

Declaration

I, Gillian Claire Walsh, of [REDACTED] Fernside, Event Coordinator
[Name] [Place of residence]

being a person authorised to present evidence in support of this Application on behalf of the Applicant, solemnly and sincerely declare that:

1. The evidence contained in and with this application, including appendices and attachments, is true and correct to the best of my knowledge.
2. I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths and Declarations Act 1957.

Name: Gillian Claire Walsh

Signature: [REDACTED]

Declared at RANGIORA this 25TH day of July 2017.

Before me:

[Name of Justice of the Peace, or solicitor, or other person authorised to take a statutory declaration.]

Signature: [REDACTED]

P.R. Fantham, JP
#10092
CHRISTCHURCH
Justice of the Peace for New Zealand



Evidence in support of application for registration of a New Zealand Geographical Indication *WAIPARA VALLEY*

Geographical Indication name

The name of the geographical indication (GI) for which registration is sought is WAIPARA VALLEY. This may alternatively be presented as WAIPARA.

The WAIPARA VALLEY GI, in either form, may be used in conjunction with the larger NORTH CANTERBURY or CANTERBURY GIs of which it is a sub-region, provided that such use is not misleading or deceptive.

Quality, Reputation or Other Characteristic

The WAIPARA VALLEY GI is smaller GI containing 1258 hectares of vineyard to the north of Christchurch, mostly planted amongst rolling hill country which rises to the foothills of the Southern Alps. It is a well-known site for production of "boutique", ultra-premium wines – particularly Pinot Noir and Riesling - in a highly attractive valley setting. Whilst still very small in scale, the GI has experienced relatively fast growth and positive critical attention. Most producers are still small and family-run, although larger companies are increasingly establishing positions in the region.

Key aspects of the WAIPARA VALLEY GI which contribute to the quality, reputation or other characteristics of wines grown and made there include:

- a moderate climate with low rainfall that is conducive to producing high quality wines from a particular suite of grape varieties;
- a high level of diurnal fluctuation driven by hill ranges close to the sea, giving wines of great fruit character with well-balanced acidity;
- distinctive geology and soils that contribute to the flavour of the wines;
- high costs relative to the volume of production, necessitating ultra-premium positioning in the market;
- the predominance of small, owner-operated wine businesses with a shared vision of the GI as a region for producing high quality wines;
- strategic location near to the major urban centre of Christchurch and tourism hubs such as Hanmer Springs and Kaikoura contributes to wine tourism and reputation.

Consequently, wines from the WAIPARA VALLEY GI have the following quality, reputation or other characteristics that are essentially attributable to their geographical origin:

- WAIPARA VALLEY GI wines are specialised in a particular suite of classic grape varieties and wine styles suited to both the physical environment and the market, in particular: aromatic varieties, Chardonnay and Pinot Noir.
- WAIPARA VALLEY GI wines display recognisable and consistent sensory characteristics across a range of varieties and styles due to the physical environment as well as viticultural and winemaking practices.



- WAIPARA VALLEY GI wines are high quality products produced for the premium to ultra-premium market segments.
- WAIPARA VALLEY GI wines have a global reputation for the foregoing based on many years of use and recognition by consumers, tourists wine experts and visitors to the GI.

History and background

Background

The WAIPARA VALLEY GI is situated within North Canterbury. The southern end of the GI is approximately 40 kilometres north from Cathedral Square, Christchurch. WAIPARA VALLEY has 1250 Ha of vines. It has fast established itself as one of the premium wine producing regions of the country particularly in Pinot Noir, Chardonnay and the Aromatics. According to Bob Campbell the region is "one of the unsung heroes of the wine industry". Today the region is the fourth largest producer in New Zealand and is listed as fourth on the top 10 day trips in Canterbury¹ The WAIPARA VALLEY GI is home to four winery restaurants including the highly acclaimed Pegasus Bay Winery Restaurant along with the more recent Black Estate. The valley has a vineyard cycle way and in 2017 a Purepod was launched² sitting high above Greystone Vineyard. This along with the historic Weka Pass Railway and the annual wine and food festival has firmly stamped the WAIPARA VALLEY as a premium wine destination.

Evolution of wine production in the WAIPARA VALLEY GI

The first plantings in the WAIPARA VALLEY were made by John McCaskey, who had a 400 hectare farm with stony soils on the Weka plains. He first experimented with grapes in the mid-1960s, but these hybrid vines were washed away by a flash flood. He tried again in 1981, with 4 hectares planted with vines. In 1982 there were four more vineyard projects including those by Bruce and Jill Moore (Waipara Springs) and John Corbett. Corbett was to establish Waipara Riesling on the New Zealand wine map, winning gold medals with his 1986, 1988 and 1989 vintages. WAIPARA VALLEY plantings expanded in the late eighties and early nineties and today there are now 74 vineyards and 12 wineries in the region. In general the valley has smaller owner operated vineyards however larger companies such as Montana have several plantings in the region. Today the WAIPARA VALLEY GI continues to expand with a new bistro opening at the end of 2017 and more cellar doors also expected to pop up.

Industry structure

Industry structure within the WAIPARA VALLEY GI contributes to the distinctiveness and reputation of wines from the GI. The WAIPARA VALLEY GI is a sub-region of the North Canterbury GI and even larger Canterbury GI. The WAIPARA VALLEY has always had its own distinctive identity which is due in large part to the fact that 85% of the fruit grown in the wider Canterbury GI comes from the WAIPARA VALLEY.

The compact nature of the WAIPARA VALLEY GI, and the "boutique" nature of winegrowing operations are elements of a closely linked winegrowing community. All winegrowers are full members of the applicant association and most participate in its activities. The Applicant provides a platform for many cooperative activities from marketing to education.

¹ www.christchurchnz.com/what-to-see-and-do/top-10-day-trips-from-christchurch/

² <https://www.purepods.com/location/greystone/>



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Many winegrowing businesses within the WAIPARA VALLEY GI cooperate in other ways for mutual benefit. For example, some businesses share winemaking staff and facilities, while others combined for targeted marketing activities.

Geographical features in the area / soil composition in the area

The WAIPARA VALLEY GI in North Canterbury is around an hour's drive north of Christchurch, a small valley bounded by Weka Pass and Waikari to the northwest, and Omihi to the northeast. Towards the southeast (and coast) are the Teviotdale Hills, which protect the WAIPARA VALLEY GI from the worst of the cold, rain-bringing southerly weather systems. Further to the west are the Southern Alps/Main Divide, the defining mountain range spine of the country which exercises a profound effect on the wider Canterbury climate. The combination of these hills allows the WAIPARA VALLEY protection from the cooling easterly wind whilst also allowing the warming north-west winds. The low rainfall and warm summers provide great growing conditions. "Drought risk is mitigated by irrigation. Canterbury's long dry autumns coupled to good diurnal variance help provide phenolic ripeness, complexity and a variety of styles"³.

Soils play an important role in grape growing and wine making as the soils anchor the vines and act as a reservoir of water and nutrients essential for growth. Soils influence the vine microclimate and therefore influence wine characteristics. While the history of winemaking in Waipara can be measured in decades, the soil's history goes back thousands of years, yet it still has a tangible influence on vine and wine. Adding to this is the input of vignerons, whose husbandry varies with place and person, leading to unique wines, expressing their terroir, or sense of place. From the mid-1980s in the Waipara region there have been changes to and intensification of land use, most notably expressed by the development and expansion of viticulture and wine making. In a relatively short span of time, this part of North Canterbury has cemented a reputation for high quality wines, particularly for Pinot noir and Riesling.⁴

The WAIPARA VALLEY GI has three general sites, valley floor, hill slopes and river terraces. The soil types include; gravely deposits on flats and terraces in the central and west of the valley, limestone derived clays on hillsides and valley floor to the eastern side and gravely loams over alluvial subsoil in the southern part of the region. The north facing moderately sloping terrain provides an ideal sun trap for fruiting vines. The image below is from 'Geology, landforms and soils of the Waipara and Waikari regions of North Canterbury with an emphasis on lands used for viticulture' by Tonkin/ Webb/ Almond/ Creasy/ Harrison/Hassell Smith 2015 and shows the variety of soil present in the valley.

This research report identifies a limestone mix of fossils, sea shells and small pebbles that have been fused together through the seismic movement of North Canterbury. Over time this ancient seabed has been pushed and folded upwards to form the Teviotdale Hills. This is significant to growers as Pinot Noir famously loves soils with limestone. The full report is attached as Appendix 1.

³ <http://www.waiparavalleynz.com/news/about-waipara/>

⁴ *Geology, landforms and soils of the Waipara and Waikari regions of North Canterbury with an emphasis on lands used for viticulture.* Tonkin/Webb/Almond/Creasy/ Harrison/Hassell Smith 2015



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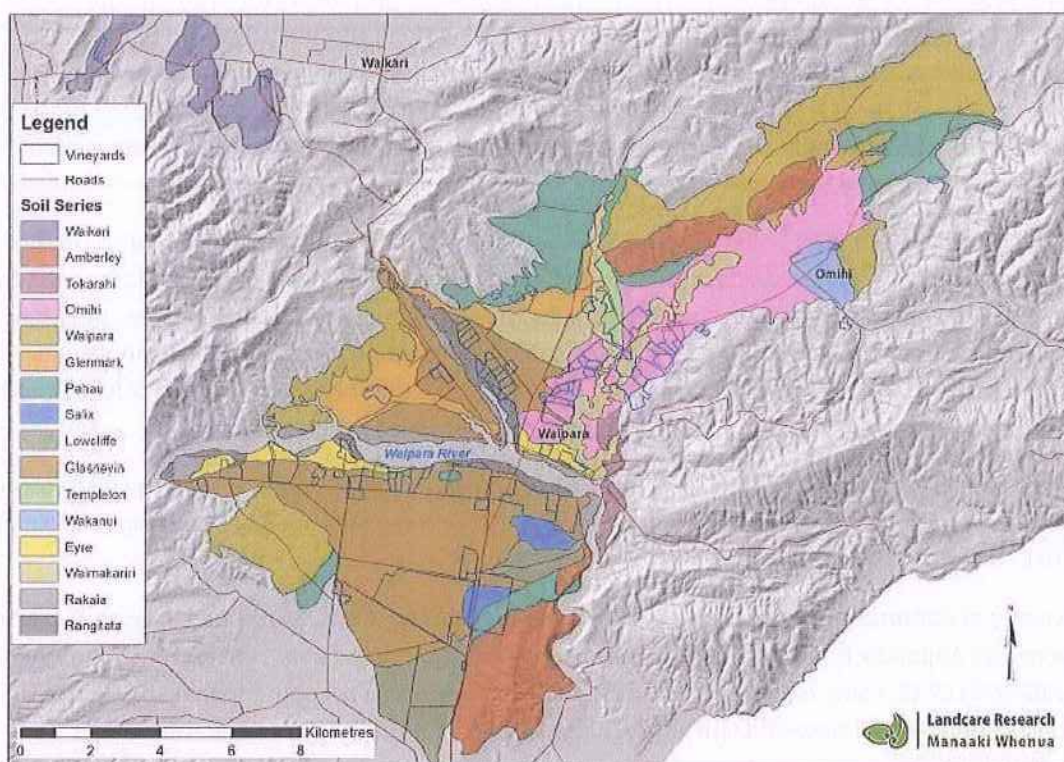


Figure 20. Dominant soil series associated with wine growing in North Canterbury.

Climate in the area

Climate is one of the primary determinants of the growth and ripening of the grapes grown within a GI, which in turn contributes to distinctive sensory attributes in the wine produced in the GI. It affects the development of fruit, the duration of ripening and the timing of harvest, as well as impacting upon fruit quality and vine health.

The WAIPARA VALLEY GI's key features are its long sunny growing season, warm summers within an overall cool-climate, significant diurnal shift and very low rainfall with drying summer winds.

Whilst the WAIPARA VALLEY GI has an overall cool climate, its protected, more northerly position means it is significantly warmer and sunnier than the Canterbury Plains winegrowing areas, with temperatures and sunshine statistics more akin to Marlborough. It is however drier than Marlborough, and slightly more prone to extremes of temperature in both summer and winter. The WAIPARA VALLEY GI is both the warmest and driest of the South Island GIs, experiencing a long, relatively cool growing season and its wines typically display a vividly aromatic fresh, fruitiness alongside a rounded, weightier palate richness as a result.

The WAIPARA VALLEY GI experiences significant diurnal shifts which enhance its wines aromatic expressiveness, varietal typicity and retention of natural acidity. The GI is also notably sunny with around 2400 hours sunshine per annum, a result of the surrounding mountainous rain shadows and low number of cloudy days. This, along with the extended growing season means the GI is able to ripen mid-season varieties such as Syrah, though such varieties can still pose a challenge in cooler years.



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The WAIPARA VALLEY GI experiences very low rainfall and has a propensity for droughts due to the marked rain shadow effect of the Southern Alps combined with its generally free-draining soils. Irrigation is widespread. However the advantage of low rainfall is a long, dry growing season: not only essential for ripening grapes in a cool climate but also contributing to very low disease pressure, enhanced flavour and phenolic development without excessive sugars, plus excellent retention of natural acids.

Prevailing winds are from the north-east and south-west, and the WAIPARA VALLEY GI also receives the notorious Canterbury nor’ westers: strong, hot, exceptionally drying winds which blast across the region in spring and summer. Their arrival is heralded by high streaky clouds arching over the Main Divide and their extreme lack of moisture has a significant impact on vines, buffeting shoots and leaves and causing water stress. The WAIPARA VALLEY is generally sheltered from the cold southerly winds which bring rain and cold temperatures, by the Teviot Hills to the southeast.

Frosts are typically a risk to the WAIPARA VALLEY GI's vineyards at both ends of the growing season; site selection on north-facing slopes helps but frost protection systems are generally regarded as an essential.

A University of Canterbury geography research paper by McCone, Cook, Stuthridge, Gibson & O’Hara is attached as Appendix 6. This paper provides useful analysis of the climate characteristics of the WAIPARA VALLEY GI, using bio-climatic indices, and was specifically prepared to investigate the relationship between climate and viticulture in the WAIPARA VALLEY GI in anticipation of the present application.

Key climate indices and statistics

The following tables and charts provide data on key climate statistics relevant to the viticulture of the WAIPARA VALLEY GI region⁵. All data were sourced from the National Institute of Water and Atmospheric Research.

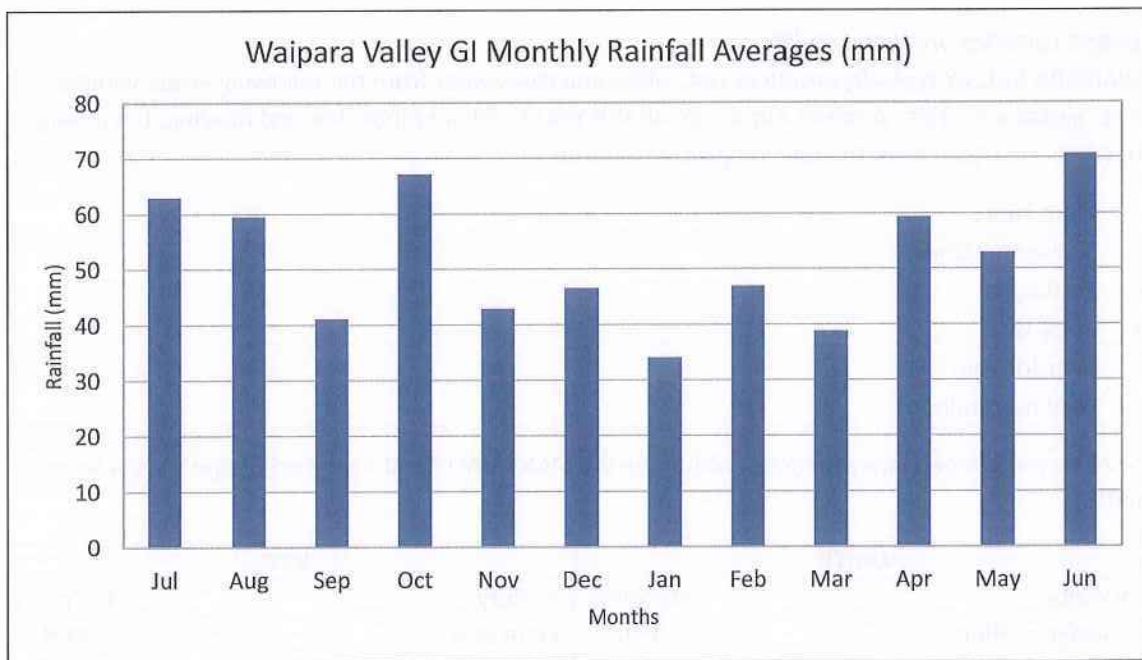
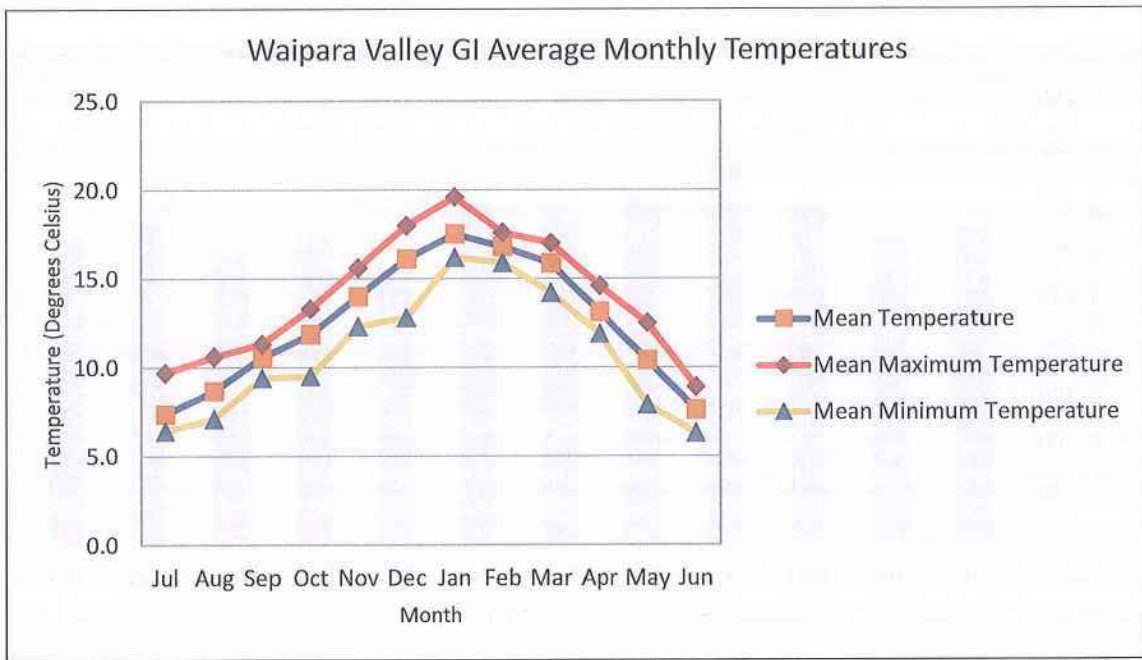
	Sunshine Hours (sum)	Growing Degree Days (>10°C) (sum)	Rainfall (mm) (sum)	Screen (air) frost (# days) (sum)	Ground Frost (# days) (sum)
Annual	2,421	1,288	623	16	59
Season (Sept - April)	1,822	1,137	377	1.9	14
Season % of annual	75%	93%	61%	12%	24%

Growing Season metrics (Sept-April)	°C
Mean Maximum Temperature	15.9
Mean Minimum Temperature	12.8
Mean Diurnal Shift	3.1

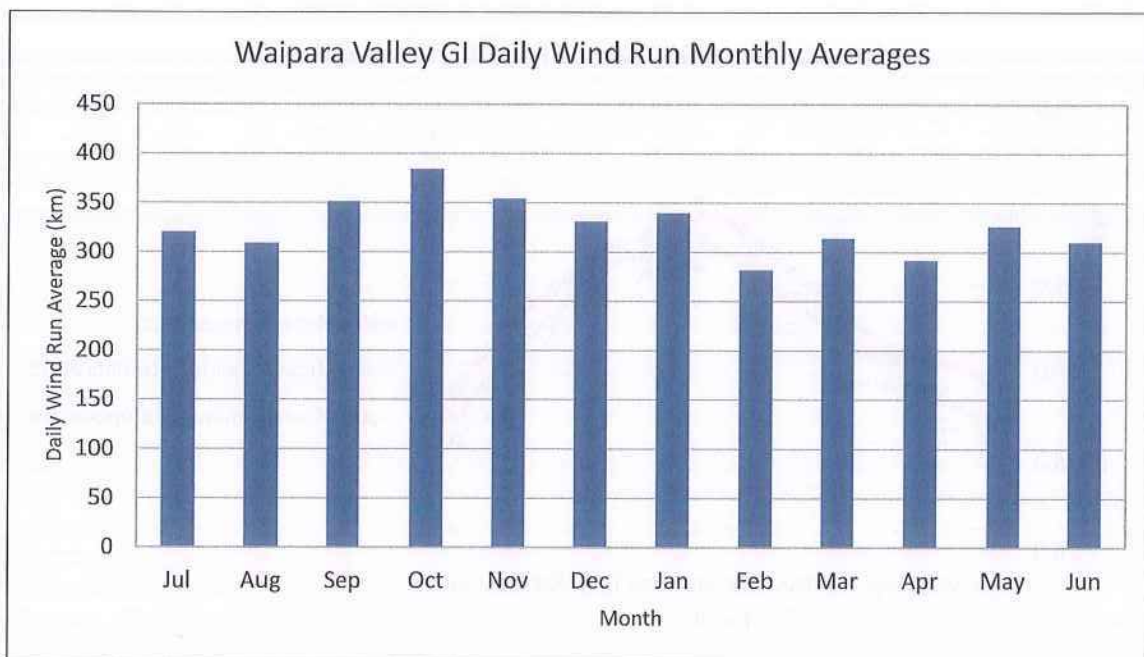
⁵ Data sourced from Waipara West EWS



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Methods of producing wines in the area

Grape varieties and wine styles

WAIPARA VALLEY typically produces red, white and rosé wines from the following grape varieties. The "signature" styles produced in the WAIPARA VALLEY GI are Pinot Noir and Riesling, but a range of wines are made from the following grape varieties.

- Pinot Noir;
- Sauvignon Blanc;
- Riesling;
- Pinot Gris;
- Chardonnay;
- Gewurztraminer.

In 2016, the planted vineyard areas within the WAIPARA VALLEY GI from each grape variety were as follows:

WHITE		RED	
Variety	Hectares	Variety	Hectares
Sauvignon Blanc	354.7	Pinot Noir	341.9
Riesling	254.4	Merlot	8.2
Pinot Gris	182.9	Syrah	8.1
Chardonnay	70.2	Cabernet Sauvignon	5.4
Gewurztraminer	16.1	Cabernet Franc	2.3
Others	10.3	Others	4
TOTAL	888.6	TOTAL	369.9



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Viticulture and winemaking

Viticultural and winemaking practices within the WAIPARA VALLEY GI are adapted to the production of ultra-premium wines from specific grape varieties in the range of physical environments that exist within the GI. While the practices themselves may not be unique, they are aimed at promoting the distinctive characteristics of wines from the WAIPARA VALLEY GI.

Particular features of viticulture and winemaking practices within the WAIPARA VALLEY GI are as follows:

- In order to ensure that grapes are of the highest quality within the WAIPARA VALLEY GI growing environment, yields are typically restricted to between 4.6 and 10 tonnes per hectare for red grape varieties for premium bottled production and 6 and 13 tonnes per hectare for white grape varieties for premium bottled production.
- Wines are made in small batches, often predominantly from single vineyards sites.
- Red wines are typically aged in oak. Red wines are macerated on their skins for extended periods resulting in red wines with significant aging ability.
- Grape growers and winemakers within the WAIPARA VALLEY GI have a strong commitment to sustainable winegrowing, with most participating in Sustainable Winegrowing New Zealand or organic certification.

Due to factors such as the capital intensive nature of winemaking facilities, fluctuations in vintages, and multi-regional ownership models, it is not unusual for winemaking to take place outside the GI. This is a widely accepted practice within New Zealand and within the GI itself and does not detract from the expression of characteristics typical of the GI in the resulting wine.

Wines from the GI may be made in styles that are lower in alcohol, including sweet wines and lower alcohol dry wines produced using permitted viticultural and winemaking practices.

Quality

WAIPARA VALLEY GI wines display recognisable and consistent sensory attributes across a range of varieties and styles due to the physical environment as well as viticultural and winemaking practices as outlined above. These qualities have been described below by an independent Master of Wine, Emma Jenkins.

Pinot Noir

The key red variety for the WAIPARA VALLEY GI in terms of significance and volume, producing richly flavoured wines displaying dark cherry, plum and red berryfruit with spice and savoury/earthy notes. The overall cool climate with summer warmth, and long sunny growing season with marked diurnal shifts typically delivers medium-bodied wines with expressive perfume, densely ripe fruit, supple tannins and finely-tuned balanced acidity. Wines would typically be made using quality French oak, and are usually sold at the premium end of the market though some highly sought-after and particularly well-regarded wines sit in ultra-premium positions. WAIPARA VALLEY GI Pinot Noir may also be used for quality Methode Traditionelle sparkling wines, generally blended with Chardonnay, and is also made into still rosé wines, usually in bright, fresh styles intended for early consumption.

Riesling

The WAIPARA VALLEY GI produces critically well-regarded Riesling in richly perfumed, finely poised styles. The long sunny growing season, significant diurnal shifts and cool dry autumnal weather



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makes the GI very well suited to quality Riesling production across a wide range of styles from dry to late harvest. The GI's wines are typically highly aromatic with pure-fruited expression of citrus and green apple, honey and floral notes and cleansing natural acidity. Wines are generally delicately structured with good balance between acidity, any residual sugar and alcohol. The cool climate and long season means fully ripe wines with naturally low to moderate alcohols (around 10% abv) are possible. Winemaking is typically neutral and protective in approach in order to showcase fruit purity, and wines are usually positioned at the mid to premium end of the market.

Chardonnay

Chardonnay is a key variety for the WAIPARA VALLEY GI, with a solid reputation for quality as well as a number of critically acclaimed sought-after wines. The GI's cool climate and long sunny growing season with marked diurnal shifts produces intensely fruited wines with excellent natural acidity and moderate alcohols. Wines typically display vivid citrus and stonefruit characters and weighty, rounded palates. Wines are made in a wide range of styles, included unoaked, but the GI's ability to deliver good depth of fruit allows a broad range of winemaking techniques including wild yeast, lees and malolactic fermentation to be employed. Wines would typically occupy a premium position or higher in the case of sought-after labels. WAIPARA VALLEY GI Chardonnay may also be used the production of Methode Traditionelle sparkling wines, either solo or blended with Pinot Noir.

Sauvignon Blanc

The WAIPARA VALLEY GI produces vibrantly aromatic Sauvignon Blanc with crisp, textural palates and racy natural acidity. The long growing season enhances varietal expression and depth of flavour, and the cool climate with marked diurnal shifts delivers heightened aromatics and precise palate structures. Wines are typically vinified in a neutral manner to preserve fruit purity but styles with a degree of oak influence may also be seen. Wines are typically positioned mid to premium market.

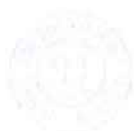
Pinot Gris

WAIPARA VALLEY GI Pinot Gris is well-regarded, with a wide range of aromatic, fruit-driven styles. The long, mostly cool and dry growing season with marked diurnal shifts gives very varietally expressive wines, with ripe pear, stonefruit and spice notes. Wines are typically medium-bodied with rounded, textural palates. Some residual sugar in wines is common, balanced by the GI's ability to retain naturally crisp acidity. Winemaking input is mostly neutral to preserve fruit purity, though there is may be some use of lees influence and occasionally older oak for texture and complexity.

Syrah

There are small plantings of this mid-season variety in warmer sites within the WAIPARA VALLEY GI. Whilst it can be a struggle to ripen Syrah in cooler years, the warm, sunny summers and long dry autumns have allowed production of well-regarded examples regularly throughout the past two decades. Wines are typically light to medium-bodied with spicy aromatics, supple, berryfruit-rich palates, fresh acidity and fine tannins. WAIPARA VALLEY GI Syrah would generally be made using some degree of French oak and be positioned at the premium end of the market.

Other varieties produced in smaller quantities include: Gewürztraminer, Pinotage, Viognier, Merlot and some dessert & rose wines.



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Reputation

Use and promotion of the WAIPARA VALLEY GI

WAIPARA VALLEY, or its alternative form WAIPARA, has been used consistently and continuously on wines since the first commercial release of wines from this GI in 1989. Some examples of labels using the GI are attached as Appendix 2.

The total harvest in the WAIPARA VALLEY GI in 2017 was 7,768 tonnes, yielding approximately 5.6 million litres of wine. A significant proportion of this will be labelled with the WAIPARA VALLEY GI. Wines from the WAIPARA VALLEY GI are also exported around the world. Data from the Ministry for Primary Industries indicates that 4.2 million litres of wine from the 2010-2016 vintages have been exported using the WAIPARA VALLEY GI.

The national wine industry association, New Zealand Winegrowers (NZW), has long recognised the WAIPARA VALLEY GI and reference to the GI has been included in many of NZW's publications which are publicly available and distributed nationally and internationally in hard and soft versions. These include the following examples:

- The NZW Annual Report^[1] <https://www.nzwine.com/media/1214/nzw-annual-report-2016.pdf>;
- The NZW Vineyard Register Report: <https://www.nzwine.com/media/4221/2017-vineyard-register.pdf>;
- The www.nzwine.com website;
- NZW pamphlets and materials about the NZ wine industry and its regions, such as:
 - *Canterbury and Waipara Valley*: <https://www.nzwine.com/en/regions/gisborne/>
 - *A Land Like No Other*: <https://www.nzwine.com/media/6390/a-land-like-no-other.pdf>.
- The New Zealand wine regions map A0 size poster which is widely used including in association with all national and international promotional activities. This map also appears as the sixth panel in the *A Land Like No Other* pamphlet.

The WAIPARA VALLEY GI has been used in marketing and promotional activities for many years. The local winegrower's association, Waipara Valley North Canterbury Winegrowers (previously Waipara Valley Winegrowers) has placed the GI at the heart of its collective marketing activities.

The hugely anticipated WAIPARA VALLEY Wine and Food Festival has been held in the region since 1992. In addition "Taste Waipara" a new release spring tasting event is staged in Christchurch each year. This event targeting trade and the public is a popular, much anticipated, event. Other successful initiatives that have put the WAIPARA VALLEY GI on the map including the Greening Waipara Projects and the Waipara Valley Vineyard Trail. Examples of regional Marketing initiatives are illustrated in Appendix 3.

Producers within the WAIPARA VALLEY GI also participate in international marketing events and incoming visitor programmes and events organised through NZW. These frequently feature regional overview tastings and education programmes including WAIPARA VALLEY GI wines as well as participation from producers within the GI. These combined activities have an enormous global reach, covering millions of consumers in NZ, Australia, Europe, North America and Asia. Data on the reach of these events is set out in the NZW 2016 Annual Report referenced above.

^[1] Where NZW publications provide data for both Waipara and Canterbury regions, Canterbury data typically exclude Waipara data, so totals may need to be aggregated to produce CANTERBURY GI data.



The WAIPARA VALLEY GI is also featured in national and regional tourism and publicity materials, for example:

<http://www.newzealand.com/int/waipara/>

<http://www.christchurchnz.com/what-to-see-and-do/canterbury-vineyards/explore-waipara-valley-by-bike/>

<http://www.tourism.net.nz/region/canterbury/canterbury---waipara-valley/tours/wine-tours>

<http://www.hurunuitrails.org.nz/waipara-valley-vineyard-trail-map>

Formal recognition of the WAIPARA VALLEY GI

While New Zealand has not had a formal registration system for GIs in place, the New Zealand Government has formally recognised "WAIPARA VALLEY" and its alternative presentation "Waipara" on several occasions where this has been necessary to facilitate exports. This provides evidence that the Waipara GI is already recognised by the New Zealand Government to the extent possible under the current New Zealand law, and that such recognition has been accepted by the governments of other countries.

In 1989, the New Zealand Government requested that "Waipara" be included as a sub-region of the Canterbury viticultural region on the European Union's official list of "geographical ascriptions"⁶ to be used on New Zealand wines exported to that market.⁷

The New Zealand Government included both "WAIPARA VALLEY" and "Waipara" in the list of "Appellations of Origin" submitted to the United States Department of the Treasury Bureau of Alcohol Tobacco and Firearms as the official list for use on wines exported to that market.

In 2008, the New Zealand Government included "WAIPARA VALLEY" as a New Zealand geographical indication for use on wines exported to the European Union in the *European Union: Wine: Overseas Market Access Requirements Notice*.⁸

In 2010, the New Zealand Government included "WAIPARA VALLEY" (and the alternative "Waipara") as a New Zealand geographical indication for use on wines exported to Brazil in the *Brazil Wine Notice of Overseas Market Access Requirements*.⁹

In 2013, the New Zealand Government included "WAIPARA VALLEY" (and the alternative "Waipara") on the list of New Zealand wine regions¹⁰ notified pursuant to Article 4(3)(e) of the World Wine Trade Group *Protocol to the 2007 World Wine Trade Group Agreement on Requirements for Wine Labelling Concerning Alcohol Tolerance, Vintage, Variety, and Wine Regions*.¹¹

"WAIPARA VALLEY" and the alternative "Waipara" are included as a New Zealand GI on the International Organisation for Wine and Vine's *International Database of Geographical Indications*.¹²

⁶ Note that the terminology of "geographical indications" did not come into use internationally until 1995.

⁷ Commission Regulation (EEC) No 632/89 of 10 March 1989 amending for the eleventh time Regulation (EEC) No 997/81 laying down detailed rules for the description and presentation of wines and grape musts, Official Journal L 070 , 14/03/1989 P. 0006 – 0012.

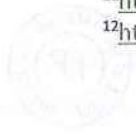
⁸ <http://www.foodsafety.govt.nz/password-protected/omars/eun/wine/other/part-2.pdf>

⁹ <http://www.foodsafety.govt.nz/password-protected/omars/bra/wine/other/part2.pdf>

¹⁰ Note that the Protocol does not use the terminology of "geographical indications" although it is understood that GIs fall within the definition of "wine regions" at Article 1(g) of the Protocol.

¹¹ [http://ita.doc.gov/td/ocg/Notification%20of%20Wine%20Regions%204%203\(e\)%20New%20Zealand.pdf](http://ita.doc.gov/td/ocg/Notification%20of%20Wine%20Regions%204%203(e)%20New%20Zealand.pdf)

¹² <http://www.oiv.int/oiv/info/enbasededonneesIG>



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References to the WAIPARA VALLEY GI in various media

The WAIPARA VALLEY GI is identified in all of the key national and international wine reference works, and has been for many years. Appendix 4 contains indicative examples from the most nationally and globally authoritative and biggest selling wine books including:

- 1996 – Cooper, M. *Wines and Vineyards of New Zealand*, 6th Ed.;
- 2007 – Johnson H. & Robinson, J. *World Atlas of Wine*, 5th Ed.;
- 2010 - Cooper, M. *Wine Atlas of New Zealand* 2nd Ed.
- 2016 – Robinson J. & Harding J. (Eds.) *Oxford Companion to Wine* 4th Ed.;
- 2016 – Cooper, M. *New Zealand Wines 2016 Michael Cooper's Buyer's Guide*.

This is just a small selection and virtually every recent wine book that covers the New Zealand wine industry will refer to the WAIPARA VALLEY GI.

The WAIPARA VALLEY GI features in other media as well including magazines, newspapers and online content. Attached as Appendix 5 is an indicative selection of such sources.

The WAIPARA VALLEY GI and/or specific wines labelled with the GI are also featured on a large number of national and international websites and blogs. Some indicative examples including the following:

<https://www.cuisinewine.co.nz/region/new-zealand/waipara-valley/>

<https://www.wine-searcher.com/regions-waipara>

<http://www.decanter.com/?s=waipara>

http://www.wineanorak.com/newzealand/northcanterbury_waiparavalley_1.htm

<http://nzwinedirectory.co.nz/wine-regions/south-island/waipara/>

<http://www.winesofnz.com/new-zealand-wine-regions/waipara-wine-region/>

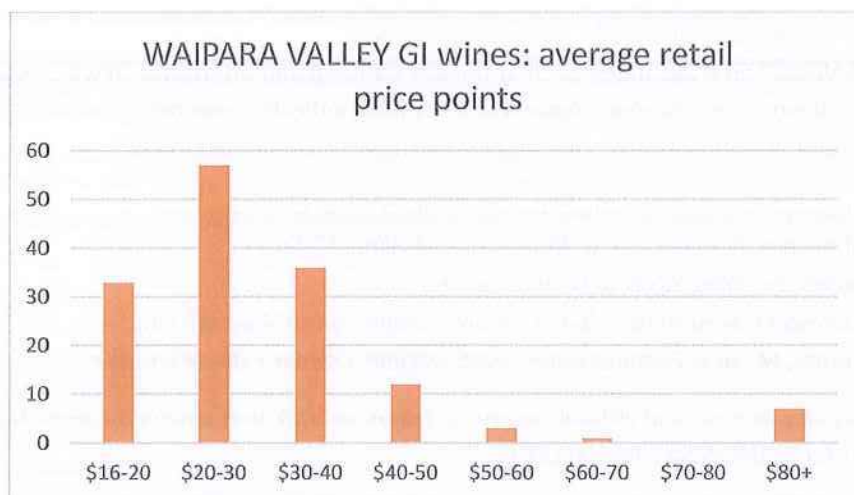
Market positioning

Wines from the WAIPARA VALLEY GI are typically positioned at the "ultra-premium" end of the wine market, defined as wines priced between US\$15 – US\$50¹³ (NZ\$22 – 73) per bottle. The mean retail price of wines bearing the WAIPARA VALLEY GI is NZ\$32.99 per bottle. The range of retail prices is between NZ\$16 and NZ\$315 per bottle, and the median price is NZ\$32.99 per bottle.

