignon blanc. This is somewhat consistent with previous findings that consumers with graduate and post-graduate education show higher overall wine consumption (WMC, 2017). However, there is little literature available examining linkages between education and environmental awareness in wine product selection.

In relation to the effects of annual household income, the current study found a higher number of those with higher incomes (particularly US\$100,000 or more per annum) to engage more frequently in sustainable sauvignon blanc consumption. This is somewhat consistent with previous findings suggesting that US wine consumers in higher income brackets exhibit higher willingness to pay for wine products in general (Loureiro, 2003; Thach and Olsen, 2015; WMC, 2017). In this respect, it may be useful to consider marketing sustainable New Zealand sauvignon blanc products to consumers with higher-range incomes in California.

The current study examined behavioural determinants of sustainable wine consumption in order to identify behavioural segments of the Californian wine market.

In relation to the effects of usual sauvignon blanc consumption, the current study found that a higher proportion of those participants that indicated a higher frequency of usual sauvignon blanc consumption also engage in sustainable sauvignon blanc consumption. This is expected as higher involvement with and knowledge of wine products is associated with more frequent wine purchase (Barber et al., 2007; Loureiro, 2003; Thach and Olsen, 2015). However, there has been little examination of the linkages between wine involvement and environmental awareness in wine product selection. Nevertheless, this suggests that it may be beneficial to target core sauvignon blanc consumers in marketing sustainable New Zealand sauvignon blanc products in California.

The usual price paid for a bottle of sauvignon blanc ranged from \$10-15 (n=236), \$8-10 (n=155) and \$15-20 (n=139). In addition, consumers who paid higher average prices for a bottle of wine also consumed

more sustainable sauvignon blanc products. This considered, it may be beneficial to price sustainable New Zealand sauvignon blanc products above current market prices for New Zealand wine in the Californian market.

In relation to the effects of consumer engagement with wine product labels, the current study found that those who more frequently read the information on wine labels also showed a higher proportional consumption frequency for sustainable sauvignon blanc products. This may indicate a higher awareness of product characteristics, including the presence of a sustainability label, on the wine products that these consumers are purchasing. The observed relationship between higher sustainable sauvignon blanc purchasing by those who read the information on wine labels may suggest that the presentation of sustainability information on product labels is preferable for marketing sustainable New Zealand sauvignon blanc in California.

The current study also examined the psychographic determinants of sustainable wine purchasing in order to identify psychographic segments of the Californian wine market. In particular, the current study included a range of statements regarding consumers' environmental attitudes in relation to wine production.

The current study found that those who indicated higher agreement with the statement "I would like to have more information about sustainably produced wines" generally showed higher proportional consumption of sustainable sauvignon blanc products. These results suggest that sustainable New Zealand sauvignon blanc exporters seeking higher premiums for their products in the Californian market may find presenting additional sustainability information to be useful in achieving this.

Responses were relatively mixed in relation to the view that the environmental impact of wine production is well managed. This suggests that marketing sustainable New Zealand sauvignon blanc products in California on the basis of existing attitudes regarding the environmental impacts of wine production may be less beneficial than other psychographic segmentation categories.

Responses regarding participants' association of sustainable wine labelling with high quality sauvignon blanc products showed a higher proportional rate of purchase for sustainable sauvignon blanc was shown by those who agreed. This suggests that this may be a possible avenue for exploration in marketing sustainable New Zealand sauvignon blanc on the Californian wine market.

There was also shown to be widespread agreement with the statement "I feel that purchasing sustainable products helps protect the environment", as well as higher proportional consumption of sustainable sauvignon blanc products indicated by those that agreed. This suggests that highlighting the environmental attributes of sustainable New Zealand sauvignon blanc may be beneficial in achieving higher premiums for these products in California.

For the statement "I could be interested in buying a bottle of wine with a sustainable label (showing environmental, economic and social aspects)", higher proportional consumption of sustainable sauvignon blanc products was shown by those with higher agreement. Californian consumers that have purchased sustainable sauvignon blanc products more frequently have also shown a greater interest in and engagement with wine labels, particularly for the provision of sustainability information. This further suggests that sustainable New Zealand sauvignon blanc producers may find the provision of additional label-based sustainability information beneficial in achieving higher engagement with target consumers in the Californian wine market.

The results also showed that participants who engaged in higher purchasing of sustainable sauvignon blanc also placed a higher importance on the reduction of environmental impacts in New Zealand wine

production. This may be beneficial to sustainable New Zealand sauvignon blanc exporters seeking to achieve higher premiums in the Californian wine market as it suggests a relationship between the promotion of the environmental stewardship of sustainable New Zealand sauvignon blanc production and the purchase of these products in this market.

Similarly, participants who engaged in higher purchasing of sustainable sauvignon blanc also placed higher importance on production practices in relation to high quality sauvignon blanc products. This suggests a perceived relationship between production practices and the quality of the finished product. As previous findings showed a relationship between higher sustainable sauvignon blanc consumption and a perception of sustainable certification to indicate higher product quality, it may be useful to link these three elements together (production practices, sustainability labelling, high quality products) in marketing sustainable New Zealand sauvignon blanc products in California.

