



# A NEW THIRST FOR SOME LIKE IT HOT



Some Like it Hot will give winegrape growers and winemakers insight into the direction and outlook of the wine industry and deliver some applicable ideas and tools from the forefront of technology.

This is the fifth consecutive year that Some Like it Hot has been run, and it is developing an enviable reputation of supplying growers and wineries with up to date information relevant to the Riverland and other warm climate regions in Australia.

There is something for all in the seminar for winegrape growers, winemakers, winery field staff, wine making and viticulture consultants, scientists, service providers and wine business people. The program will give plenty of insight into where the industry is heading – especially in light of the protracted drought conditions – and provide some 'take home' tools for people involved in the industry.

**Pooling the data : Update of industry performance.** *Mr. Lawrie Stanford, Australian Wine and Brandy Corporation*

**Charting a course : Directions for Australian wine.** *Mr. Robert Hill Smith, Yalumba Wine Company*

**Up the creek? : The politics and policy.** *Mr. Ian Kowalick, South Australia's Independent Commissioner, Murray Darling Basin Commission*

**Hot days, cool grapes : Canopy management tool for quality.** *Dr. Erika Winter, GrapeLinks*

**Our drought : The international trade position.** *Mr. Paul Henry, Australian Wine and Brandy Corporation*

**Berry to bottle : What happens after the crusher?** *Mr. Tony Ingle, Angove's Pty Ltd*

**Managing the drought : Business decisions.** *Mr. Andrew Weeks, Jubilee Park Vineyards*

**Locking the water in : An organic perspective on water use.** *Mr. Tim Marshall, TM Organics*

**Just add water: The outlook.** *Panel session*

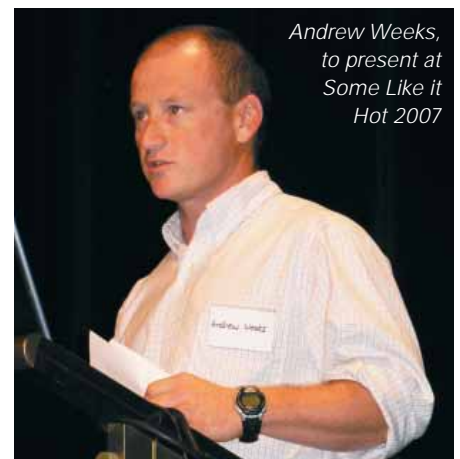
**MC:** *Ms Roseanne Healy, Chairman, Riverland Wine Industry Development Council.*

Demonstrations will be planned also for the Bureau of Meteorology, CropWatch Online, and TM Organics during the breaks. Morning tea and lunch will be provided.

Some Like it Hot is proudly presented by the Riverland Wine Show in conjunction with the support of the following sponsors;

- Riverland Wine Industry Development Council
- Grape and Wine Research and Development Corporation
- Orica
- Rabobank
- JMA Engineering

'Some Like it Hot' registration forms are downloadable from [www.riverlandwine.org.au/slih.htm](http://www.riverlandwine.org.au/slih.htm). For more information, call the RWIDC on (08) 8582 2952.



*Andrew Weeks,  
to present at  
Some Like it  
Hot 2007*

**Some Like it Hot 2007:  
Advanced Tasting**

*Tuesday 16th October 2007  
2.00 – 4.00 pm*

*Berri Resort Hotel, South Australia  
Guest Presenter: Nick Stock  
\$85 registration*

The Riverland Wine Show is pleased to advise details for the renowned 'Some Like it Hot' Advanced Tasting.

Australian food and wine culture has gone through a massive transformation over the last 10 years and someone who has been on the cutting edge of this change is Nick Stock – an award winning sommelier and now one of Australia's leading wine writers and judges. Nick Stock will lead a tutored tasting on Tuesday the 14th of October examining a range of wines including a focus on the wines of the Languedoc region - the French wine industry's own 'engine room'.

Registration forms will be made available from [www.riverlandwine.org.au/slih.htm](http://www.riverlandwine.org.au/slih.htm) in the coming weeks. For more information, call the RWIDC on (08) 8582 2952.



**Riverland  
Wine Industry  
Development  
Council Inc.**

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Mr Kevin Pfeiffer  
Mr Glen Arnold  
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(Industry Development Officer)

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# BEST OF LUCK SANDY!