¹³See, for example, Veseth, M. (2006), *Globaloney: Unravelling the Myths of Globalization*, Rowman & Littlefield, Maryland.



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On average, wines bearing the WAIPARA VALLEY GI scored 90.8 points on the 100 point scale¹⁴, in which scores of 90-95 points are classed as Outstanding: a wine of superior character and style. Average scores in this range demonstrate that WAIPARA VALLEY GI wines are perceived in the market as being of ultra-premium or higher quality levels.

Awards and competitions

Wines from the WAIPARA VALLEY GI have won recognition for their high quality in many national and international wine competitions and influential reviews. One of the first examples of a prize-winning wine bearing the GI name WAIPARA was the *Glenmark Waipara Red 1991*, which won the *Champion Other Red Wine Trophy* at the *Air New Zealand Wine Awards* in 1992.

Below are some other indicative examples over the years:

Air New Zealand Wine Awards

Alan McCorkindale Waipara Valley Pinot Gris 2002, Champion Pinot Gris 2002

Mud House Estate The Home Block Vineyard Waipara Valley Pinot Gris 2010, Champion Pinot Gris 2010

Greystone Waipara Valley Basket Star Riesling 2011, Champion Dessert Wine Trophy 2012

Waipara Hills Pinot Gris 2016, Gold 2016

Thornbury Waipara Valley Pinot Gris 2016, Gold 2016

Waipara Hills Equinox Riesling 2015, Gold 2016

Decanter World Wine Awards

Best Regional Pinot Noir Trophy 2014 - Greystone Brothers Reserve Pinot Noir 2012

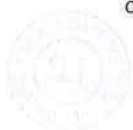
Best Regional Pinot Noir Trophy 2015 – Greystone Brothers Reserve Pinot Noir 2013

Gold 2011 – Waipara Hills Equinox Waipara Valley Pinot Nor 2010

International Wine Challenge

2015 New Zealand Pinot Noir Trophy – Waipara West Pinot Noir 2013

¹⁴ Data courtesy of Waipara Valley North Canterbury Winegrowers as at 30 April 2017. Scores are an average of points awarded on a 100-point scale by leading wine critics.



GAW

Australian Boutique Wine Awards

Wine of the Show 2015 – Mount Brown Estate Grand Reserve Pinot Noir 2013

NZ Organic Wine Awards

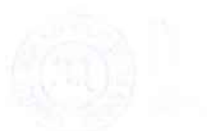
Greystone Sauvignon Blanc 2016 - Gold 2017
Terrace Edge Rose 2016 - Gold 2017
Bellbird Springs Dry Pinot Gris 2016 - Gold 2017
Greystone Pinot Gris 2016 - Gold 2017
Terrace Edge Liquid Geography Riesling 2016 - Gold 2017
Terrace Edge Classic Riesling 2016 - Gold 2017
Muddy Water James Hardwick 2015 - Gold 2017
Muddy Water Chardonnay 2015 - Gold 2017
Muddy Water Hares Breath Pinot Noir 2014 - Gold 2017
Muddy Water Slow hand Pinot Noir 2013 - Gold 2017
Terrace Edge 2015 Syrah - Gold 2017
2016 Vineyard of the Year – Greystone
2016 Wine of the Show – Terrace Edge 2014 Liquid Geography Riesling
Greystone Riesling 2015, Gold 2016
Terrace Edge 2014 Liquid Geography Riesling, Gold 2016
Greystone Pinot Gris 2015, Gold 2016
Greystone Gewürztraminer 2015, Gold 2016
Muddy Water Pinot Noir 2014, Gold 2016
2015 Wine of the Show – Muddy Water Hare's Breath 2012
Terrace Edge Pinot Gris 2014, Gold 2015
Muddy Water Hare's Breath 2012, Gold 2015
Fancrest Estate Pinot Noir 2011, Gold 2015
Muddy Water Pinot Noir 2013, Gold 2015
Terrace Edge Rose 2014, Gold 2015
Muddy Water James Hardwick Riesling 2014, Gold 2015



gow

APPENDIX 1 – Geology, landforms and soils of the Waipara and Waikari regions of North Canterbury with an emphasis on lands used for viticulture. Tonkin/Webb/Almond/Creasy/ Harrison/Hassell Smith 2015

[Note: due to file size constraints in the registration system,
this appendix (220 pages) will be provided separately]



GW

APPENDIX 2 – Examples of Wine labels Showing WAIPARA VALLEY GI usage

1980s

A Decade of Fine Waipara Wines

1986



1996

GLENMARK WINES

Waipara, Nth. Canterbury

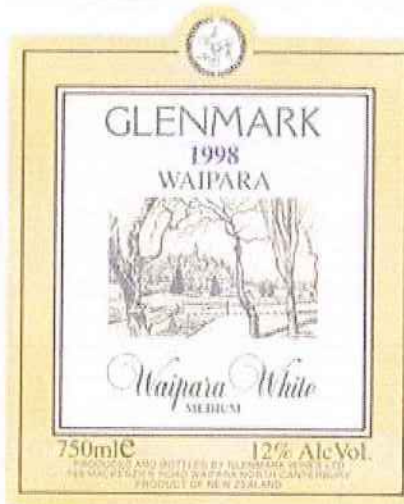
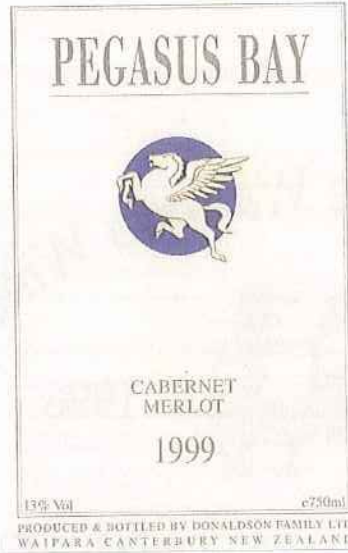
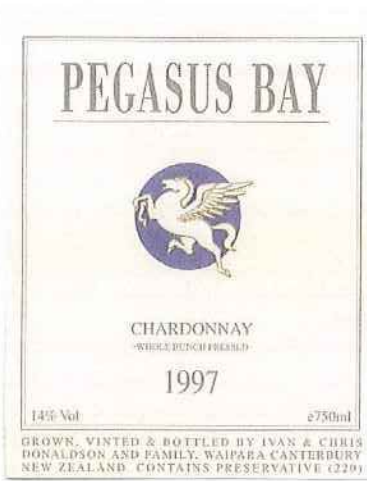
"Weka Plains" R.D.3 Amberly Ph/Fax: (64) 03-314 6828



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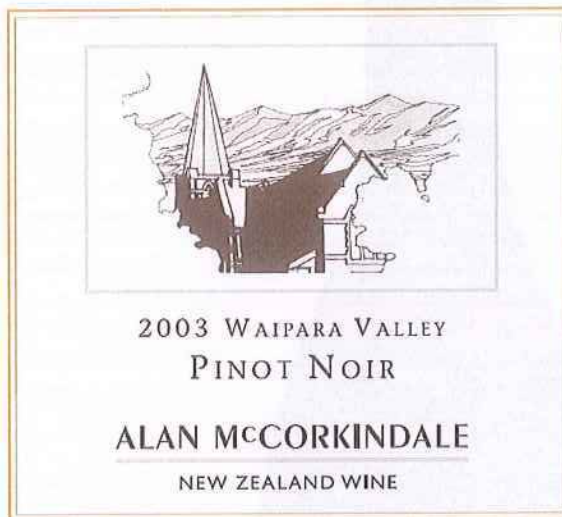
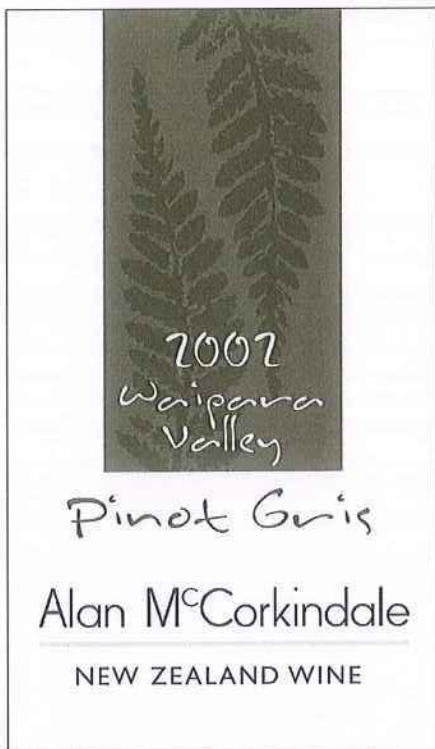
GCW

1990s



ECW

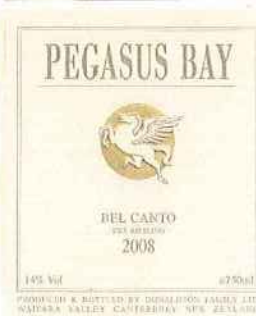
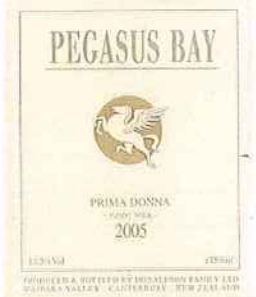
2000s



Contains preservative (E220)
Contains approx. 80 standard drinks
Fined with egg whites

Produced and bottled by Alan McCorkindale Ltd
478 Omihiri Road, Waipara, New Zealand

e75CL 13.5% VOL



2010s onwards



J *Gaw*

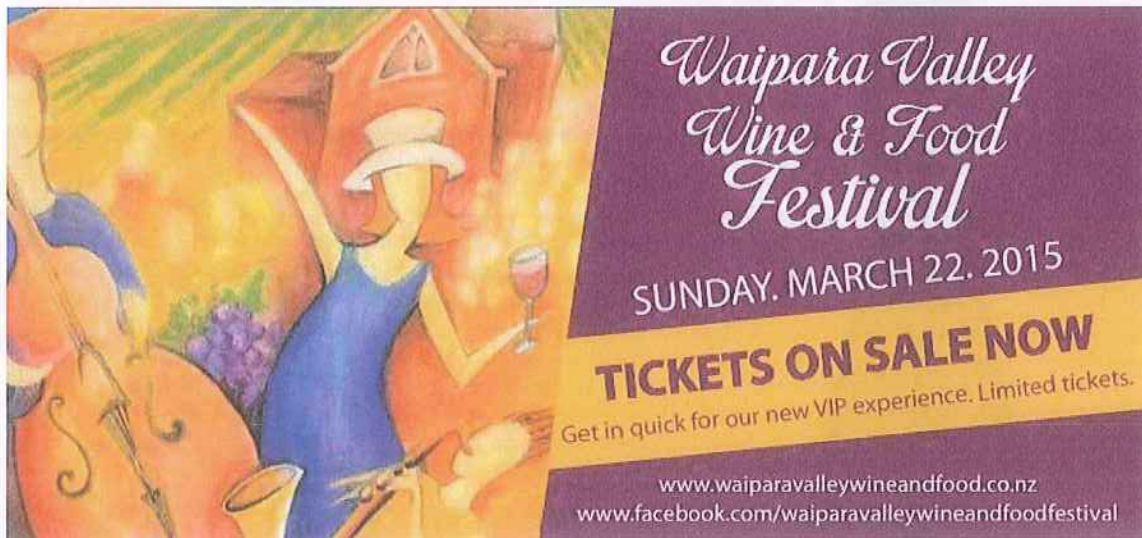


[Faint handwritten notes and a circular stamp]

[Handwritten initials 'B' and 'gaw' next to a circular stamp]



APPENDIX 3 - Waipara Valley GI use in Marketing



*Waipara Valley
Wine & Food
Festival*

SUNDAY, MARCH 22, 2015

TICKETS ON SALE NOW

Get in quick for our new VIP experience. Limited tickets.

www.waiparavalleywineandfood.co.nz
www.facebook.com/waiparavalleywineandfoodfestival

The poster features a stylized illustration of a person in a blue dress holding a wine glass, with a violin and other musical instruments in the background. The text is set against a dark purple background with a yellow banner for the ticket sale.



Your day
always be

NUPL

Cluster is New
Zealand's leading
manufacturer of
proven, practical
specialist hygiene
finishes for Food
and Walls that
are widely used
throughout the
food processing
industry and
Dairy Sheds
and Factories.
range of
are durable,
wearing
and easy
cleaning.

Top drops: David McGuckin samples a Mountford Estate vintage at the Waipara Wine and Food Festival.

The photograph shows a man in a white cap and dark shirt drinking from a wine glass. The glass has a label that reads "Waipara Valley Wine & Food Festival". In the background, a newspaper clipping is visible with the text "Your day always be" and "NUPL".





Taste
WAIPARA VALLEY
BRINGING THE VALLEY TO THE CITY

BOUTIQUE WINE TASTING EVENT

TUESDAY 1 SEPTEMBER 2015
MASHINA LOUNGE
PETERBOROUGH ST, CHRISTCHURCH

TRADE ADMISSION 4PM - 5PM
GENERAL ADMISSION 5PM - 9PM
GET YOUR TICKETS AT WAIPARAVALLEY.NZ.COM
FOR \$25 OR IN-STORE ON THE DAY FOR \$30.
CASH ONLY PLEASE

MEET THE WINEMAKERS BEHIND THE LABELS
DINER WITH CHEFS & WINEMAKERS

Waipara Valley
North Canterbury, NZ



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GCW

Monday, 21 March 2016 10:55

Waipara's new landmark

Written by Tessa Nicholson

font size   | Print | Email

While Rakaia has its giant trout, Paeroa has a massive L&P bottle, Waipara now has an eight and a half metre windswept grapevine.

The Waipara landscape is special in its own way. Large areas of flat valley land, rolling hills to the east, dozens of generational sheep farms, large tracts of vines and now a massive sculpture that will help define the area.

It has been six years since the idea of creating a regional landmark was first mooted by Julian Ball and Daryl Harris of the Waipara Promotions Association. It's a long time between the original idea and the unveiling, which finally took place in November last year.

For Ball, seeing the final product was a very sweet moment.

"It is magnificent and we are thrilled with it. It was back in the winter of 2009 that Daryl and I discussed creating an icon for the valley. It seemed to us that too many people were just driving along the main highway, through Waipara without stopping. So we wanted something to give the area an identity."

The sculpture certainly does that, and it is an appropriate nod to the growing reputation of the



Windswept and beautiful. The New Waipara sculpture. From left: Julian Ball, Daryl Harris and Sculptor Raymond Herber. Photo: Nathan Trelhowen.



gaw

The screenshot shows the Facebook page for 'I love the Waipara Valley'. The page header includes the name, a search bar, and navigation links like 'Home', 'Inbox', 'Notifications', 'Insights', and 'Publishing Tools'. The main content area features a large landscape photo of a vineyard. Below the photo are interaction buttons: 'Liked', 'Following', 'Share', and 'Contact Us'. A central section offers various actions: 'Share a Photo or Video', 'Advertise your Business', 'Create an Offer', 'Start a Live Video', 'Get Messages', 'Help People Find your Business', 'Create an Event', and 'Write a Note'. On the right, there are 'Page tips' and a notification for 932 likes. The left sidebar contains navigation options like 'Home', 'About', 'Events', 'Reviews', 'Photos', 'Videos', 'Notes', 'Posts', 'Join Our Mailing List', 'Community', and 'Promote'.

The screenshot shows the Twitter profile for 'WaiparaValleyNZ'. The profile header includes the name, a circular profile picture of a vineyard, and statistics: 1,677 tweets, 1,259 following, 1,213 followers, and 1 like. The bio describes the region as 'Exciting wine & food region in New Zealand' and lists products like Pinot Noir, Chardonnay, lamb, truffles, and olive oil. The main content area shows a tweet from June 12 celebrating 'North Canterbury Vineyards' and a retweeted tweet from May 6 about 'MANAGERS CHOICE'. A large image of a wine bottle with '#sauvblanc #ngwine' is featured. The right sidebar shows 'Who to follow' (Cigna New Zealand, Auntsfield Estate, Clive Jones) and 'Trends' (Doctor Who, #slanza17, Māori, WINZ, Paula Bennett, #OPCU19W). The bottom of the image shows a Windows taskbar with various application icons and the system clock at 6:22.



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Waipara Valley North Canterbury is a Masterclass in Cool Climate Wine Making

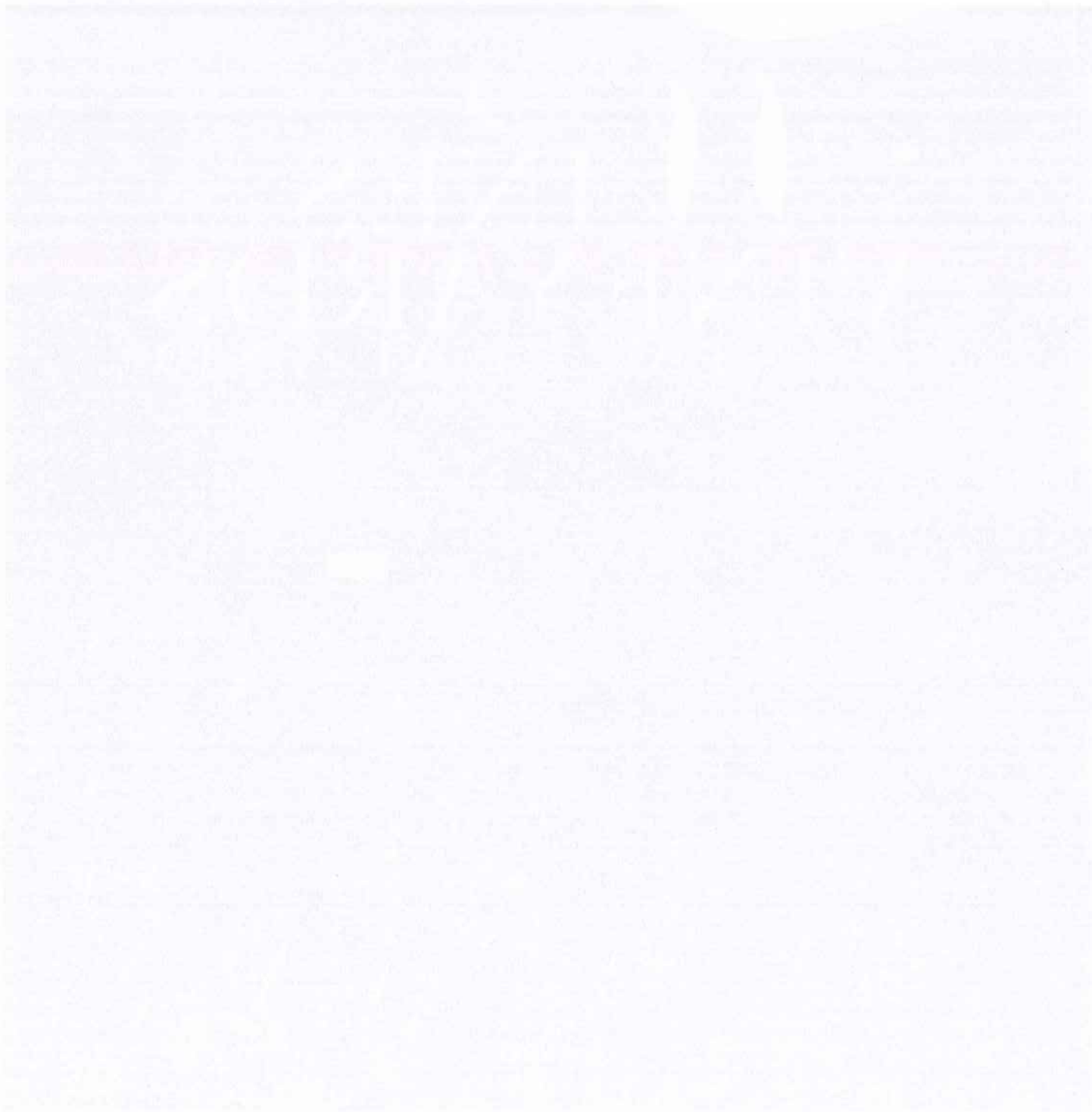
Best known for exquisitely spicy and rich Pinot Noirs and Rieslings, the region has a great reputation for other aromatic varieties such as Pinot Gris and Gewürztraminer as well as its own distinctive take on Sauvignon Blanc and Chardonnay.



b

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APPENDIX 4 – Extract from key texts referencing the WAIPARA VALLEY
GI



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THE WINES AND VINEYARDS OF NEW ZEALAND

Text by
Michael Cooper

Photographs by
John McDermott



b

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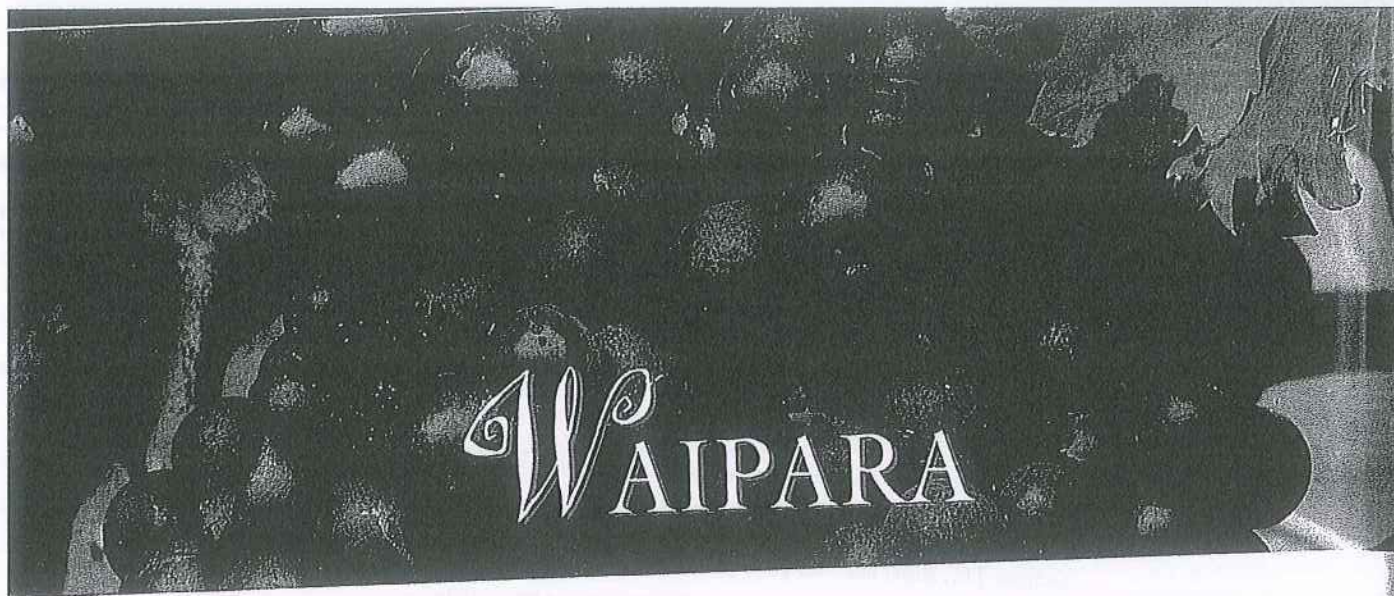
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Cover photo: Montana's Brancott Vineyard, Marlborough
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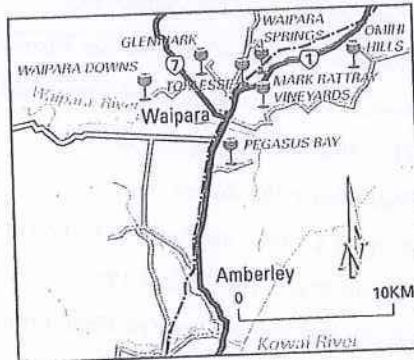
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Canterbury is New Zealand's fourth largest wine region, behind only Marlborough, Hawke's Bay and Gisborne. The latest 1995 vineyard survey revealed that Auckland, the Wairarapa and Otago all have a smaller area planted in vines than Canterbury. From Waipara in the north to Burnham, south of Christchurch, the Canterbury region now has four per cent of all New Zealand's vines, and 10 per cent of its wine producers. Vineyards are spreading like wild-fire - from 35 hectares in 1986 to 198 hectares in 1992 and 325 hectares in 1995.



in 1973, research focused on identifying the most suitable varieties for Canterbury's cool climate. After losing 70 per cent of his vines to a late frost, Jackson began 'wondering if I really was making a mistake'.

Trial plantings of more than 60 varieties later demonstrated, according to the university, that Canterbury produces grapes of high acidity and high sugar levels. Jackson saw Canterbury as

'borderline' for such mid-to-late season ripeners as Sauvignon Blanc and such late-season ripeners as Cabernet Sauvignon, but Pinot Noir and Chardonnay were 'particularly promising'.

Riesling is also flourishing in Canterbury. The 1995 vineyard survey reveals the four principal varieties planted in Canterbury are (in order): Chardonnay, Pinot Noir, Riesling and Sauvignon Blanc.

Riesling, Chardonnay and Pinot Noir are Canterbury's most rewarding wines. The fleshy, rich, spicy Corbans Private Bin Amberley (in fact, Waipara-grown) Riesling; Giesen's intense, spine-tingling, estate-grown Rieslings; the chunky, flavour-rich Pegasus Bay range and Mark Rattray's consistently stylish and ripe-tasting Pinot Noir and Chardonnay, all prove Canterbury's ability to produce class wine.

Canterbury's wineries are clustered in two zones: on the pancake-flat plains surrounding Christchurch, and further north in the undulating country around Waipara. Vineyards in both districts are exposed to the assaults of Canterbury's fierce, hot nor'-westers, but at Waipara the Teviotdale Hills shelter the vines from the province's cooling easterly breezes. The best Waipara wines are thus typically more mouth-filling and ripe-flavoured than the leaner, crisper wines from the south.

Canterbury wines enjoy strong parochial support in local stores and restaurants. But following an unhappy series of cool, ultra low-cropping vintages (in 1994, Canterbury produced less than 0.4 per cent of the national grape crop), Canterbury wine has been in desperately short supply. Even in the 1995 vintage, when the region escaped most of the rain problems further north, Canterbury produced barely one per cent of the national grape harvest. The flurry of recent plantings should do much to alleviate the shortage.

French peasants who landed in 1840 at Akaroa on Banks Peninsula carried vine cuttings, from which wine soon flowed for their domestic consumption. A century after their arrival, W.H. Meyers built a small winery, Villa Nova, in the Heathcote Valley. By 1945 he had a tiny vineyard of about 0.8 hectares planted in Verdelho, Pinot Gris, Muscat and other grapes. Although wine was made, Meyers' vines were uprooted around 1949 after they failed to flourish.

The current resurgence of interest in Canterbury wine stems from research conducted at Lincoln University under the direction of Dr David Jackson. When the first trials commenced



Hugh Johnson

Frederic Robinson

The World Atlas of

WORLD

COMPLETELY REVISED
5
FIFTH EDITION

John Beazley



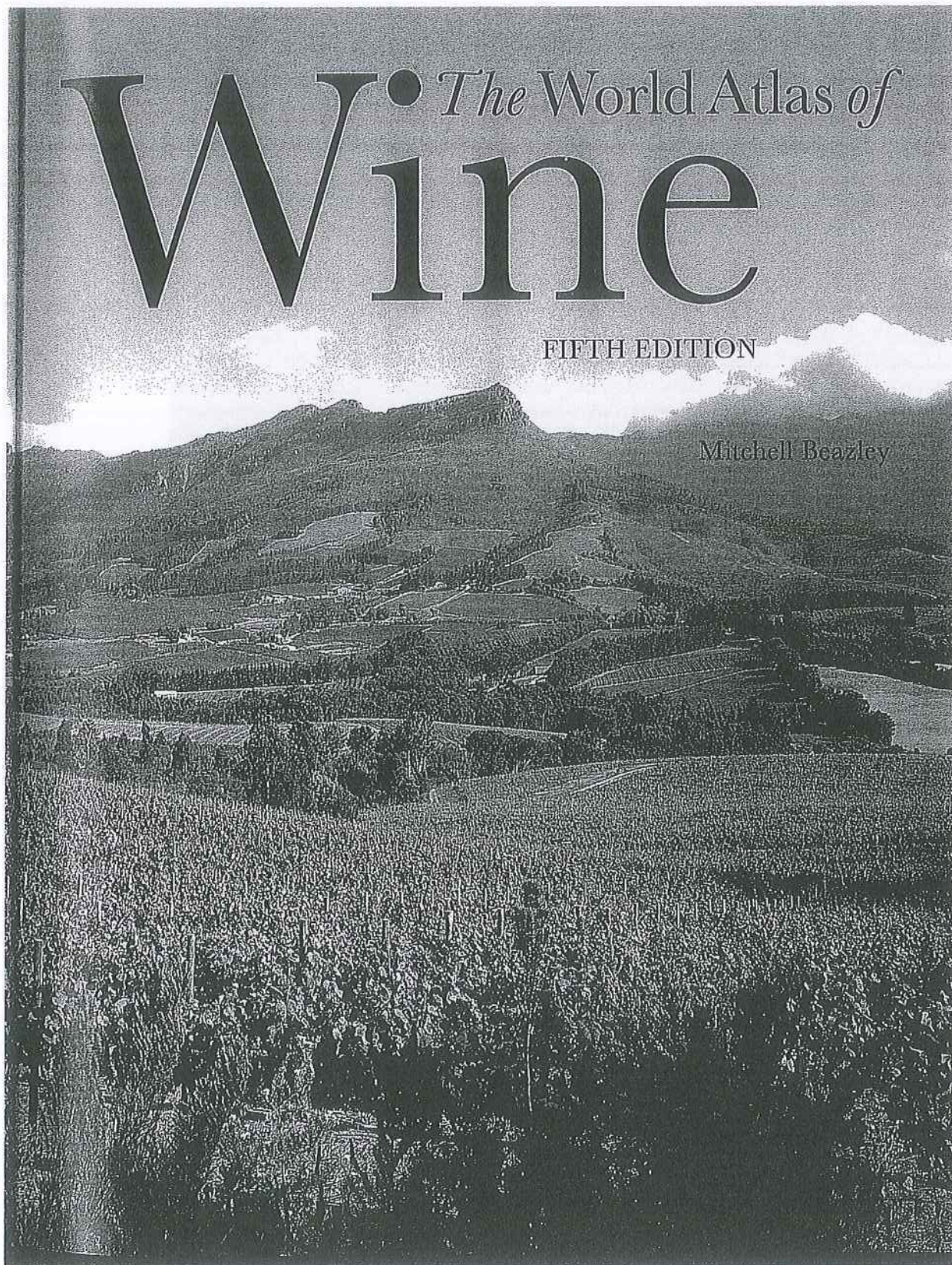
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Wine

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Hugh Johnson, Jancis Robinson
THE WORLD ATLAS OF WINE

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How the maps work

The maps in this Atlas vary considerably in scale, the level
of detail depending on the complexity of the area mapped.
There is a scale bar with each map. Contour intervals vary
from map to map and are shown in each map key. Serif type
(eg MEURSAULT) on the maps indicates names and places
connected with wine; sans serif type (eg Meursault) mainly
shows other information.

Each map page has a grid with letters down the side and
numbers across the bottom. To locate a château, winery, etc,
look up the name in the Gazetteer (pages 339-351) which
gives the page number followed by the grid reference.

Every effort has been made to make the maps in this Atlas
as complete and up to date as possible. In order that future
editions may be kept up to this standard, the publishers will
be grateful for information about changes of boundaries or
names that should be recorded.



cover moderates what could be overmuch sunshine and gives steady ripening conditions. Vintage-time rain and rot are problems. The most ingenious (and successful) answer has been to plant, as it were, out to sea - on an island east of the city that misses the mainland rain. Waiheke Island's Stonyridge and Goldwater Cabernets are evidence of a mesoclimate miraculously right for Bordeaux grapes.

Of the wineries using West Auckland grapes, Kumeu River is the most successful. Collards is another largely dedicated to local fruit. Most other Auckland wineries such as Nobilo's and Selaks (both owned by Hardys of Australia), Babich, Matua Valley, Delegat's, and Villa Maria draw on other wine regions for the majority of their grapes.

The wine giant Montana has over 60% of the New Zealand market following its purchase of Corbans (the second-largest company) in 2000. Both ferment in local sub-wineries in Gisborne, Hawkes Bay or Marlborough and finish their wines in Auckland. But many wine producers still transport white grapes long distances to their own crushers - a process that is not without some risk.

Gisborne on the east coast of the North Island (it has another name, Poverty Bay, like so many of New Zealand's wine regions) is a good example of a region plundered by the bottlers. It is the country's third most important wine region, after Marlborough and then New Zealand's answer to Bordeaux: Hawkes Bay (see page 319 for more detail), but has very few wineries. Gisborne, warmer but wetter than Hawkes Bay, especially in autumn, grows almost exclusively white grapes on relatively fertile soils and it has a particular reputation for Chardonnay.

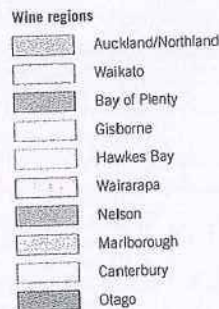
The North Island's most exciting area for Pinot Noir is variously called Martinborough, Wairarapa, and Wellington; it is just an hour's drive west of the nation's capital over the mountains and into the country's eastern rain shadow. Temperatures may be lower but autumns are drier here than in other North Island wine regions, and its nearly 40 wineries, led by Ata Rangi, Martinborough Vineyards, and Dry River, have made some of New Zealand's most vividly varietal Pinot Noir so far. It has ranged from potentially plummy to lean, dry, and earthy; but then so does burgundy. Here Chardonnay ripens well, keeping high acidity, while Riesling has demonstrated real potential.

Just across the windy straits on the South Island, the little Nelson region to the west of Marlborough has higher rainfall and richer soil than Martinborough but does well with similar grape varieties.

Meanwhile, well south of Marlborough, on the plains surrounding Christchurch and an hour's drive north in undulating terrain at Waipara, Canterbury's winemakers are producing crisp, flinty Rieslings and Chardonnays as well as Pinot Noir that ranges from disappointingly herbal to tantalizingly promising in extremely varied environments.

Canterbury's grapes struggle to ripen in some years. Even further south, testing the limits of cool-climate grape-growing, is Central Otago, the world's southernmost wine region. In this mountainous inland region the climate is not maritime, as in the rest of New Zealand, but continental, and vines have to be planted on hillsides to maximize radiation and escape frost

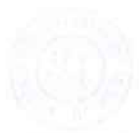
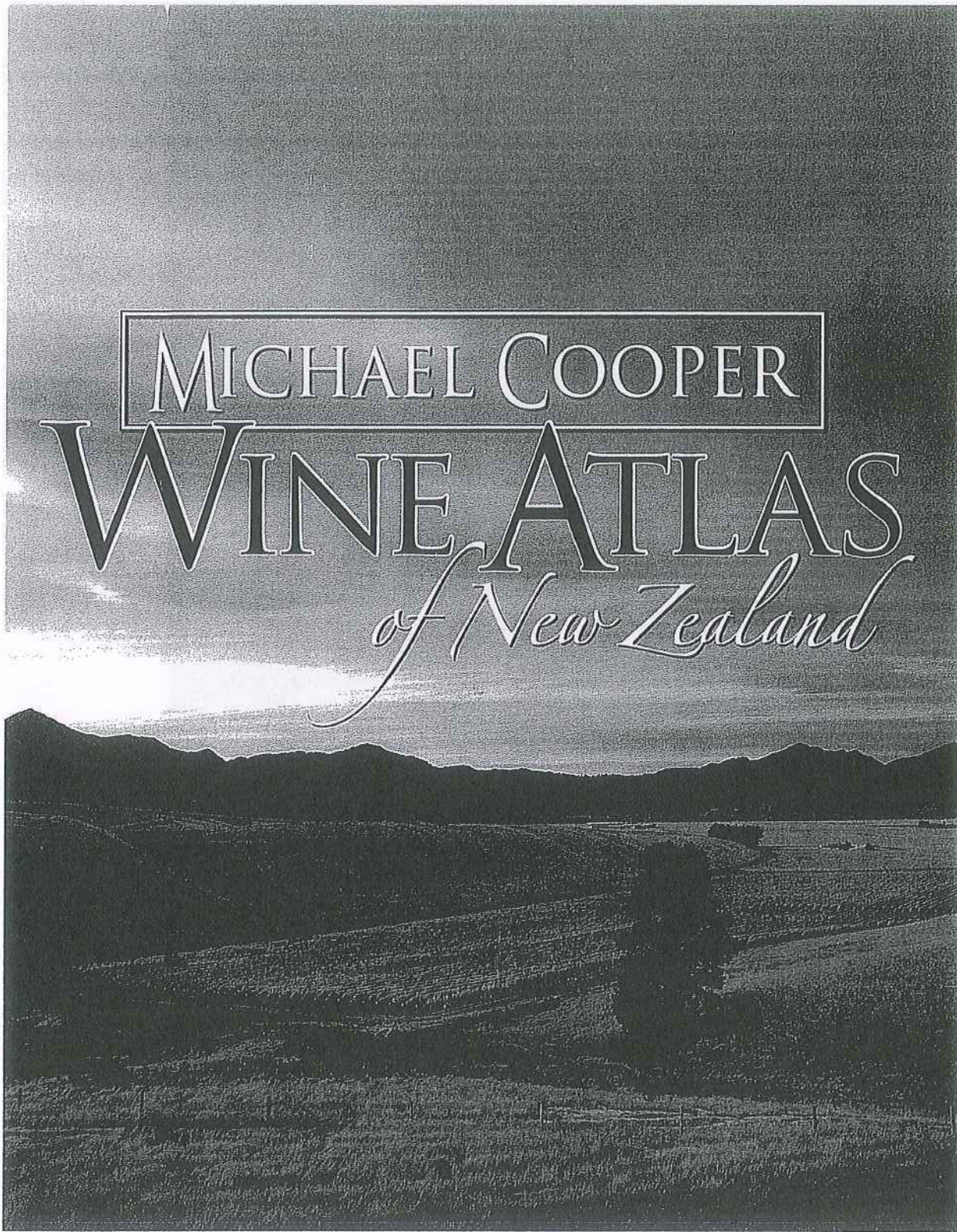
danger. In a good year, however, Central Otago can produce Pinot Noir, Pinot Gris, and Riesling to rank among New Zealand's finest, and many believe that this is where the Pinot grail is to be found. The old contention that New Zealand conditions are close to German is truer here than anywhere - and marginal vineyards can make wonderful wine.