Finally, results detailing Californian consumers WTP to wine products showed the highest WTP for organic wine products. This suggests that there is a potential premium market segment for organic wines in California that could be targeted by New Zealand wine exporters. In addition, given the most common price paid by participants in this study for wine products was between US\$10 and US\$15 per bottle, the above premiums present a substantial additional gain for New Zealand wine exporters if these attributes can be incorporated into their production practices. This could be achieved by positioning New Zealand's organic wine products in the upper end of the Californian wine market.

Chapter 6

Conclusion

The analysis presented in this report provides some insight into potential target market segments for New Zealand sauvignon exporters in the Californian wine market. Table 1 below presents the demographic, behavioural and psychographic attributes shown to correlate with sustainable sauvignon blanc purchasing behaviour in California. The most significant attributes of the Californian sustainable sauvignon blanc consumer are shown to be:

- younger males (specifically 25-34 years old);
- higher income ranges (specifically annual household incomes of \$100,000 or more);
- higher education;
- higher degree of engagement with wine labels;
- a preference for greater wine product information;
- a perception that sustainable products are of high quality, and;
- higher importance placed on production practices and associated environmental impacts.

At present, 98 per cent of New Zealand's wine products are SWNZ-certified, meaning that virtually all New Zealand wine is currently accredited for its sustainability status. From an environmental management perspective, this suggests that New Zealand winegrowers are already engaged in operations that support environmental sustainability in production. However, given the substantially higher premiums that Californian consumers are willing-to-pay for organic wine attributes, a potentially significant but currently unmet consumer market for New Zealand organic wine may exist in California. This may provide incentive for New Zealand winegrowers to convert from conventional to organic production methods in order to capture additional value for their products. This presents a dual opportunity wherein it may be possible for New Zealand winegrowers to capture additional value for their products as well as increase the sustainability of their operations by organic methods that do not undermine the environmental integrity of their production systems.

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Appendix 1 Cross Tabulation Results

Table A.1: Frequency of sustainable wine purchase by gender

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					TOTAL
		Always	Often	Sometimes	Rarely	Never	
Gender	Male	114	78	89	27	59	367
	Female	71	84	130	24	85	394
	Diverse	1	0	1	0	0	2
TOTAL		186	162	220	51	144	763

Table A.2: Frequency of sustainable wine purchase by age

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					TOTAL
		Always	Often	Sometimes	Rarely	Never	
Age	21-24	43	20	30	3	7	103
	25-34	90	42	47	10	27	216
	35-44	31	48	42	12	31	164
	45-54	11	23	47	8	23	112
	55-64	6	22	32	11	21	92
	65+	3	7	22	7	35	74
TOTAL		184	162	220	51	144	761

Table A.3: Frequency of sustainable wine purchase by highest level of education

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					TOTAL
		Always	Often	Sometimes	Rarely	Never	
Highest level of education	Up to high school	12	4	2	0	1	19
	High school	32	19	22	3	9	85
	Tertiary qualification other than degree	35	26	25	6	19	111
	University degree	73	83	116	28	64	364
	Post-graduate degree	33	30	54	13	49	179
	Other	1	0	1	1	2	5
TOTAL		186	162	220	51	144	763

Table A.4: Frequency of sustainable wine purchase by level of average annual household income

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Household Income (last 12 months)	Less than \$20,000	10	6	5	3	5	29
	\$20,000-\$39,999	23	16	24	3	10	76
	\$40,000-\$59,999	30	34	35	7	15	121
	\$60,000-\$79,999	40	24	29	6	26	125
	\$80,000-\$99,999	41	18	31	3	15	108
	\$100,000 or more	38	60	83	27	63	271
	Prefer not to answer	4	4	13	2	10	33
TOTAL		186	162	220	51	144	763

Table A.5: Frequency of sustainable wine purchase by frequency of wine consumption (usual personal consumption at home)

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Wine purchase frequency (for usual personal consumption at home)	Daily	59	11	11	1	12	94
	Weekly	64	69	61	8	36	238
	Monthly	44	74	136	40	82	376
	Once	15	6	9	2	12	44
	Never	3	2	4	0	2	11
TOTAL		185	162	221	51	144	763

Table A.6: Frequency of sustainable wine purchase by usual wine purchase spend

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Usual wine purchase spend (for usual personal consumption at home)	\$2-3 per bottle	9	3	2	0	1	15
	\$3-5 per bottle	10	9	2	3	3	27
	\$5-8 per bottle	24	9	25	6	16	80
	\$8-10 per bottle	30	34	50	9	32	155
	\$10-15 per bottle	45	47	68	17	59	236
	\$15-20 per bottle	34	32	44	9	20	139
	\$20-25 per bottle	13	14	17	5	5	54
	Over \$25 per bottle	18	11	9	2	6	46
TOTAL		183	159	217	51	142	752

Table A.7: Frequency of sustainable wine purchase by those who read the information on the label

