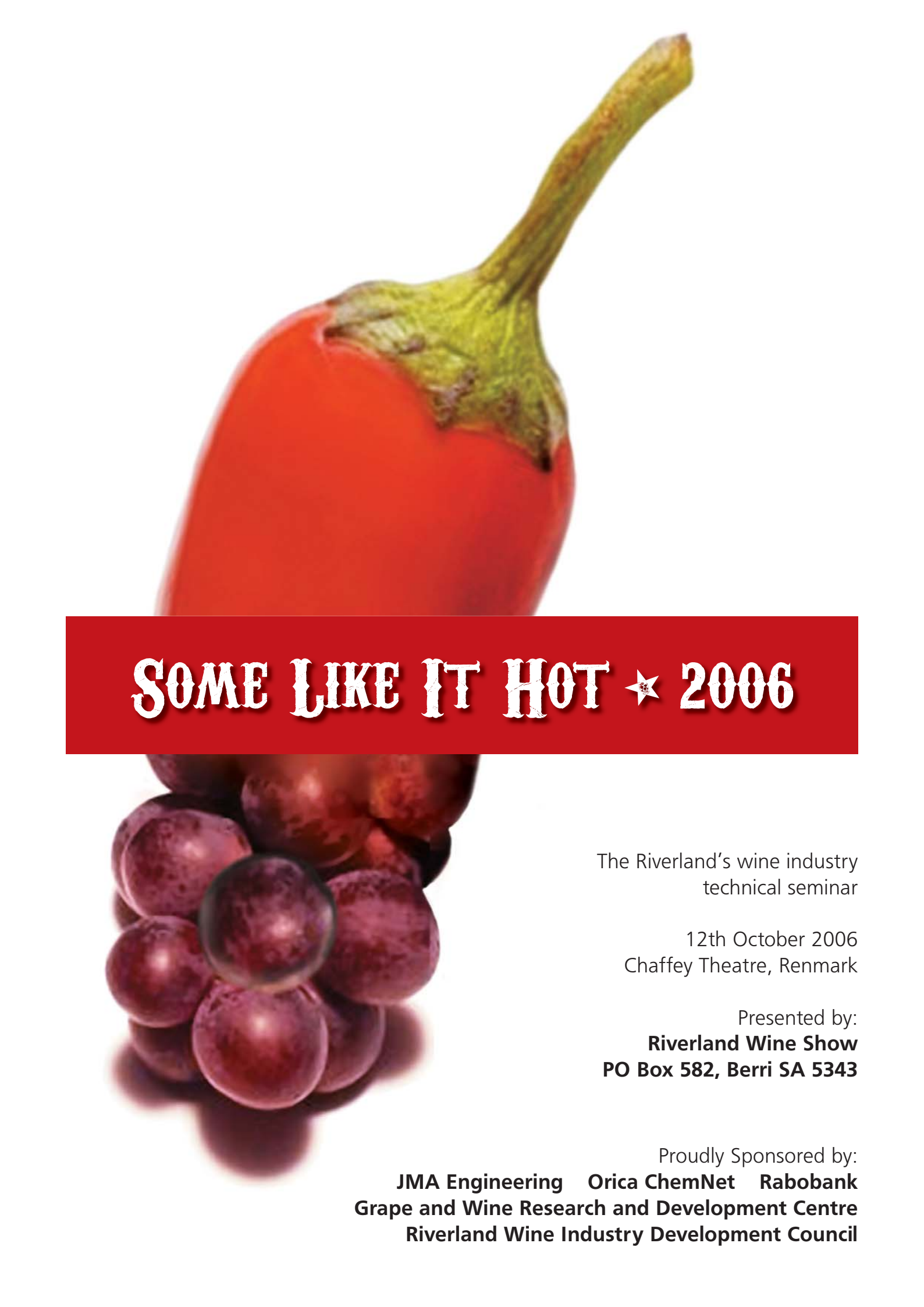


Some Like It Hot ⋆ 2006

The Riverland's wine industry
technical seminar

12th October 2006
Chaffey Theatre, Renmark

Presented by:
Riverland Wine Show
PO Box 582, Berri SA 5343

Proudly Sponsored by:
JMA Engineering Orica ChemNet Rabobank
Grape and Wine Research and Development Centre
Riverland Wine Industry Development Council

★ SOME LIKE IT HOT ★ 2006

Nearly 200 winegrape growers and winemakers from around the country descended on Renmark on Thursday the 12th of October to attend the 'Some Like it Hot' seminar.

Enclosed in the proceedings are the expert presentations that examined the Australian wine industry's position in the world wine business, and explored some of the options available to maintain our reputation for quality.

The impressive program of speakers assembled, to look at what's happening to wine sales, with a focus on the local market and one of Australian wine's principal export destinations; the United States of America.

Climate change is an issue of increasing concern and debate, and as such there was consideration to how the Australian wine industry is poised to cope with the challenges that this global phenomenon is posing.

The seminar had a deliberate blend of commercial, economic, and technical presentations with the intent of delivering valuable and usable insight to those who attended.

The annual Some Like It Hot Seminar will continue to position itself as a leading forum that presents relevant and current industry updates and trends for irrigated and warm climate regions. The calibre of presentations at this year's seminar along with the strong support in the feedback will see the next seminar program continue to strengthen it's 'must see' status.

Thank you to all of those who provided your views through the post event survey. The responses indicated that delegates recognise the importance for all players in the wine industry to broaden their appreciation of markets trends, consumer demands, global issues, technological advancements and vineyard cost reductions, to secure and strengthen the future of the industry in the region.

Thanks must go to the organising committee: Warwick Billings (Angove's Pty Ltd), Chris Byrne (RWGA), Shane Clohesy (Angove's Pty Ltd), Tiffany Greig (Orlando Wyndham), Anthony Matulik (Kingston Estate Wines), Tim Smythe (RWIDC), Cameron Hills (RWIDC), Sandy Iosefellis (RWIDC), Mark Zeppell (Hardy Wine Company). Thankyou to Anne Stepien for assistance at the seminar and the Chaffey Theatre staff.

Presented by the Riverland Wine Show, the seminar is proudly supported by Orica Chemnet, JMA Engineering, Rabobank International, the Grape and Wine Research and Development Corporation, and the Riverland Wine Industry Development Council.

Rabobank

Riverland Wine Industry Development Council Inc.

Australian Government
Grape and Wine Research and Development Corporation

ORICA CHEMNET

JMA ENGINEERING

Contact details for seminar:
'Some Like It Hot' Seminar and Tasting Secretariat
C/- Riverland Wine Industry Development Council
PO Box 520, Berri SA 5343

p 08 8582 2952
f 08 8582 3309
e wine@riverlandwine.org.au
w www.riverlandwine.org.au/techseminar.htm

SOME LIKE IT HOT 2006

Speakers and Topics

Ms Jan Steubing Smyth Wine Australia (New York)	***The USA Scene:*** *Too hot to be cool?*
Dr Richard Smart Smart Viticulture	***Snapshot:*** Impressions on the Global Wine Trade
Mr Tony Leon Dan Murphy's	***The Heat is On:*** An overview of the domestic wine trade
Mr Lawrie Stanford Australian Wine and Brandy Corporation	***Supply and Demand:*** Are we running hot or cold?
Dr Tony Proffitt AHA Viticulture	***Precision Viticulture:*** Is there profit in better knowledge?
Mr Des Walker Gooree Park, Mudgee	***Strategies*** for reducing cost in the vineyard
Dr Richard Smart Smart Viticulture	***Global Warming:*** How hot is too hot?
Dr Bob Dambergs The AWRI	***Grapes to Glass:*** Predicting wine quality in the vineyard

All documents © Some Like It Hot Seminar, 2006

Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm

THE USA SCENE

Too hot to be cool?

Ms Jan Steubing Smyth
Wine Australia (New York)

Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm



Wine Australia

Too hot to be cool?

Where does Australia go from here?

Jan Stuebing Smyth, Regional Director, USA
Australian Wine and Brandy Corporation
Renmark, 12 October 2006

© Australian Wine and Brandy Corporation

Organization and Support

- GWRDC
  - Research and development for viticulture and winemaking
- Austrade
  - Market entry
- Wine Grape Growers Australia
  - Government advocacy
  - Planning and policy
- State and regional associations
  - Local promotion
  - Government liaison
- Australian Wine and Brandy Corp
  - Regulation and compliance
  - Statistics and analysis
  - **Wine Australia** -- international



www.awbc.com.au
www.wineaustralia.com

The State of the Market

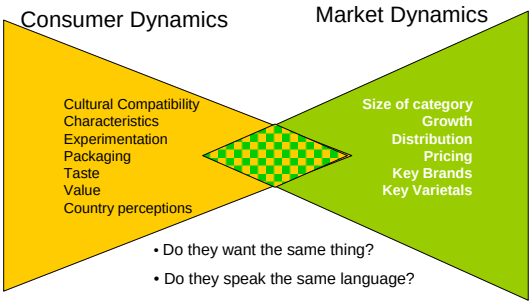
- Where we are
  - + 28.5 percent of the imported category
  - + 10 percent of the total US wine market
  - – No longer "different"
- How we got here
- Where do we go next?





BRAND CHAMPIONS
generation next
Iconic Australia

The Consumer . . . or the Trade



- Do they want the same thing?
- Do they speak the same language?

The Consumer

- 32% of wine buying population likely to try Australian wine
- They are:
  - Highest % male
  - Average age 35
  - Adventurous
  - More involved
  - Younger
  - Affluent

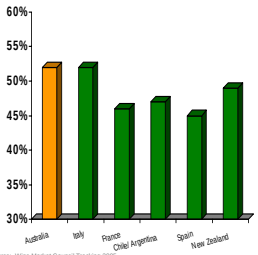




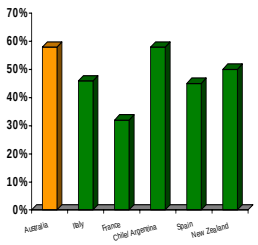


Australia Delivers

Better quality than similar wines:



Better value than similar wines:



Source: Wine Market Council Tracking 2005.