*Wine region boundaries always follow an administrative boundary



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MICHAEL COOPER
WINE ATLAS
of New Zealand

Second Edition

Text by Michael Cooper
Photography by John McDermott



Hodder Moxley



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Wine Atlas of New Zealand

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Photographs

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Front cover: From the south side of Marlborough's Wairau Valley, past the Oyster Bay winery, vines sweep across the plains to the Richmond Range. Back cover: Matahiwi Estate, Masterton, Wairarapa.



Handwritten signature in blue ink.

Handwritten initials 'GCW' in blue ink.

Canterbury

Waipara Springs

Behind a row of gum trees on the state highway at Waipara nestles a collection of rustic grey farm buildings. Waipara Springs, named after a spring which rises in the nearby hills, boasts one of the region's most popular restaurants and also produces some of its most distinctive and memorable wines.

The Moore and Grant families processed their first vintage in 1990. Bruce and Jill Moore, who originally owned the property, planted 4 hectares of Chardonnay in 1982 as contract growers for Corbans. After the Moores formed a partnership in 1989 with Roy Grant and his family, the vineyard was expanded, and in 1990 a winery was built.

Today, Bruce Moore still runs the vineyards, Jill runs the wine bar, and their son, Andrew, is the general manager.

The 26-hectare estate vineyard behind the winery is planted in relatively heavy loam clay soils, with an underlying pan over a limestone and shingle base. Chardonnay, Riesling, Sauvignon Blanc, Gewürztraminer, Pinot Noir and Merlot are the chosen varieties.

Waipara Springs' early vintages were made by Mark Rattray, followed by Belinda Gould (now at Muddy Water) and Stephanie Henderson-Grant. Duncan McTavish, who took the winemaking reins in 2005, has also made wine in Australia, California, France and Germany.

The 'standard' range includes a fresh, punchy and crisp Sauvignon Blanc; a full-bodied, peachy, slightly buttery Chardonnay; a vibrantly fruity and finely poised, gently sweet Riesling; and a Merlot that can be unexpectedly ripe, brambly, plummy and rich.

Launched from the 2006 vintage, the flagship Premo range is based entirely on estate-grown grapes and made with 'a focus on longevity and evolution'. The Old Vine Chardonnay is citrusy, complex, minerally and tight; the Sauvignon Blanc, partly barrel-fermented, is bone-dry, with excellent weight, texture and intensity.

The light and lovely, very intense, distinctly medium Premo Riesling and more austere, oak-aged Dry Riesling should mature well. Premo Pinot Noir is enticingly fragrant, with sweet-fruit delights and masses of cherryish, plummy, spicy flavour.

Waipara West

Waipara West's intense, tautly structured wines are better known in London than Christchurch or Wellington. Part-owner Paul Tutton, an expatriate New Zealander, sells most of the wine through his London-based importing and distribution business, Waterloo Wine Company.

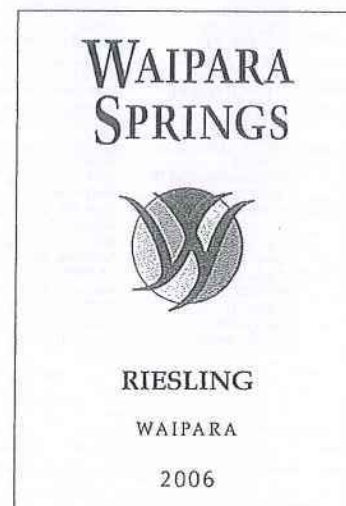
Waipara West was founded in 1989 by four partners: Tutton and his wife, artist Olga Sienko, his sister, Vic Tutton, who handles the business administration, and her husband, Lindsay Hill, who manages the vineyard. The venture is named after a weather station on the property, 6 kilometres inland from the main north-south highway, near the Waipara Gorge. When the partners purchased the property in 1989, it was discovered that the family had owned the land 90 years earlier. The 22-hectare vineyard, on terraces partly surrounded by steep cliffs, is planted in Riesling, Chardonnay, Sauvignon Blanc, Pinot Noir, Merlot, Cabernet Sauvignon and Cabernet Franc. The soil types vary from river stones with limestone to alluvial loams over gravels.

Entirely estate-grown and produced on-site, the wines have been made since 2002 by Robert Rowe, who earlier worked at Giesen, Villa Maria and Grove Mill. Waipara West's first commercial vintage flowed in 1996.

Fermented to dryness, the Riesling is vibrantly fruity, with intense lemon, lime and spice flavours, fresh, poised and steely. The Sauvignon Blanc is similarly dry, punchy and racy, with piercing melon/lime flavours.

The Chardonnay is fresh and elegant, with a mealy, toasty, minerally richness. The Pinot Noir is berryish, herbal and spicy, but lacks the ripeness and richness of the district's top reds.

Address	Waipara Springs Wines, 409 Omihiri Road, Waipara www.waiparasprings.co.nz
Owners	The Moore and Grant families
Key Wines	Waipara Springs Premo Pinot Noir, Riesling, Dry Riesling, Sauvignon Blanc, Chardonnay, Old Vine Chardonnay Waipara Springs Riesling, Sauvignon Blanc, Chardonnay, Merlot



Address	Waipara West, 376 Ram Paddock Road, Waipara www.waiparawest.com
Owners	Paul Tutton, Olga Sienko, Vic Tutton and Lindsay Hill
Key Wines	Pinot Noir, Riesling, Sauvignon Blanc, Chardonnay

2002
WAIPARA WEST

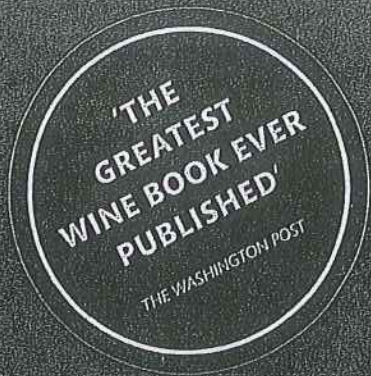


Ram Paddock Red
WAIPARA
750ml WINE OF NEW ZEALAND 13.5%vol



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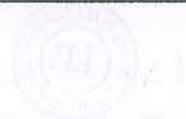


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JANCIS ROBINSON
and JULIA HARDING



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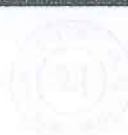
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GAW

New Zealand

Marlborough, at the north eastern tip of the South Island, consists of a large, flat, river valley with deep deposits of silt and gravel. A number of soil patterns are found throughout the valley and even within single vineyards, leading to significant variations in quality and style depending on the grape source. Shallow, stony soils, which aid DRAINAGE and limit fertility, are favoured for high-quality wine production although some of the region's best Pinot Noir is from heavier, clay-rich soils at the base of the Wither Hills. Irrigation is widely used throughout the valley to establish vines in the sometimes arid, free-draining soils and to relieve vine stress during the typically dry Marlborough summer. Many of Marlborough's best wines are made from irrigated grapes, which, it is claimed, would have suffered a loss in quality if the vines were forced to rely on a natural supply of ground water. Three subregions are now gaining increased recognition. The northern Wairau Valley's lighter, stonier soils tend to make riper and often more pungent wines. The Southern Valley's richer soils produce richer and more concentrated wines, while the cooler, lower-cropping Awatere Valley would be the country's second-largest if it were a region in its own right.

Sauvignon Blanc is Marlborough's best-known and most planted variety. These pungent, aromatic wines that blend tropical fruit flavours with gooseberry and capsicum herbaceousness are regarded as representative of New Zealand's national wine style. The scramble to meet growing world demand for Marlborough Sauvignon Blanc combined with an unexpectedly bloated 2008 crop resulted in a drop in grape, vineyard land, and export prices causing financial hardship for many producers. Sauvignon Blanc accounts for more than 80% of the country's exports while Marlborough has nearly 90% of the country's vines. In the early years of this century Marlborough Sauvignon Blanc enjoyed particular success in Australia where it captured 40% of the white wine market, to the annoyance of local wine producers. Marlborough Pinot Noir has overtaken Chardonnay to become the region's second most planted grape variety, and a small but growing proportion of the Marlborough Pinot and Chardonnay crop is used in traditional method SPARKLING WINE production. Pinot Gris, whose NZ wines tend to follow the richer Alsace style than the Italian Pinot Grigio model, has risen rapidly to follow closely in Chardonnay's wake, although growth appears to have tapered off. Riesling is another very successful Marlborough vine variety, reaching its apogee as a sweet, luscious, botrytis-affected dessert wine. BOTRYTIZED wines can be produced here most years although the results vary considerably with vintage conditions.

Hawke's Bay around the town of Napier is one of New Zealand's older wine regions and

certainly one of the best. Complex soil patterns and MESOCLIMATES make it difficult to generalize about the wines of such a diverse region, particularly when they are made by such an eclectic group of winemakers. Situated on the east coast of the North Island, 215 km/130 miles south of Gisborne and 323 km/194 miles north of Wellington, Hawke's Bay frequently records the country's highest sunshine hours. The terrain varies from coastal ranges that rise to 1600 m/ 5,300 ft to wide, fertile plains consisting of alluvial and gravelly soils. A high water table and fertile soils can result in excessive vine vigour over much of the plains. In other parts of the region, deep, well-drained gravel soils encourage WATER STRESS and many vines require irrigation during long, dry periods. In pursuit of wine quality, vineyards were established on free-draining soils of lower fertility, at least from the mid 1980s. For ease of cultivation, vines have been almost exclusively planted on flat land, despite the allure of nearby limestone hills which may offer superior aspect and DRAINAGE. A collective of local grape growers and winemakers has identified an approximate 800 ha of deep shingle soils as an ideal area for the production of high-quality wines, particularly Syrah, Merlot, and Cabernet Sauvignon. The defined area has been named Gimblett Gravels, a district name that now appears on some of Hawke's Bay's better red wines.

Chardonnay and Merlot are the most planted Hawke's Bay varieties, with Sauvignon Blanc close behind. The best Hawke's Bay reds are a blend of Merlot and Cabernet Sauvignon, often with Cabernet Franc and/or Malbec playing a supporting role. They have intense berry and cassis flavours, often with a gently HERBACEOUS reminder of their moderately COOL CLIMATE origin and, sometimes, strong OAK influence from up to two years' maturation in new French BARRIQUES. The exalted status of BORDEAUX BLENDS is being tested by a small but rapidly expanding volume of Syrah, which at its best can perform with distinction. Hawke's Bay Chardonnay may lack the seductive charm of the Gisborne equivalent but the best have intense citrus flavours and a brooding elegance that are seldom matched by the wines of other regions. Hawke's Bay Sauvignon Blanc is a softer, fleshier wine than the better-known Marlborough Sauvignon Blanc. It often has a nectarine or stone fruit character, a useful indicator of regional identity.

Central Otago Central Otago grows New Zealand's, and the world's, most southerly grapevines, some of them cultivated south of the 45th parallel. It is New Zealand's only wine region with a CONTINENTAL climate, providing greater diurnal and seasonal TEMPERATURE VARIABILITY than any other. Most Central Otago vines are planted on HILLSIDE VINEYARDS to give better sun

exposure and reduce frost risk. No other New Zealand wine region is as dependent on a single grape variety. Pinot Noir represents nearly 75% of the region's vines with Pinot Gris a distant second and Riesling in third place; this is one of New Zealand's very few Sauvignon Blanc-free zones. The growth in vineyard area, and development of new districts within the larger region, have been extraordinary. The now crowded valley at Gibbston was, with Wanaka, one of the original areas to be planted with vines as recently as the early 1980s. Bannockburn is widely regarded as the most successful district although subsequently planted vineyards in the Cromwell/Bendigo and Alexandra districts may challenge Bannockburn's crown. Central Otago's often voluptuous and intensely fruity Pinot Noir has helped put New Zealand red wine on the world map. The wines from this youthful and very experimental area have evolved rapidly in quality with potential for further gain.

Gisborne Total plantings in this east coast North Island region peaked in 2009, not least because of its dependence on once-popular Chardonnay when Pernod Ricard NZ decided that the future lay in Sauvignon Blanc. Gisborne Chardonnay is certainly the country's most distinctive regional example of the variety, with soft and charming fruit flavours that often resemble ripe peach, pineapple, and melon. Gewürztraminer is Gisborne's other claim to vinous fame. Pernod Ricard NZ sold off its large Gisborne winery and cancelled grape contracts there. Most Gisborne grapes are grown by farmers who sell them to wineries under long-term contract, or to the highest bidder. Several Auckland wineries buy Gisborne grapes and ship juice or wine to avoid extraction of unwanted PHENOLICS that might result from shipping grapes.

At the other end of the production scale are many small LIFESTYLE WINERIES that make only premium bottled table wine or TRADITIONAL METHOD sparkling wines. They include Millton Vineyards, New Zealand's first certified ORGANIC winery, which now produces grapes and wine according to the principles of BIODYNAMICS.

Canterbury/Waipara Canterbury, around Christchurch on the central east coast of the South Island, represents a collection of mostly small and very diverse subregions. Waipara, one hour's drive north of Christchurch, is by far the largest while each of Banks Peninsula to the east of the city, the plains west of Christchurch, the Cheviot Hills 40 minutes north of Waipara, and the limestone-rich Waikari Basin 15 minutes north west of Waipara have just a few producers each or, in the case of Cheviot Hills, a single winery. The region is cool



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and dry with a moderate risk of October and April frosts. Low rainfall and light soils of moderate fertility help control vine vigour and canopy here. Viticultural research at LINCOLN has had a considerable influence on selecting suitable vine varieties for the local growing conditions and in assisting local growers with viticultural techniques. Sauvignon Blanc and Pinot Noir are, yet again, the region's most planted varieties, with Pinot Gris in third place.

Nelson Nelson is the South Island's most northerly wine region, nearly two hours' drive across high ranges from Marlborough. The rolling hills of Nelson rise from a scenic coastline to form a beautiful setting for the region's 38 wineries. Sauvignon Blanc has overtaken Chardonnay to become the region's main grape variety, thanks to world demand for this varietal. Pinot Noir and Pinot Gris are second and third respectively with Chardonnay a distant fourth. The varied topography of Nelson makes it difficult to generalize about weather and soils, although records show that the region is slightly cooler and wetter than the Marlborough average.

Wairarapa/Martinborough Wairarapa, which includes the Martinborough region, is at the southern end of the North Island about one hour's drive from the nation's capital, Wellington. In 2012, Wairarapa had less than 3% of the country's vines but 9% of its winemakers. They are typically small-scale, LIFESTYLE producers with a quality-at-all-costs attitude to winemaking and a passionate faith in their region's potential. Pinot Noir occupies half the region's vineyard area and is undoubtedly the flagship wine. In their quest to make great wine, most producers crop their vines so that YIELDS are considerably below the national average, a significant factor in the region's success. In terms of topography, climate, and soils, Wairarapa might easily be considered a miniature Marlborough, were it not for the region's ability to make top-quality reds on a regular basis.

Auckland Auckland, the largest city, gives its name to the one New Zealand wine region where winery visitors can be assured of finding wines made from grapes grown as far south as Canterbury in the South Island, and are more likely to be offered wine from Marlborough and Hawke's Bay than the product of a local vineyard. Auckland viticulture declined during the rapid growth of Gisborne, Hawke's Bay, and Marlborough through the 1970s and 1980s but began to grow in the 1990s as grape-growers adopted canopy-thinning techniques to correct vine vigour. New subregions, including Clevedon, Matakana, and especially Waitheke Island, where some very fine BORDEAUX BLENDS are made, are now producing high-quality and highly fashionable reds which have

helped raise Auckland's profile and esteem as a wine region.

Northland Northland, at the very northern tip of the country, was the birthplace of New Zealand wine. The region's warm, wet, temperate climate has proved to be a barrier to good-quality wine production, particularly on the wetter west coast. Modern viticultural methods and careful site selection have allowed several producers to establish relatively rot-resistant varieties such as Cabernet Sauvignon and Syrah with promising results.

Waitaki on LIMESTONE in North Otago was rapidly being developed in the mid 2000s. That development has slowed although the quality of Waitaki's Pinot Noir and Pinot Gris may stimulate further growth. R.F.C.

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- www.centralotagopinot.co.nz
- www.wine-marlborough.co.nz
- www.winenelson.co.nz

Neyret, Neret, or Neiret, rare, dark-berried wine, strictly Neret di Saint-Vincent, still found in VALLE D'AOSTA and likely to be related to several transalpine varieties.

Niagara, American hybrid grown successfully in NEW YORK state. This *VITIS labrusca* variety is vigorous, productive, and withstands low temperatures well. Known as the white answer to CONCORD, one of its parents, it makes wines with a particularly FOXY flavour. It was created in Niagara, New York, in 1866 and is now planted widely in New York state, Canada, and Brazil. For details of Niagara, Canada, see ONTARIO.

Nieddera, promising Sardinian red wine grape.

Niederösterreich, or Lower AUSTRIA, is the state in which well over half of the country's vineyards are situated. In it are the wine regions CARNUNTUM, KAMPFAL, KREMSTAL, THERMENREGION, TRAISENTAL, WACHAU, WAGRAM, and WEINVIERTEL. Since the names Kampf, Kremstal, Traisental, and Weinviertel between 2002 and 2008 became those of official DAC appellations of origin reserved for wines made from Grüner Veltliner or (in the first three of these) Riesling, wines made

from other varieties are labelled simply Niederösterreich, guaranteeing this name a prominence that it did not previously enjoy. D.S.

Nielluccio, Corsica's name for SANGIOVESE, probably brought there by the GENOISE who ruled the island until the late 18th century. Often blended with SCIACARELLO (Mammolo), it constitutes an increasing proportion of the island's APPELLATION CONTRÔLÉE reds and, particularly, rosés, for which it is especially suitable. It is the principal ingredient in Patrimonio, on whose clay-limestone soils it thrives. It buds early and ripens late and is therefore susceptible to late frosts in spring and rot during the harvest.

nitrogen, mineral element and inert colourless, odourless, tasteless gas that is extremely useful in both grape-growing and winemaking. Nitrogen gas is an inert constituent of the atmosphere, making up 78% by volume. In its combined forms, nitrogen is an essential element in AMINO ACIDS, PROTEINS, and ENZYMES, without which life could not exist. In soil, it is an important constituent of ORGANIC MATTER, from which it is released during decomposition in the form of ammonium ions. Although these ions are taken up by plant roots, much of the ammonium is oxidized by specialist soil bacteria to nitrate ions, which are also absorbed by roots. Ammonium and nitrate compounds are important constituents of many FERTILIZERS.

Viticulture

Nitrogen has a major impact on vineyard VIGOUR, and potentially on wine quality. Nitrogen is essential for vine growth and is one of the three major elements, along with POTASSIUM and PHOSPHORUS, needed most for plant growth. It is an important component of proteins, and also of chlorophyll. The most common symptoms of nitrogen deficiency, which can be expected on sandy soils low in organic matter, are reduced vigour and uniformly pale green or yellow leaves. Soil and plant tests can be used as a guide to the use of nitrogen fertilizers.

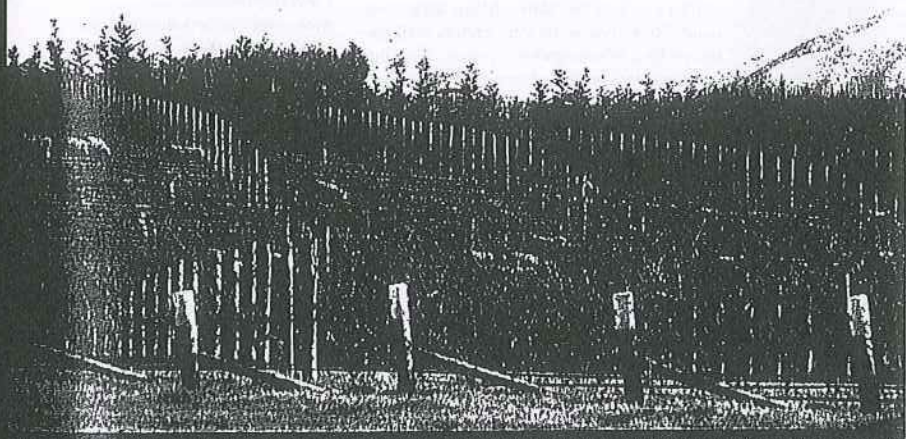
Much more caution is needed with vines than with most other plants in applying nitrogen fertilizers, or large amounts of manure, or planting in soils naturally rich in nitrogen. The use of COVER CROPS containing clover and other legumes should also be monitored carefully as they might add excessive nitrogen to the vineyard soil.

Whatever the origin, too much nitrogen in a vineyard results in excessive vegetative vine growth, termed high vigour. Such vineyards typically show higher YIELDS than low-vigour vines and reduced quality owing to the SHADE effects. CANOPY MANAGEMENT procedures may be used to overcome some of these effects, but will not eliminate them completely. Vineyards with excessive nitrogen supplies are also prone to



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With independent, unbiased ratings and the most comprehensive collection of tasting notes on practically every New Zealand wine in the marketplace, it's seriously heavy.' - *Hangarua Chronicle*

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Front cover photograph: Greenhough's Apple Valley Vineyard, Nelson, by Elspeth Collier.



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Te Awa Left Field Hawke's Bay Pinot Gris

The 2013 vintage (☆☆☆☆) is a single-vineyard wine, fermented in a mix of seasoned oak barrels, stainless steel 'barrels' and a stainless steel tank. Made in a dry style (4 grams/litre of residual sugar), it shows very good freshness and vigour, with strong citrus-fruit, pear and lychee flavours. Fine value.

Vintage	13
WR	6
Drink	15-16

DRY \$15V

(☆☆☆☆)

Te Awanga Estate Hawke's Bay Pinot Gris

From Rod McDonald Wines, the 2013 vintage (☆☆☆) is a fresh, medium to full-bodied wine with good depth of citrusy, apple, slightly peachy and gingery flavours, in a smooth, easy-drinking style. The 2014 vintage (☆☆☆), grown at an inland site, was hand-picked, tank-fermented and less-aged. Still youthful, it's a mouthfilling wine with vibrant pear, lychee and spice flavours and a dry (under 3 grams/litre of residual sugar) finish.

DRY \$25-V

(☆☆☆☆)

Te Kairanga Martinborough Pinot Gris

The 2014 vintage (☆☆☆☆) was fermented in tunks (80 per cent) and old French oak barrels (20 per cent). Made in a dry style (2.6 grams/litre of residual sugar), it is full-bodied (14 per cent alcohol), with satisfying depth of citrusy, peachy flavours, fresh acidity and a tight, slightly mineral, spicy finish.

DRY \$22-V

Vintage	14
WR	6
Drink	15-20

Te Mania Nelson Pinot Gris

The 2014 vintage (☆☆☆☆) is attractively scented and mouthfilling, with a splash of sweetness (6 grams/litre of residual sugar) and its peachy, slightly spicy and gingery flavours, which show good concentration and harmony. Delicious from the start.

MED/DRY \$22V

Te Rere Waiheke Island Pinot Gris

The 2013 vintage (☆☆☆☆) is a powerful wine, maturing very gracefully. Bright, light-lemon green, it is ripely scented and fleshy, in a dryish style with strong, peachy, slightly spicy flavours showing good freshness and complexity. Drink now or cellar.

MED/DRY \$15-V

Terra Sancta Lola's Block Bannockburn Pinot Gris

The youthful 2014 vintage (☆☆☆☆) was estate-grown, hand-picked and fermented in tunks (70 per cent) and old oak barrels (30 per cent). Fleshy and mouthfilling, it has generous, ripe stone-fruit and spice flavours, in a dryish style (5.5 grams/litre of residual sugar), with excellent complexity, harmony and length.

MED/DRY \$22-V

Terra Sancta Mysterious Diggings Bannockburn Pinot Gris

Estate-grown in Central Otago and hand-picked, the 2014 vintage (☆☆☆☆) is a youthful, full-bodied wine with concentrated, ripe, peachy, slightly citrusy and spicy flavours, showing a touch of complexity, and a fresh, dryish, lengthy finish. The 2015 vintage (☆☆☆☆) is already delicious. Pale lemon/green, it is mouthfilling, vibrant and finely poised, with concentrated peach, lychee and spice flavours, showing a touch of complexity, and a long, off-dry (5.5 grams/litre of residual sugar), very harmonious finish.

MED/DRY \$22V

Terrace Edge Waipara Valley Pinot Gris

Consistently top value. The 2013 vintage (☆☆☆☆) was hand-picked and mostly (75 per cent) fermented with indigenous yeasts in old barrels. It is an Alsace-style Pinot Gris, weighty, creamy-fermented and generous, with a hint of oak, gentle sweetness, and rich stone-fruit, ginger and spice flavours. The 2014 vintage (☆☆☆☆), also oak-fermented, is a fleshy wine, with strong, ripe stone-fruit flavours, a light splash of sweetness (12.5 grams/litre of residual sugar), gentle acidity, and excellent harmony and roundness. Certified organic.

MED/DRY \$23V

Vintage	14	13	12	11
WR	6	7	7	6
Drink	15-19	15-18	15-17	15-16

Thistle Ridge Waipara Valley Pinot Gris

From Greystone, the 2014 vintage (☆☆☆☆) is a drink-young style. Medium-bodied, it is vibrantly fruity, with citrusy, slightly peachy and spicy flavours, showing good depth. Ready.

MED/DRY \$20V

Thomas & Sons Reserve Collection Waiheke Pinot Gris

The 2013 vintage (☆☆☆☆) was grown south of Oenangi at the highest vineyard site on the island, 200 metres above sea level. Fermented with indigenous yeasts and handled entirely in tunks, it's an attractively scented, medium style (17 grams/litre of residual sugar), mouthfilling and fleshy, with a slightly oily texture and strong, vibrant pear and lychee flavours. It should mature well. (From Batch Winery.)

MED \$45-V

Thorbury Waipara Pinot Gris

The 2014 vintage (☆☆☆☆) shows good varietal character, with mouthfilling body, fresh peach, pear and spice flavours, showing moderate concentration, and a slightly gingery, off-dry finish (6 grams/litre of residual sugar). The 2015 vintage (☆☆☆☆), made with a small percentage of barrel fermentation, is highly aromatic and full-bodied, with good concentration of peachy, spicy flavour and a dryish (5.6 grams/litre of residual sugar) finish. Great value. (From Villa Mania.)

MED/DRY \$16V

Vintage	14	13
WR	5	7
Drink	15-17	P



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APPENDIX 5 - Selection of national & International Media Articles referencing the WAIPARA VALLEY GI

<http://www.scoop.co.nz/stories/BU1410/500317/thistle-ridge-waipara-pinot-noir-2013-best-of-the-best.htm>

<http://www.stuff.co.nz/life-style/food-wine/food-news/76279409/waiparas-wine-and-food-festival-goes-retro-and-cool>

<http://www.stuff.co.nz/travel/destinations/nz/91891020/watching-the-grass-grow-in-seethrough-luxury-at-waiparas-greystone-purepod>

<http://www.theloop.ca/guide-lowest-stress-road-trip-planet/>

<http://www.stuff.co.nz/the-press/news/86679267/wineries-hoping-to-still-attract-business>

<http://www.stuff.co.nz/travel/destinations/nz/93752662/liz-carlson-sit-back-and-sip-the-best-new-zealand-vineyards-have-to-offer>

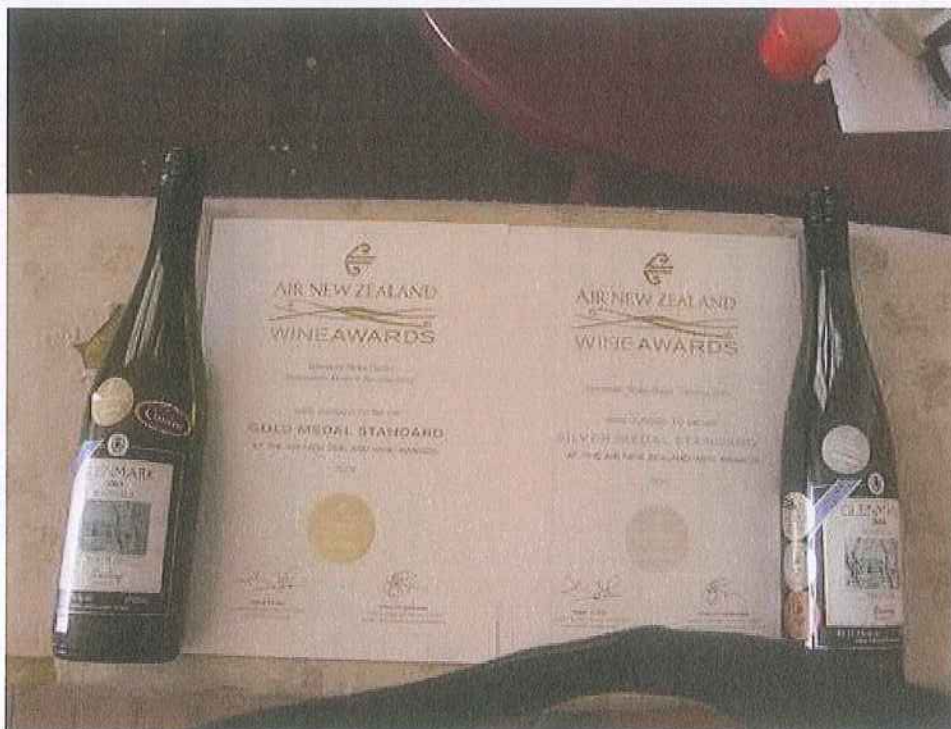
<http://www.radionz.co.nz/news/national/330600/tweaked-tourism-route-for-kaikoura-coast>

<http://www.stuff.co.nz/life-style/home-property/83528546/my-favourite-space-a-christchurch-party-barn>

<http://www.stuff.co.nz/life-style/food-wine/cuisine/65960488/new-zealands-best-rieslings>

<http://www.ruralnewsgroup.co.nz/wine-grower/wg-general-news/waipara-s-new-landmark>

<http://lesgrappes.leparisien.fr/pegasus-bay-vin-nouvelle-zelande/>



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Waipara wines' winning ways around the world

Spring has come to the Waipara Valley, but the growing lull in the industry is not centred around the new vine growth - instead it's the ripples being made by the region's wines at both national and international levels.

This year has seen record numbers of the region's wines recognised as gold medal winners and the accolades are flooding in.

Last week, it was announced that Greystone Wines is in the running for top honours in the Air New Zealand Wine Awards. Its 2013 pinot noir was awarded a Pure Gold in the show, for which the overall winner and trophies are announced at a black-tie dinner on November 22.

The 2014 International Aroma Competition, which runs alongside the Canterbury A&P Show, also awarded a gold medal to the Georges Road pinot gris 2013. Six silver medals were also bestowed on the region.

In October, Mud House brought home the top trophy from the Canberra International Riesling Challenge for its 2013 Mud House Estate The Mound Waipara Valley riesling.



On show: The Waipara Valley Wine and Food Festival at the Glenmark Domain. Nicole Alfred enjoying her wine and food.

And at the start of October, Greystone's Thistle Ridge pinot noir 2013 was named Champion Red Wine at the 2014 New World Wine Awards.

In the same show, gold medals were awarded to Sherwood Estate for its Signature Family Waipara Valley pinot noir 2013, and to the Waipara Hills Main Divide pinot noir 2013.

In the results of the September 2014 Decanter World Wine Awards, Greystone Brothers' Reserve made wine 2012 was the trophy for best pinot noir in New Zealand. It then went on to win the International Trophy for Best Pinot Noir, beating out France, Germany, Oregon, Slovenia and Chile in the final.

Along with that gold, the region received three silver and seven bronze medals in the contest.

Waipara Valley North Canterbury marketing spokesman, Geoff Shier, says the continuing ability of Waipara Valley wines to win significant local and international awards is testament to the micro-climate, the soils in the region and the winemaking skills concentrated in North Canterbury.

Waipara Valley North Canterbury represents 74 vineyards, including 21 wineries, 12 cellar doors and four winery restaurants. The region has 355 hectares planted in pinot noir, 343ha in sauvignon blanc, 260ha in riesling, 185ha in pinot gris, and 71ha of chardonnay.



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Local wineries win gold in wine awards

Three Waipara Valley wines won gold at this year's Air New Zealand Wine Awards.

Judges awarded 84 gold medals from the 1407 wines entered from around the country in the competition.

In addition 220 silver medals and 551 bronze medals were also awarded by the judges, bringing the total number of medals awarded across the 16 different classes to 855.

Greystone Pinot Gris, Waipara Valley 2015 won pure gold in the Guala Closures NZ Ltd Champion Pinot Gris section.

The Boneline Waimanu Pinot Noir and Waipara Valley 2014 won pure gold in the Nelson Airport Ltd Champion Exhibition Red Wine.

Waipara Springs Riesling, Waipara Valley 2015 won pure gold in the Plant & Food Research Champion Riesling and New World Champion Open White Wine.

Chair of Judges and Master of Wine Michael Brajkovich said the most pleasing aspect of this year's awards was the spread of gold medals across a number of varietal styles and regions.

Pinot Noir was once again the star performer with 18 golds.

Predominantly the wines came from Otago, Marlborough and the Wairarapa, but Nelson, Canterbury and Hawke's Bay Pinot Noirs were

"The top wines were exceptional"

— Michael Brajkovich, Chair of judges

also in the mix.

"The top wines from other categories were exceptional, particularly from Chardonnay, Sparkling, Gewürztraminer and the Sweet White wines, and the quality of Hawke's Bay Syrah continues to impress," said Mr Brajkovich.

Sustainability continues to be a strong focus of the Air New Zealand Wine Awards, with a record 99.7 percent of wines entered into this year's competition having sustainable accreditation.

The acclaimed trophy winning wines and winners of the elite gold medals will be revealed at a black tie dinner in Nelson on November 28.

The Air New Zealand Wine Awards celebrate excellence in New Zealand winemaking and are widely considered to be the country's most prestigious wine competition.

New Zealand Winegrowers, the national organisation for the country's 1600 grape growers and winemakers has owned and organised the competition for 40 years.



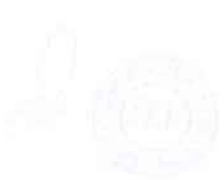
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APPENDIX 6 – Research Paper: Climate characteristics of the WAIPARA VALLEY wine district, using bio-climatic indices

WAIKATO UNIVERSITY OF TECHNOLOGY
RESEARCH REPORT
2014

WAIKATO UNIVERSITY OF TECHNOLOGY
RESEARCH REPORT
2014



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GEOGRAPHY 309

**RESEARCH METHODS IN
GEOGRAPHY**

ASSIGNMENT 4

GROUP REPORT

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Climate characteristics of the Waipara Valley wine district, using bio-climatic indices.

EMMA R. MCCONE, EDWARD W. COOK, JAKE STUTHRIDGE, BROGAN GIBSON & JACK O'HARA

University of Canterbury Geography Department, Christchurch, New Zealand

Key words: Viticulture, terroir, climatic indices, spatial variation, Waipara Valley

Abstract

The key objective of this report is to investigate the relationship between climate and viticulture in Waipara, and to clearly define the unique climate characteristics that will support a Geographical Indications registration application. The Waipara Winegrowers Association will use this analysis in a submission to the Geographic Indications (Wine and Spirits) Registration Act (2006). The research aims to appropriately differentiate the Waipara Valley's environmental and biophysical characteristics, often described by the concept of "*terroir*" to indicate a unique wine producing area. Using the Hall & Jones (2010) Australian classification methodology, temperature records of different vineyard stations as well as the NIWA CliFlo dataset will be analysed to investigate the climate characteristics of the Waipara Valley. The output from this in the form of the four indices (*growing season temperature, growing degree-days, huglin index and biologically effective degree-days*) will enable us to comprehensively describe this sub-region's climate and the quality of wine it produces in a way that can be compared to other regional climates. The results of this research; the first known study in Waipara to be taken using direct measurement of up to four growing seasons of climate; have allowed preliminary classification of the sub-region as a cool-climate area. The results have also enabled the report to discuss the local and commercial implications of such a climate classification.



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Executive Summary

- This report investigates the relationship between climate and viticulture in the Waipara region.
- The key aim of the research is to provide the Waipara Winegrowers Association with a detailed report of the region's climate for an application to register under the *Geographic Indications (Wine and Spirits) Registration Act (2006)*.
- The methodological process involves the calculation of four temperature indices using data sourced from five different weather stations with 22 temperature sensors. The NIWA CliFlo dataset has been used as a validation baseline to support the local records.
- The results of the data describe different characteristics of the Waipara region climate. They are then used to classify the area as a cool climate wine production region and validate the production of certain wine varieties.
- Given the application process for the submission to be recognised as a separate geographical indication (GI) is successful, the Waipara wine industry would benefit from legal protection on their produce. This is likely to have many other positive cumulative effects for the industry.




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Introduction

The relationship between viticulture and climate is well-regarded. Many studies have demonstrated (Spellman, 1999; Hall & Jones, 2010; Overton & Murray, 2014) that a variation in climate can impact grapevine response and alter not only the quantity of wine produced in any given growing season- but also the quality by influencing taste and flavours. The 'where' factor (origin) of wine is very important and indicates quality to consumers. The way origin can be such a significant part of the market value makes the wine industry very unique (Overton & Murray, 2014).