The Riverland Wine Industry  
Development Council would like to thank  
Sandy Iosefellis for her efforts over the  
last year as its Marketing and Promotions  
Officer. Sandy came to the organisation  
with a wealth of experience, most notably  
as Tourism Manager at Banrock Station  
Wine and Wetland Centre, and was able  
to contribute immediately to the Council's  
activities. She made significant progress  
in managing the Riverland Cellar Door  
and Promotions Forum, Secretary to the  
Riverland Wine Show following its last  
AGM, Event Manager to the Some Like  
it Hot activities, and Committee Member  
to the Riverland Renaissance. In addition  
to her other responsibilities she was able  
to enhance the Riverland wine industry's  
marketing planning.

Sandy is moving on to work with local  
winery; Pennyfield Wines in a customer  
service capacity – and we wish her all  
the best as she continues to support  
awareness and appreciation of the  
Riverland's wines in this new role.



## RIVERLAND WINE, AUSTRALIA'S MOST POPULAR WINE POLO SHIRTS



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# A NATIONAL PLAN FOR WATER SECURITY

## WHAT DOES IT ALL MEAN?

The aim of the National Plan for Water Security is to achieve a 25% gain in efficiency and generate a 2500GL per year (3000GL Australia Wide) water saving in the Murray Darling Basin (MDB).

The plan outlines five initiatives, of which four are addressed below.

### Modernising Irrigation

\$5.9b has been set aside for:

- Modernising irrigation infrastructure;
- Channel lining and piping;
- Improved measurement (water meters); and
- River operations and storage management (reducing evaporative losses).

\$70m of the money assigned to this program will be invested in an initial assessment to identify the hotspots within the system. From this a target approach to works can be formulated.

\$3.1b is earmarked for channel lining, piping and system automation with an expected 1500GL saving generated. To share in 50% of the generated savings irrigators will be expected to contribute \$750m.

At an on-farm level \$1.6b of Federal Government money will be used to simulate private investment that will enable 1 million hectares to be converted to modern irrigation methods. A further 1200GL of saving is expected.

In addition an extra \$15m will go to developing tools that will assist growers with irrigation scheduling and measurement on-farm.

The remaining money will be proportioned as follows:

- \$125m to upgrade bulk off-takes;
- \$225m to upgrade farm off-takes (irrigators to contribute 50% of costs);
- \$200m in telemetry and data requirements for better monitoring;
- \$50m to cover half the cost of introducing metering for stock and domestic users (no intention to meter bores); and
- \$500m in practical projects to improve river operations (200GL savings in reduced evaporative losses)

Mandatory national metering standards will be introduced to meet in-field accuracy of  $\pm 5$  per so that water diverted for irrigation more accurately matches entitlements. A 700GL saving is estimated by improving the accuracy of meters and reducing over use.

### Addressing Over Allocation

\$3b has been set aside to:

- Assist irrigation districts update irrigation systems and retire non-viable areas (exit strategies etc.); and
- Where necessary purchase entitlements (no compulsory purchases).

Addressing over allocation will occur in conjunction with the 'Modernising Irrigation Program'.

### New Governance Arrangements

The Water Bill establishes the Murray Darling Basin Authority (MDBA) which will be an 'expert, independent body' and will report to the Commonwealth Minister for the Environment and Water Resource.

The responsibilities and resources provided to the MDBA include:

- \$100m to set and administer a new sustainable cap on surface water and groundwater diversions ; and
- \$500m for operations.

A Basin Community Committee consisting of at least 8 members will also be formed under the new Bill. The Committee will play a key consultative role to the MDBA.

Furthermore the Australian Competition and Consumer Commission (ACCC) will have their responsibilities expanded to include water charging and trading principles.

### Water Information

Under the new Water Bill the Bureau of Meteorology will receive \$480m to collect accurate and up-to-date water data and comprehensive information on water use availability.

The \$480m will be proportioned as follows:

- \$80m to enable water data collecting agencies to modernise and extend their water resource monitoring systems;
- \$120m for information management and reporting (web based reporting, national water account etc.);
- \$120m for analysis and forecasting services (water resource assessment, sustainable yield, river health etc.); and
- \$160m on an investigation program and strategic data procurement (informed policy decisions).

### A watching brief for the Riverland wine industry

As implementation of the programs with the National Plan for Water Security progress, careful consideration will need to be given to the following:

- The sequencing of implementation – The Plan notes that the 'Modernising Irrigation' and 'Addressing over allocation' programs will occur in conjunction with one another and it is critical that they do: spending large sums of money on infrastructure improvements in an area where irrigation may become un-viable would be a poor use of resources.
- Improved irrigation efficiency and return flows – Often the water saved by increases in delivery and irrigation efficiency end up being used elsewhere...and whilst the Plan intends to share 50% of the savings with irrigators there is the issue of the determination of savings. If the determination is made on the entitlement, of which, not all may have been used, the resultant return flows to the river may be negligible.