The Critter Craze



- Since January 2003, 77 of 438 new brands have been "critter" or "adventure" labels
- "Glut suckers" or a permanent fixture?
- Little consumer or distributor loyalty

The Retail Realities

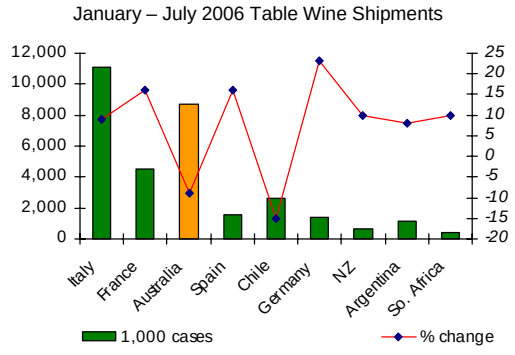
The Good
- Consumption is up
- Imports outpacing US
- Strong growth over time

The Bad
- Prices (and profits) are down
- Crowded shelves
- The stereotyping of Australia
- What's next?





The Competition



The Challenges

- Two markets?
- Varietal v. regional set
- Competition from everywhere in all categories
- Too many myths
- Reaching the audience



The Opportunities

- Move above that $10
- "Alternative" varietals
- Target restaurants
- Tell *your* story
- Project a positive, diverse image
- The educational imperative
- Quality



★ SOME LIKE IT HOT ★ 2006

SNAPSHOT

Impressions on the Global Wine Trade

Dr Richard Smart
Smart Viticulture

Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm

SNAPSHOT IMPRESSIONS OF GLOBAL WINE TRADE

By Dr Richard Smart
Tamar Ridge Estate and
Smart Viticulture

WHAT ARE AUSTRALIA'S ADVANTAGES IN WINE EXPORT?

- Better technology?
- Better climate?
- Cheaper land?
- Better marketers?
- Better wines?
- Better varieties?
- More mechanisation?
- Cheaper grapes?
- Mostly fewer regulations

AUSTRALIA'S COMPETITION

- South America, esp Chile
- Europe, esp Spain and Southern France

HOW WELL SUITED ARE YOUR PRESENT VARIETIES?

Present varieties

Shiraz	116 kt
Cab Sauv	79 kt
Merlot	29 kt
Petit Verdot	14 kt
Ruby Cab	14 kt
Total	278 kt

White varieties

Chardonnay	106 kt
Colombard	37 kt
Gordo	23 kt
Semillon	11 kt
Chenin Bl	5 kt
Total	204 kt

WINE LABELLING….
The genesis

- Generic labelling like hock, claret burgundy
- Australia until 1960's
- California, post prohibition, 1930s introduced varietal labelling
- Now more or less spread around world
- One finds "claret" or Bordeaux labelled Cabernet Sauvignon
- Varietal names have become like brands

THE ALTERNATIVE

- Develop a "brand name" for the best red and white blends for the region
- Examples Classic Dry White WA
  Emilio, Merlot from St Emillion, Fr
  Brilliant Blend, SA

THE DEVIL YOU KNOW……
VARIETAL LABELLING

★ SOME LIKE IT HOT ★ 2006

THE HEAT IS ON

An overview of the domestic wine trade

Mr Tony Leon

Dan Murphy's

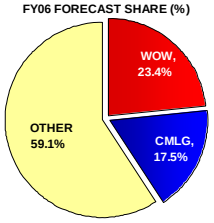
Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm

The Heat Is On

An Overview of the Domestic Wine Trade

Tony Leon

Off Trade: Who Owns What?



How We See the Market

Retail consolidation

Production & distribution consolidation

Globalisation

The future



What's Happening at Woolies

Supply Chain re-vamp

New CEO Michael Luscombe

New Zealand

Our competition

The Dan Murphy's Story

The family history – Melbourne 1878

Mr Murphy opens "The Cellar" Prahran 1952

Changes in the 1980's

1998 and beyond…

Group Wine Category Trends

Sales value growing by value at around 10% year-on-year outside DM's

Sales $ growing at 20% year-on-year at DM's

Volume growing faster than value

Cleanskins – speeding up sales

Our Advice

Create, lead & drive varietal trends

Quality – yield management & winemaking

Marketing – packaging and a reason or story

It pays to advertise & profit is <u>not</u> a dirty word!

Keeping Your Customers Happy

Drive your costs down to deliver value & profit

Deliver, deliver, deliver!

Accuracy in administration & invoicing

Keep us informed – where's the marketing manager?

Thank You

Questions?

★ SOME LIKE IT HOT ★ 2006

SUPPLY AND DEMAND

Are we running hot or cold?

Mr Lawrie Stanford

Australian Wine and Brandy Corporation

Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm

Australian Government
Australian Wine and Brandy Corporation



Riverland Wine Show Society

Some Like It Hot Seminar

12 October 2006

Lawrie Stanford
Manager-Information and Analysis

Wine Australia

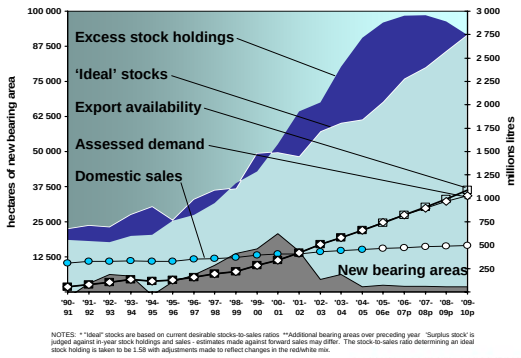
AWBC © October 2006

Presentation overview …

1. The Situation
   - Balance – WI versus CC
   - Supply issues – balance
2. Reasons to be positive
3. Market opportunities
4. Local data

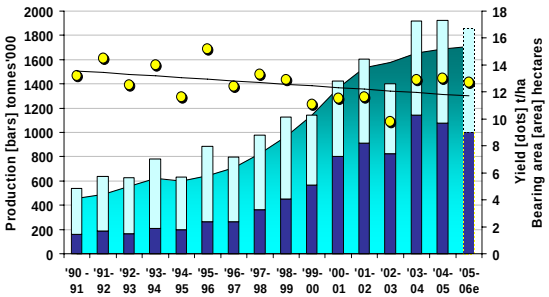
The situation

An overview of industry prospects …



NOTES: * "Ideal" stocks are based on current desirable stocks-to-sales ratios **Additional bearing areas over preceding year 'Surplus stock' is judged against in-year stock holdings and sales - estimates made against forward sales may differ. The stock-to-sales ratio determining an ideal stock holding is taken to be 1.58 with adjustments made to reflect changes in the red/white mix.

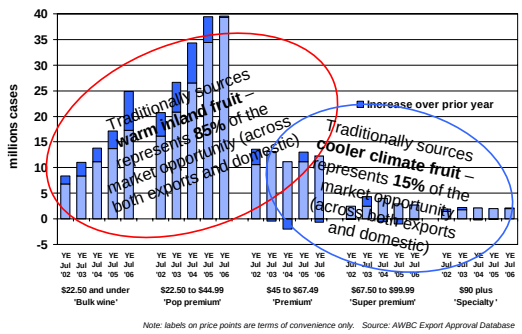
Another big harvest in 2006, but not as big…



Conclusion on yields …

- Higher yields than previously thought may need to be factored in for the future.
- This adds to the weight of evidence in favour of a longer timeline to recovery than short.

An important distinction in the current oversupply

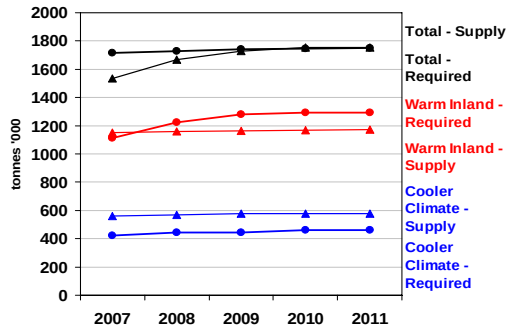


Note: labels on price points are terms of convenience only. Source: AWBC Export Approval Database

An important distinction in the current oversupply

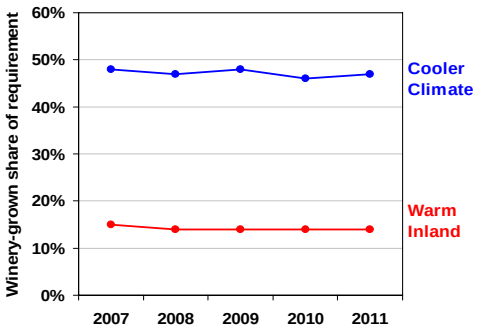
	Warm inland	Cooler Climate
Market opportunity	85%	15%
Share of winegrape production	60%	40%
Oversupply	No	Yes
Price pressures	Yes	(Yes)
Margin pressures	(Yes)	Yes

2006 ARWCS Results - preliminary



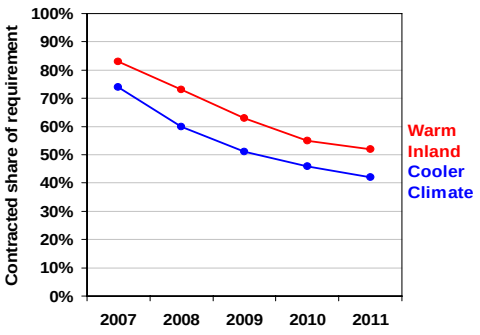
Source: 2006 Australian Regional Winegrape Crush Report, ABARE, PGIBSA, MD-SH IDC, NSW WIA