The variations in wine quality, flavour and taste due to geographic location is a concept that is protected in New Zealand under the *Geographical Indications (Wine and Spirits) Registration Act (2006)*. The purpose of this legislation (*as outlined in Section 3, Geographical Indications (Wine and Spirits) Registration Act 2006*) is to provide a suitable legal framework that enables development and growth in the New Zealand wine and spirits industry. It provides an effective market environment that facilitates trade in wine and spirits. The Ministry of Business, Innovation and Employment (2016) defines a "geographical indicator" as a term used to "identify a good as being from a particular place where the good also possesses a certain quality, reputation or other characteristic attributable to its geographical origin".

This research is working collaboratively with the Waipara Valley Winegrowers association towards finalising their application to be considered a protected area under the *Geographical Indications Act (2006)*. In order to establish a climate profile that can assist the winegrower's association in their registration, the research question is framed as follows:

"In what ways is the Waipara Valley climate unique, and does this allow the region to be legally recognised as a separate terroir/Geographic Indicator?"

The term "terroir" is widely used in viticulture literature. It originated in France where it derives from the Latin term "Territorium" which refers to territory, region or area of land being considered for its qualities or agricultural properties (Vaudour, 2002). This definition has been developed and reworked amongst the viticulture industry and has become an official term defined by the *International Organisation of Vine and Wine* in 2010 as "a concept which refers to an area in which collective knowledge of the interactions between the identifiable physical and biological environment and applied vitivincultural practices develops, providing



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distinctive characteristics for the products originating from this area. "Terroir" includes specific soil, topography, climate, landscape characteristics and biodiversity features".

To achieve the research objectives and answer the research question, the Hall & Jones (2010) methodology, that has been used in to characterise wine regions in Australia, is being implemented for this New Zealand study. This uses secondary data sources from temperature records gathered over a 3-year growing season period from different vineyards that transect the Waipara Valley sub-region. This data is complemented by the national (NIWA) dataset as the validation baseline for measurement. Four key climate indices that represent the area's suitability for wine production are to be used in an attempt to characterise this area.

Therefore, the results of this research aim to;

- describe the Waipara Valley climate in sufficient detail to distinguish the region apart from others in New Zealand, and
- provide clear evidence for the Waipara Valley Winegrowers Association to use in their application to register as a "Terroir" under the *New Zealand Geographic Indications (Wine and Spirits) Registrations Act (2006)*

Study Area

The Waipara Valley is a sub-region of North Canterbury, located north of the Canterbury Plains on the east coast of the South Island, New Zealand. The area comprises of both flat alluvial plains and terraces and hillsides on limestone derived clays (Overton, 2010). The physical geography of the area impacts the climate and therefore wine qualities. The valley is sheltered from cooling easterly winds while experiencing generally higher temperatures and sunshine hours in comparison to elsewhere on the Canterbury Plains make it a unique and suitable micro-climate for viticulture (Cooper, 2002; Tipples, 2007; as cited in Overton, 2010).



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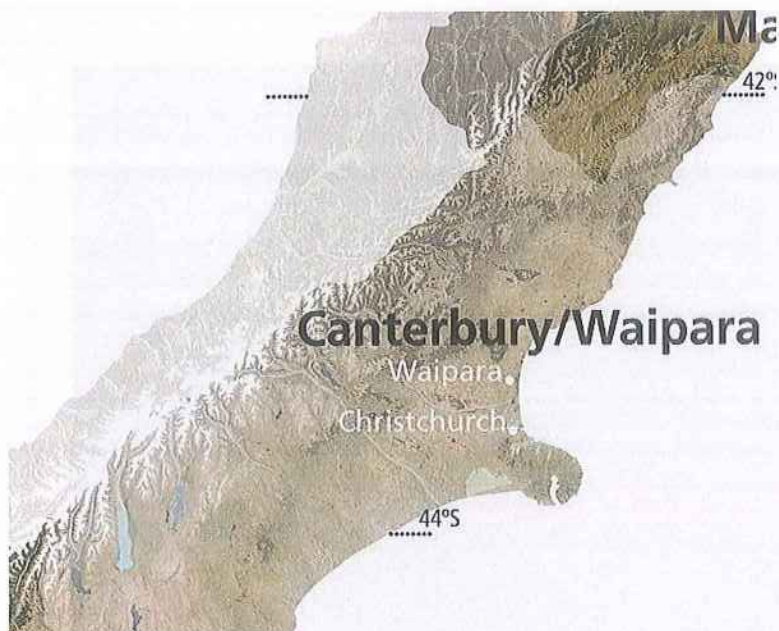


Figure 1: Site of Canterbury and Waipara in relation to the South Island of New Zealand. Source: NZ Wine.

Long term temperature trends vary inter-regionally in New Zealand and this can impact climate patterns at the local scale. Data from the long-term *NIWA* records (beginning in 1940) shows the temperature trends (*Figure 3*) nationally. The longevity of the data source reveals larger temporal scale climatic processes. Sturman and Quèrol (2013) explain the causes of these significant variations in temperature for this time period. For example, a period of significant cooling after 1990 can be observed in the data (*Figure 3*) which is due to a combination of both the processes of El Nino and the effect of the Pinatubo eruption (1991). A period of La Nina is visually obvious in the temperature records between 1970-1971, as well as 1960 (*Figure 3*). These large scale processes all proceed to have an impact on wine quality as it perturbs the inter-annual average temperature trend. This has implications for the marketing of wine from particular years. Vintage wines have a key value in the industry and represent guaranteed higher quality (when compared to non-vintage years). While these national level variations are important to consider when studying climate, New Zealand's terrain is extremely complex which offers many unique micro-climatic areas suitable for wine production.



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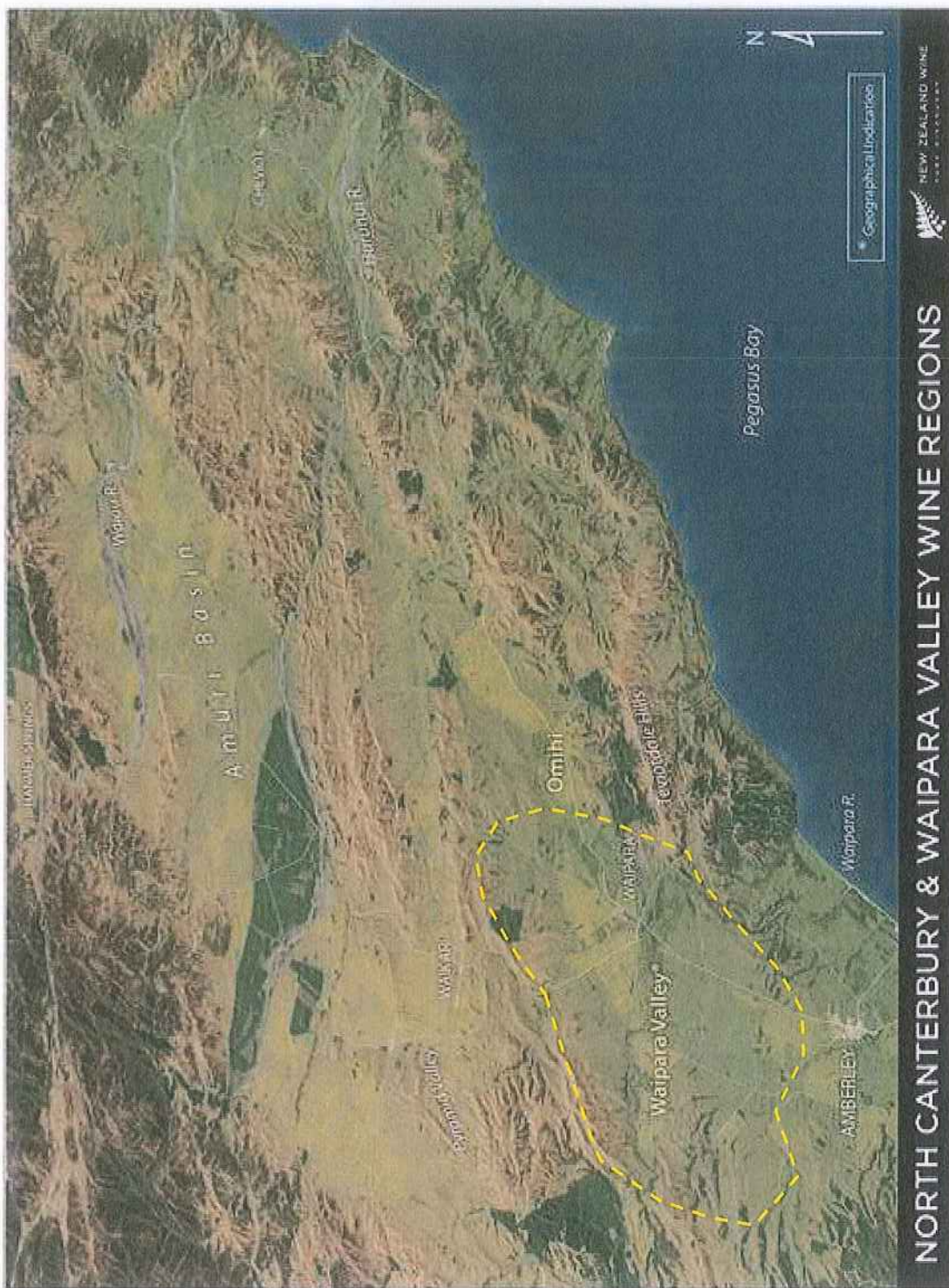


Figure 2: Map of the Waipara Valley (boundary circled) and surrounding sub-regions, North Canterbury, New Zealand. Source: New Zealand Wine



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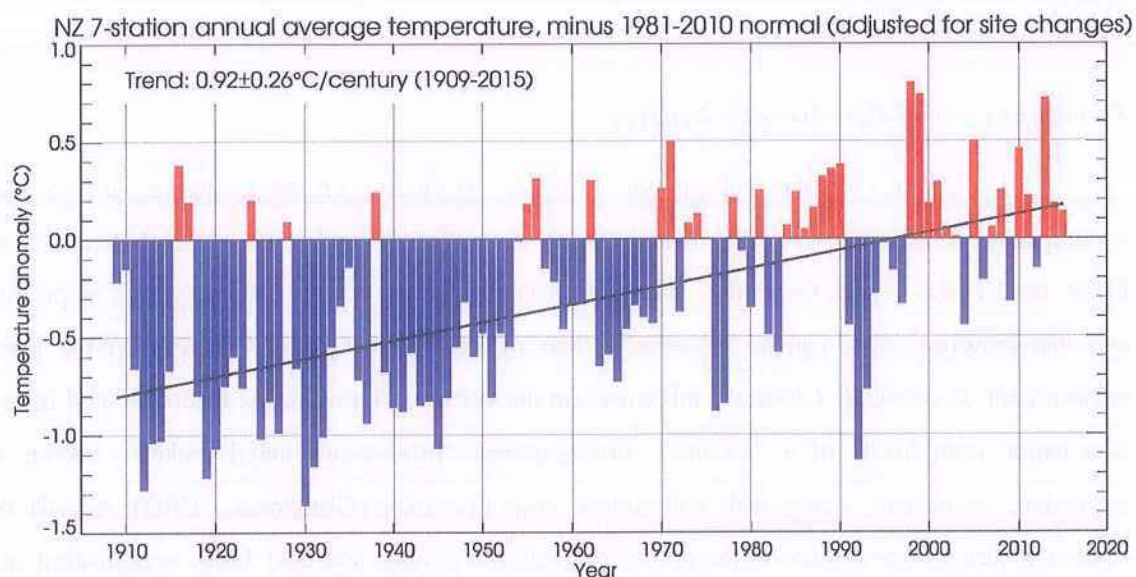


Figure 3: Mean annual temperature for New Zealand, calculated from NIWA's 'seven-station' series. This series uses climate data from seven geographically representative locations. The data are adjusted to take account of factors such as different measurement site. Source: NIWA

Wine production as an industry in Waipara has rapidly developed over the last 30 years. The land in Waipara was found to be more suitable for wine cultivation after traditional pastoral methods were found to not be very effective due to the stony and unfertile land around the 1970's (Overton & Murray, 2014). Establishment of wineries in the 1980's started the steady rise of Waipara's strong viticulture industry. Comparatively, the entirety of the New Zealand wine industry was developed only in the last 30-40 years. Other major areas of vineyard production have come to be mostly by trial and error, including the Waipara Valley (Sturman & Quèno, 2013). Canterbury was an area that experimented with viticulture and although there was little success in places like Banks Peninsula and the plains, Waipara prevailed as a more successful region for this industry (Overton, 2010). Consequently, Waipara is now a significant wine producing region in New Zealand. Waipara makes up 3.4% of New Zealand's total wine production, as of 2016. Since 2007, the area of producing vineyards has increased almost 50% from 1,034 to 1,436 hectares in 2016 (New Zealand Winegrowers, 2016).



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Background Theory

Development of Bioclimatic Indices

A background on the well-known influence of climate on the grapevine growth and wine quality is essential in order to understand the rationale and result of each bioclimatic indice used in this report. Generally, when assessing a location for its suitability as a grapevine and winegrowing area, climate is seen as one of the most important factors of the local environment to consider. Climate's influence on the viticultural practice is extensive and hence is a major component of a "*terroir*". For grapevine production, initial cultivar choice is dependent on climate, along with subsequent crop operation (Gladstones, 1992). As will be discussed further, the growth of the grapevine, rate of ripening and final berry composition are all determined by the surrounding climate. Therefore, local climate plays a major role in developing the characteristics of wines in any given geographic location (Fernández Seoane, 2006).

So what is the most important variable of climate to Viticulture? Research supports air temperature as the most influential out of any of the climatic variables including wind, relative humidity, precipitation and air pressure (Jackson, 2000). This is due to the ability of temperature to modify the biology of the plant, specifically the growth rate of the grapevine and its berry properties (formation and maturation). The concentration and composition of the colour and aroma of the berry that develops during the ripening period is fully dependent on the maximum and minimum air temperatures (Ramos et al, 2008). Consequently, the quality of the wine is governed by temperature (Jackson & Lombard, 1993).

As each area is inherently different from one another in terms of the behaviour of its environmental factors (e.g. local climate and soil type), "*terroir*" is a process that aims to differentiate one wine-producing zone from another and characterise each area's uniqueness (Van Leeuwen et al, 2004). Furthermore, using an area's characterisation to then compare and identify other viticulture regions of similar environments globally (Tonietto & Carbonneau, 2004; Jones et al. 2010). Applying descriptive climatic indices to study the spatial suitability of an area for grapevine and wine production, allows a more accurate classification of its "*terroir*".



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Internationally there are four predominant temperature derived bio-climatic indices in use. The first to be developed was the *Winkler Index* (WI) (Amerine & Winkler, 1944). WI is based on classifying climate growing temperature regions based on heat summation/accumulation of days over a set temperature threshold during a growing season.

Growing degree-days (GDD) is a sum total of days in which the air temperature is above a base threshold required for growth - usually 10°C (Winkler et al, 1974). *Growing season temperature* (GST), is the average daily temperature through the growing season (Jones, 2006). GST allows the cultivator to predict the duration in which a berry will take to reach its optimal sugar accumulation and ripening stage.

The *heliothermal/ huglin index* (HI), developed originally for European vineyards (Huglin, 1978), considers the mean and maximum temperatures (giving preference to diurnal temperatures) and outputs a heat summation value for the first six-months of the growing season period. The *biologically effective degree-day index* (BEDD) uses heat summation values similar to HI and GDD, and corrects for additional variables, such as day length correction, the diurnal temperature range and an optimal growing interval for the grapevine (Gladstones, 1992).

A selection of three climatic indices into one multi-criteria climatic classification system (MCC) was developed by Tonietto & Carbonneau (2004) in order to create a classification zoning of viticulture areas internationally. This method used HI, the *cool nights index* (CI), and the *dryness index* (DI) to create a holistic overview of heat summation in an area. CI is an index that incorporate minimum temperatures, allowing both extreme ranges of temperature and its effect on grapevines and wine production to be analysed. This method of zoning using multiple indices has been adopted in other research using different index combinations, including the one on which the following research in this report is based on (Hall & Jones, 2010). In New Zealand, Australia and North America, zoning studies predominantly use GST, GDD, HI & BEDD (Jones et al, 2010; Anderson et al, 2012). Given the New Zealand location of this , it was viewed as optimal to use this existing classification method (GST, GDD, HI & BEDD) in order to then create draw similarities and differences between the Waipara Valley and other wine-producing regional studies.

Methodology

This study joins a large volume of prior-research in the area of the application of climate analysis for viticulture. Secondary quantitative climate data, which makes the entirety of data for this analysis, was sourced from a variety of commercial and private automated weather stations (AWS). This included the NIWA *CliFlo* dataset recorded at the Waipara West station for the period of May 2012 to May 2016, which was used as the validation baseline for all other measurements. Also used were 3 growing seasons (2013-2016) of temperature data from 5 different vineyards in the Waipara Valley, represented by 22 different temperature sensors across all the properties. Field visits to a range of these vineyard sites enabled identification of any accuracy or precision bias from the AWS measurement, and obtaining coordinate points for each to geo-reference the dataset for mapping output. There was an acceptable level of consistency between the sensors positioning in each of the vineyards, for the exception of one sensor in an individual vineyard set at a different height of 2 metres. This was an outlier to the rest who were all set at a relatively uniform ~1m.

Figure 2 shows the spatial extent and size of the Waipara Valley GI. The elevation of all sites all fell between 60-250 m.s.l.

This elevation variation is significant enough to increase temperature ranges even at the micro-scale within some vineyards. One specific site was found to have an average range of 1.3 °C in GST values between different blocks on its vineyard, attributed to the altitude difference between river terrace heights on the site.

The limited research period and quality of secondary data gathered for this analysis led to the use of temperature as the predominant climate factor for data analysis, using general wind and precipitation to assist in the explanation of the general variation of the region. Adopting the Hall & Jones (2010) method, the research used the same four climate indices (GST, GDD, HI & BEDD) to summarise the overall characteristics of the area.

Using Microsoft Excel to perform the equations, the data gathered from the sources was calculated to the different climatic indices. For the purpose of this research it was decided to compare the data of the Waipara Region to the indices used in the research of Hall & Jones (2010) on the spatial variation of wine-growing regions in Australia. This was a simple, effective and already widely-applied method in both northern and southern hemispheres, and was seen as the most time-effective way to gain a strong-understanding of the extent of the variation in the climate of Waipara Valley to surrounding regions.



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The values for the indices from each site were then tabulated for comparison of discrepancy with values calculated by the Weather and Research Forecasting (WRF) mesoscale model of the Waipara Valley developed by Professor Andrew Sturman. The WRF model uses 3 years of the data from 2013-2016 taken at an hourly temporal resolution to plot a high spatial (<1km) grid resolution of temperature values across a 50km by 50km region of the Waipara Valley, as well as the surrounding topography of varying terrain complexity. This method has been utilised in other temperature variability case studies in South Africa, and Marlborough, New Zealand. The discrepancy comparison revealed a cold bias of ~1°C, and 450 Hugin units in the model. These allowed this research's index values to be applied to the model using a correction to plot them and adjust the WRF model. A tabular format of the results was also generated for numerical analysis to complement the visual analysis of the maps.

Climate variables derived, and the median index classification frequencies of the Australian geographical indications, adapted from Hall & Jones (2010)

Variable	Equation	Months	Class limits	Count	Frequency (%)
Average GST	$\sum_{d=1}^n [Tmax + Tmin]/2$	1 October-30 April	Too cool <13 Cool 13-15 Intermediate 15-17	0 9 54	0 14 86
GDD	$\sum_{d=1}^n \max \left[\frac{Tmax + Tmin}{2} - 10, 0 \right]$	1 October-30 April	Too cool <850 (Region I) 850-1389 (Region II) 1389-1667	0 49 0	0 100 0
HI	$\sum_{d=1}^n \max \left[\left(Tmean - 10 + Tmax - \frac{10}{2,0} \right) K \right]$ Where <i>K</i> is an adjustment for latitude/day length	1 October- 31 March	Too cool <1200 Very cool 1200-1500 Cool 1500-1800 Temperate 1800-2100	0 4 27 23	0 7 50 43
BEDD	$\sum_{d=1}^n \min [\max ([Tmax + Tmin] \div 2 - 10, 0) K + TR_{adj}, 9]$ Where, $TR_{adj} \begin{cases} 0.25[Tmax - Tmin - 13], [Tmax - Tmin] > 13 \\ 0, 10 < [Tmax - Tmin] < 13 \\ 0.25[Tmax - Tmin - 10], [Tmax - Tmin] < 10 \end{cases}$ And <i>K</i> is an adjustment for latitude/day length.	1 October- 30 April	<1000 1000-1200 1200-1400 1400-1600	0 30 24 0	0 56 44 0

Note:
n= 66 records of 22 sensors over three growing seasons. Where total observations do not add to 66, there have been gaps in data.
Some classification categories have been removed from the table due to irrelevancy

Table 1: Equations and Count of bio-climatic indices for each vineyard, adapted from Jones et al (2010)



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Results

The location of vineyards and AWS in the Waipara geographical indicator region vary in altitude from 68 to 211 m above sea-level, with micro-scale topographical features in vineyards such as river terraces and mounds providing up to 1°C in temperature variation within these sites (*Table 1*).

Growing season data from the 2012/13 to 2015/16 season at the NIWA Waipara West station forms the baseline for the individual vineyard climate stations. The vineyard data was sourced from different locations across the Waipara Valley (*see Figure 4a-b*) and analysed from the 2013/14 to 2015/16 growing seasons. The index and elevation data is summarised by the 23 individual locations within the Waipara Valley GI using whole values in *Table 2*.

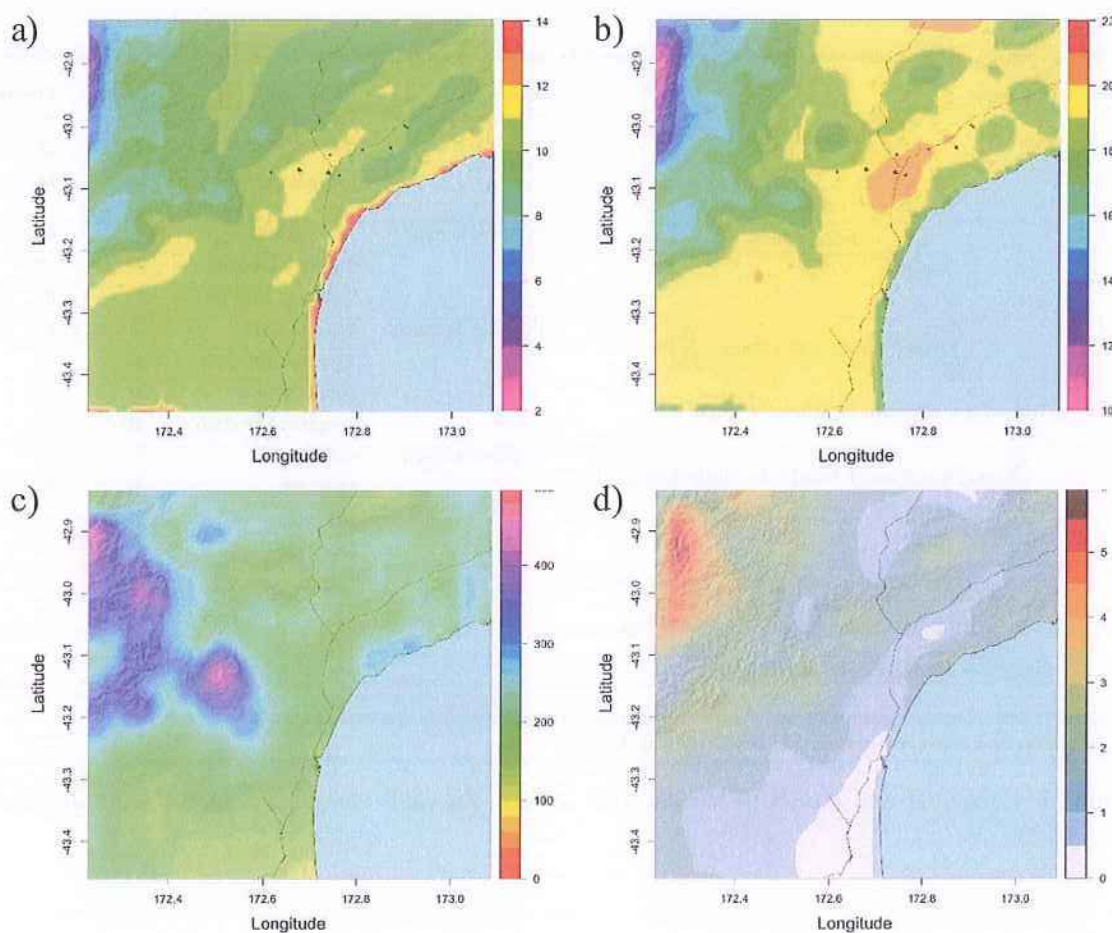
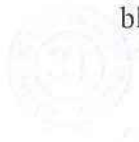


Figure 4: WRF model maps created by Professor Andrew Sturman of the Waipara Region at 1km Spatial Resolution showing (a) minimum temperatures (T_{min}), (b) maximum temperature (T_{max}), (c) rain map (scale showing precipitation in mm) and (d) wind map (scale showing wind intensity from 0-5). Black lines inland represent state highways and black dots on (a) and (b) represent location of AWS's used in study.



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General Climate

Minimum Temperature

As modelled by Prof. Sturman in *Figure 4a*, the Waipara Valley minimum average temperature is generally between 9-12°C. This prediction is supported by the research findings which were predominantly in the 9-11°C range. As already highlighted in this study, temperature is a significant contributing factor to wine quality. Minimum temperature over the growing season should ideally not drop below 0°C as this causes frost which can be extremely damaging to the crop. During the final month of ripening, a climate that is too cool can cause immaturity in the berry producing an inferior product of higher acidity (Spellman, 1999).

Maximum Temperature

The Waipara Valley has been modelled to show a range of maximum average temperature of between 19-21°C (*Figure 4b*), complemented by the recorded vineyard data. Grapevines need a certain level of warmth along with sunshine hours in order to ripen optimally. The maximum temperature results validate Waipara as a suitable wine growing climate, that doesn't exceed the 23°C threshold that is detrimental to plant growth (Jones et al, 2015).

Precipitation

The Waipara Valley receives around 200mm/year. As shown in figure 4c, this does not vary much across the flat basin of the valley. However, the hills and Southern Alps to the west experience much higher rates of precipitation. Records from the 2014-16 growing seasons are consistent with this precipitation model, whereas 2013/2014 experienced above average rainfall for the year, affected the wine produce for that year. The variation is due to the areas susceptibility to synoptic conditions generated by the complex topography and the general maritime climate.

Wind map

The general wind trend for the Waipara area is low overall. The average is around 0.5-1.5 m/s (*Figure 4d*). The valleys protection from the Teviotdale hills reduces some of the local wind anabatic gusts. Data from a selected local vineyard weather station show the extreme maximum wind gusts recorded over the last three growing seasons. These gusts tend to vary in strength significantly during the growing season (*Figure A1*) as well as between seasons, and are caused predominantly by katabatic processes (i.e Foehn effect).



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Table 1: Numerical data and location for each of the vineyard AWS sensors used in study.
Source: 5 Waipara Valley vineyards

Waipara 2013-2015 Growing Season statistics for average GDD, HI, GST and BEDD. Adapted from Hall & Jones (2010)												
GI Name	2013/2014				2014/2015				2015/2016			
	GDD	HI	GST	BEDD	GDD	HI	GST	BEDD	GDD	HI	GST	BEDD
Black Estate												
Road	959.6	1709.4	15.44	1118.6	1028.5	1863.3	15.47	1181.2	1121.3	1861.7	15.88	1242.7
Central	N/A	N/A	N/A	N/A	1069.7	N/A	15.67	1223.4	1174.0	1942.8	16.10	1297.4
Top Block	1071.3	1883.4	15.96	1272.0	N/A	2054.0	16.73	1314.4	1205.9	2008.4	16.72	1362.4
Caravan	N/A	N/A	13.68	N/A	1018.9	1772.1	15.45	1158.2	1186.7	1944.9	16.38	1288.2
Limestone Hills												
	N/A	N/A	14.94	1004.8	N/A	N/A	15.3	1093.6	N/A	N/A	15.78	1149.1
Mud House: The Deans												
River	976.5	1593.2	14.74	1029.6	1078.6	1674.2	15.19	1107.3	1134.1	1739.0	15.58	1175.0
Pinot Gris	971.6	1559.5	14.98	1020.3	1100.4	1678.5	15.44	1105.5	1156.1	1729.9	15.58	1147.4
Road	968.9	1569.8	14.62	1007.5	903.1	1362.7	15.16	N/A	1149.9	1738.2	15.48	1162.5
Mud House: Glasnevin												
SB	1071.3	1805.2	15.94	1202.8	N/A	1150.4	16.06	N/A	N/A	1835.3	15.97	1237.6
CY	1052.6	1650.9	15.14	1094.8	1047.3	1751.1	15.93	1067.8	1047.3	1837.5	16.11	1279.3
WP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1197.7	1873.2	15.91	1273.7
Mud House: The Mound												
Road 2	1026.8	1623.9	14.83	1046.9	1131.0	1722.4	15.41	1144.2	1128.1	1737.5	15.70	1138.8
Middle	857.2	1624.9	16.12	N/A	928.8	1550.7	15.44	1053.7	N/A	1296.6	14.38	N/A
Road 1	1025.2	1640.3	14.95	1074.7	1107.9	1756.8	15.63	1082.8	1157.1	1751.9	15.62	1176.1
Mount Brown												
	957.5	1699.6	15.06	1111.6	1078.9	1763.3	15.33	1156.6	1078.6	1880.0	16.29	1278.3
Mount Brown: Weka Gravels												
Air	1093.5	1779.2	15.43	1180.8	N/A	1924.0	16.21	1269.1	N/A	1951.8	16.33	1314.1
Remote	1106.1	N/A	15.42	1175.1	N/A	N/A	16.27	1276.2	N/A	N/A	16.48	1334.9
Muddy Water												
Base	1108.2	1779.0	15.44	1168.6	1218.9	1866.2	15.98	1229.0	1295.7	2211.8	16.29	1271.6
Block 13	1055.8	1818.6	15.51	1208.6	1159.4	1849.5	15.81	1227.3	N/A	N/A	15.96	N/A
Old Chardonnay	960.8	1565.8	15.29	N/A	1182.3	1978.8	16.07	1291.3	N/A	N/A	14.91	N/A
New Chardonnay	967.2	1807.4	15.20	1201.0	1111.1	1899.7	15.49	1241.5	1160.3	1853.9	15.54	N/A
Greystone	1097.2	1793.0	15.52	1375.9	1119.1	1810.2	15.66	1190.8	1124.1	1783.2	16.04	1182.2



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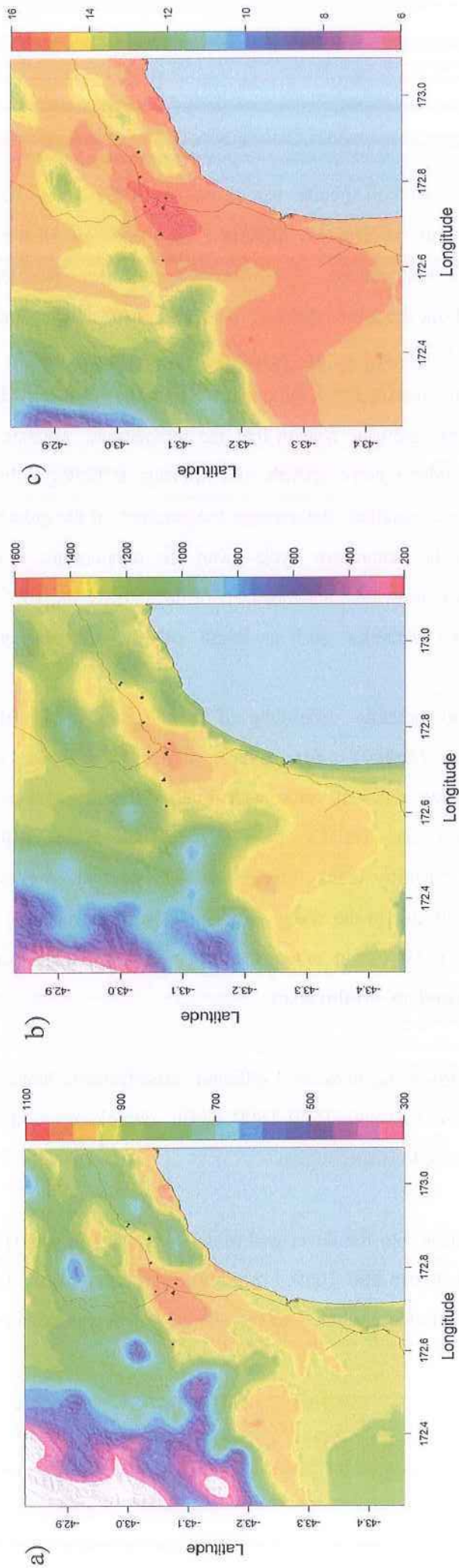


Figure 5: WRF model maps created by Professor Andrew Sturman of the Waipara Region at 1km Spatial Resolution showing (a) *Huglin index* (HI), (b) *Growing degree days* (GDD) and (c) *Growing season temperature* (GST). Black lines inland represent state highways and black dots on (a), (b) and (c) represent location of AWS's used in study.



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Bioclimatic Indices

The following results discussion is based on specific viticulture climatic indices. This provides a more comprehensive understanding of climate's influence of phenology of the grapevine using specific components of air temperature. The measurements are calculated to give viticulture-specific information about the area's climate. The first is the Huglin Index, which considers the mean and maximum temperatures, giving preference to diurnal values, outputting a summation of days representing heliothermal potential. Secondly, growing degree-days identifies the amount of days in the growing season that the temperature reaches above the 10°C, hence the amount of days where berry growth and ripening is biologically possible. Thirdly, growing season temperature identifies the average temperature of the growing season, and hence can forecast stages of the maturation cycle given the temperature is consistent. Finally, biologically effective degree days uses a summation of days above the 10°C threshold, however is corrected for additional variables such as length of day, and position on earth through latitude.

The spatial distribution and therefore variability of index values is high due to non-uniformity of vineyard topography (*Table 2*). For example, at the Mud House winery, the vineyards are dispersed across three different sites with three different sensors recording measurements at each. At the first site, The Deans, a river terrace causes slightly lower temperatures than what occurs at a nearby block (Glasnevin). The Mound block specifically records a large temperature variation due to the wider dispersal of sensors over the larger area of this block, especially compared to Glasnevin where the observed temperature sensors were within ~30m of one another compared to ~100m apart.

Huglin Index

The range in HI values (*Figure 5a*) crossed 3 different classification limits (*Table 1*), but predominantly all values were between 1500-1800 which complements the common acknowledgement of the area as a cool climate region.

Growing degree-days

GDD values (*Figure 5b*) all fit into the lower end of the category (Region I) 850–1389, as were predominantly of values between 900-1050. For purposes of comparison, this value is less than the Region II (1100-1280) range attributed to the overall North Canterbury region for this index.



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Growing Season Temperature

The range in average GST between all study sites was 1.5°C, enough to cross two GST classifications (*Table 1*), cool and intermediate climate. Majority of these values however were on the threshold temperature that separates a cool and intermediate climate GST value, with ~40% of sites analysed being within 0.5°C of the 15°C upper threshold for a cool climate. Data for this calculation comes from the growing seasons between 2014-2016, some of the warmest on record (*Figure 3*).

Biologically effective degree-growing days

The BEDD values (*Table 1*) range from a minimum of 1000 to a maximum of 1450. This crosses 3 different class limits, all on the cooler end of the scale.



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Discussion

The results of this study have shown the details of the Waipara climate. This section will lead on from the results and describe how that impacts the production of wine. Firstly, this will distinguish the unique value of the Waipara climate by comparing it to other regions. This comparison will provide more evidence to meet the criteria for the *Geographical Indications (Wine and Spirits) Registration Act (2006)* application. Following this is a discussion of grapevine response to the climate characteristics described in the results. This further emphasises the aim of explaining the relationship between climate and viticulture in Waipara. To conclude the discussion, the legal and other formal implications will be summarised and related to the Waipara Winegrowers Association application to register under the Act.

Comparative analysis

The Waipara Valley when compared with the neighbouring regions of Marlborough and North Canterbury shows a cooler climate (*Appendix A, Figure A2*), which correlates to a stronger cool climate classification than its warmer, more intermediate climate contemporaries. The variation of temperature across the Waipara sub-region (*Figures 4-5*) also makes the area specifically unique, especially when compared to its encompassing North Canterbury region which is more homogenous in temperature distribution because of its topography, a plain – rather than enclosed valley. This “*terroir*” gives the Waipara Valley the ability to produce a large selection of cultivar choices (*Figure 6*) unmatched by any other cool climate zone in New Zealand. Internationally, this research’s preliminary indice values align with other cool climate zones in the U.S.A and Europe where a sufficient comparative analysis has been undertaken using the Jones et al (2010) methodology (*Appendix A, Figure A3*). These areas also have similar cultivar choices (e.g. Pinot Noir, Chardonnay and Savignon Blanc).

Grapevine response to climate characteristics

This research has validated Waipara as a cool climate region, which is defined as “one that is capable of imparting certain distinct sensory nuances to its wines as well as possessing a unique combination of climate characteristics” (Shaw, 1999). It is important to recognise the meaning of a cool climate region and how it influences choice of grape variety, as well as quality, taste and flavour. The chemical composition of grapes is heavily impacted by climatic influences. According to Jones (2015), there are several identifiable berry characteristics that can be attributed to a cool climate and a GST between 13-15°C. This includes a lean, tart fruit

style, light body and crisp, tangy acidity. He describes the overall style of wine produced from these berries as subtle and elegant. We can expect these qualities in the berries produced from Waipara vineyards based on a HI of 1500-1800 and BEDD of >1200. An important aspect of managing a vineyard is the ability to choose the most appropriate grape variety given not only the market demand forces but the unique climate conditions that enable the grapes to grow and ripen best (Shaw, 1999). This is important in relation to the Waipara area and the grape varieties winegrowers choose to invest in.