The Federal Government on August the 8th 2007, in the absence of support from the Victorian Labour Government, used its constitutional powers to implement the Plan for National Water Security. It was also announced that the roll out of the programmes would proceed immediately. The \$10b will be invested over 10 years.

Note: The plan also addresses Northern Australia and the Great Artesian Basin (initiative 5) and has \$85m set aside to address issues specific to these regions.

### Further Reading

The National Plan for Water Security: what's it all about? Irrigation Australia, Winter 2007 edition; pg 16-17.

The National Plan for Water Security [www.pm.gov.au/docs/national\\_plan\\_water\\_security.rtf](http://www.pm.gov.au/docs/national_plan_water_security.rtf)

ARE YOU OPERATING OR CONSIDERING INSTALLING A DRIP IRRIGATION SYSTEM...  
ARE YOU INTERESTED IN KNOWING THE PERFORMANCE OF OTHER DRIP IRRIGATION SYSTEMS?

# A REVIEW OF DRIP IRRIGATION SYSTEMS IN THE RIVERLAND

A recently completed project commissioned by the Riverland Wine Industry Development Council and funded by the Grape & Wine Research & Development Corporation, reviewed 5 drip irrigation systems currently in operation in the Riverland viticulture sector. Participants were asked to identify their worst shift and Irrigated Crop Management Service (ICMS) conducted a range of tests to determine characteristics such as: distribution uniformity, colloidal load of irrigation water and flow and pressure variation. System design and maintenance were also assessed against the ability to meet peak daily crop water demand.

Data provided by ICMS shows that the average annual water requirements for winegrapes is some 6.5ML/ha and the highest daily maximum ET(winegrapes) between 1990 and 2005 was estimated to be 6.74mm. Irrigation systems need to be able to meet these demands and a carefully constructed graph, within the project report, shows the frequency at which the average ET(winegrapes) exceeds irrigation capability at varying depths of applied water. From this data it becomes apparent that there are drip irrigation systems (< 5.5 mm/day) that rely on the water holding capacity of the soil; using the readily available water (RAW) as a bank to manage peak demands. Depending on the soil type and possible chemical or physical restriction this can represent a significant risk.

The low application rates of drip systems (approximately 1mm/day) generally means that the frequency and duration of irrigations is greater than for other methods of irrigating. The danger that exists, if a system is unable to meet crop water demand over a period of several days, is that the soil can become dry and inturn make the re-wetting process difficult. The changing hydraulic properties of dry soils have particular relevance in drought conditions. Preferential pathways can open up,



meaning water can bypass the rootzone and transmit quickly to the subsoil, beyond the reach of the efficient water absorbing feeder roots. Careful management is required if such occurrences are to be avoided.

Of the systems reviewed in this project all but one were considered to operate satisfactorily. The system that was deemed unsatisfactory had deviated from the original, professionally constructed design. In this case, non-pressure compensating drippers were used against the recommended specification and the result in terms of distribution uniformity and variation was consequently far from adequate. Not surprisingly the report recommends that; "Irrigation designs and any modifications should only be carried out by a professional designer, preferably accredited by the Irrigation Association of Australia."

The report is well written and provides a good, succinct source of information for all winegrape irrigators. Given the current restrictions on water allocation and the pressure on our natural resources the project report is particularly relevant to an industry that prides itself on its adaptive capacity, competency and general technical acumen.

Electronic versions of the report can be accessed by logging on to: [http://www.riverlandwine.org.au/downloads/GWRDC\\_drip\\_assessment\\_project.pdf](http://www.riverlandwine.org.au/downloads/GWRDC_drip_assessment_project.pdf)

A limited number of hard copies are also available and can be obtained by phoning the RWIDC office on (08) 8582 2952 or emailing Tim Smythe at [tim.smythe@riverlandwine.org.au](mailto:tim.smythe@riverlandwine.org.au)

# RIVERLAND RENAISSANCE

October will once again bring about the regional celebration of our wines and food. The Riverland Renaissance will again provide a two week program of activities that will attract locals and tourists alike.

The Renaissance concept was born last year from an extension of the Riverland Wine and Food Festival and Wine Week activities with a broader menu of activities.

## Wine Week

This year the program will again kick off with Wine Week activities. The Riverland Wine Show celebrates its 35th year, and will see local producers compete against each other as well as against wines from other warmer-climate Australian regions in one of Australia's most popular regional Wine Shows. A panel of Judges will be assessing the wines on the 8th and 9th of October. The announcements will be made on Friday the 12th of October at the prestigious Riverland Wine Show Dinner, which will be preceded that day by the Exhibitors' Tasting and the Public Tasting at the Berri Resort Hotel.