2006 ARWCS Results – exposure to risk



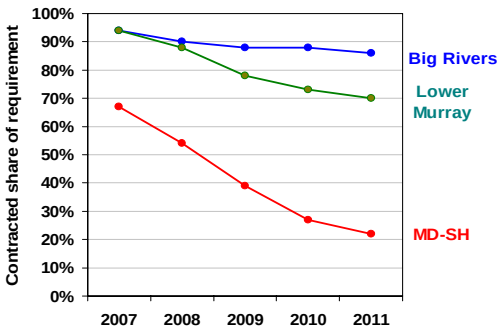
Source: 2006 Australian Regional Winegrape Crush Report, ABARE, PGIBSA, MD-SH IDC, NSW WIA

2006 ARWCS Results – exposure to risk



Source: 2006 Australian Regional Winegrape Crush Report, ABARE, PGIBSA, MD-SH IDC, NSW WIA

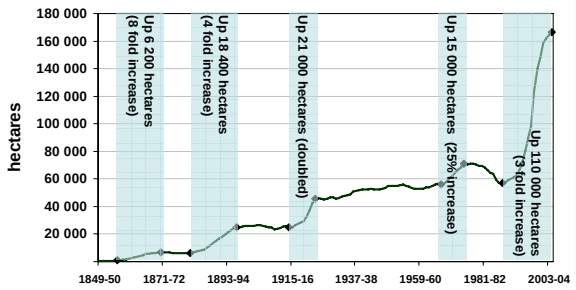
2006 ARWCS Results – exposure to risk



Source: 2006 Australian Regional Winegrape Crush Report, ABARE, PGIBSA, MD-SH IDC, NSW WIA

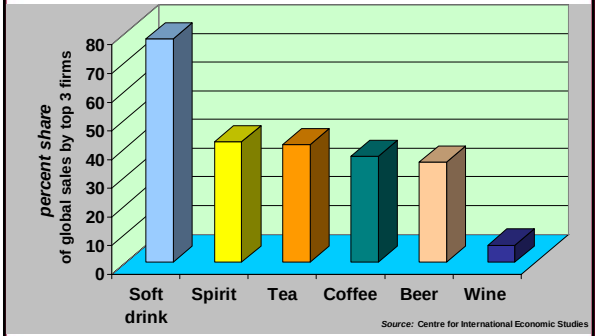
Reasons to be positive?

History counts? Total area of Australian vines …

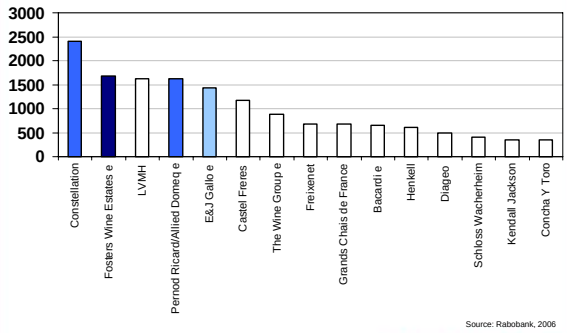


Source: Osmond and Anderson, Trends and Cycles in the Australian Wine Industry

Australia *can* be a global wine player



Australia *is* a global wine player



Source: Rabobank, 2006

Aspirations to higher price points ?

What they say overseas about Australian wine …

" .. they have generally a full, rich, vigorous character and quality. Some few are especially fine in all that constitutes a high-class wine, and bear comparison with the best European growths, while the average of the remainder, compared with the bulk of Continental wines ... is higher in quality, strength and body, as also in character and flavour"

Published in the Morning Post (UK) 8 June 1874

Sources: Laffer, The Wine Industry of Australia; Osmond and Anderson, Trends and Cycles in the Australian Wine Industry

Reckon we're good … any evidence?

The 2006 International Wine Challenge …

- Australia second only to France in the number of awards
  - 953 plays 1252.
- Australia beat France in the awards rate
  - 70% of Australian entries win awards versus 61% for France.

The 2006 International Wine and Spirit Competition …

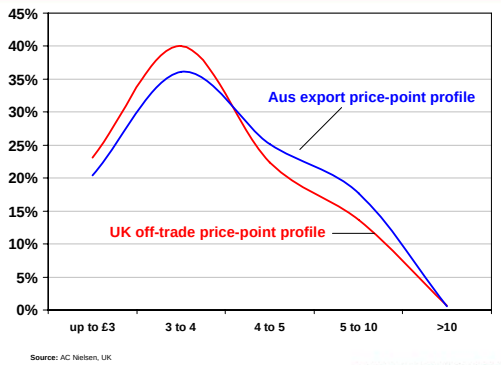
- Overall country winner with 30 gold, 107 silver and 269 bronze.
- Leading score (874.5) ahead of South Africa (740.5), France (577).

Market opportunities

Confucius …

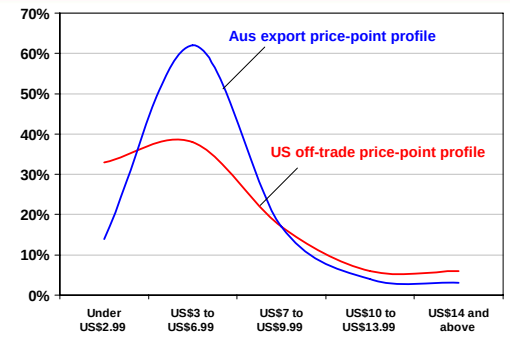
"He who has a thorough knowledge of himself and of the enemy, is bound to win"

Market opportunities, UK is low price point …



Source: AC Nielsen, UK

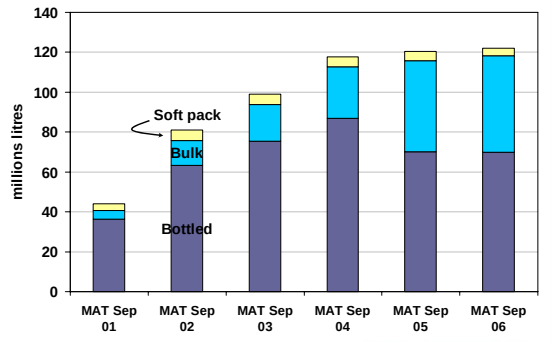
Markets – US has higher-price opportunities …



Note: the two datasets are superimposed for illustration purposes only. Local market profile is sourced from Euromonitor and relates to local retail prices indicated on the horizontal axis – the Australian export profile is sourced from the AWBC Export Approval Database and is in A$ fob terms.

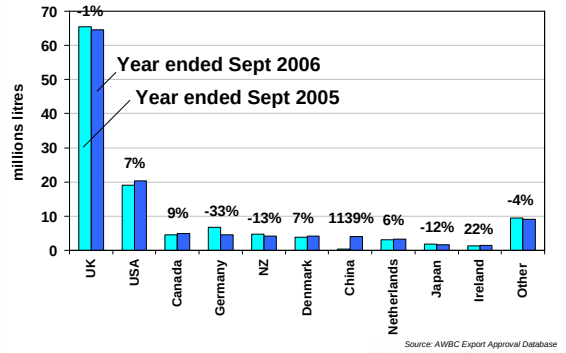
Local data

Wine exports from the Riverland …



Source: AWBC Export Approval Database

Riverland exports, by destination …



Source: AWBC Export Approval Database

Key conclusions …

- Current imbalances are a likely to be transitional – the longer-run, fundamental reasons for continued success are unchanged.
- While 'cooler climate' fruit is oversupplied – the effects are industry-wide.
- If recovery is not 1 or 2 years out, but rather 3,4 or even 5, each operator will need to decide if they can hang on for better times or if they should cut their exposure to the risk.

SOME LIKE IT HOT 2006

PRECISION VITICULTURE

Is there profit in better knowledge?

Dr Tony Proffitt
AHA Viticulture

Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm

Precision viticulture:
is there profit in better knowledge?

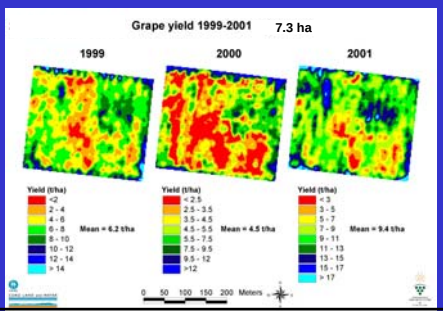
Tony Proffitt

AHA Viticulture/
Precision Viticulture Australia

Vineyard variability in yield

Areas within vineyard blocks differ in vine performance – typical variation in yield under uniform management is 8 to 10-fold (eg. 2 – 20 t/ha).

Yield variation within a vineyard block is relatively stable between years.

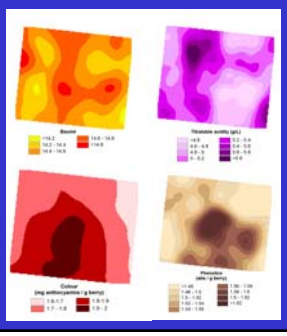


Vineyard variability in 'quality'

Variation in fruit 'quality' indices also show spatial structure - in some cases these follow a similar pattern to those defined by yield and soil properties.

Baumé

Titratable acidity



Colour

Phenolics

What are the consequences of vineyard variability?

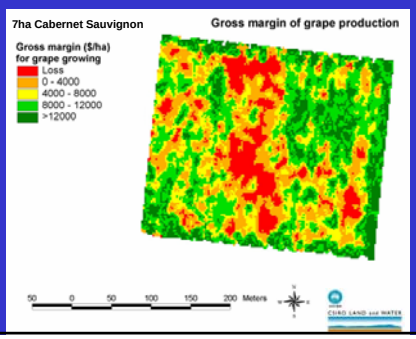
- Uncertainty in the delivery of fruit parcels of uniform quality to the winery.
  limits the opportunity to maximise the production of high quality wines, and to reproduce successful wines (eg. those that have won a medal).

- Inefficiencies in the management of inputs to the vineyard (eg. water, fertiliser, labour and machinery).
  compromises productivity and profitability, and increases the risk of undesirable environmental impacts.