Climatic influences on viticulture initially at the macro scale, which determines whether or not the vine will grow and produce a fruit at all. Warmth is the key factor that gives the fruit sugar content. Grapes require an average annual temperature $\sim 15^{\circ}\text{C}$ and sustained warmth over the growing season expressed by a consistent growing season expressed by a GDD of >1000 to ensure a high sugar content for the fruit to convert to alcohol without the need for additives in later production stages (Spellman, 1999). The average GST for Waipara from the analysis supports this idea (*refer to Table 1*) as the range of results were all between around 14°C and 16°C .

Generally, the most suitable common grape varieties for a cool climate region of similar temperature range to Waipara would be the fast developing variety (Sluys, 2006), Reising, Pinot Gris, Pinot Noir, Chardonnay and Savignon Blanc (*Figure 6*). The suitability of different grape varieties is a viticulture concept also determined by climate.



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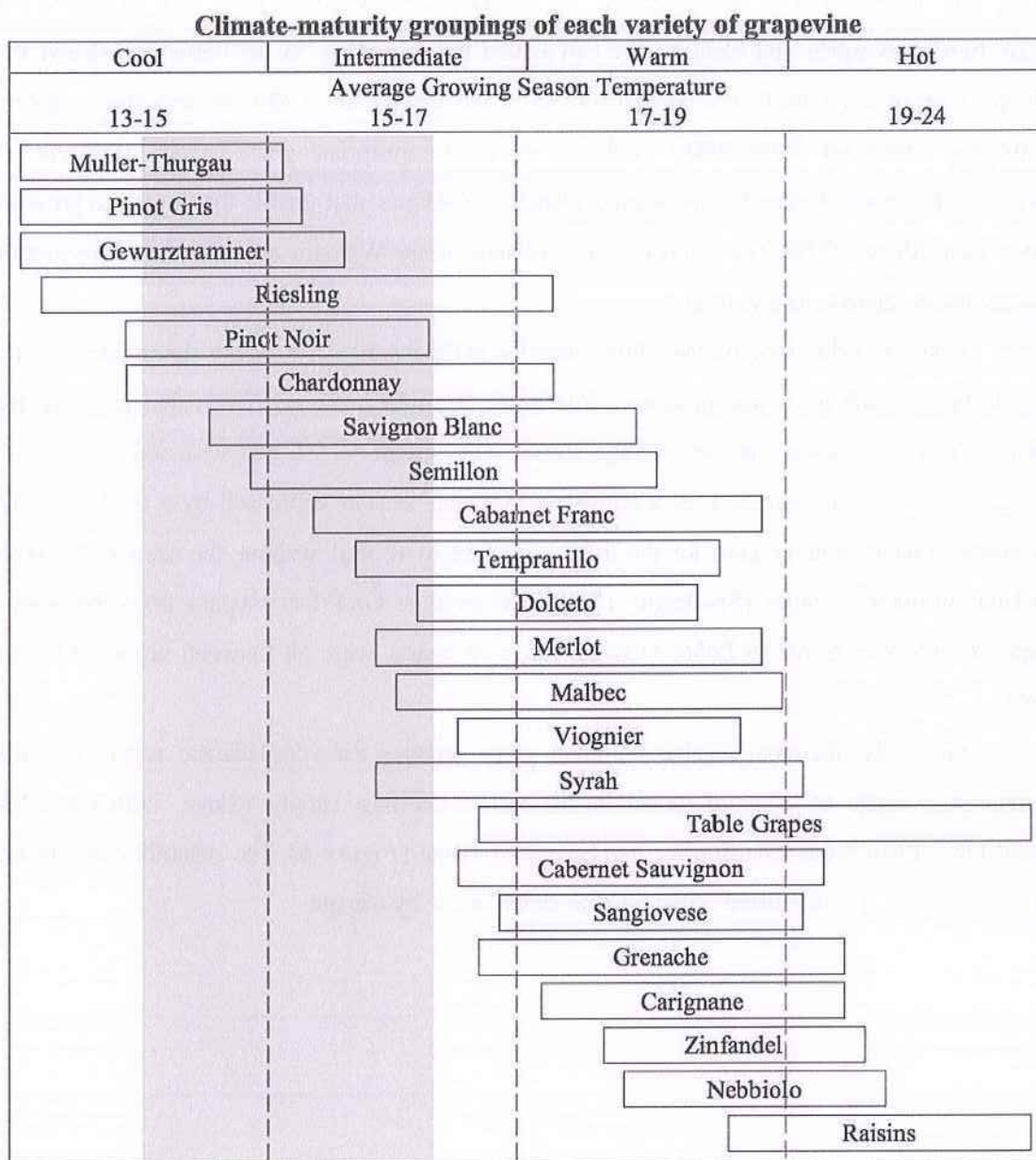
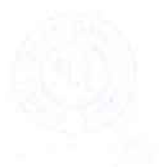


Figure 6: Wine cultivar temperature ranges, adapted from Jones (2007), grey shaded area representing cultivar possibilities for the Waipara sub-region based on AWS data, North Canterbury, N.Z



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Legal and Formal Implications

Given the details of the *Geographical Indications (Wine and Spirits) Registration Act (2006)*, the findings from this report will be valuable to the Waipara Winegrowers Association registration application. Climate is one of the most important factors influencing wine geographical indicators. Therefore, this research is essential to the application process.

The success of the Waipara Winegrowers Association application will offer winegrowers within the region significant benefits, specifically legal protection within national and international markets. The Geographical Indications Act creates a register of Geographical Indication regions and boundaries that is administrated by the Intellectual Property Office of New Zealand (IPONZ). This means that any wine produced within the criteria of the Waipara GI (Geographical Indication) is protected in key markets both domestically and internationally. Consequences of breaking the guidelines set out in the act will be administrated through the Fair Trading Act (1986). The act is an opportunity for the Waipara Winegrowers Association to formalise the name and boundary of Waipara. This research helps to achieve that by constructing the first detailed analysis of key temperature indices, as used by other viticulture-climate experts. A potential entailment of this act would include the economic market value of obtaining an official GI for the region. The reputational value of an official GI could have an influence on market value for Waipara wine. As discussed earlier, the 'where' factor of wine seems to have significant influence on consumer demand behaviour (Overton & Murray, 2014).

To conclude on the legal and formal implications, the success of the Waipara Winegrowers Association's application would have significant beneficial impacts on the industry. Any negative impacts of obtaining an official GI status for Waipara have not been observed, although there is always the possibility of unforeseen circumstances arising. Identifying the unique climate of Waipara is a significant part of obtaining the official GI status for Waipara. Therefore, reinforcing the relationship of climate and viticulture which is the key focus of this study.



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Conclusion

In relation to the initial aims of the project, the results of this study present the Waipara Winegrowers Association with a detailed description of the climate features that influence their wine production. This is essential to the Geographical Indications Act which specifies the importance of climate on viticulture. The information regarding climate that is provided in this study further enforces that Waipara should be identified as a separate Terroir/GI due to the verified cool climate classification of the region. The figures computed in the analysis stage of the study are the first to be available for the Waipara region, taken from observed rather than modelled data. The four temperature indices that were calculated contribute significantly to the understanding of climatic processes within the region. The analysis also provides an insight into the impacts of certain climate characteristics for berry ripening processes. This significantly improves the understanding of climatic influences for viticulture.

Limitations in this study exist mainly due to the time and resource constraints inflicted by the nature of the course. A much more comprehensive analysis could have been completed if both the quantity and quality of data sources could be increased. The number of local vineyard weather stations that temperature records were obtained from is limited by the time available to compute the results as well as privacy for the vineyard owners. Differences in some parts of existing work that this study has compared to could be the cause of inaccuracy. In particular, the values for indices in this analysis has been averaged rather than divided into quartiles. The comparison has therefore been based on median versus mean results. The analysis could also be improved if given more than three growing seasons of data but this was not available at the time of research. The field visit to check temperature sensors for potential bias was limited by time and unfortunately a small proportion of sensors were not able to be investigated. This study assumes that they were at the standard vineyard height and were placed in sensible locations to ensure accurate recordings.

Given these limitations, future work that could investigate the Waipara climate with a much larger scope would be a significant development on the existing level of understanding. A larger sample size of temperature sensors at vineyard locations, as well as an extended time period to analyse data would be optimal conditions for this study.



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Acknowledgements

Our first and foremost appreciation goes to our project tutor, Professor Andrew Sturman, who has been an incredible mentor to this project and to the students involved. We are privileged to have the opportunity to work with him and his extensive knowledge of viticulture and climate modelling. Also to Dr. Hervé QuénoI for providing feedback and guidance on the direction of the report, and on the theory of the bio-climatic indices for viticulture.

Finally, thanks to the Waipara Winegrowers Association, for giving us the opportunity to study such an intriguing area and topic. We have been grateful for the support you have given us throughout the project assuring us that our work is appreciated and will be useful to the application to be made later in the year.



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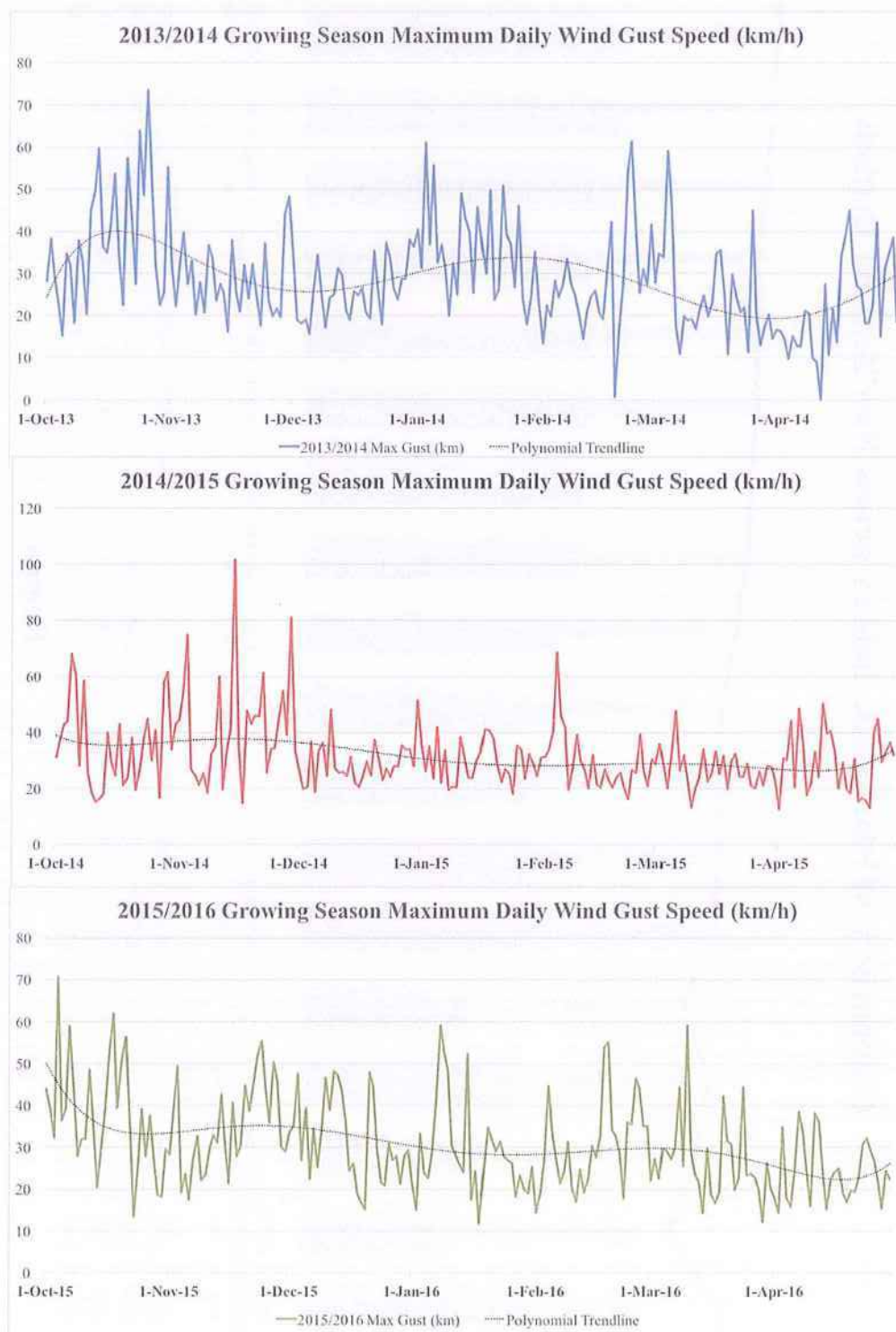
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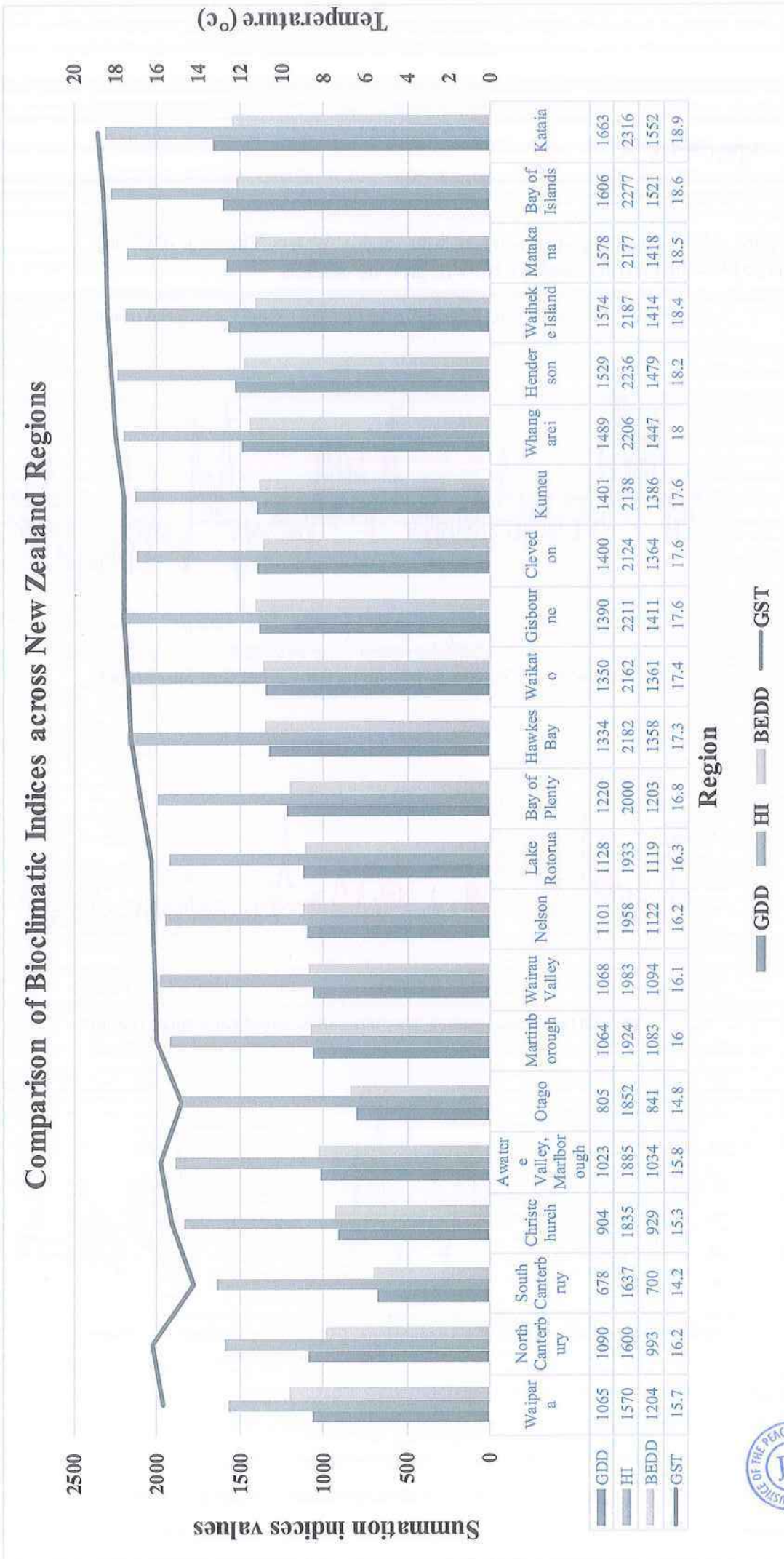
Appendix A

Figure A1: Wind gust graphs sourced from Muddy Waters Vineyard AWS for (a) 2013/14, (b) 2014/15 and (c) 2015/16 growing seasons



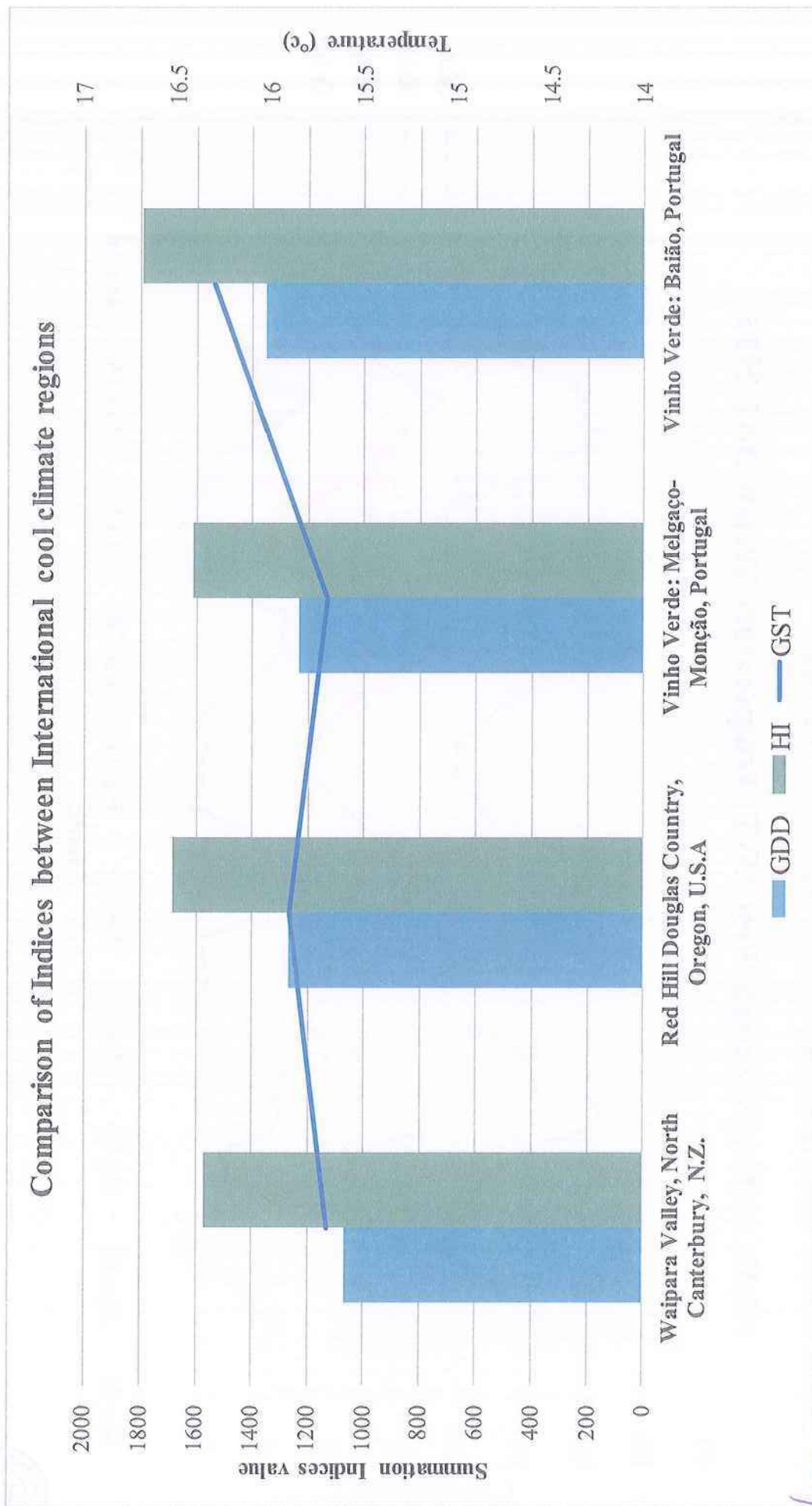
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Figure A2: Bar graph showing indices value for each region of New Zealand (adapted and adjusted for ~1°C and 450 HI unit cold bias from Anderson et al, 2010 model values)



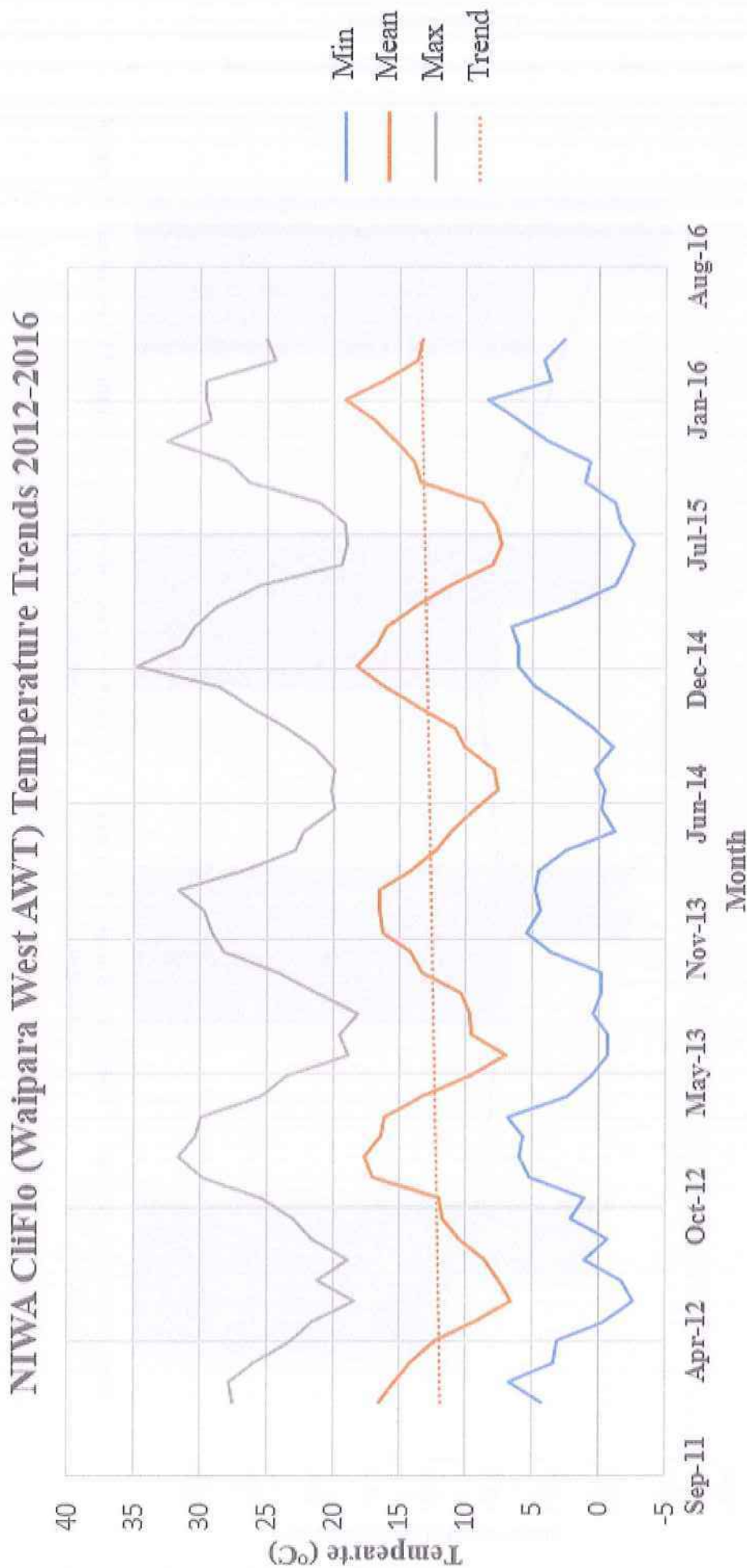
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Figure A3: Cool climate indices comparison of Waipara Valley with other international regions. Source Jones et al (2010).



J.P.
OFFICE OF THE PEACE FOR NEW ZEALAND
90W

Figure A4: AWS Validation baseline of temperature trends for study period. Source: CliFlo



gab

✓



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gaw



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Declaration

I, Paul Ivan Donaldson, of Christchurch,
[Name] [Place of residence]

being a person authorised to present evidence in support of this Application on behalf of the Applicant, solemnly and sincerely declare that:

1. The evidence contained in and with this application, including appendices and attachments, is true and correct to the best of my knowledge.
2. I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths and Declarations Act 1957.

Name: Paul Ivan Donaldson

Signature: 

Declared at CHRISTCHURCH this 15th day of April 2018.

Before me: 

[Name of Justice of the Peace, or solicitor, or other person authorised to take a statutory declaration.]

Signature:

Emily Walton
Solicitor
Christchurch

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Supplementary evidence in support of an application for registration of a New Zealand Geographical Indication: WAIPARA VALLEY/ WAIPARA

Response to request for supplementary information

In the Compliance Report received by The Waipara Valley, North Canterbury Winegrowers' Incorporated in response to this application to register the WAIPARA VALLEY/ WAIPARA GI, the following was noted by the examiner:

Before your application can be accepted, you will need to provide:

- *Further evidence to support their position that Waipara is an alternate name for the Waipara Valley GI.*
- *This further evidence should show how the Waipara GI is used in relation to the applicant's wine goods. The evidence should include additional wine labels from various vineyards. The evidence should go towards showing consistent and continuous use of the Waipara GI on the applicant's wine goods from the first commercial release of wines from this GI in 1989, up until the filing date of this GI.*
- *If the applicant is unable to provide this further evidence they may request to proceed in respect of the Waipara Valley GI alone.*

Attached at Appendix 1 as further evidence to support Waipara being an alternate name for the Waipara Valley GI is additional wine labels from the following various vineyards: Torlesse; Tiki Estate; Waipara West; Waipara Springs; Thistle Ridge; The Boneline; Waipara Hills; Omihi Road; House of Ball; Muddy Water; Barons & Potter; Mountford Estate; The Crater Rim; Silver Wing; Lil Ripa; Georges Road; Lighthouse; Deliverance; and The Winemaker's Wife.

These labels provide solid evidence of the use of GI WAIPARA consistently and continuously on wine since 1997. We also confirm that the name was in use before that date. However, given that winegrowers in the region did not anticipate any requirement to subsequently prove such use, obtaining reproducible evidence to include in this document has been difficult. We have, for example, identified that the National Archive has a 1989 Waipara West Winery WAIPARA Ram Paddock Red label from 1989, but we have not yet been able to obtain a copy of that.



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Appendix 1



107 Montreal Street - PO Box 7121
Christchurch 8246 - New Zealand
Tel 03 365 1200 • Fax 03 365 3862
Email: sales@leadinglabel.co.nz
www.leadinglabel.co.nz

- Dia Keyline
- Black x2
- Gold Foil
- Matt Varnish



TO MEET YOUR DESPATCH DATE, THIS ARTWORK WILL NEED TO BE APPROVED PROMPTLY

PROOF VERSION ONE

Date: 7/7/2017
Final Size: 100 x 139
Barcode Magnification: 80%
Quantity: 8,000
Job Number: 82097

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OK to proceed

Revised proof required

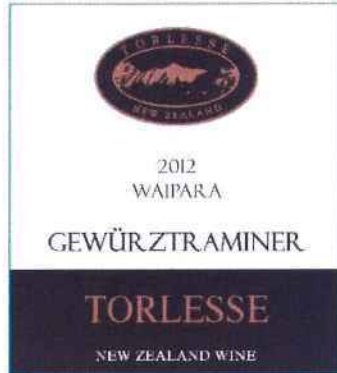
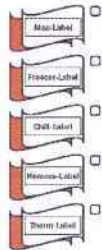
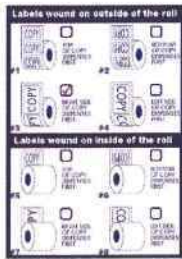
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<p>First Label <i>More than meets the eye</i></p> <p>Ph 03 349 6633 Fax 03 349 6632 www.firstlabel.co.nz sales@firstlabel.co.nz</p>	<p>Client: Torlesse Wines Date: 03-11-15 Description: Torlesse Gewürztraminer 2012</p>	<p>Front Size: 80 x 90mm Back Size: 65 x 90mm Corner Radius: 0,5mm</p>	<p>Please examine this proof carefully and mark whichever action is required.</p> <p><input type="checkbox"/> OK to proceed <input type="checkbox"/> OK to proceed with corrections as listed on proof <input type="checkbox"/> Further proof required</p> <p>Customer Sign-off: _____ Date: _____</p>
	<p>Colour List: </p> <p>Colours are indicative and should not be relied upon for colour matching</p>		

TIKI
ESTATE

PINOT GRIS
2016

WAIPARA : NEW ZEALAND

P.S.

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TIKI Wine & Vineyards was founded by Royce and Sue McKean. The TIKI name pays homage to Royce's great-great grandfather, Tiki Tere Mihi, chieftain of the Ngati Uenuku tribe. The esteemed tiki is also a powerful good luck charm for all.

TIKI ESTATE WAIPARA
PINOT GRIS 2016

Quince and ripe Nashi Pear aromas dominate the nose with floral, perfumed notes of fermentation esters enhancing their impact. The palate is full, round and luscious with an exceptional phenolic balance and moderate acidity that gives the wine a lovely intensity and length of flavour.

NEW ZEALAND WINE
13.5% ALC/VOL
750ML

Contains sulphites.
Contains approximately
8 standard drinks.

Our vineyards are all certified 'sustainable'. We care for our land under the guiding Maori principles of Kaitiakitanga: guardianship, protection and preservation of the earth.

TWV LTD Trading as
Tiki Wines & Vineyards
9/18 Taurus Place
Christchurch
New Zealand
www.tikiwine.com



TIKI
ESTATE

CHARDONNAY
2016

WAIPARA : NEW ZEALAND



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TIKI Wine & Vineyards was founded by Royce and Sue McKean. The TIKI name pays homage to Royce's great-great grandfather, Tiki Tere Mihi, chieftain of the Ngati Uenuku tribe. The esteemed tiki is also a powerful good luck charm for all.

Sourced from the Waipara region in North Canterbury, this wine may be cellared for up to 8 years.

TIKI KORO WAIPARA PINOT NOIR

This is an elegantly rich, ripe and full bodied wine with the typical regional characters of chocolate, cherry, plum & spice. This wine has been matured in French oak for eighteen months.

NEW ZEALAND WINE
14.0% ALC/VOL
750mL

Contains sulphites.
Contains approximately
8.3 standard drinks.
Bottled: October 2017

Our vineyards are all certified 'sustainable'. We care for our land under the guiding Maori principles of Kaitiakitanga: guardianship, protection and preservation of the earth.

Tiki Wines & Vineyards
9/18 Taurus Place
Christchurch
New Zealand
www.tikiwine.com



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TIKI Wine & Vineyards was founded by Royce and Sue McKean. The TIKI name pays homage to Royce's great-great grandfather, Tiki Tere Mihi, chieftain of the Ngati Uenuku tribe. The esteemed tiki is also a powerful good luck charm for all.

TIKI ESTATE WAIPARA CHARDONNAY 2016
The use of careful juice handling, malolactic and French oak has resulted in a wine of vibrancy and complexity. The fruit notes of the best clones of Chardonnay are supported by subtle oak flavours and the softness of the malolactic in an easy drinking style.

NEW ZEALAND WINE
13.5% ALC/VOL
750mL

Contains sulphites.
Contains approximately
8.0 standard drinks.

Our vineyards are all certified 'sustainable'. We care for our land under the guiding Maori principles of Kaitiakitanga: guardianship, protection and preservation of the earth.

TWV LTD Trading as
Tiki Wines & Vineyards
9/18 Taurus Place
Christchurch
New Zealand
www.tikiwine.com



TIKI
ESTATE

PINOT NOIR
2016

WAIPARA : NEW ZEALAND



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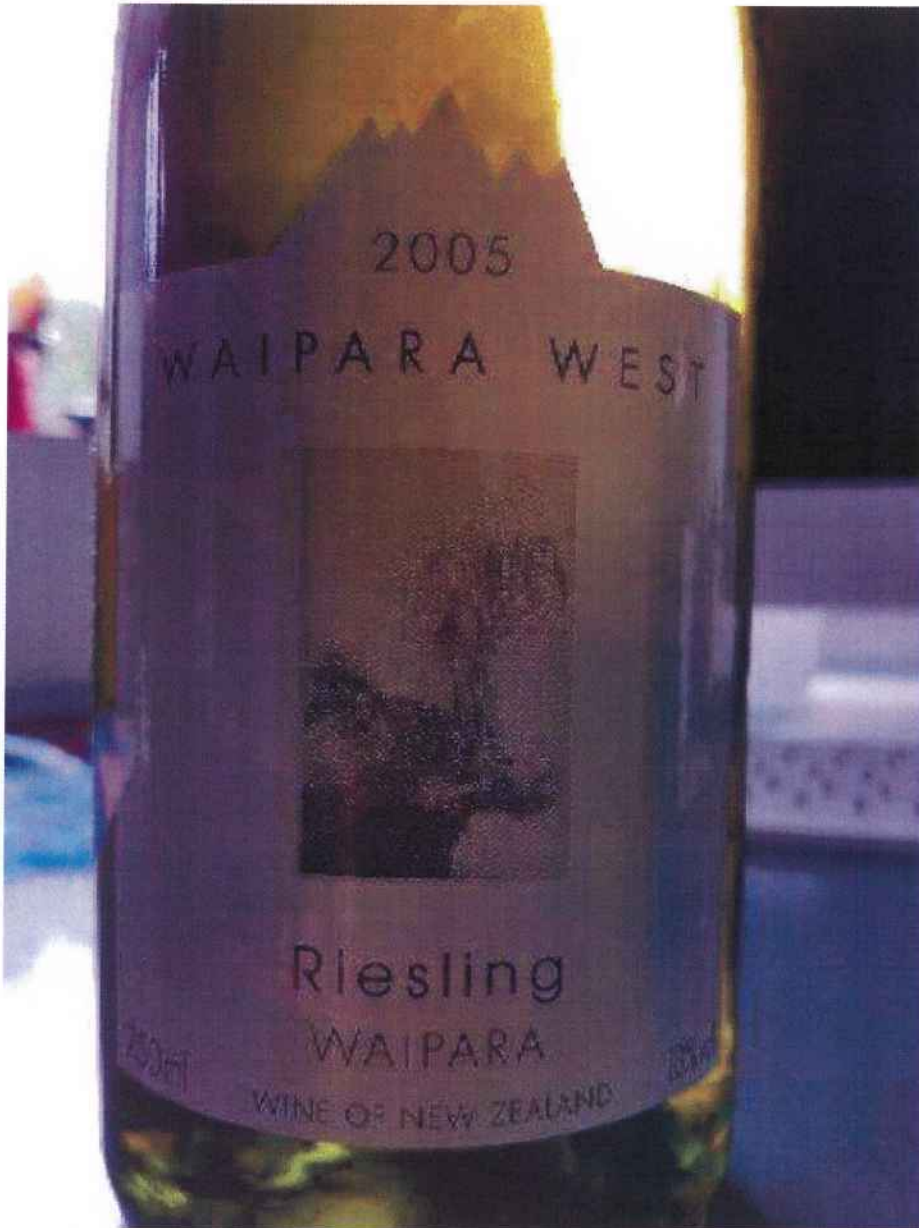
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TIKI ESTATE WAIPARA
PINOT NOIR

DELICIOUS ELEGANT **EARTHY & SPICY** SMOOTH

Bring this handcrafted Taonga “Treasure” of New Zealand with you wherever your journey leads. Best shared while enjoying life’s adventures and connecting with Friends and Family.

Tiki is an indigenous New Zealand wine producer.

NEW ZEALAND WINE
13.5% ALC/VOL
750mL

Contains sulphites.
Contains approximately
8.0 standard drinks.
Bottled: August 2017.