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Statement: "I read the information that is on the label"	Strongly agree	79	44	43	15	26	207
	Agree	57	67	117	22	75	338
	Neutral	25	35	45	10	23	138
	Disagree	6	10	6	2	6	30
	Strongly disagree	4	3	5	1	6	19
	Don't know	2	2	2	0	5	11
TOTAL		173	161	218	50	141	743

Table A.8: Frequency of sustainable wine purchase by agreement with statements regarding environmental awareness: “I would like to have more information about sustainably produced wines”

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Statement: “I would like to have more information about sustainably produced wines”	Agree	97	47	45	5	31	225
	Partly agree	42	52	87	16	36	233
	Neutral	24	47	63	21	45	200
	Partly disagree	7	9	10	4	8	38
	Disagree	6	3	6	5	13	33
	Don't know	2	3	4	0	7	16
TOTAL		178	161	215	51	140	745

Table A.9: Frequency of sustainable wine purchase by agreement with statements regarding environmental awareness: “The environmental impact of wine is well managed”

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Statement: “The environmental impact of wine is well managed”	Agree	84	27	18	3	15	147
	Partly agree	48	66	70	16	31	231
	Neutral	26	42	89	20	55	232
	Partly disagree	14	10	17	5	12	58
	Disagree	3	5	5	1	6	20
	Don't know	2	11	20	5	24	62
TOTAL		177	161	219	50	143	750

Table A.10: Frequency of sustainable wine purchase by agreement with statements regarding environmental awareness: “Sustainable wine labelling certification is a guarantee of high product quality”

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Statement: “Sustainable wine labelling certification is a guarantee of high product quality”	Agree	81	36	20	6	17	160
	Partly agree	52	58	73	10	26	219
	Neutral	29	44	86	17	52	228
	Partly disagree	11	11	20	7	13	62
	Disagree	2	4	6	8	15	35
	Don’t know	1	9	12	2	17	41
TOTAL		176	162	217	50	140	745

Table A.11: Frequency of sustainable wine purchase by agreement with statements regarding environmental awareness: “I feel that purchasing sustainable products helps protect the environment”

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Statement: “I feel that purchasing sustainable products helps protect the environment”	Agree	82	60	64	11	43	260
	Partly agree	54	48	83	19	44	248
	Neutral	23	36	54	10	33	156
	Partly disagree	9	9	8	6	3	35
	Disagree	3	4	2	4	4	17
	Don’t know	1	4	6	1	13	25
TOTAL		172	161	217	51	140	741

Table A.12: Frequency of sustainable wine purchase by agreement with statements regarding environmental awareness: “I could be interested in buying a bottle of wine with a sustainable label (showing environmental, economic and social aspects)”

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					TOTAL
		Always	Often	Sometimes	Rarely	Never	
Statement: “I could be interested in buying a bottle of wine with a sustainable label (showing environmental, economic and social aspects)”	Agree	87	50	55	10	39	241
	Partly agree	53	54	89	17	36	249
	Neutral	23	40	55	18	45	181
	Partly disagree	4	9	9	2	8	32
	Disagree	5	6	4	3	6	24
	Don’t know	1	3	7	1	7	19
TOTAL		173	162	219	51	141	746

Table A.13: Frequency of sustainable wine purchase by importance of environmental attributes of New Zealand wine products: Reduced environmental impact of production

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					TOTAL
		Always	Often	Sometimes	Rarely	Never	
Importance of NZ wine product attributes: Reduced environmental impact of production	High importance	58	20	7	2	6	93
	Some importance	30	30	33	8	16	117
	Neutral	18	15	38	12	24	107
	Little importance	4	8	10	3	10	35
	No importance	1	3	7	3	12	26
	Don’t know	1	1	6	3	9	20
TOTAL		112	77	101	31	77	398

Table A.14: Frequency of sustainable wine purchase by association of environmental attributes with high quality wine products: Production practices

		How often do you purchase Sauvignon Blanc with [sustainability labels]?					
		Always	Often	Sometimes	Rarely	Never	TOTAL
Association of environmental attributes with high quality wine products: Production practices	Strong association	88	37	30	5	20	180
	Moderate association	55	64	77	17	32	245
	Little association	30	38	74	17	35	194
	No association	6	10	21	7	18	62
	Don't know	4	9	16	5	38	72
TOTAL		183	158	218	51	143	753

Appendix 2

Definitions of Choice Experiment Environmental Attributes

Attribute	Definition
100% Organic	Both growing and processing are Organic. No GMOs. No added sulphites. No synthetic fertilisers or agrichemicals.
Biodiversity Management	The winery or grower has been set aside area for biodiversity restoration or enhancement on the same property as the vineyard, or off site.
By-Product Management	Production by-products are diverted from landfill and turned to beneficial use.
Energy Management	Monitoring, measurement and limitation of energy resources is undertaken.
GHG Management	Monitoring, measurement and limitation of GHG emissions is undertaken.
Made with Organic Grapes	Grapes are Organic but some ingredients are not. Sulphites may be added. No GMOs. No synthetic fertilisers or agrichemicals in grape growing
Pest & Disease Management	Integrated control strategies used to optimise control and fruit quality and prioritise minimisation of the impact on the receiving environment.
Water Management	Monitoring, measurement and limitation of water resources is undertaken.



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