- Uncertainty in the forecasting of potential crop yield.
  estimated yields are generally ±30% different to actual tonnages delivered; this inaccuracy costs the industry $Ms/year.

In this tough market, how can we best use our resources?

Could we make better management decisions or manage the risks better if we had this type of information?



Precision Viticulture

Describes technology which allows viticulturists/growers and winemakers to:
- see precisely where and how much variation there is,
- manage vineyard blocks differentially rather than uniformly, and
- make more informed management decisions in the vineyard in order to increase production efficiency, profitability and/or sustainability.

The tools associated with precision viticulture
- global positioning system (GPS) - tells you where you are.
- geographical information system (GIS) - software with mapping capabilities for the storage, analysis and display of spatial data.
- sensors - for acquiring data at high spatial resolution.

Commercially available sensors:
- remote sensing (attached to satellites and aircraft)
- yield monitoring (attached to harvesters)
- soil sensing (attached to 4 wheel bikes, etc)

Global positioning system (GPS)

Precision viticulture applications require sub-metre accuracy.



GPS mounted in a backpack

GPS mounted in a harvester



GPS mounted on a bike



Airborne remote sensing

Often the 'entry point' for those adopting PV practices due to the relatively low cost.

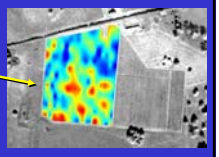


Cameras are mounted under the aircraft and a computer and GPS on board collects the data.

Data collected in 4 wavebands at high resolution (eg. 50 cm) and combined to give a single value for each image pixel (spectral vegetation index, eg. PCD).



Variation in vine performance as seen with the naked eye



Zones showing variation in vine canopy biomass (PCD)

Yield monitoring

You have to harvest anyway so why not collect the data!



GPS antenna

weigh platform positioned under conveyor belt



data collection and viewing





individual bins to keep fruit separate

Soil and elevation surveys

Soil and topography are often the main causes of vine variation



GPS antenna

EM38



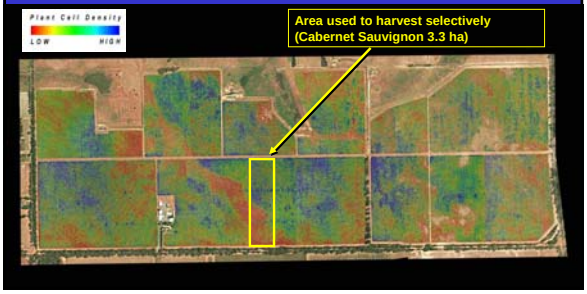
Gamma-ray spectrometry, ground-penetrating radar, & elevation survey in progress



1. PV as a tool for selective harvesting

Case study - Margaret River, WA

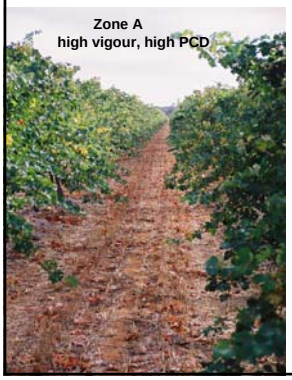
Airborne imagery of a 151 ha vineyard acquired at veraison 2002.



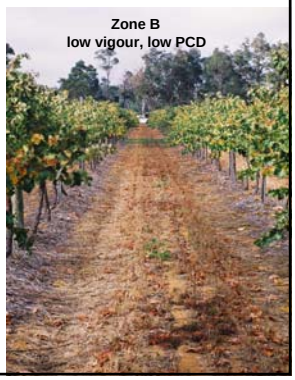
Ground truthing imagery is essential

Does variation shown on imagery resemble variation on the ground?

Zone A
high vigour, high PCD

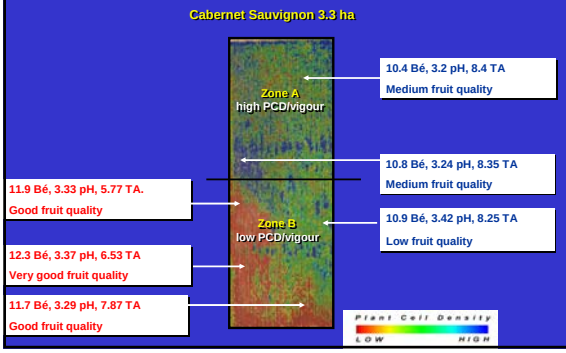


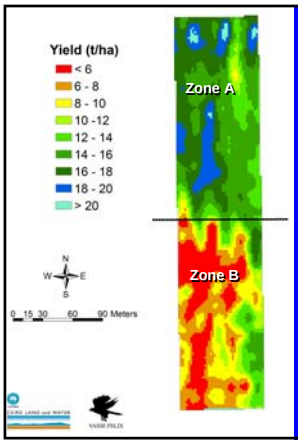
Zone B
low vigour, low PCD



Ground truthing imagery - 2002 vintage

Assessment 2 weeks before harvest confirmed that vines within zones A and B differed in vigour and that fruit differed in 'quality' attributes.





Yield map of the same block

Note the similarity between the yield map and the imagery

2002 vintage

Large variation in yield (<6 to >20 t/ha)

- Average yield 13 t/ha
- Northern zone A: 16 t/ha
- Southern zone B: 8 t/ha

Harvesting and wine allocation 2002-2004

2002 vintage: Both zones harvested on same day.
2003 vintage: High vigour zone harvested 9 days after low vigour zone.
2004 vintage: Both zones harvested on same day.

Sufficient differences in wine quality between zones to make different end-use products. If harvested together - allocation would have been to the lower end-use products.

2002	2003	2004
Zone A (high vigour/yield)	Zone A (high vigour/yield)	Zone A (high vigour/yield)
Classic Dry Red	Cabernet/Merlot blend	2nd label varietal
RRP $19/bottle	RRP $22.5/bottle	RRP $25/bottle
Zone B (low vigour/yield)	Zone B (low vigour/yield)	Zone B (low vigour/yield)
1st label varietal	1st label varietal	Cabernet/Merlot blend
RRP $30/bottle	RRP $30/bottle	RRP $22.5/bottle

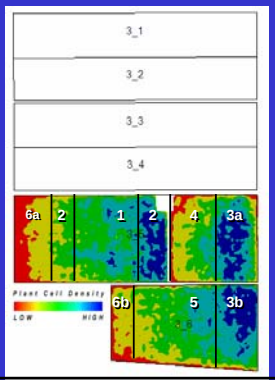
Economic benefit to winery

(example vintage 2002, assumes 1 t fruit = 750 L wine)

- **Selective harvesting**
  - Higher quality southern area - 12.7 t fruit
  - $30 / bottle product
  - Gross retail value of production - $380,400
  - Lower quality northern area - 25.5 t fruit
  - $19 / bottle product
  - Gross retail value of production - $484,500

  $864,900
- **Single, uniform harvest**
  - 38.2 t fruit
  - $19 / bottle product
  - Gross retail value of production - $725,420
- **Benefit of PV approach (gross retail value of production)**
  - $139,480 over 3.3 ha
  - $3,653 / t fruit harvested
  - $42,267 / ha

Case study – Riverland, SA



Split picking based on 2005 imagery

Chardonnay 18.8 ha

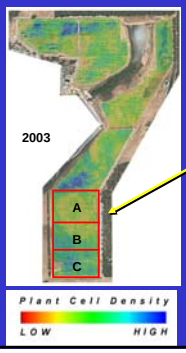
Pick	Baumé	End-use product
1	12.4	top label
2	12.3	2nd level commercial blend
3a	13.3	unwooded
3b	12.9	
4	14.0	2nd level commercial blend
5	13.6	1st level commercial blend
6a	13.6	1st level commercial blend
6b	13.1	

Benefits to winery and vineyard

- Split picking increased range of final wine products, some at a higher brand quality than in previous years – economic benefits and improved confidence in ability to reproduce successful wines.
- Vineyard manager was in a better position to plan harvest and to sample correctly.
- Less surprises – "what was grey suddenly became black and white"!

2. PV as a tool for improved application of inputs

Case study - Margaret River, WA



Irrigation water
9 ha Cabernet Sauvignon, planted 1999

Airborne imagery acquired at veraison 2003 and 2004.

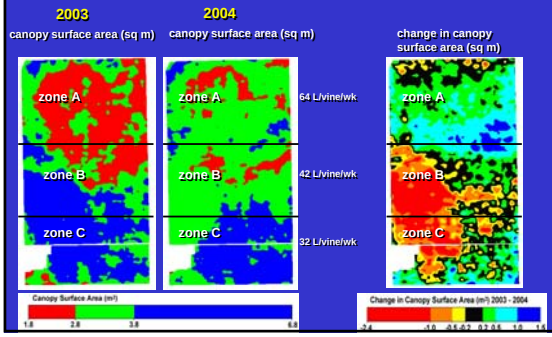
Management zones (A, B, C) were defined within the constraints of the existing irrigation design.

- Zone A had high proportion of weak vines.
- Zones B and C had high proportion of excessively vigorous vines.

Irrigation management in 2004 was adjusted:
- increase in water applied to zone A.
- decrease in water applied to zones B and C.

Ground truthing established correlation between PCD and direct measures of vine vigour (eg. canopy surface area) in both years.

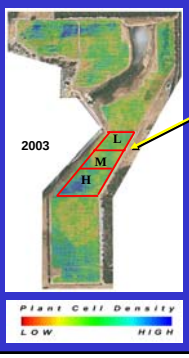
Changes in irrigation management resulted in changes in vegetative growth.



Benefits to vineyard and winery

- Cost reduction in canopy and fruit manipulation for vigorous zones (6 ha):
  - less machine leaf plucking @ $300/ha — approx. $1,800
  - less machine shoot trimming @ $140/ha — approx. $840
  - less hand crop thinning @ $300/ha — approx. $1,800
  - Total approx. $4,440
- Reduction in canopy size improved aeration and spray penetration; reduced the risk of bunch rot (*Botrytis cinerea*) - $ saving.
- Improvement in fruit exposure hastened rate of ripening so that fruit specifications across the whole vineyard block were more uniform – wine improvement .
- More efficient use of water (yield per ML water used).