TWVLTD Trading as
Tiki Wines & Vineyards
9/18 Taurus Place
Christchurch
New Zealand



SWEETNESS



CHEESE



FULLNESS



BEEF

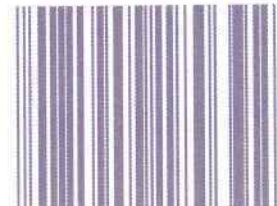


ACIDITY

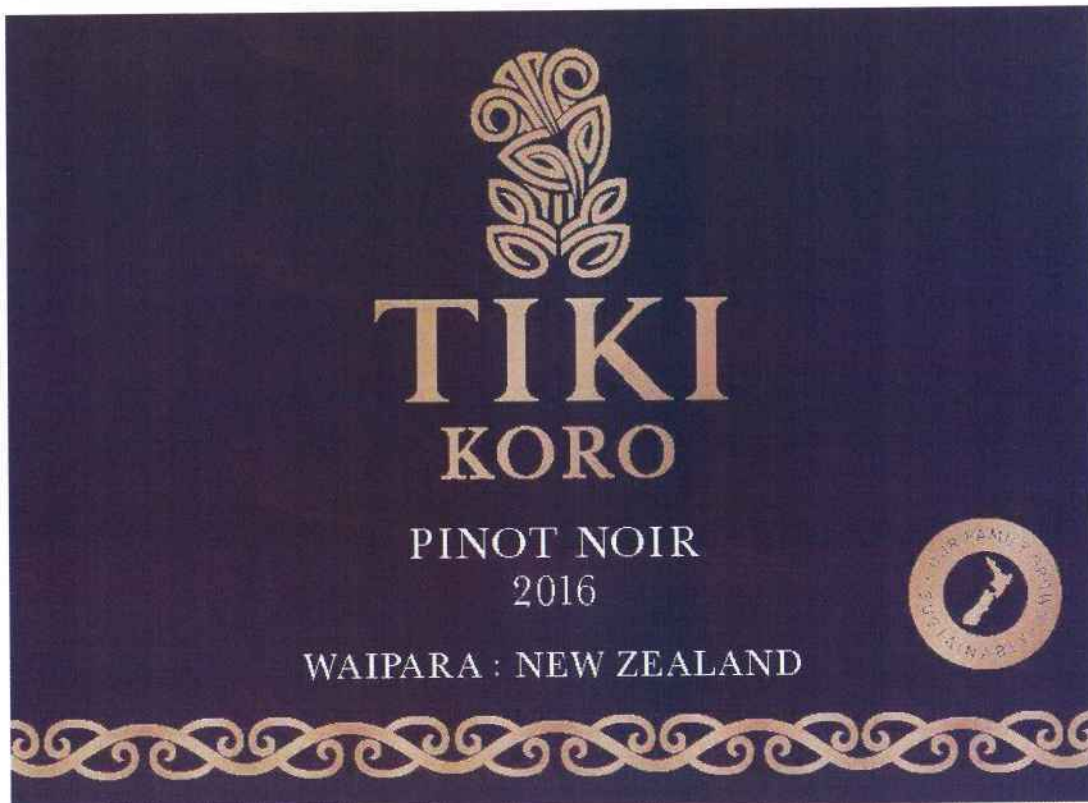


SERVE AT 18°C

tikiwine.com



9 421902 180392 >



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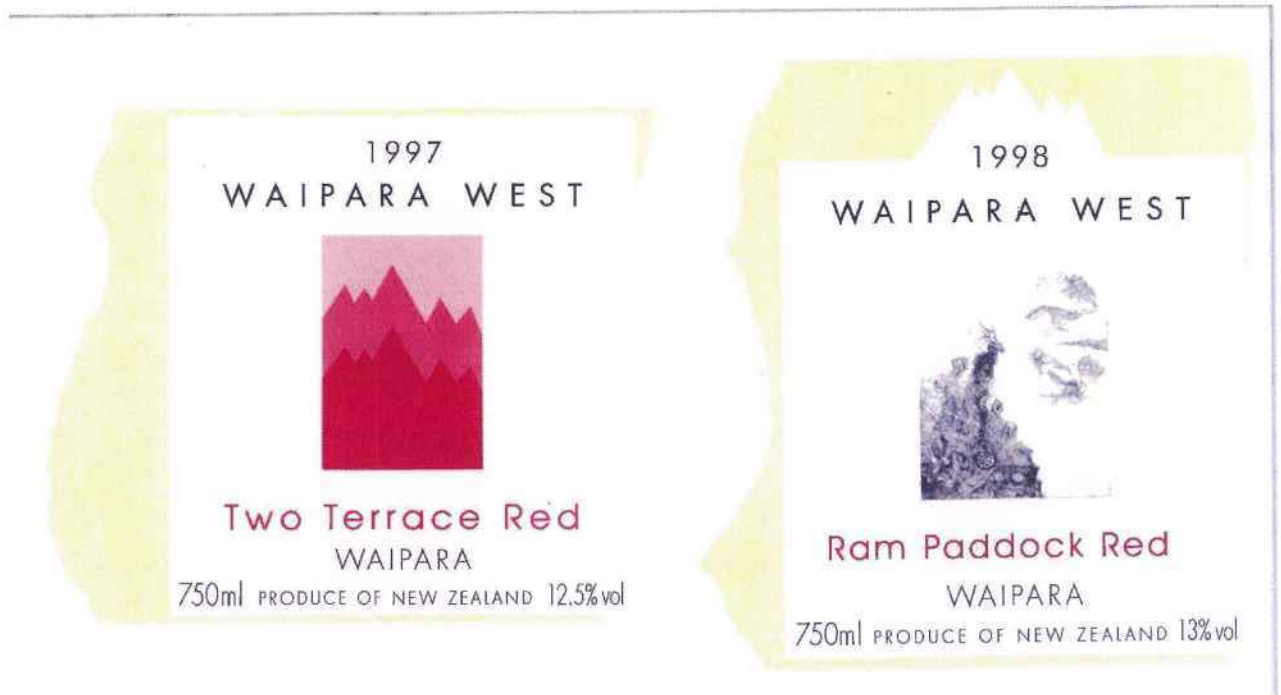
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[Vintages produced since 1997]

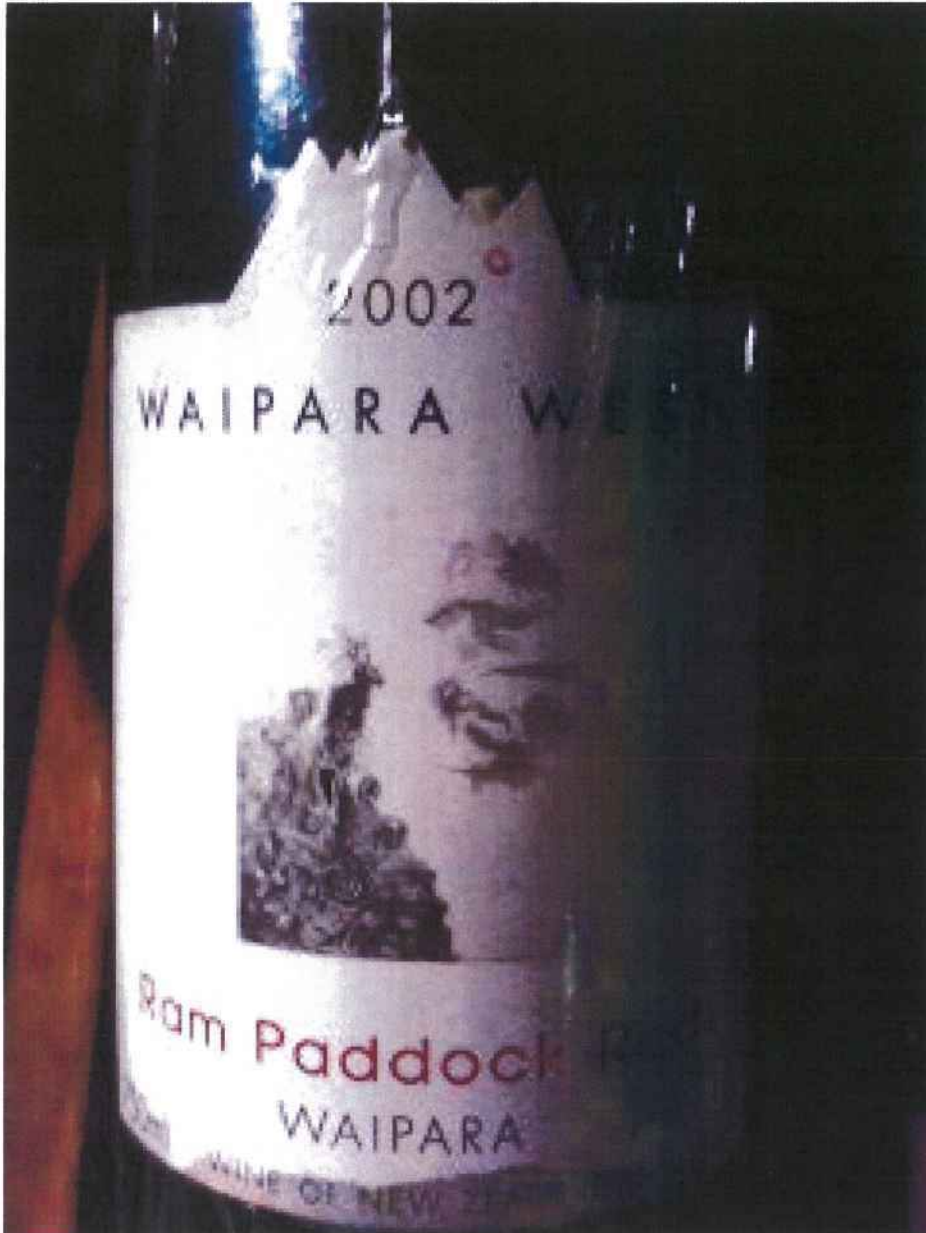
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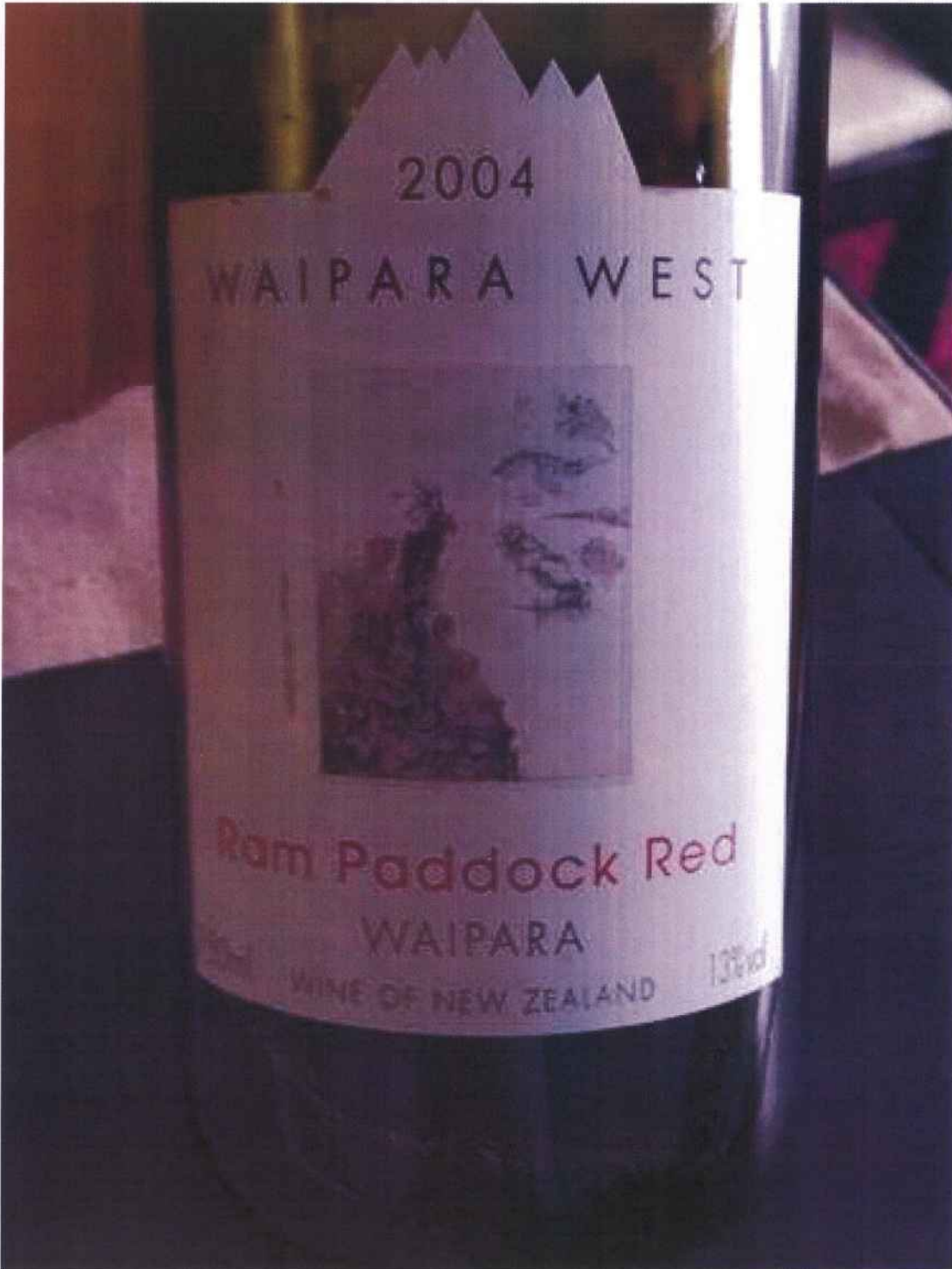
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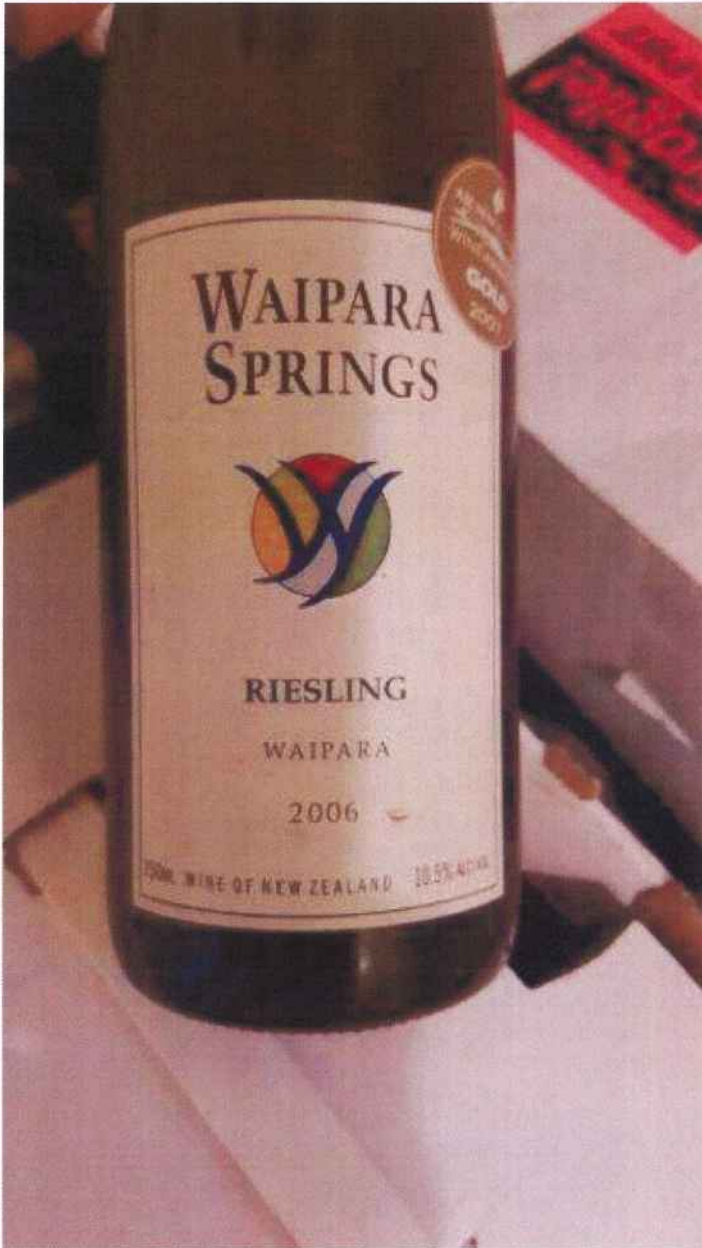
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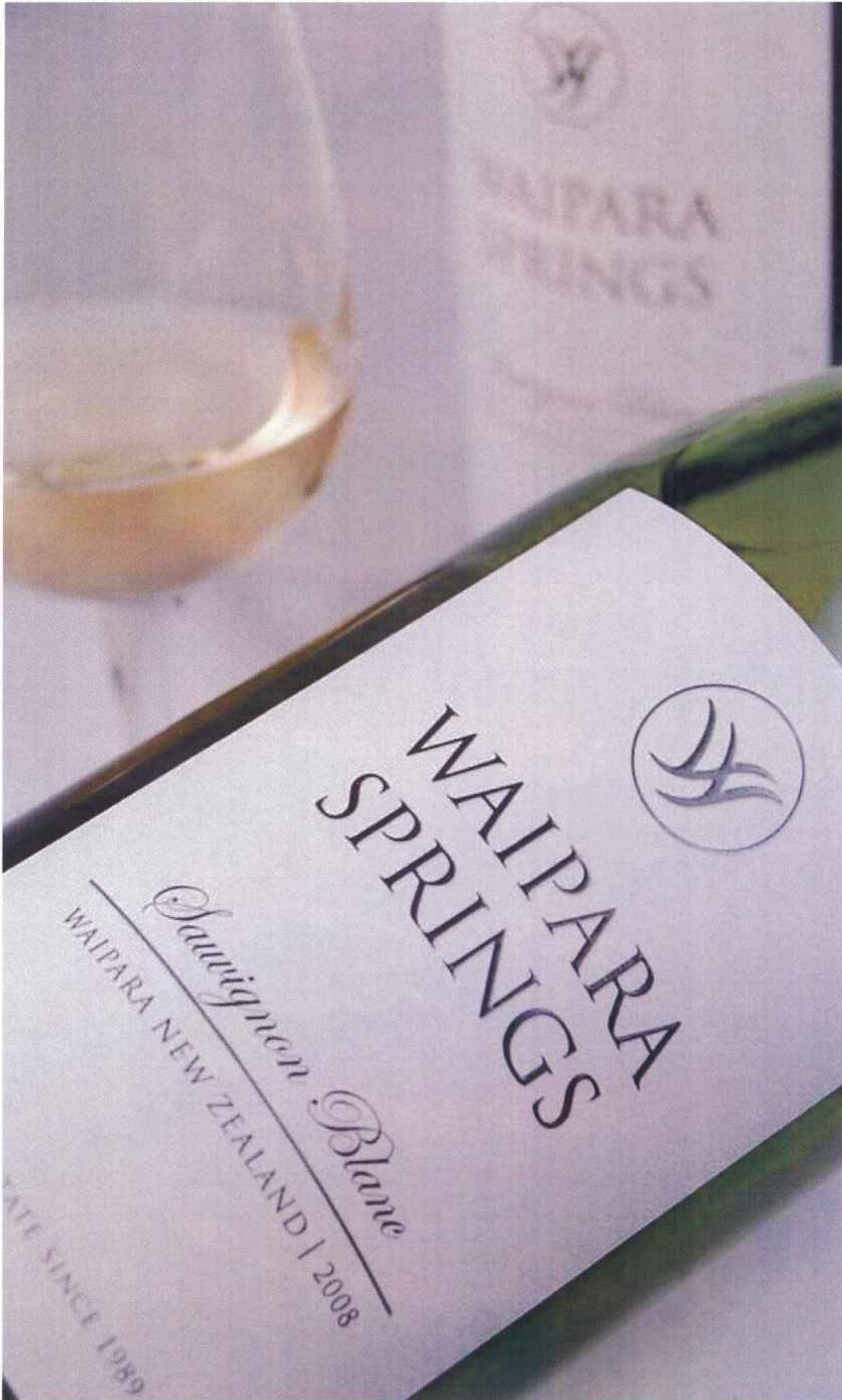
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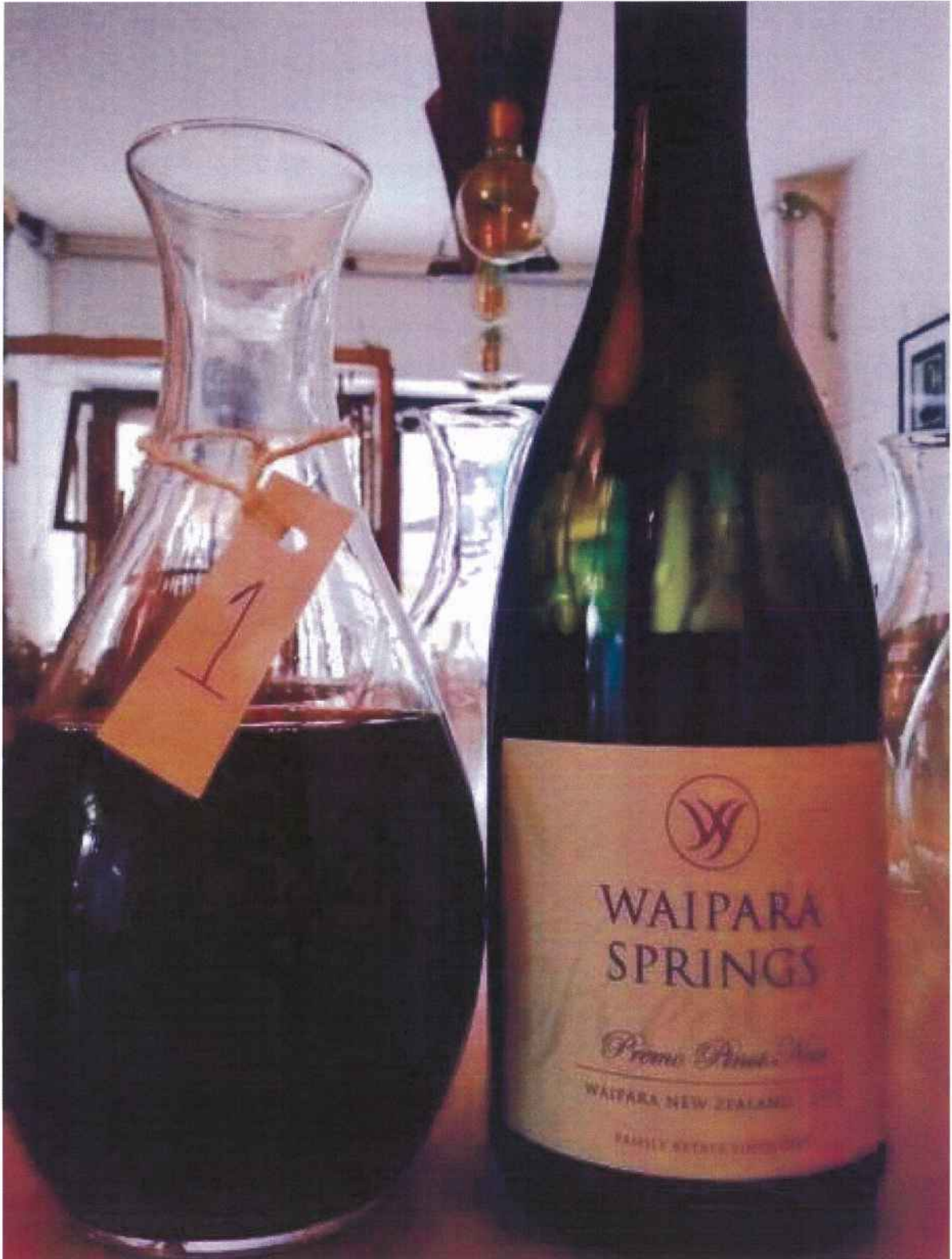
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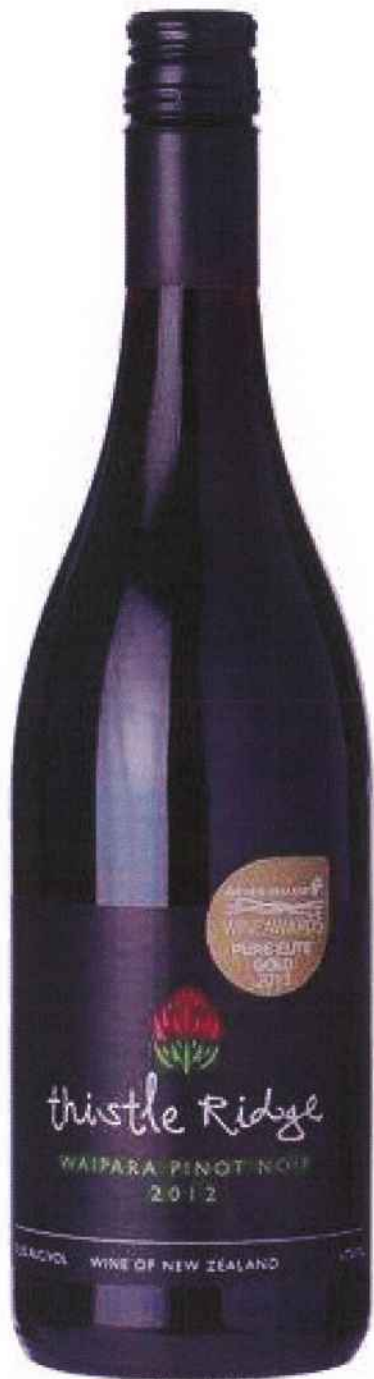
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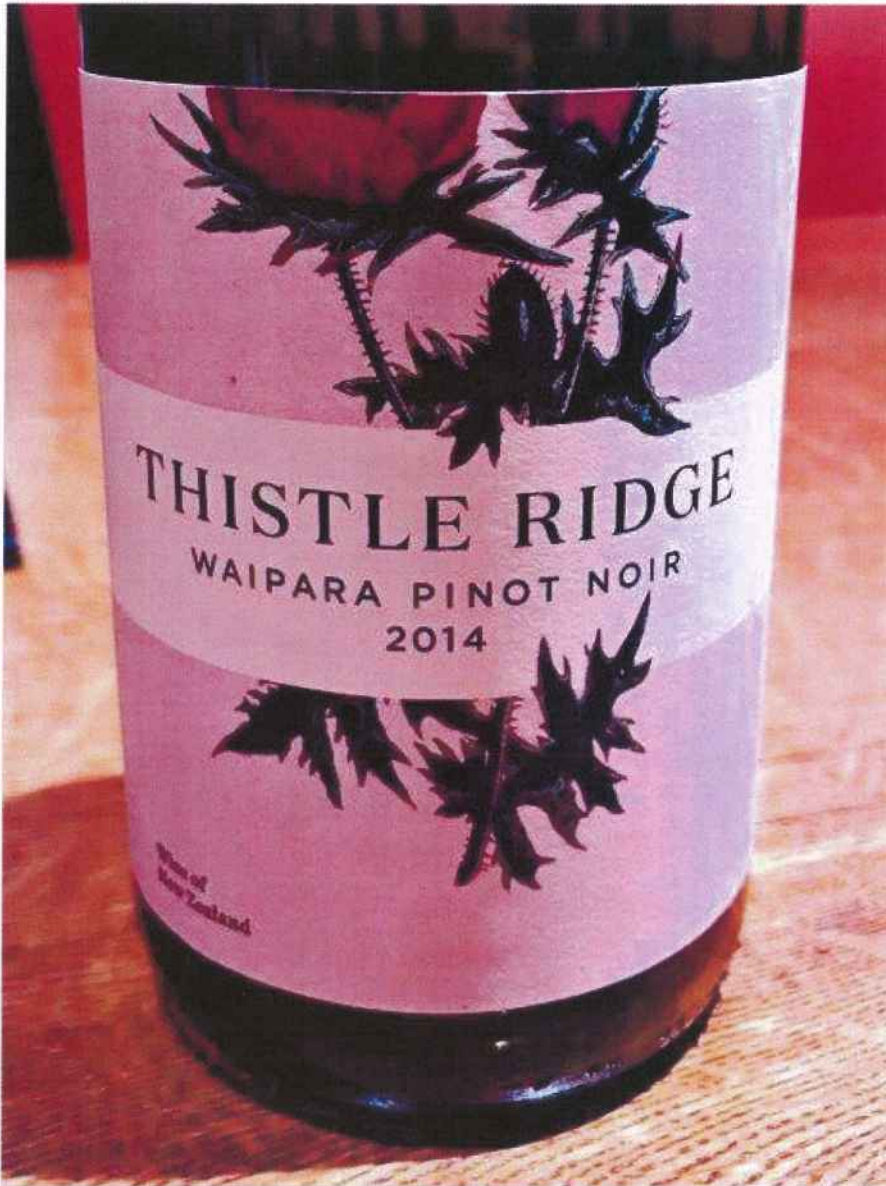
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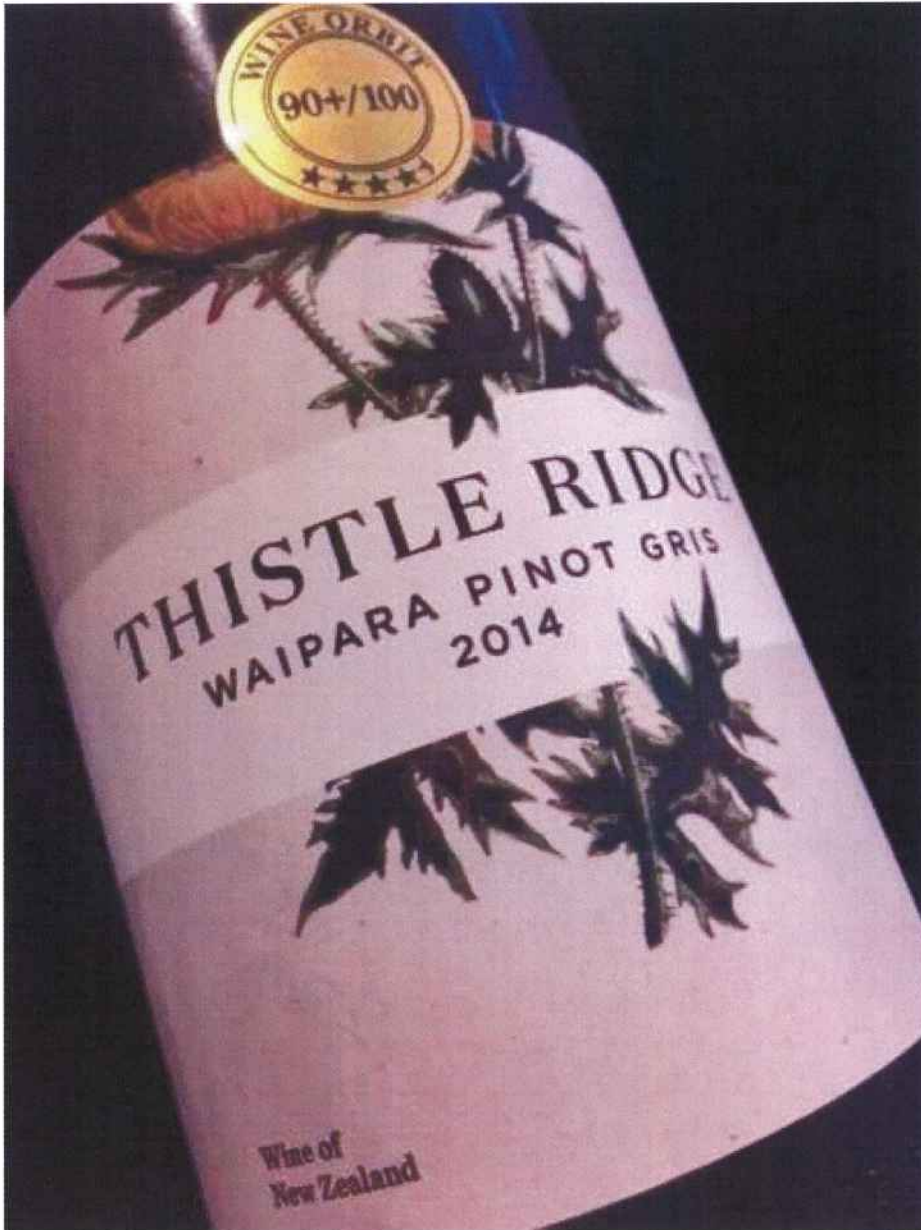
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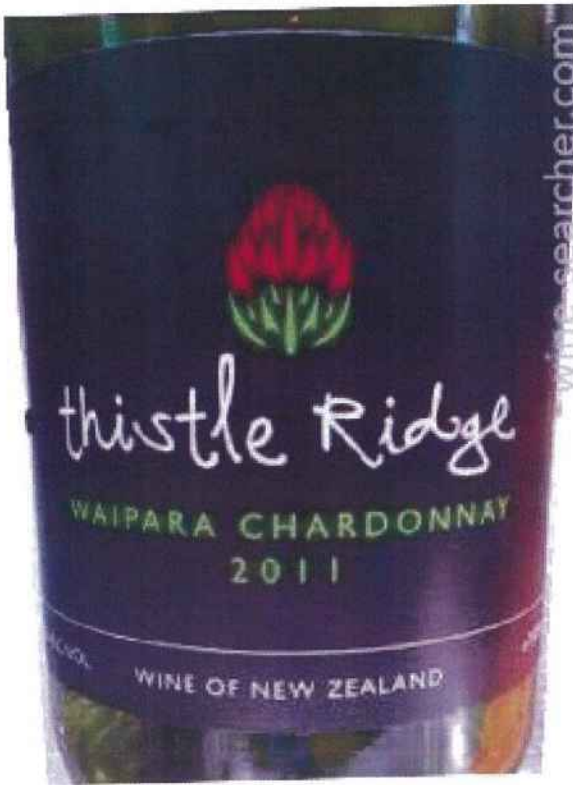
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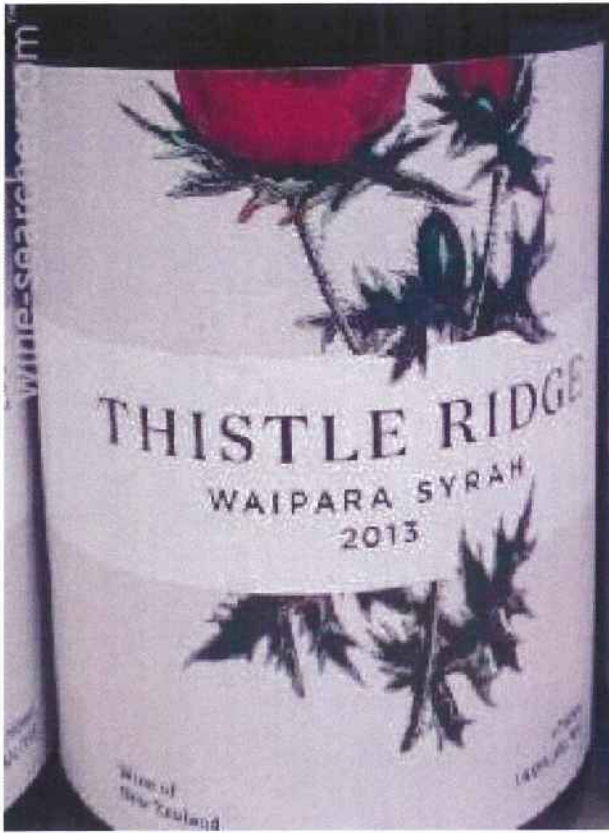
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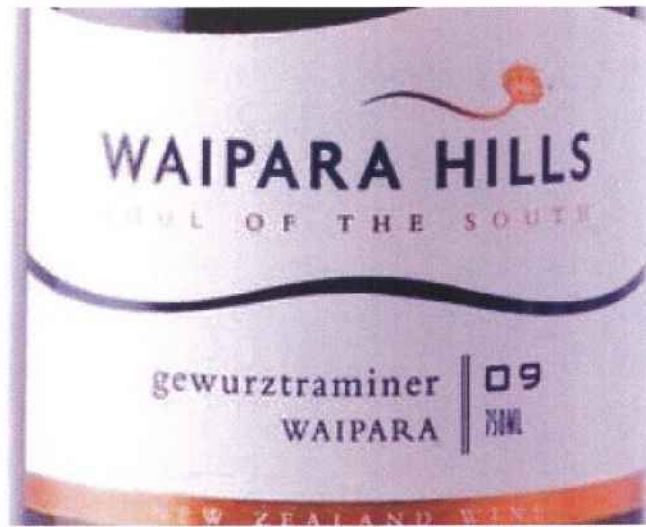