Case study - Margaret River, WA



Pruning/labour
8.3 ha Shiraz, planted 1998

Imagery (2003) used to identify zones of high, medium and low (H, M, L) vine vigour.

Pruning 'piece' rates per vine ($) determined for each zone according to the amount of time allocated to work on the vines, which was determined according to the degree of difficulty to prune.

Benefits to vineyard

- A cost saving of approximately $2,400 (11.6%) across the block.
- All staff made similar amounts of money which ensured morale remained high and 'absentee' issues were much reduced.

Pruning method	No. of vines	Lopping cost ($/vine)	Pulling cost ($/vine)	Wrapping cost ($/vine)	Total pruning cost ($)
Zones					
High vigour	2,578	0.44	0.42	0.92	4,588.84
Med vigour	5,562	0.37	0.35	0.76	8,231.76
Low vigour	4,305	0.31	0.30	0.68	5,553.45
Total block cost ($)					18,374.05
Uniform					
Total block cost ($) (approximate)	12,445	0.42	0.40	0.85	20,783,15
Cost difference ($ and %)					2,409.10 (11.6%)

3. PV as a tool for improved sampling

Sampling is a key activity throughout the season:
- crop forecasting
- petiole/leaf blade nutritional analysis
- fruit maturity assessment
- pest and disease monitoring

Case study - McLaren Vale, SA

Crop forecasting
2.5 ha Cabernet Sauvignon, planted 1983

Imagery and ground truthing used to define zones of high, medium and low vine vigour. Differences in vine vigour corresponded to differences in vine yield and fruit 'quality'.

2 weeks before harvest, crop yield was estimated using:
- whole block random sampling approach (30 vines sampled)
- zone based sampling approach (10 vines sampled in each of 3 zones)

Benefits to vineyard and winery

- Zone based sampling improved the accuracy in crop yield.

Method	Vine no.	Mean no. bunches	Mean bunch wt (g)	Estimated yield (t)	Difference to actual
Whole block	3553	176.8	41.8	26.26	+4.96 t (23.3%)
Zones					
• High	991	167.0	48.9		
• Medium	2514	153.9	39.5	23.58	+2.28 t (10.7%)
• Low	48	145.0	27.0		
Mean		*155.3*	*38.5*		
Actual delivered				21.30	

NB. the no. of samples allocated to each zone should be proportionate to the zone area (or vine no.), relative to the total for the whole block.

- Zone based sampling showed differences in fruit 'quality' which was of interest to the winemakers.

Zone	Baumé	TA (g/L)	pH	Berry colour (mg antho/g berry wt)
High	13.13	6.70	3.76	1.53
Medium	13.75	6.02	3.77	1.82
Low	14.31	5.63	5.63	2.00

Is there profit in better knowledge?

✓ Selective harvesting – especially profitable for wineries because of the value adding aspect of winemaking.

- form partnerships with wineries to explore opportunities (eg. bonuses).
- use of the technology may make the difference between selling fruit or not.

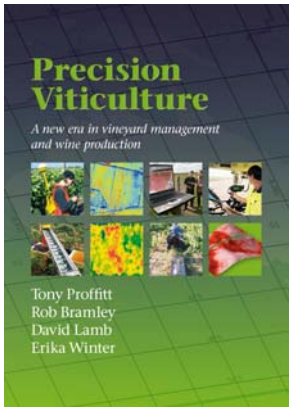
✓ Matching inputs to vine requirements and soil properties - an opportunity to reduce costs of production, to minimise the risk of resources being wasted or causing damage off-site, and to ameliorate or 'mothball' under-performing areas.

- understand the cost of production for each activity in each block to better manage the risk.

✓ Sampling – zone based sampling appears to have potential for greater accuracy, saving in time and resources, etc.

Good decisions can only be made from good information!

Funded by the CRCV
Available from Winetitles late October
$49.50



Acknowledgements

- Riverland Wine Industry Organising Committee
- CSIRO Land & Water (now CSIRO Sustainable Ecosystems)
- Southcorp Wines (now Fosters' Wine Estates)
- Angove's
- Vasse Felix
- Barwick Estates

Thank you!



SOME LIKE IT HOT 2006

STRATEGIES

for reducing cost in the vineyard

Mr Des Walker

Gooree Park, Mudgee

Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm

Strategies for reducing costs in the Vineyard
Mr. Des Walker, Gooree Park Vineyards, Mudgee

First of all I should tell you a little about the company that I work for. Gooree Park Vineyards.

Gooree Park is owned by Eduardo Cojuangco the Chairman and Major shareholder of San Miguel Breweries in the Philippines.

San Miguel also owns Australia's National Foods, Berri and James Boags Breweries in Tasmania.

The boss as we all call him has been in Mudgee for over thirty years, he breeds and races horses, some fast and some not so fast. At the moment he has a very good horse by the name of Desert War. In the past three years he has won the Epsom Twice and finished second, last Saturday to Race to Win. If they were all that good we would not need to grow grapes.

He also breeds Wagu cattle for the Japanese market.

He is heavily involved in agriculture in the Philippines growing some five thousand hA's of mangos and other tropical fruits. In total he employees thirty five thousand people.

The vineyards in Mudgee total 555hA. We grow about 8000 tonnes of fruit per year. Orlando and Casellas take 5500 tonnes under contract. The problem is the other 2500 tonnes. We do make wine and export it to the Philippines but only in a small way.

The two thousand odd tonnes were contracted to Southcorp but when the contract was up they did not renew it.

Forty per cent of our fruit is premium, forty per cent semi premium and the other twenty goes into commercial.

The year after the contract was up we grew the fruit as per formal thinking that we would be able to sell it on the open market. We did sell the fruit that year. The highest price that we could get was seventy-five dollars per tonne.

The cost of growing grapes in Mudgee is at least four to five hundred dollars per tonne. We decided that if we had no home for the grapes when we would not grow them. I think that we are only cutting our own throats selling grapes for a lot less than they cost us to produce.

The next season we looked at ways to cut our costs. On sixty ha of cabernet that we had no home for. We barrel pruned then did a quick clean up by hand. This still cost us over six hundred dollars per ha. We sprayed the block four times through the season, not our normal thirteen to sixteen.

We decided to use a Bayer product called Etherel which is used to thin out bunches, we used it at a higher rate to get rid of all of the fruit thus taking away any threat of Botrytis and the like.

We found that we had to use it twice, once at fruit set and then at verasion. In some places all of the crop was gone and in others not quite all. The canopy looked bad for a while but then recovered by the end of the season. It looked better than where we grew fruit.

The next season we did not prune at all. We ran sheep and cattle in the areas that we were not growing.

We run sheep in all of the vineyard over winter and take them out just before budburst otherwise they will reduce your crop over night.

We found that older cows were the best. They soon got the hang of the rows and did no damage to the trellis or dripper lines at all. They cleaned up every berry in the vineyard.

We used approximately half our irrigation, no fertiliser, no slashing, and no moving of foliage wires. We were able to use phos acid to control Downey, as the fruit was not used to make wine.

We looked at our spraying cost for the vineyard, we were running eight tractors and eight two thousand litre two row spraycards.

We changed over to five ninety horsepower tractors and five four thousand litre three-row spray carts. We traded in eight tractors on five.

We used two of the old carts joined together as a nurse cart to supply the bigger carts out in the vineyard

This saved us a lot of money. We were able to do without two operators and two tractors. One employee would wear all of the safety gear do all the batching (this is good from a safety point of view). Then run the nurse cart out to the other operators in the vineyard.

This also saved us money on repairs and maintenance as we found that most of the damage done to our spray carts was when they were travelling back to the fill station empty at high speeds.

I realise that some of these savings only apply to larger scale vineyards, but if you are small you still should look at the way you use equipment maybe you could share larger gear with your neighbour.

Other savings we have made in the vineyard are by doing all of our pruning on a piece rate, rather than an hourly rate. Moving foliage wires is done by the ha basics.

The down side to mothballing is that you have no income, we are only able to do this because we still have contracts in place for a large part of our vineyard.

I think that if you are going to stay in the game you need to produce the best quality fruit that you can at the lowest cost that you can.

Both lamb and beef fed on grapes and taste great.

Des Walker

★ SOME LIKE IT HOT ★ 2006

GLOBAL WARMING

How hot is too hot?

Dr Richard Smart
Smart Viticulture

Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm

GLOBAL WARMING AND YOU

By Richard Smart
SMART VITICULTURE
Tamar Ridge Wines

GLOBAL WARMING IS HIGHLY POLITICISED

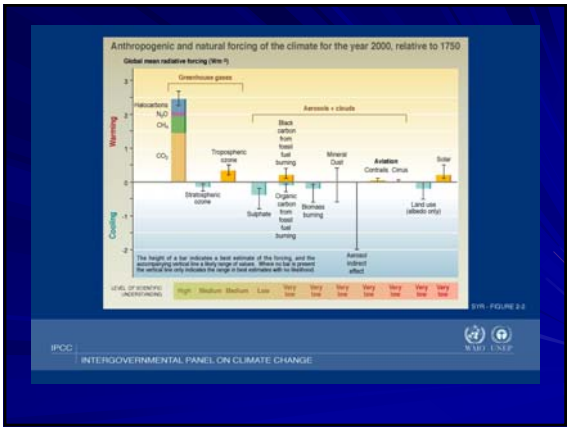
- Over the last few decades it was the interest of fringe scientists
- Now the majority of the world's climatologists are concerned, but there are still "renegades"
- Australia has the world's highest per capita CO_2 emission, and USA has the world's highest emissions. Both have refused to sign Kyoto protocols
- Next Federal election you may get to vote on the issue
- South Australia is the leading state in being proactive to global warming, maybe because it has most to lose.

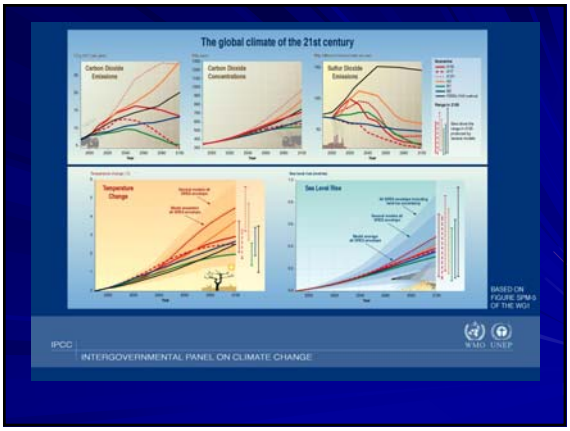
AWARENESS IN THE WINE SECTOR IS ABYSSMALLY POOR

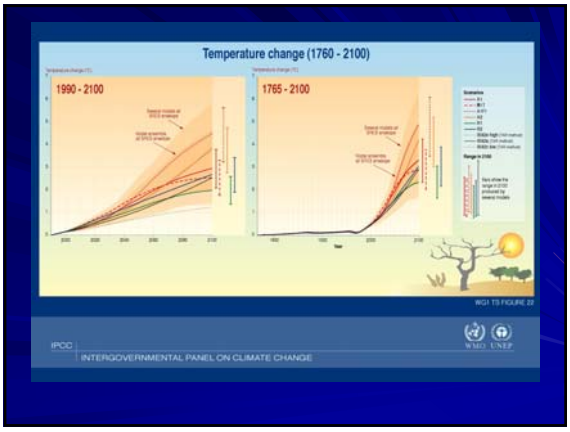
- Global warming effects are not seen as a research priority (consumer preference is)
- Global warming is not mentioned as a strategic issue
- I wrote to five peak industry bodies about this in March 2006, and had one reply
- After a lot of argument, global warming will be discussed at the next Wine Industry Technical Conference
- Global warming represents an opportunity for the Australian wine sector

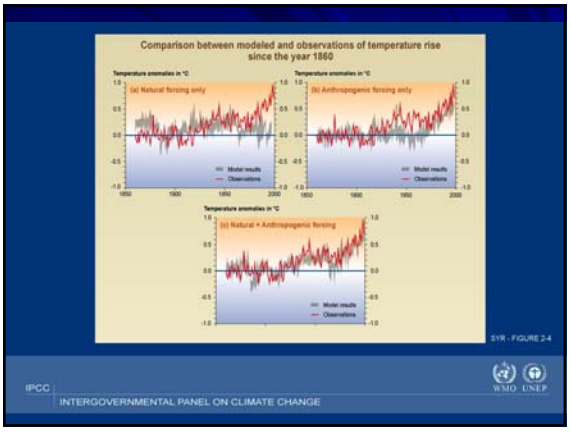
WHAT IS GLOBAL WARMING?

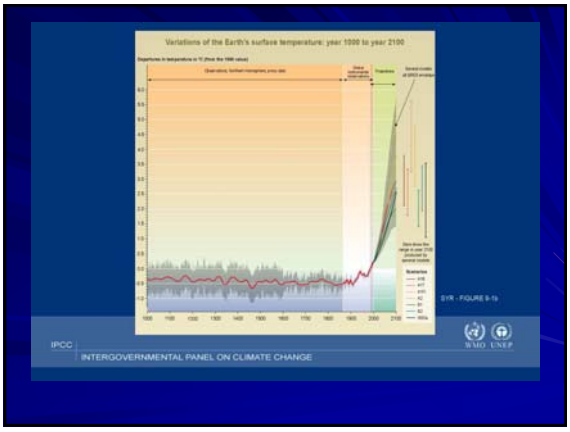
- Man made emissions of CO2 and other "greenhouse gases" will cause more of the sun's energy to be trapped in the atmosphere, warming it.
- These effects can be predicted by Global Circulation Models, but the future levels of the greenhouse gases can only be guessed at. For example, will Australia reduce its emission?

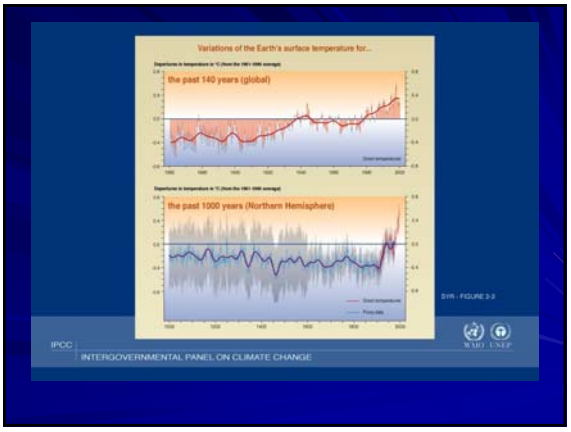


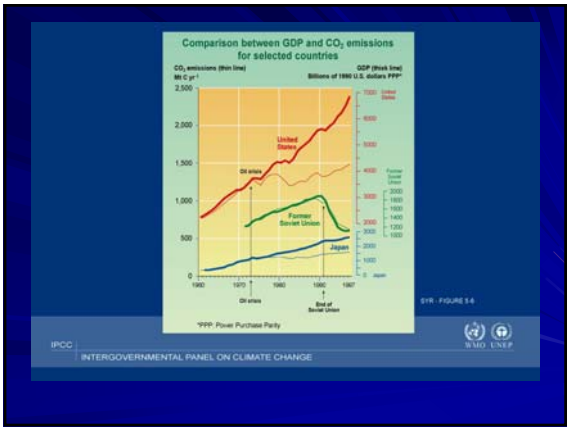


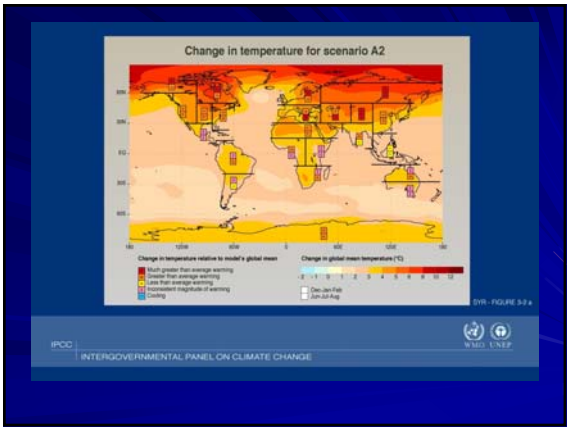

Temperature change (1760 - 2100)
1990 - 2100
1765 - 2100
IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

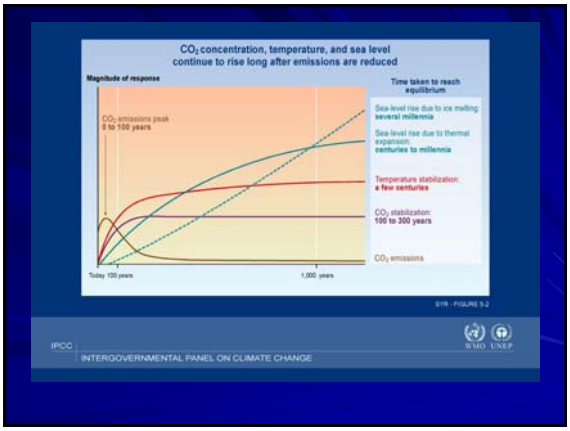

Comparison between modeled and observations of temperature rise since the year 1860
(a) Natural forcing only
(b) Anthropogenic forcing only
(c) Natural + Anthropogenic forcing
Model results
Observations
SYR - FIGURE 2-4
IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE


Variations of the Earth's surface temperature: year 1000 to year 2100
SYR - FIGURE 3-1b
IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE


Variations of the Earth's surface temperature for...
the past 140 years (global)
the past 1000 years (Northern Hemisphere)
SYR - FIGURE 2-3
IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE


Comparison between GDP and CO2 emissions for selected countries
United States
Former Soviet Union
Japan
Oil crisis
*PPP: Power Purchase Parity
SYR - FIGURE 3-6
IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE


Change in temperature for scenario A2
SYR - FIGURE 3-3 a
IPCC
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



WHAT ARE THE IMPLICATIONS FOR THE RIVERLAND

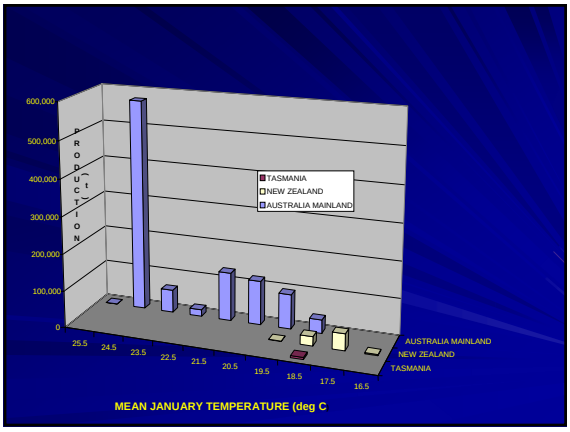
- Winters will not be so cold
- Fewer spring frosts
- Summers will be hotter
- Peaks of extreme heat
- Earlier bud break, flowering, veraison and harvest
- Harvest will happen during hotter temperatures
- Increased water use?