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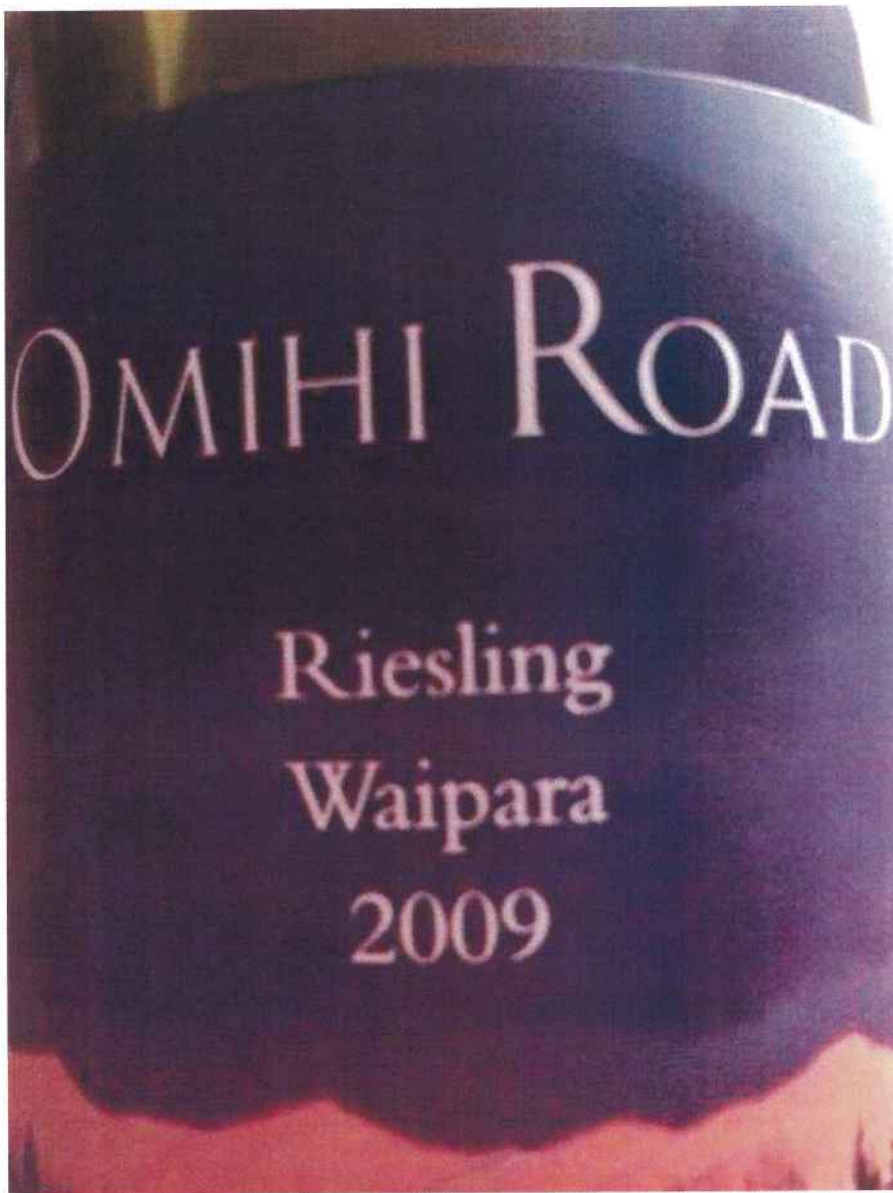
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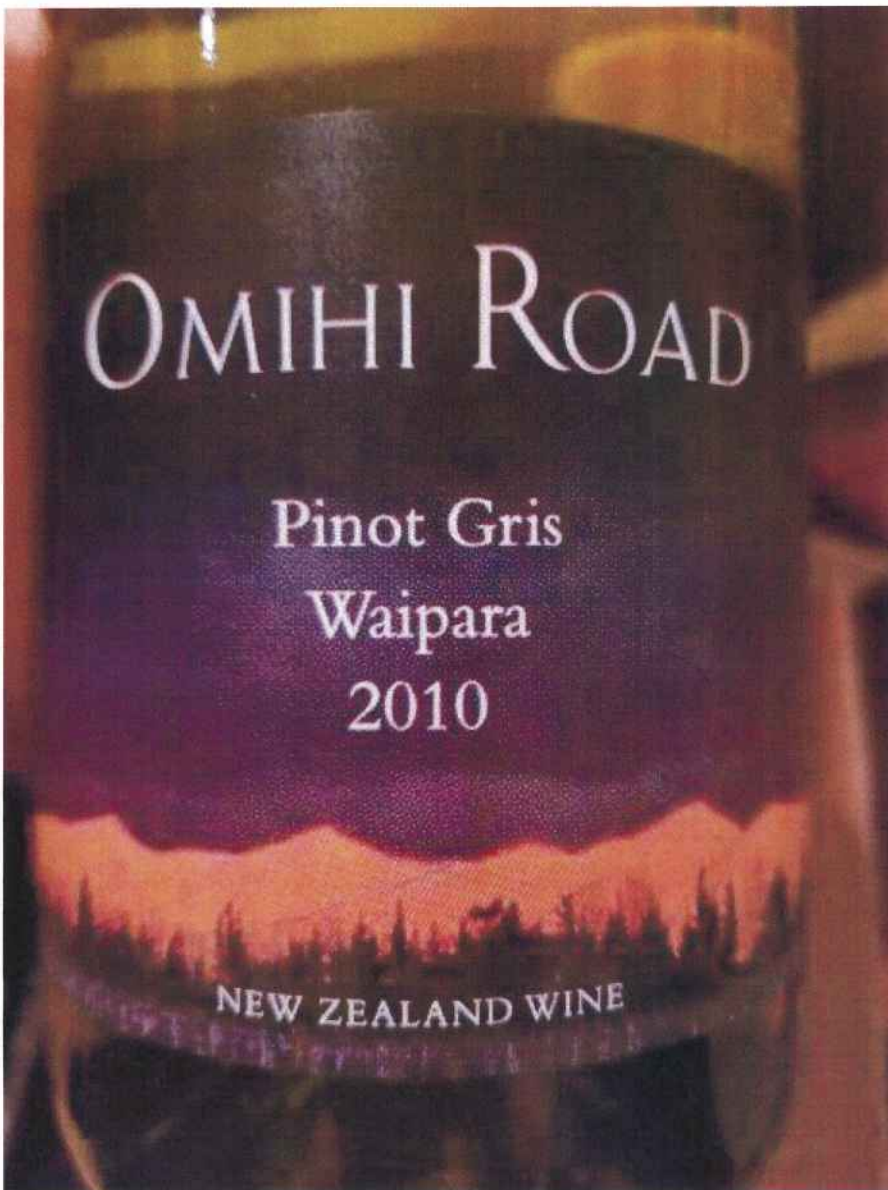
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PTD

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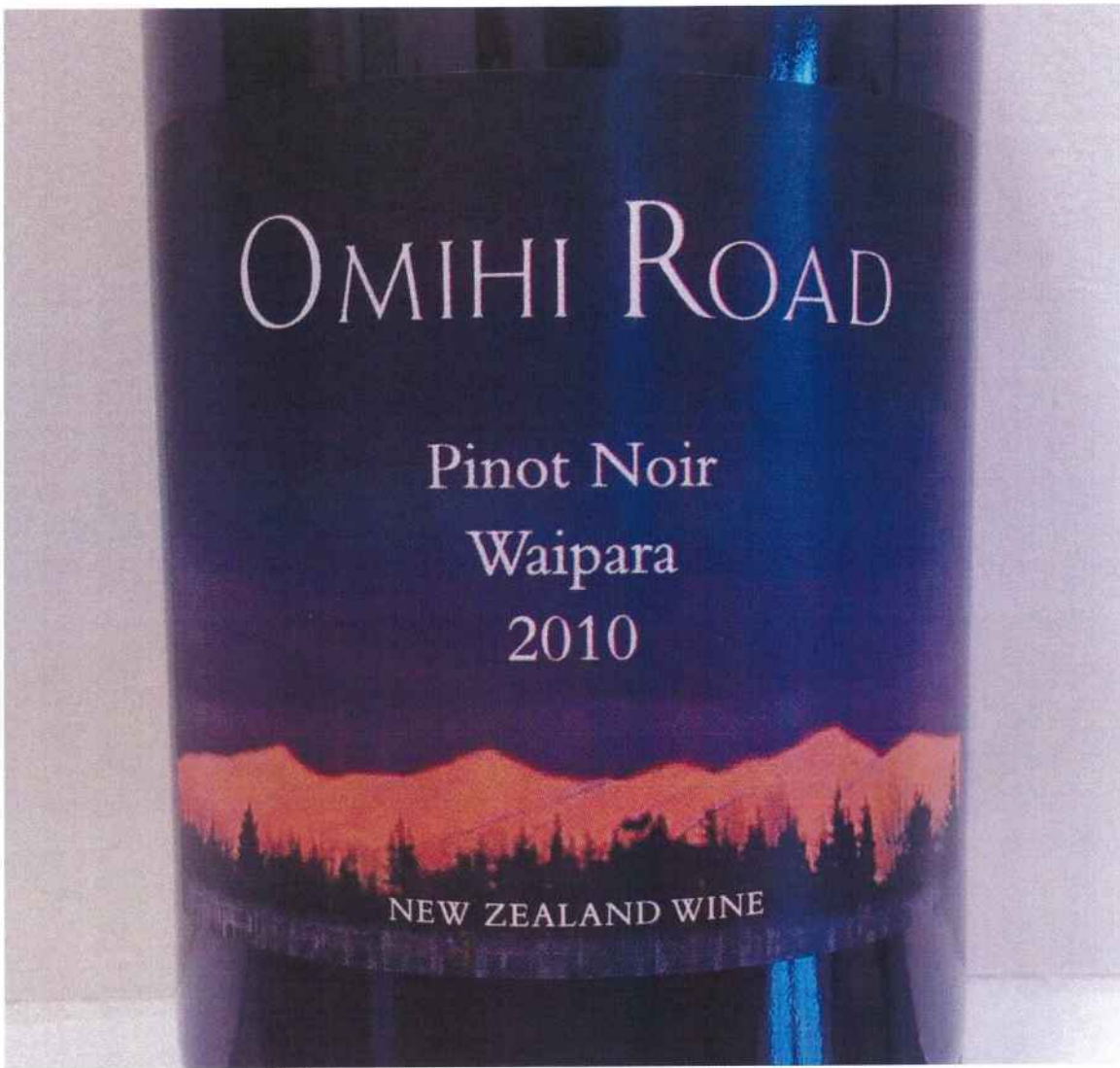
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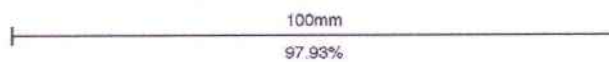
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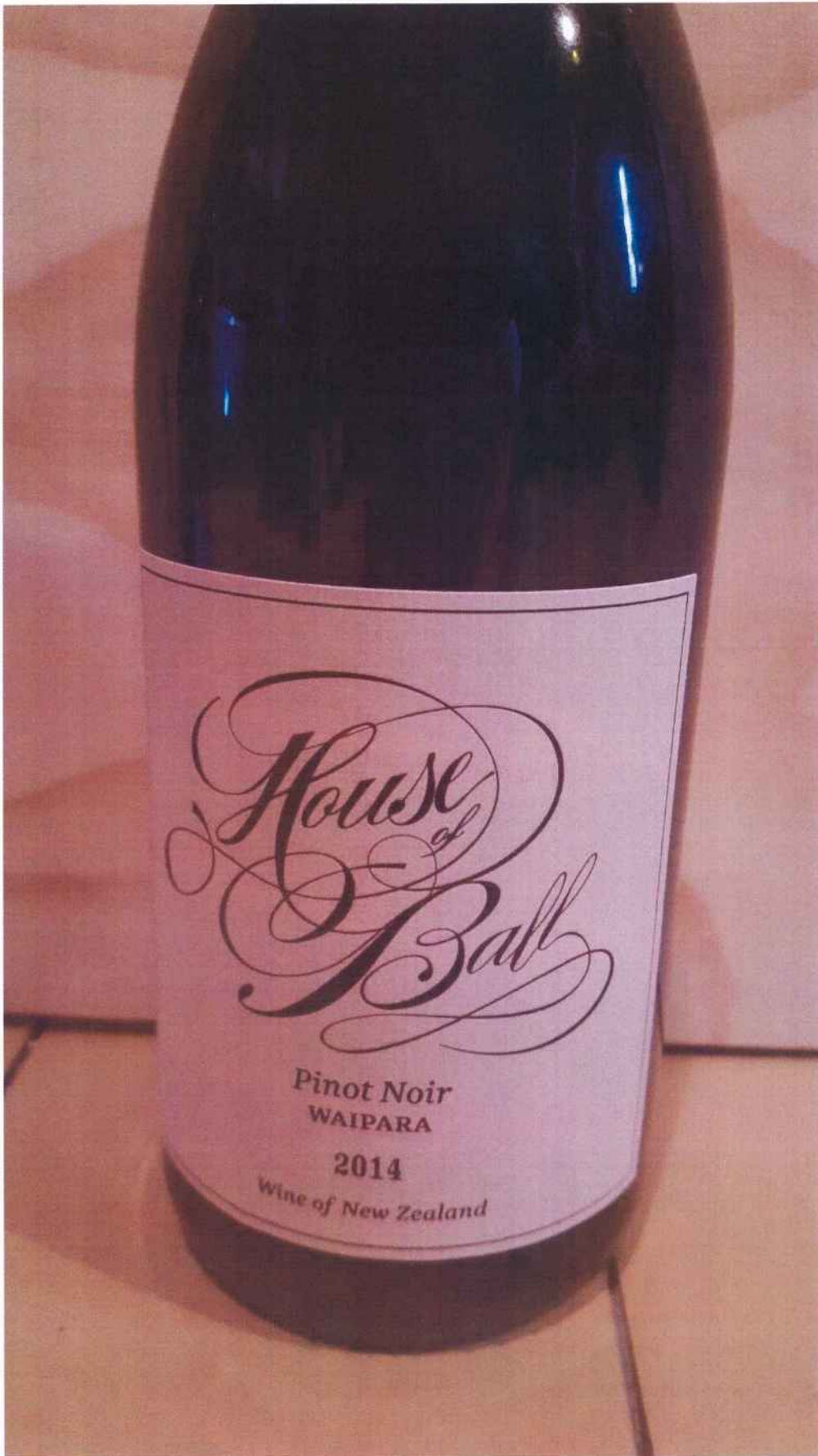
07970 Torlesse Wines Omihi Road Gewürztraminer 2014 Hikari 97.93% 04/11/15

<p>OMIHI ROAD</p> <p>Gewürztraminer Waipara 2014</p>  <p>NEW ZEALAND WINE</p>	<p>Waipara Gewürztraminer</p> <p>www.torlesse.co.nz</p> <p><i>Omihi Road runs through the heart of the Waipara Valley in the South Island of New Zealand. The front label depicts a sunrise on the Three Deans, a distinctive cluster of hills within Waipara. This wine represents the best Gewürztraminer from the vintage, showing opulent ripe fruit and complex flavours. It finishes full, rich and spicy with a touch of sweetness. Excellent drinking now but will reward further cellaring for 3-5 years. Enjoy with asian cuisine such as chicken, pork or seafood dishes.</i></p>  <p>9 421021 000076</p> <p>Produced and Bottled by TORLESSE WINES Ltd. Loibagen Drive Waipara North Canterbury</p> <p>Contains Sulphites Contains 8.0 Standard Drinks</p> <p>ALC. 13.5% VOL. NEW ZEALAND WINE 750ML</p>
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Orange Black 133#

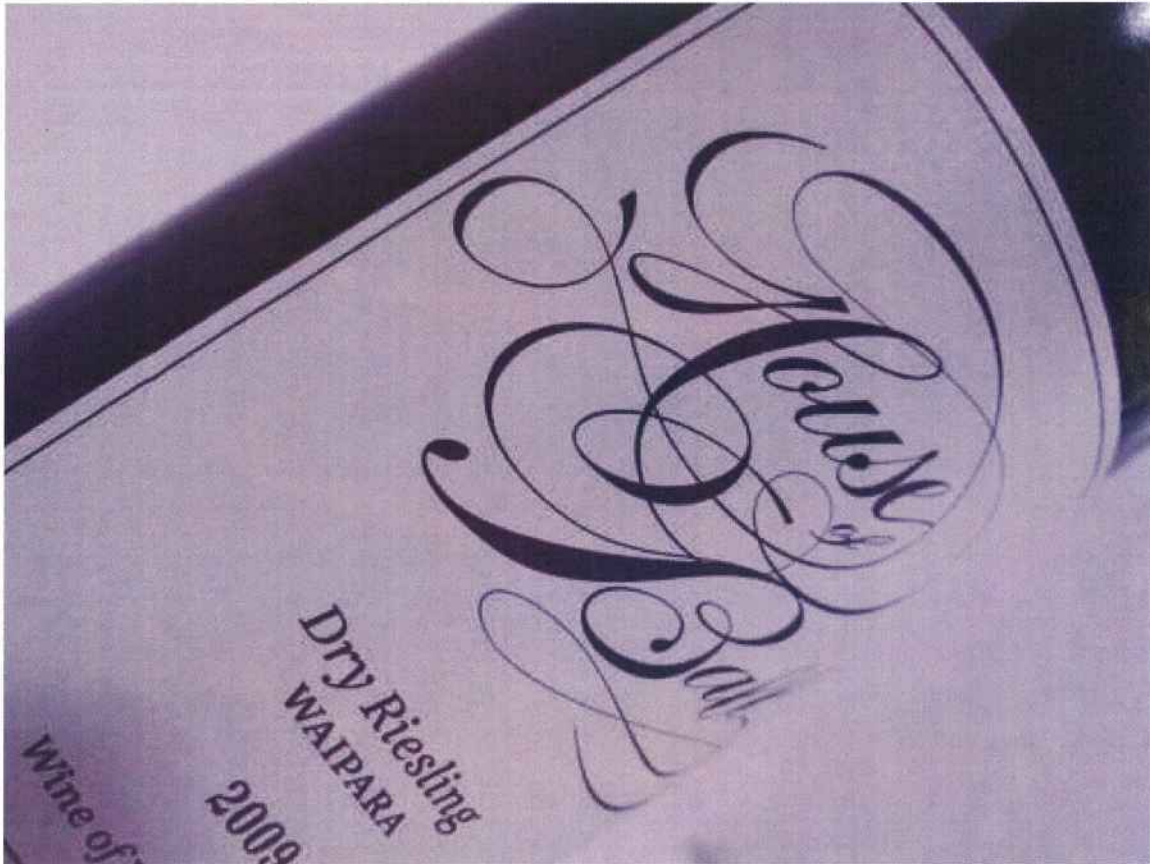


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The House of Ball produces small batches of quality, estate grown wine.

The 350 Pinotage plants which produced this fruit are hand tended solely by Lynda Ball.

The 2011 vintage has been fermented to produce a deliciously fruity, medium bodied wine.

Twenty five cases of this wine was produced.

PRODUCED AND BOTTLED BY

House of Ball
345 Mackenzies Road
Waipara, Canterbury, New Zealand
+64 3 314 6909
www.houseofball.co.nz

CONTAINS SULPHITES

CONTAINS APPROX. 8 STANDARD DRINKS

14.5% Alc/Vol
750ml

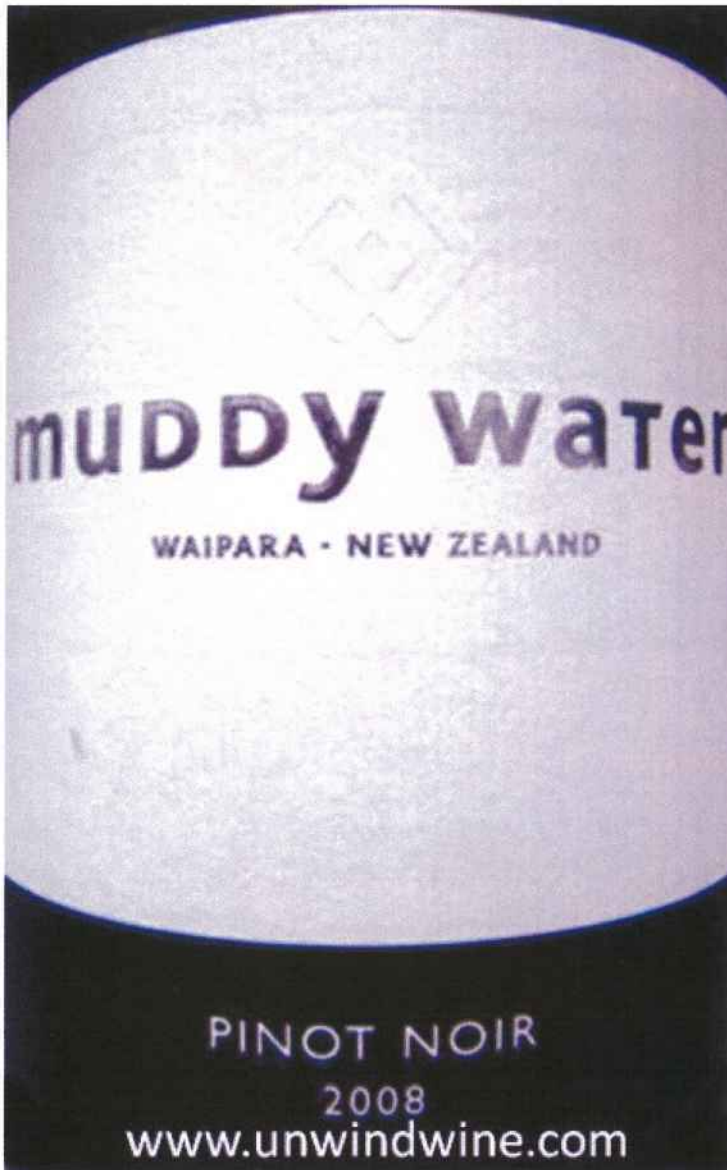
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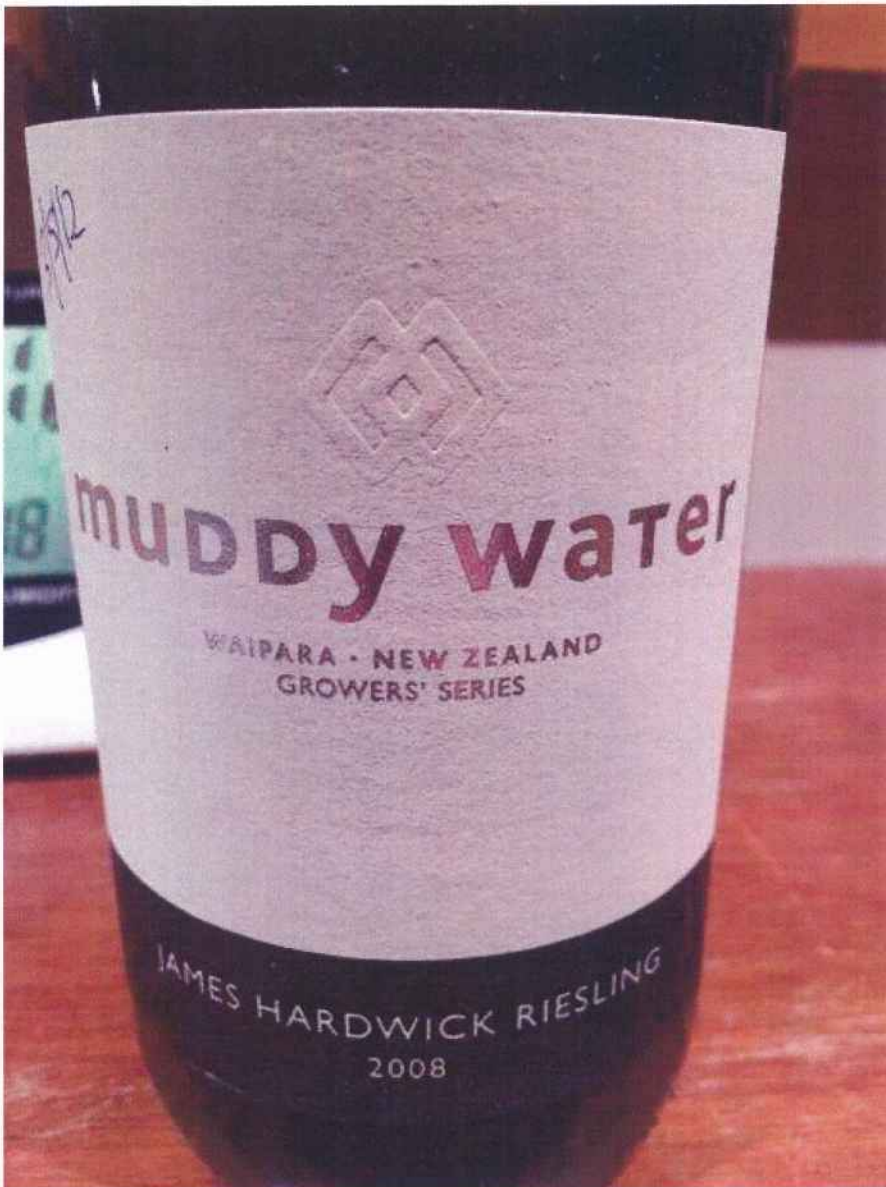


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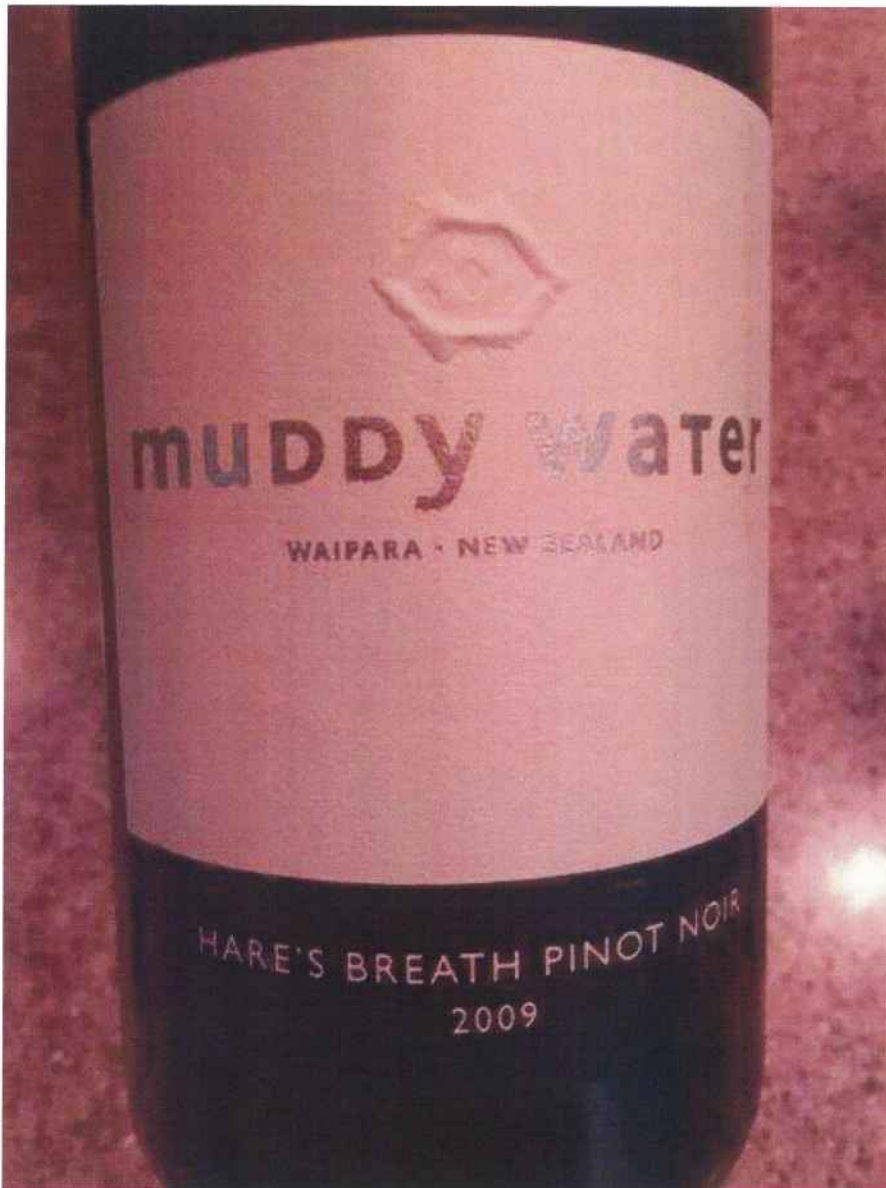