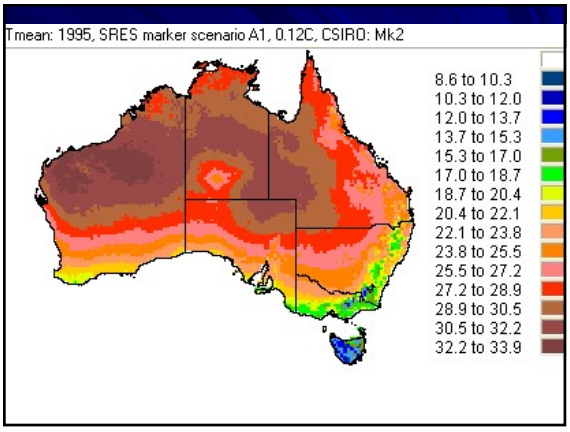
WHAT ARE THE IMPLICATIONS FOR THE RIVERLAND WINE QUALITY

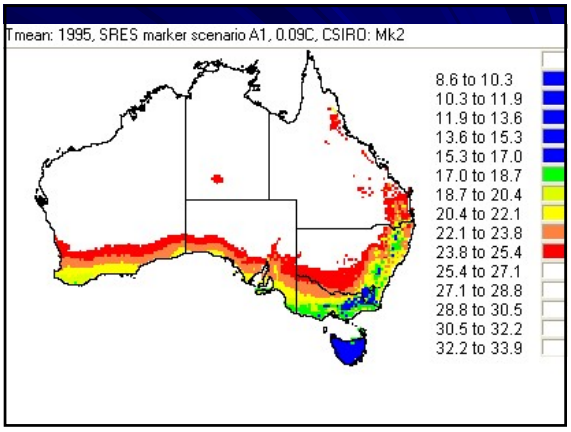
- To answer this we need to understand what high temperatures do to grapevines, and wine
- Temperature peaks cause water stress, leaf damage and loss of colour and flavour compounds
- Similar effects from continued hot days, and warm nights

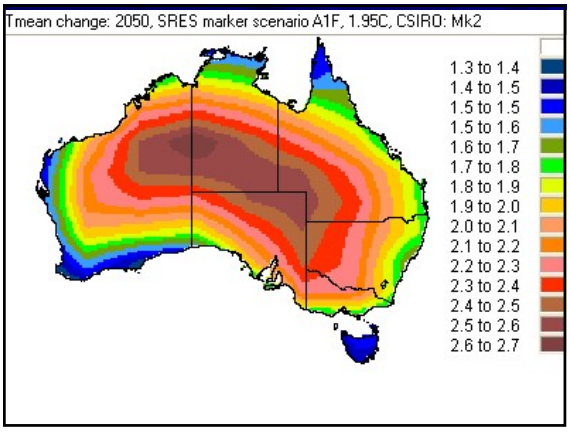
IMPORTANT QUESTION

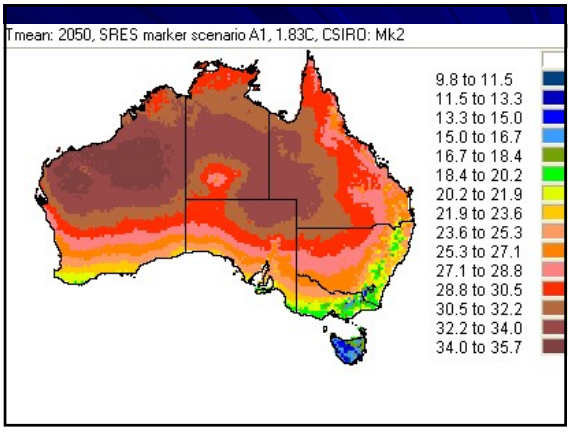
- What will happen when the Riverland gets hotter?
- Consider Mean January Temperature
- Roma 27.3 C
- Swan Valley 24.3, Sunraysia 23.9 , MIA 23.8, Riverland 23.0 C
- Barossa 21.4 C
- Coonawarra 19.6 C
- Launceston 17.2 C

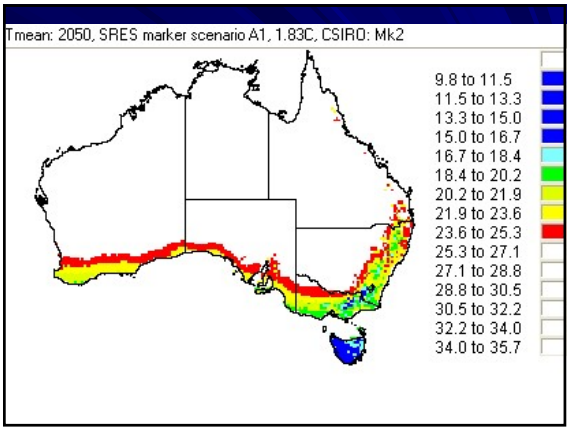




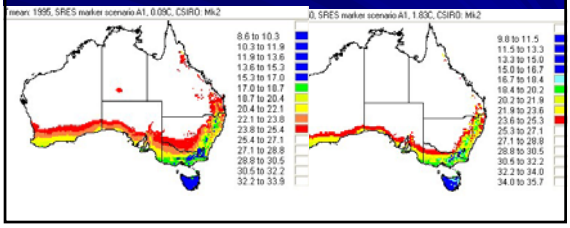


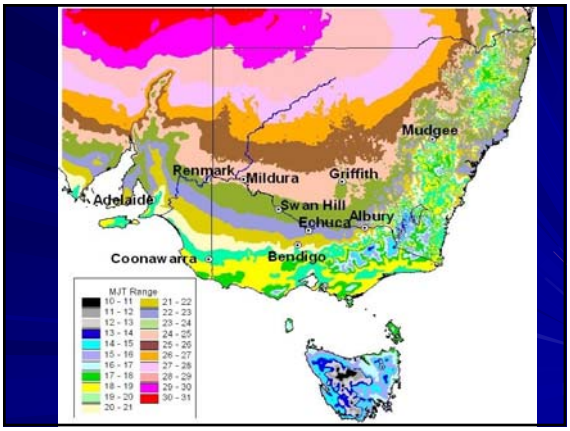






THE SHRINKAGE OF THE AUSTRALIAN WINE INDUSTRY





What to do?

- Argue for more research
- Involve your politicians
- Support CSIRO Merbein grapevine breeding
- Do not support molecular biologists
- The solution will be use new varieties, or move
- Or both

WHAT NOT TO DO

- Believe that it is not already happening
- Remember, it will be worse for your competitors!!!!
- Is this an opportunity??

SOME LIKE IT HOT 2006

GRAPES TO GLASS

Predicting wine quality in the vineyard

Dr Bob Dambergs

The AWRI

Riverland Wine Show Society Inc.
PO Box 852, Berri S.A. 5343
Phone: (08) 8582 2952
Web: www.riverlandwine.com.au/techseminar.htm

The Australian Wine Research Institute

From grapes to glass – predicting wine quality in the vineyard





Bob Dambergs

"Some Like it Hot"

Renmark

12th October 2006

Grape and wine quality



There are many factors that will determine and describe the final wine quality involving complex interactions between:

grapes



yeast



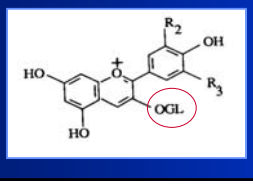
the winemaking process



but I will concentrate on what can be measured in grapes

POTENTIAL GRAPE QUALITY ASSESSMENT TOOLS

- End use
- Viticultural parameters
- Brix (sugar)
- pH and total acidity
- Colour (anthocyanins): reds only
- Glycosyl - Glucose (G-G): reds and whites

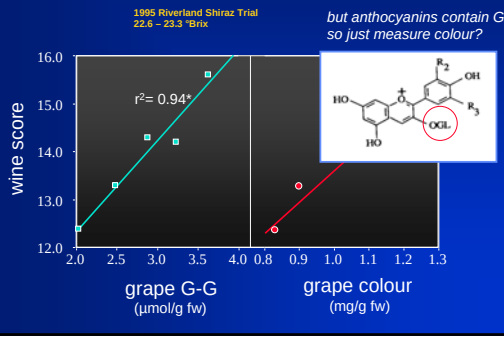


Grape colour and glycosyl-glucose correlate with wine quality rating

Francis et al, AWITC 10

1995 Riverland Shiraz Trial
22.6 – 23.3 °Brix

but anthocyanins contain GG so just measure colour?



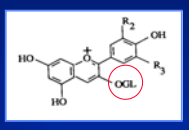


What is grape colour?

Colour is due to anthocyanins which occur in many plants and are a major source of natural colour

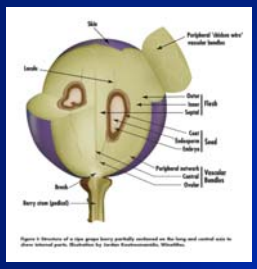
Malvidin – the major anthocyanin in grapes derives its name from the common mallow from which it was first identified

Anthocyanins normally occur as glucosides



- Anthocyanins normally have a glucose molecule attached via a glycosidic bond
- Glucosylated anthocyanins are more stable
- Anthocyanins contribute to the GG content of red grapes
- Anthocyanins also exist as acetyl and coumaryl derivatives

Where is colour in the grape berry?



- Anthocyanins are located In the skin of Vinifera grapes

The implications of this are:

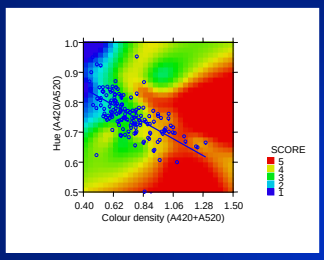
- increasing the skin to flesh ratio will concentrate colour and flavour
- the original skin to flesh ratio must be retained for accurate measurement of anthocyanin concentration in whole grapes

Some 'take home' messages about colour development in grapes

- For a given patch of grapes, colour correlates strongly with Brix, but this does not necessarily apply when comparing different patches
- Colour is in the skin, so for berries with the same amount of skin colour, overall colour concentration (colour per gram fruit weight) increases with smaller berries
- After berry 'abscission' colour can increase in concentration due to dehydration – the actual amount of colour per berry can decrease during this phase
- The best quality fruit is most likely to be when sugar, acid, colour and tannin reach optimal levels at the same time and before berry abscission (i.e. early ripening)
- Colour development is temperature dependant – can be a limitation in hot climates



There is a lot of data showing that wine colour correlates with wine quality e.g.

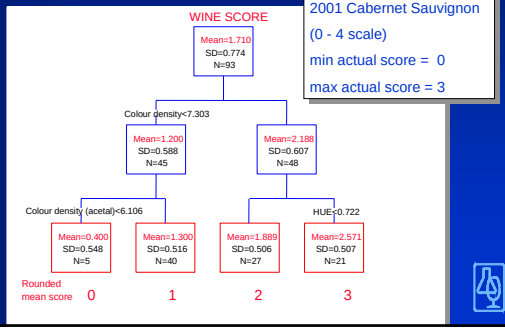


1999 Riverland Shiraz:
3D mosaic plot relating colour density, hue and commercial wine gradin

1 is lowest quality

5 is highest quality

Classification tree for wine score using Somers' analyses plus alcohol, acid and s.g. (12 variables)



2001 Cabernet Sauvignon
(0 - 4 scale)
min actual score = 0
max actual score = 3

Wine score and colour density – small lot wine making



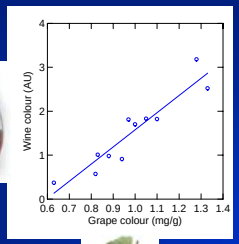
Winemaker's scores
- averages of duplicate wines, tasted blind

(Garth Swinburne, Sunraysia Shiraz)

Scholefield Robinson Horticultural Services

Grape colour correlates with wine colour

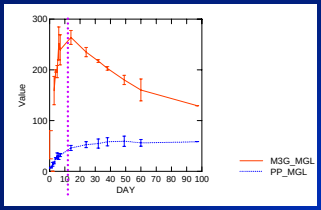






1995 Riverland Shiraz trial

But grape colour does not equal wine colour

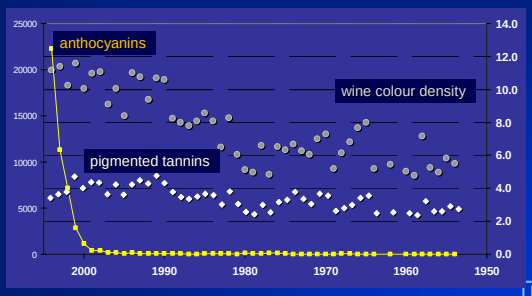


2001 AWRI fermentation trial

- The concentration of M3G increases during fermentation until taken off skins, then it rapidly declines, while pigmented polymer levels increase
- Anthocyanins are not the final stable colour in wine – they react with tannin to produce "pigmented polymers"

Aging of red wine colour and tannins

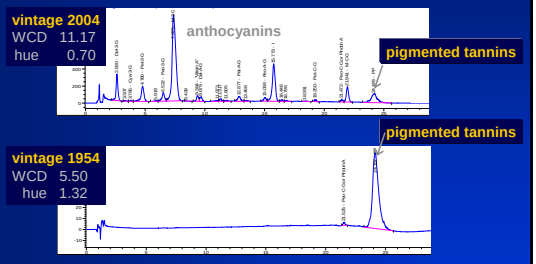
wine colour = ∑ anthocyanins + pigmented tannins



Coonawarra Cabernet Sauvignon vintage 1954 – 2004, analysed 12/2004

HPLC analysis of red wine pigments:

wine colour = ∑ anthocyanins + pigmented tannins



Coonawarra Cabernet Sauvignon analysed 12/2004

Colour expression in free anthocyanins is sensitive to pH and SO_2



pH<1.5 **pH 3.7** **pH 3.7+SO_2**

Polymerised pigments are less affected by pH and SO_2 this differential sensitivity forms the basis of The "Somers measurements" which use a combination of absorbance at 420 and 520nm with and without acetaldehyde, SO_2 and low pH treatment

Predicting wine pigmented polymer potential

[PP] = 0.06 [M3G] + 0.04 [T] - 2.88

$R^2 = 0.92$

PP: pigmented polymers

M3G: malvidin 3-glucoside

T: tannins

Can we use tannin values with this equation to predict wine pigmented polymers from grape tannin and anthocyanins?

NOTE: this equation was derived from anthocyanin and tannin extracted under winemaking conditions, not with 50% ethanol

A quotation from a famous person

"We can routinely measure sugar, acid and anthocyanins in grapes – we need a simplified, reasonably specific tannin assay to at least differentiate tannins from non-phenolic UV absorbing material and low MW phenolics, but ideally to differentiate skin and seed tannin"

Bob Dambergs, Riverlink Cabernet quality workshop 29 July 2003

We have it now……

- Total phenolics is simply absorbance at 280 nm but includes tannin, anthocyanins, phenolic acids protein etc.
- There are many preciptation based assays that use protein to precipitate tannin but protein absorbs at 280 nm
- This new tannin assay uses a polymer that does not absorb at 280nm: A_{280} before and after precipitation are used to calculate the tannin

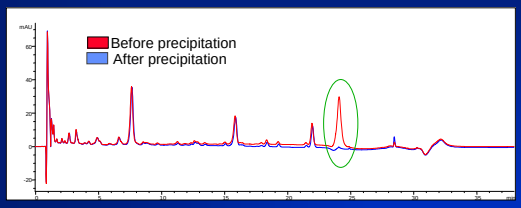
Rapid Tannin assay

- measure A_{280} (i.e. total phenolics) of grape extract or wine
- add polymer precipitant
- measure A_{280} of supernatant after precipitation and centrifugation

A_{280} **total phenolics** − A_{280} **supernatant** (after removal of tannin by precipitation) = A_{280} **tannin**

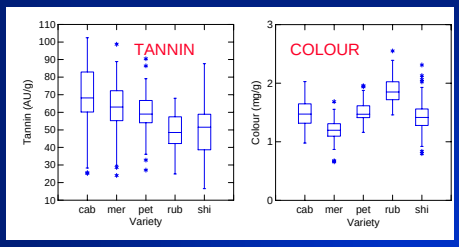
Sarneckis, C.J.; Dambergs, R.G.; Jones, P.; Mercurio, M.; Herderich, M.J.; Smith, P.A. Aust. J. Grape Wine Res. 12: 39–49; 2006

Precipitation step only removes tannin from grape extracts



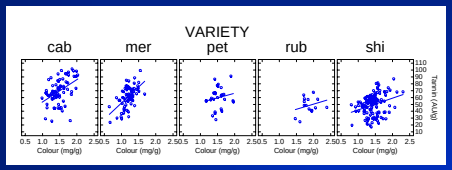
HPLC chromatogram monitored at 280 nm, i.e. UV absorbing material

Tannin and colour vary with grape variety



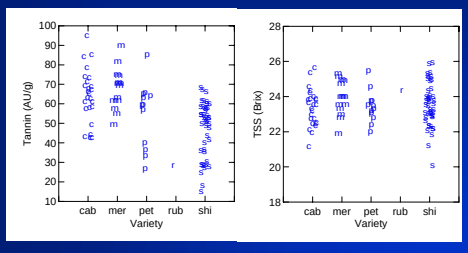
Sunraysia, 2004 vintage

There was some correlation of tannin and colour



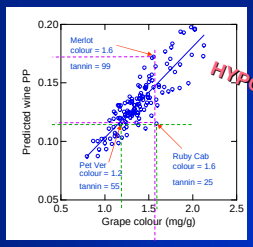
	cab	mer	pet	rub	shi
r	0.48	0.57	0.05	0.45	0.27
p	<0.001	<0.001	ns	ns	0.001

Tannin, colour and sugar maturity are not necessarily coupled – so we should measure them all



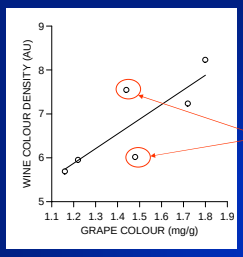
Tannin and TSS in samples with a colour of 1.3 – 1.5 mg/g

Predicting wine pigmented polymers from grape anthocyanins and tannin



HYPOTHETICAL

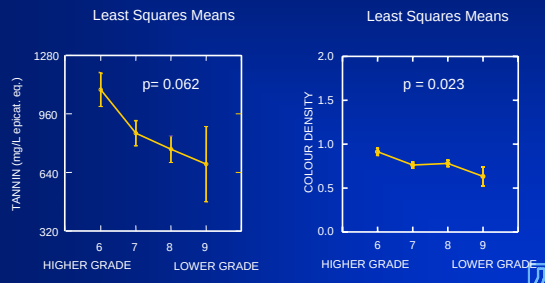
Grape colour correlates with wine colour – tannin related outliers?



different tannin levels?

(Garth Swinburne, Sunraysia Shiraz)

Shiraz Wine Tannin and Colour by 'Grade' (2004 Riverland):



'GRADE' = POST-VINTAGE WINE ALLOCATION

The next challenge

"We can routinely measure sugar, acid, anthocyanins and total tannins in grapes – *we need a simplified, reasonably specific method to differentiate skin and seed tannin*

Bob Dambergs, Riverland "Some Like it Hot", 12 October 2003

PS we also need to work on whites

Acknowledgments

Many wineries who have participated with our projects but in particular:

Hardy Wines: Chris Bevin, Kylie Goldsack, Audrey Lim

McGuigin-Simeon: Bruce Kambouris, Brenton Porter

The AWRI RAMS

"Rapid Analytical Methods" team



Wies Cynkar Mark Gishen Daniel Cozzolino
Bob Dambergs Les Janik

This work was financially supported by Australia's grape growers and winemakers through their investment body the Grape and Wine Research and Development Cooperation, with matching funds from the Federal Government, and by the Commonwealth Cooperative Research Centres Program.

GWRDC

CRCV

And the AWRI Tannin Group

Question time?