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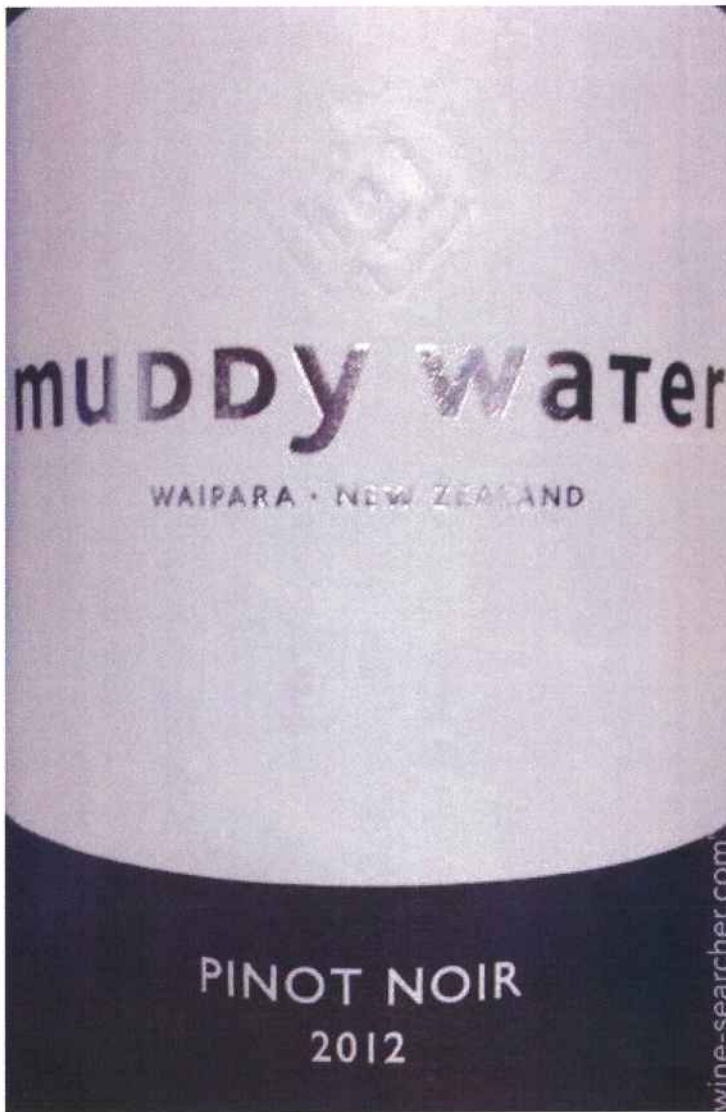
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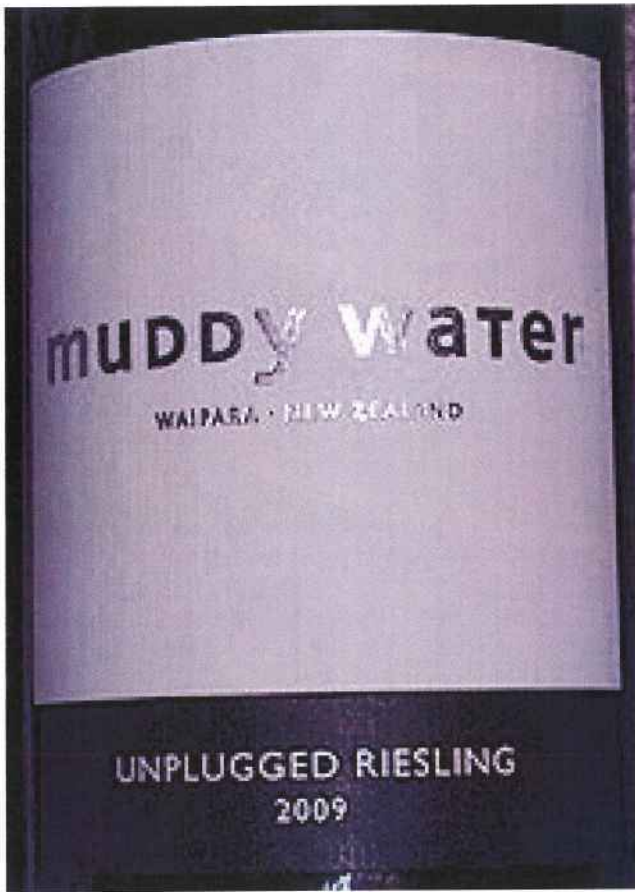
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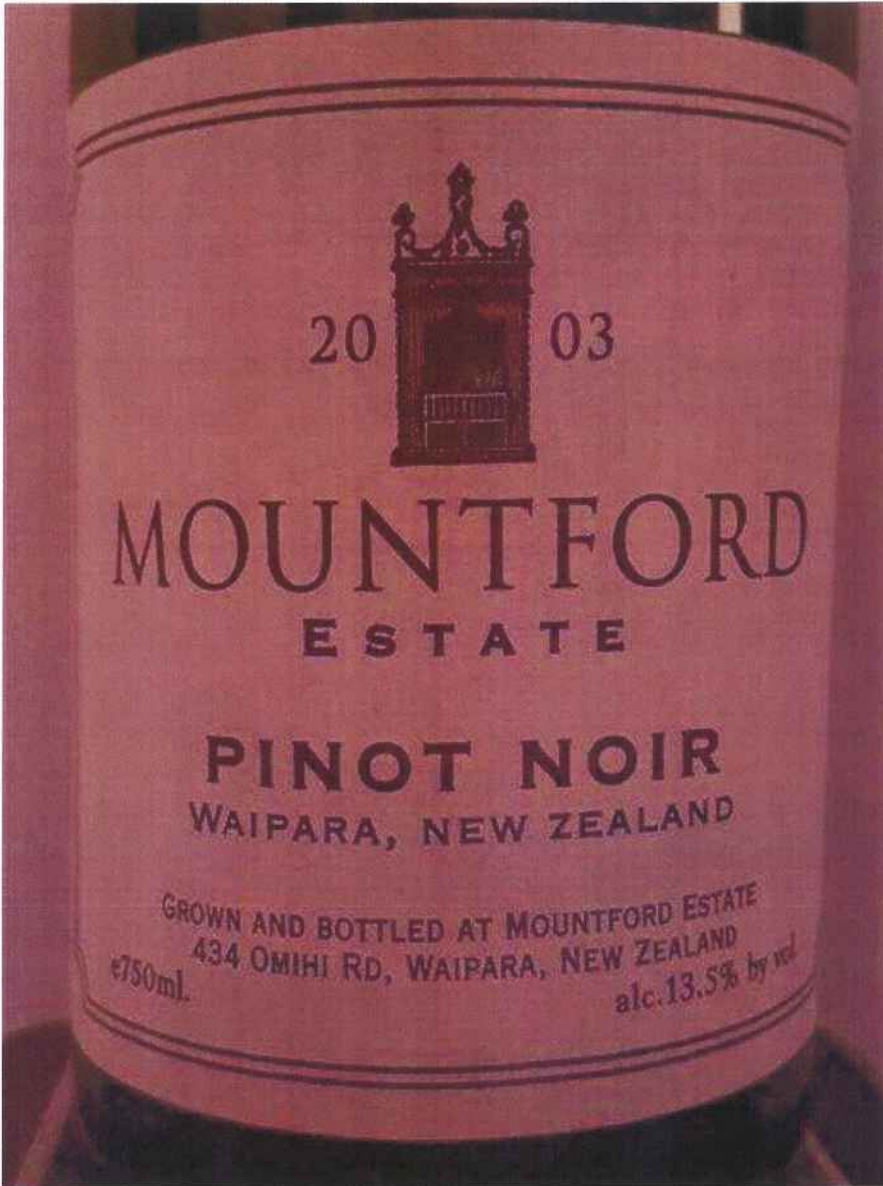
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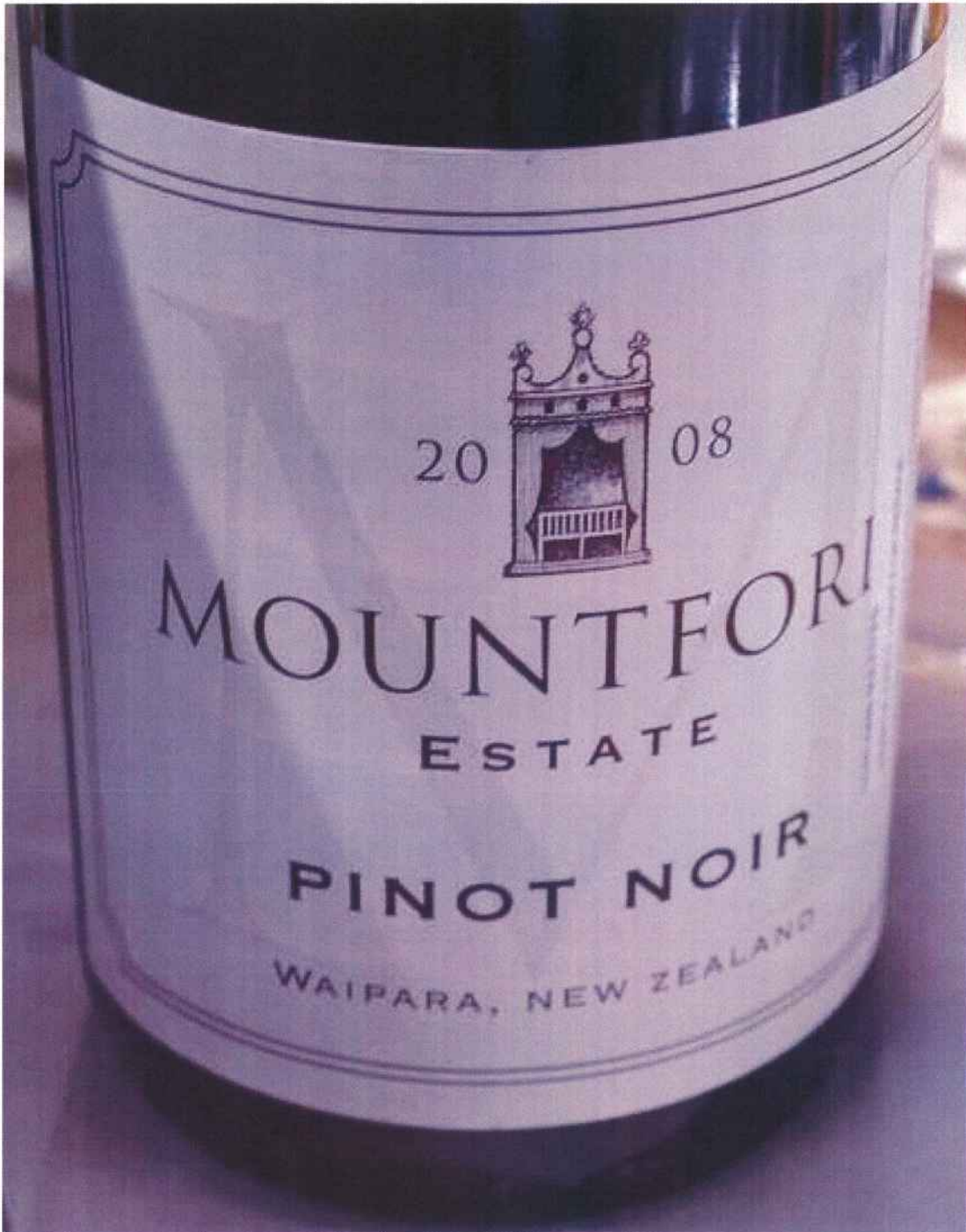
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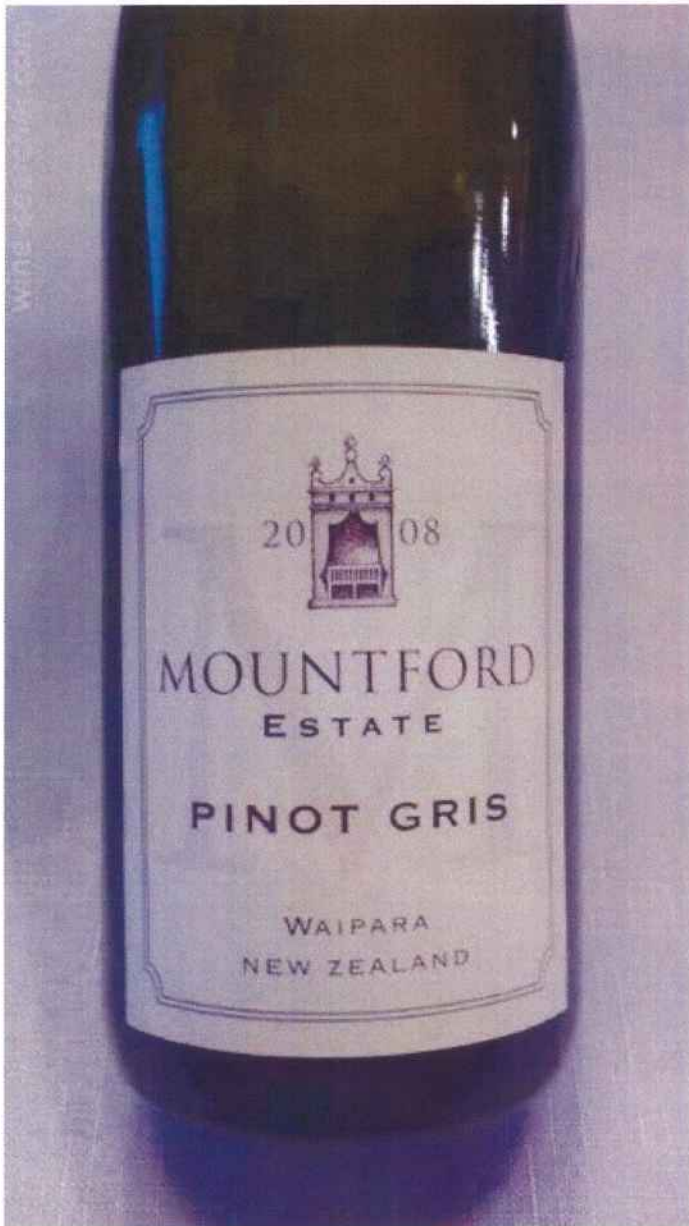
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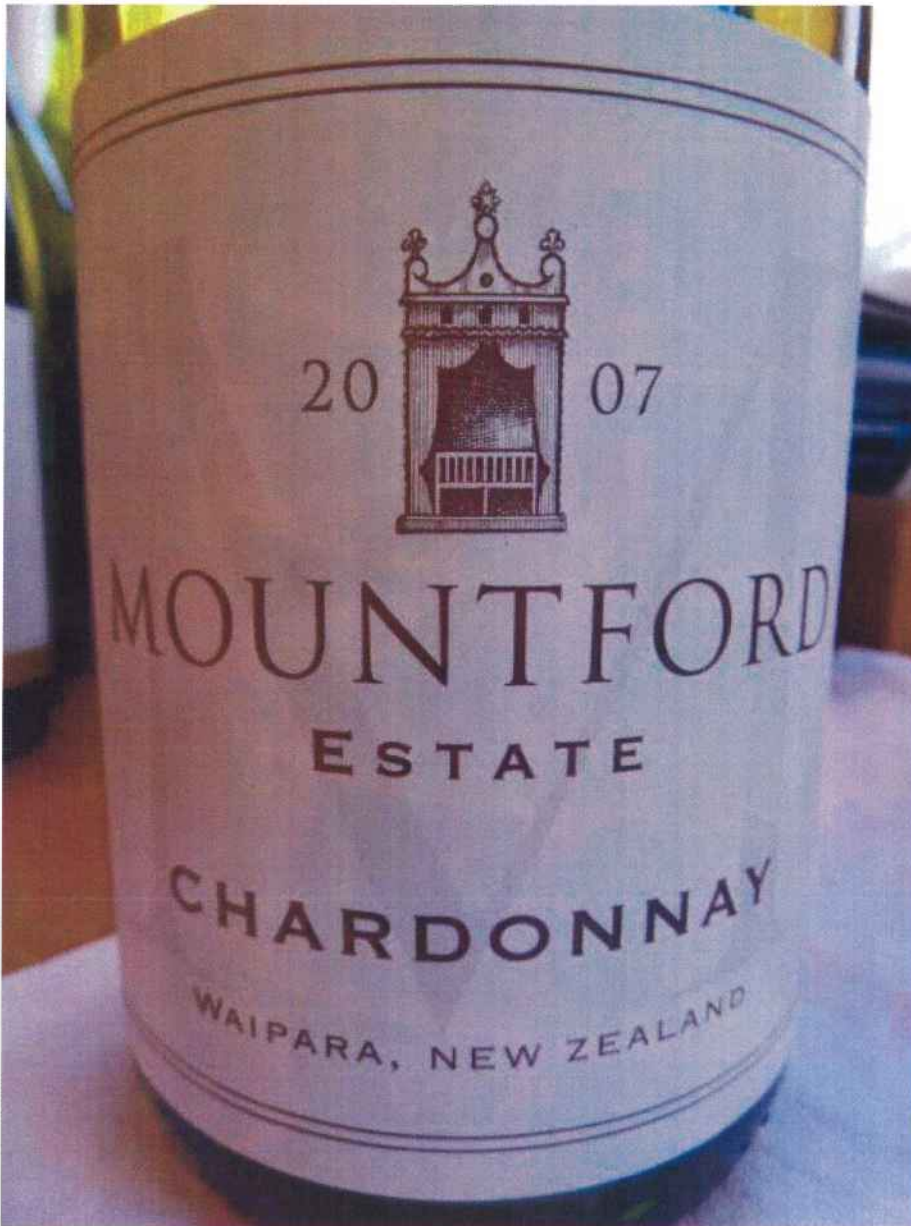
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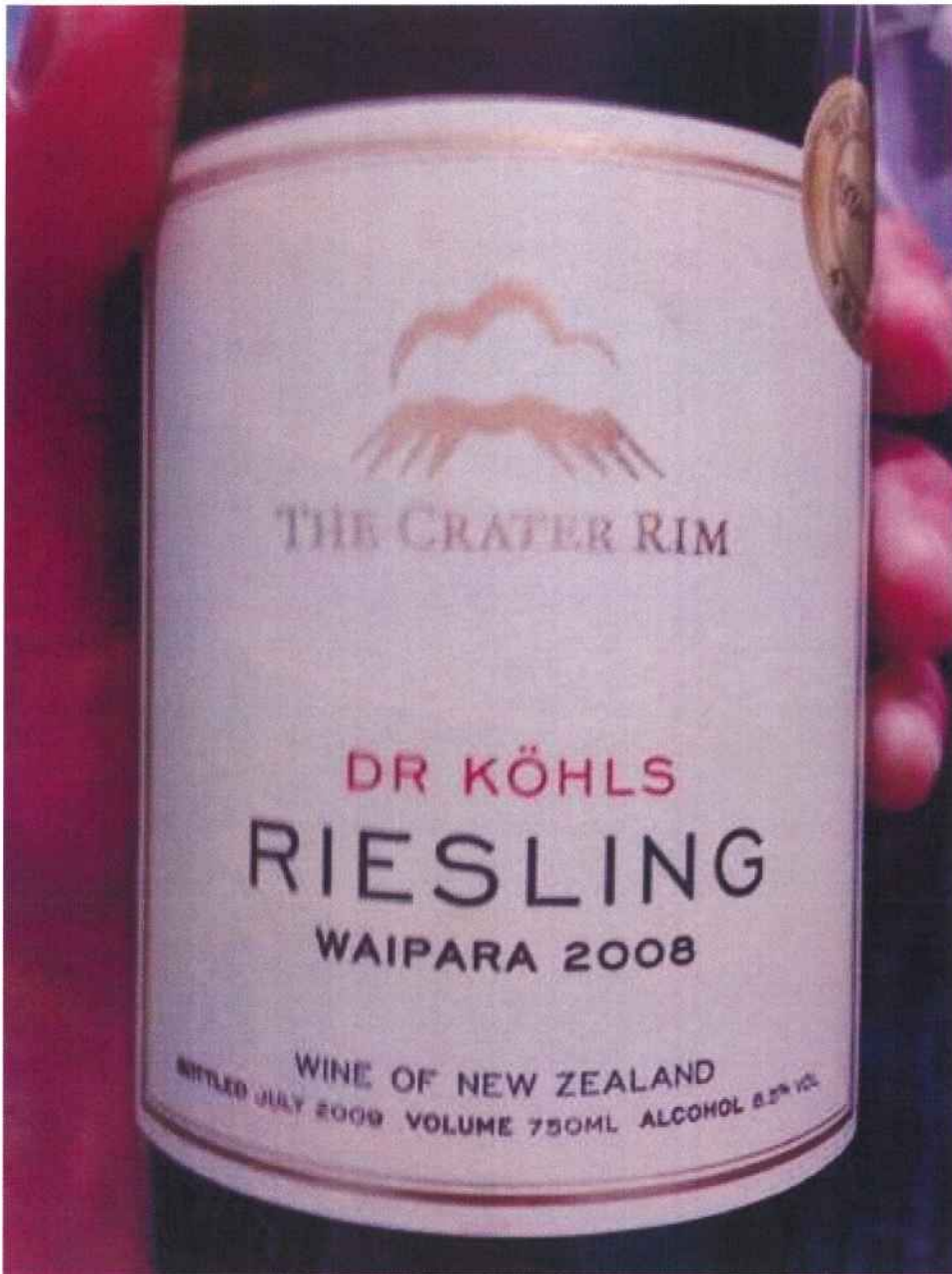
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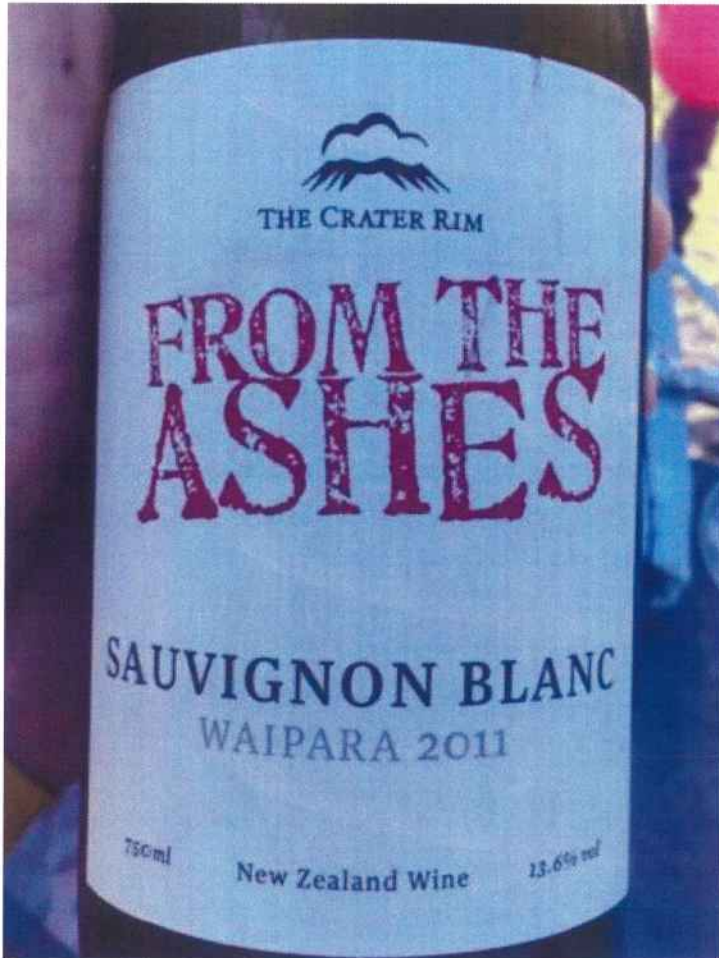
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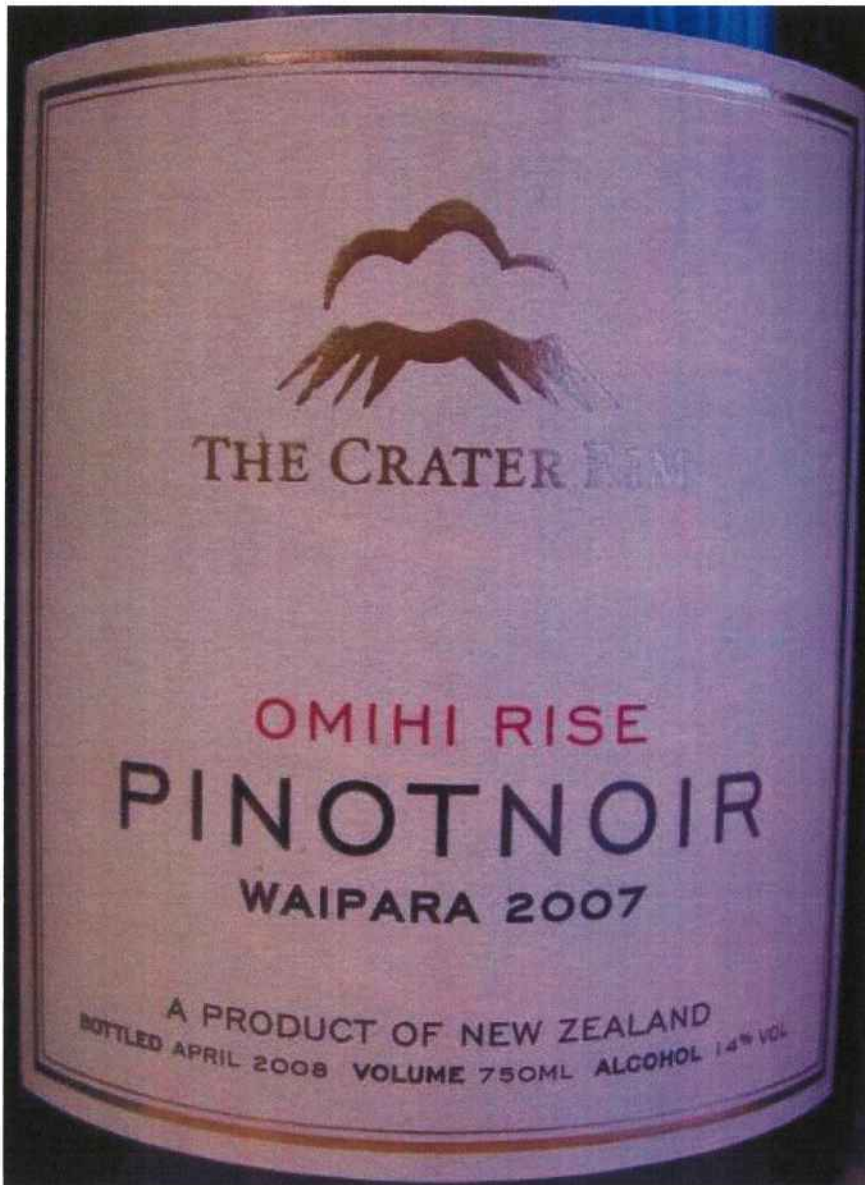
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AM

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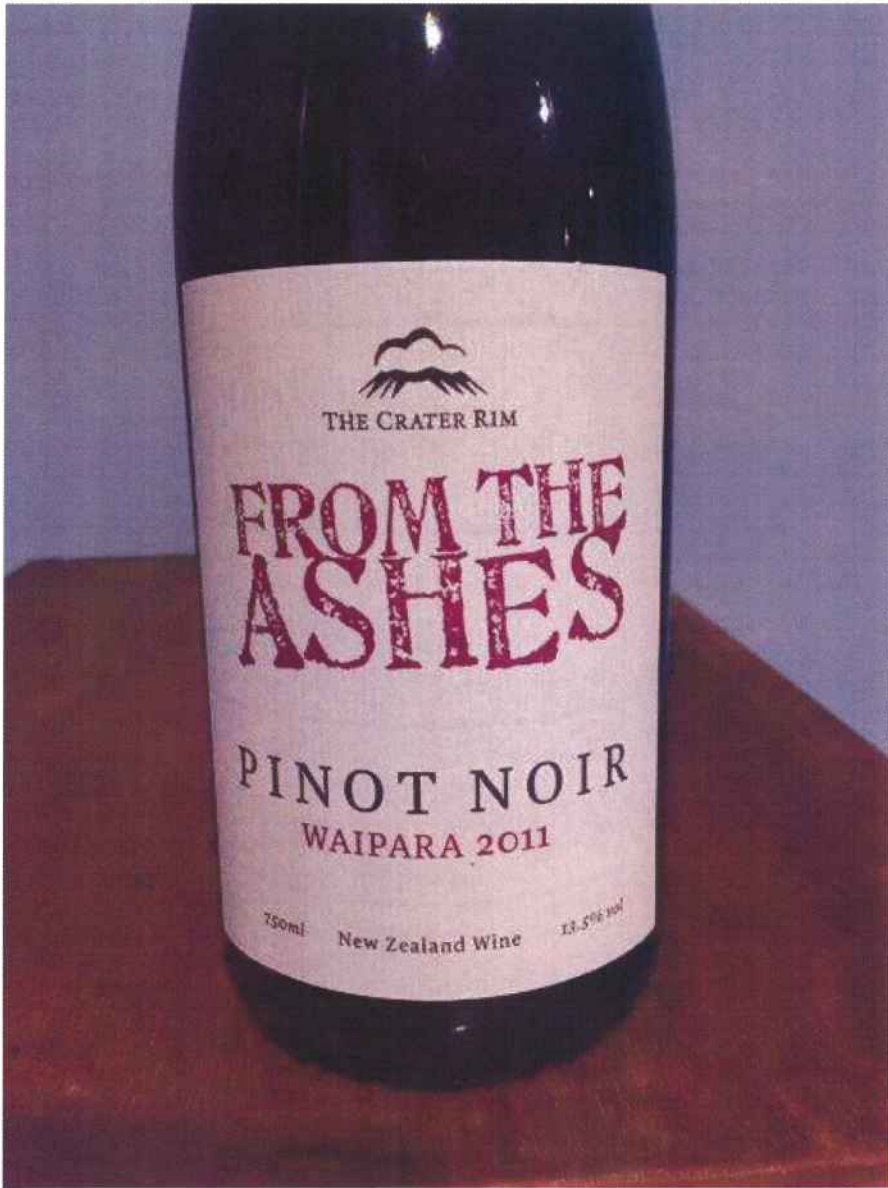
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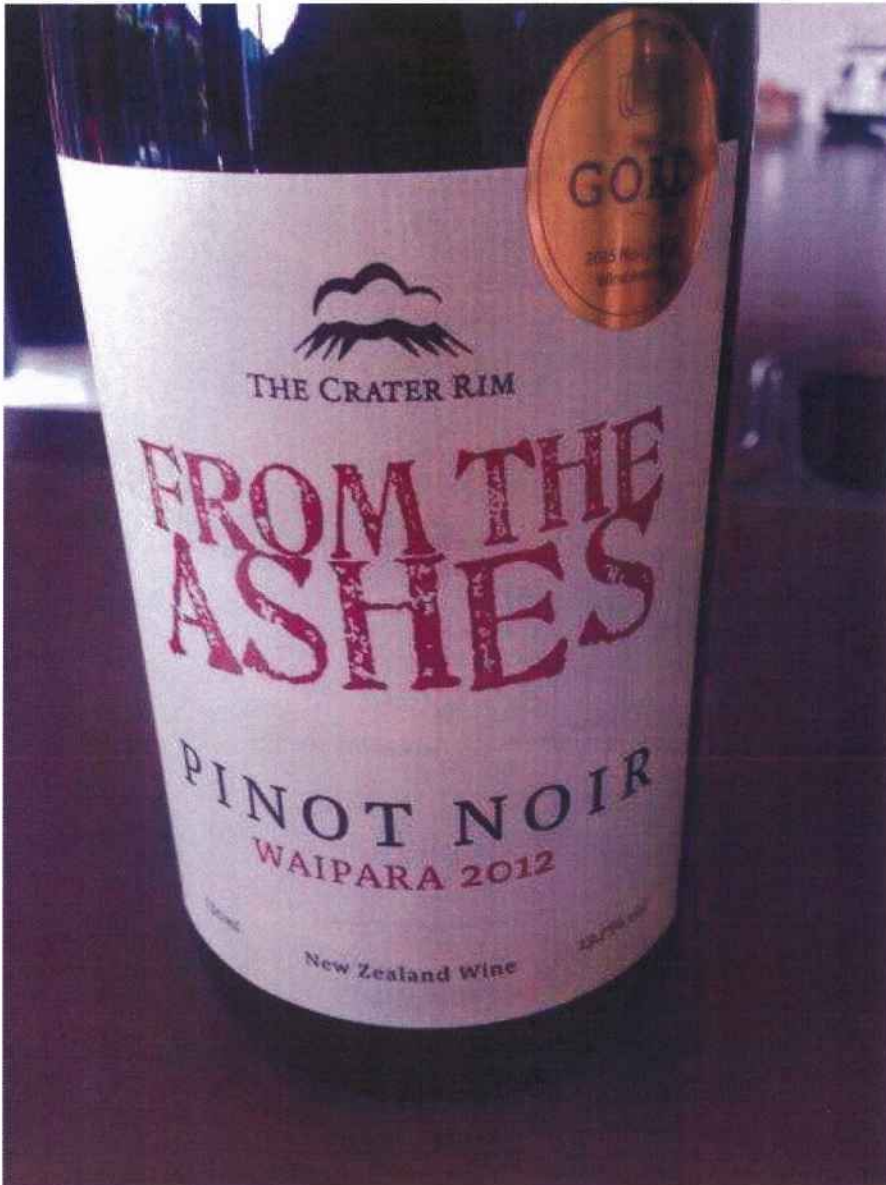
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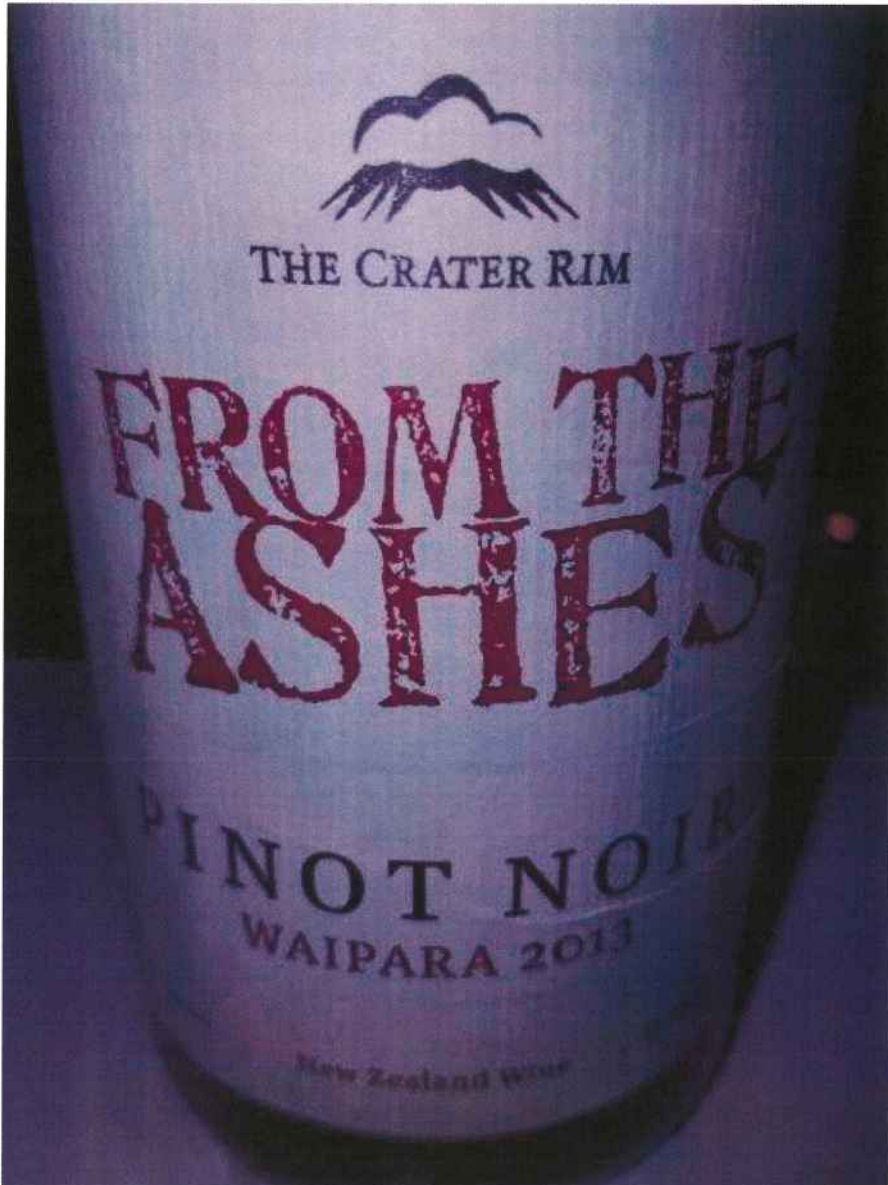
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AM

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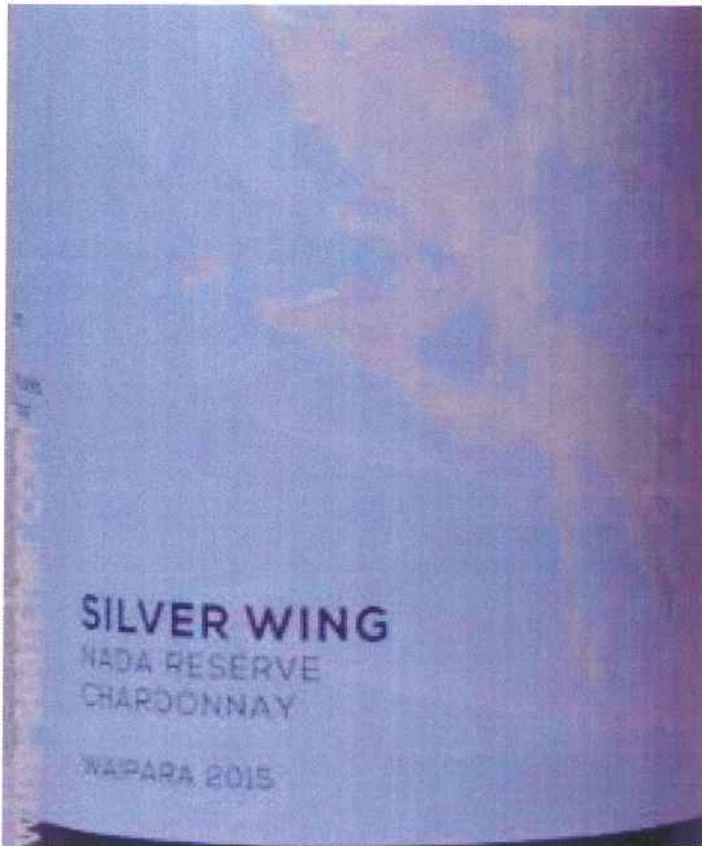
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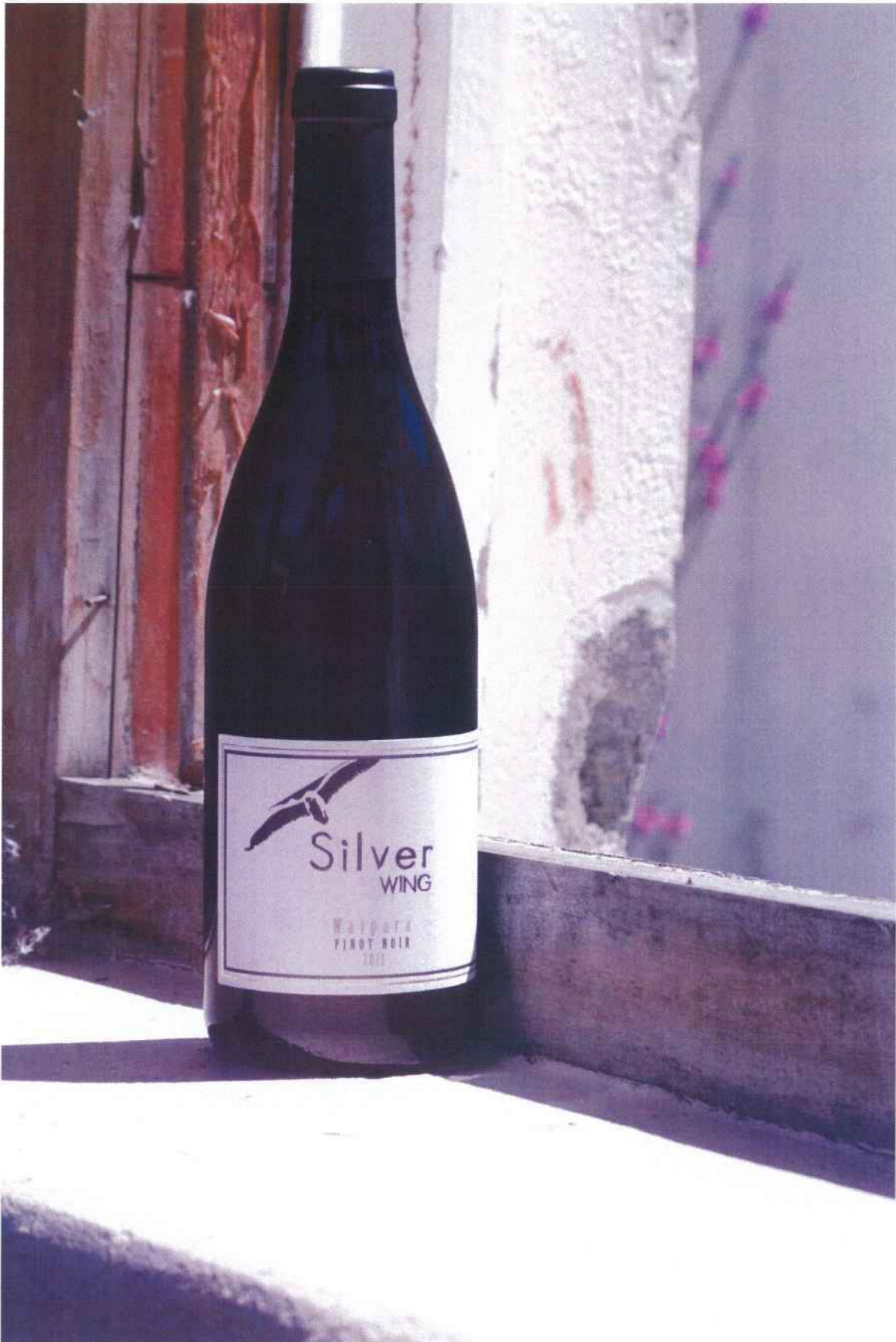
Handwritten initials in blue ink, possibly "PML".

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A handwritten signature or set of initials in blue ink, located in the bottom left corner of the page. The signature is stylized and appears to consist of a large, sweeping curve followed by a vertical line and a smaller curve.

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Handwritten signature or initials in blue ink, possibly reading "ML".

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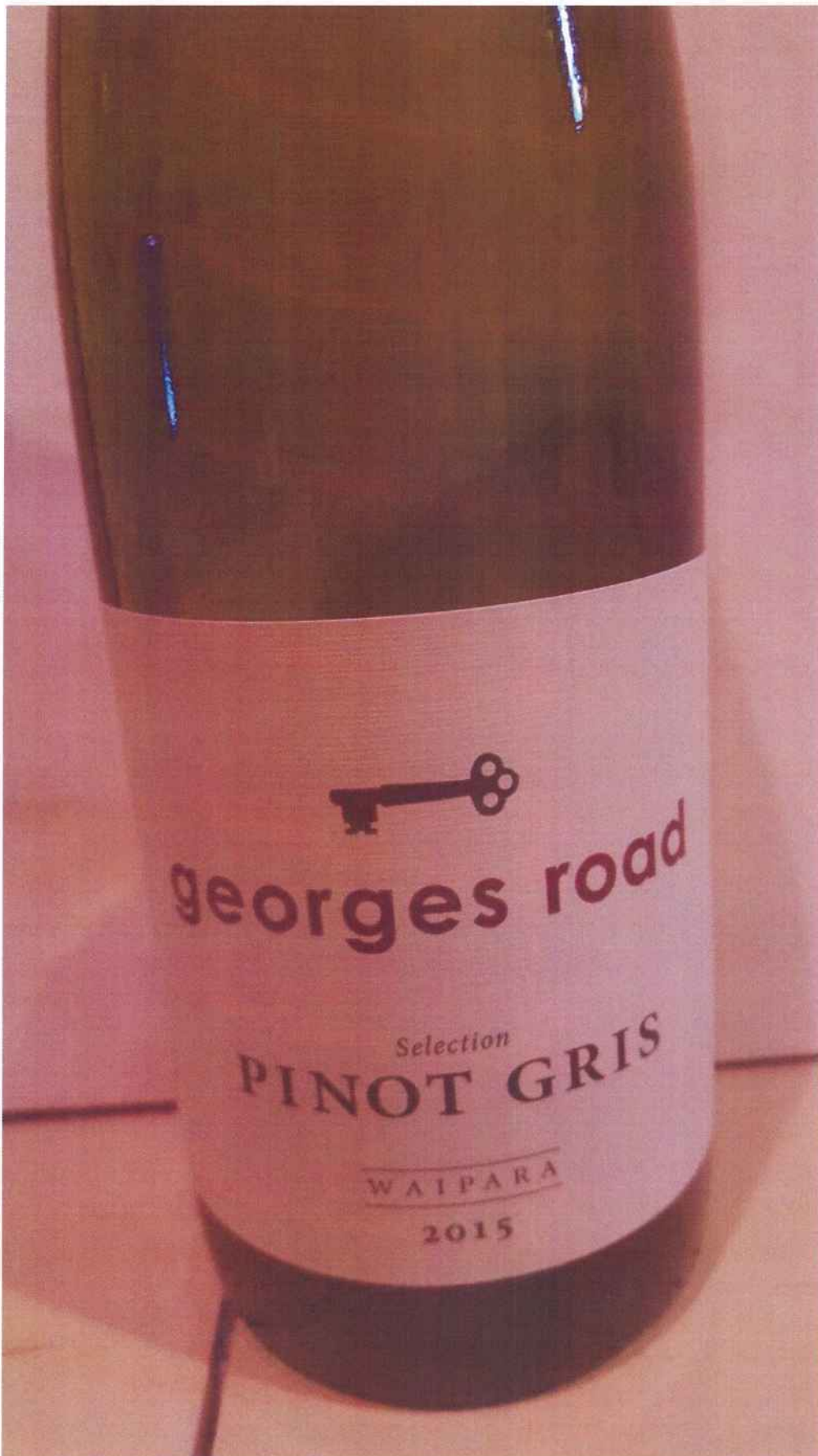


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AO

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AP

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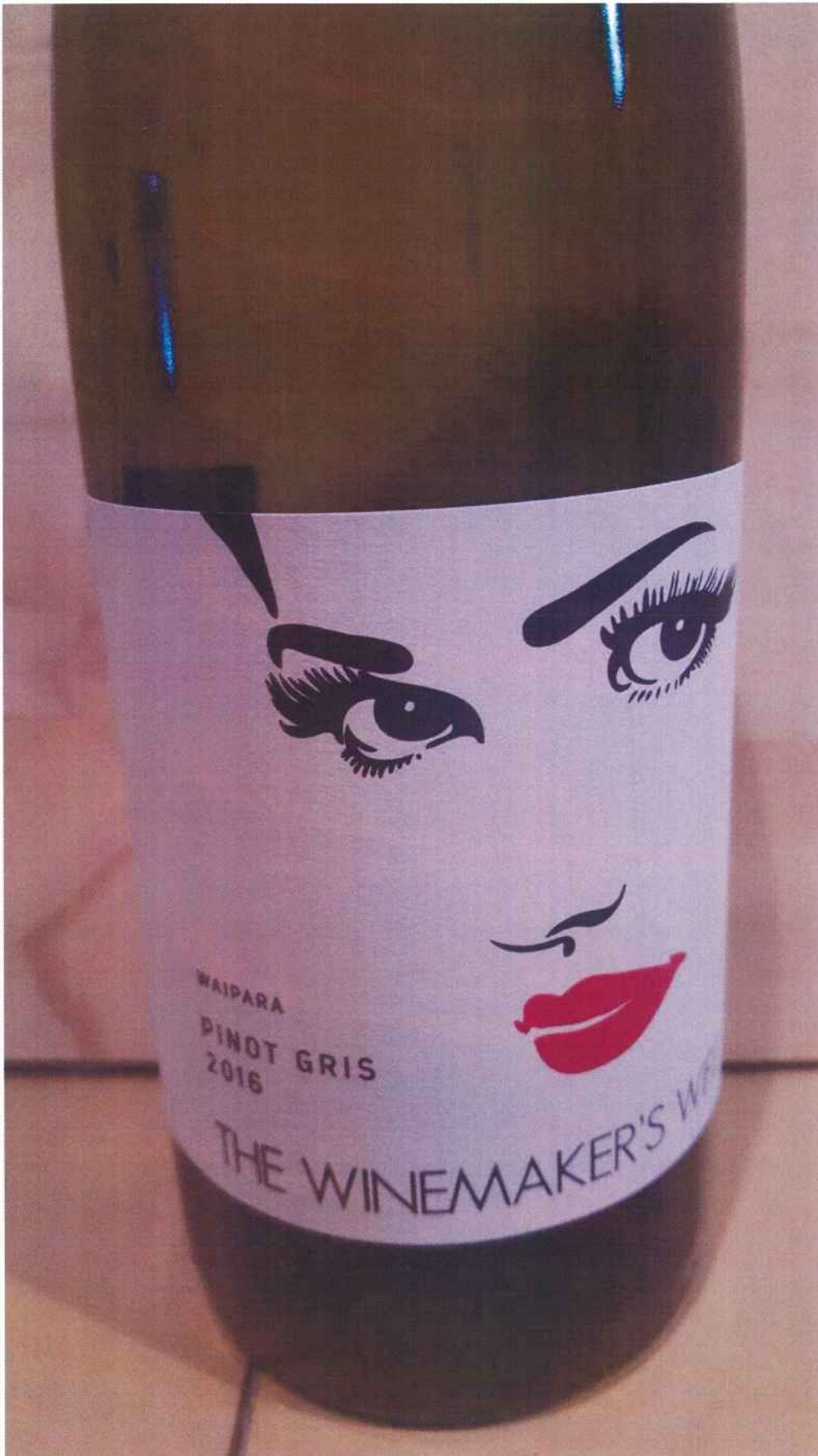
PM

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Handwritten signature

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PH