## Some Like it Hot

Some Like it Hot is another feature of Wine Week, and will feature both the Seminar and the Advanced Wine Tasting. Winegrape growers, winemakers, suppliers to the winegrape industry, and other stakeholders are invited to attend the Seminar to be held on Thursday the 11th of October the Chaffey Theatre in Renmark. The Advanced Wine Tasting will be held the following Tuesday at the Berri Resort Hotel and will be Chaired by wine writer Nick Stock who will examine modern wine styles with an emphasis on wines from the Languedoc region in the south of France.

## Special Dining Events

Several dinners and shows will form part of the Riverland Renaissance program;

Internationally regarded jazz singer; Janet Seidel will be performing at a dinner featuring Riverland wine and food at the Origin Jazz Club, Renmark Club, Murray Avenue, Renmark on the evening of Saturday October the 13th. Special cocktails prepared from Riverland spirit, sparkling wine, fruit and beverage will be presented overlooking the majestic Murray River.

Proudly supported by Australian Zircon and Food Riverland Inc, Banrock Station Wine and Wetlands Centre will host a spectacular Chefs of the Murray regional dinner overseen by Grant McGregor of the Adelaide Hilton Hotel on Thursday October the 18th. The Australian String Quartet will delight the guests during the evening.

Italian stage band; 'Carnival' will entertain attendees at the Pranzo experience where platters of regionally produced Mediterranean style foods will be enjoyed with local wines and beverages. A casual and relaxed setting at Lock 4 overlooks the River Murray, where the event will run from noon to 5.00pm on Sunday October the 14th.

## Riverland Wine and Food Festival

The Festival will be held in a vibrant surroundings. It's a remarkable regional food, wine and entertainment package, presented in a picturesque setting on the Berri riverbank. The Festival brings together the Riverland's wineries and dining venues in a celebratory environment. The event features an array of food styles that go to recognise the numerous cultural influences in the region. Meals are prepared with an emphasis on using local produce. As Australia's largest wine producing region, the Festival provides visitors with a great opportunity to check out the region's 'food wines' that boast rich and ripe fruit flavours.

## Around the Region

To complement the wine, food, and music activities are a host of events held through the region towards the conclusion of the Riverland Renaissance;

### Friday 19th October

- Australian String Quartet's 'Musica', Chaffey Theatre, Renmark
- Ruston's Rose Garden's Art and Cuisine Evening
- Murray River Queen dinner featuring 'Tossed Salad'

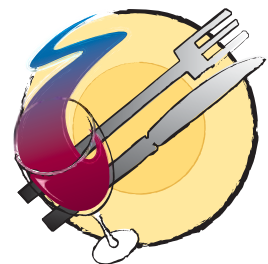
### Saturday 20th October

- Berri Resort Hotel hosts 'The Crush'
- Murray River Queen with Jazz Band

### Sunday 21st October

- Sigismondi Estate Wine's 'Italian Barbeque Breakfast'
- Mallee Estate Wines' 'Greek Taverna'
- Loxton Hotel, Breakfast on Kekwick Balcony
- Torambre Nissen Hut Cellar Door's 'Blockies Lunch'
- Banrock Station Wine & Wetland Centre with Joss Kelly

The Riverland Renaissance is a tremendous celebration of the quality produce that our region produces. For more information on the events and activities, see [www.riverlandwineandfood.org](http://www.riverlandwineandfood.org)



**Riverland  
Renaissance**

# SAVING A DROP BY CONVERTING TO DRIP



David Zadow presents to the 'Where is the water?' seminar

At the 'Where's the water?' seminar held on the 2nd of May 2007, Mr. David Zadow, of JF Zadow & Son (Blanchetown, South Australia), gave a compelling presentation on his experience with converting to drip irrigation. The presentation, aptly titled "Saving a drop by converting to drip", detailed the decision making processes involved in the conversion and the impact on the business. Below is a summary of the transcript from David's presentation:

## Aim

To convert 27.6 ha (68.2 acres) of vineyard from a manually operated overhead sprinkler system, with no pressure control or safety devices, to a fully automated pressure regulated drip system with dial up capabilities. Installation had to occur between the end of harvest 2004 and budburst season 2004/05.

## Why convert to drip?

The decision to convert was not one that was made over night. After years of battling with an antiquated overhead irrigation system, the benefits to for converting to drip became overwhelming and obvious. The following events were critical in the decision making process.

- Installation of soil moisture monitoring equipment in the 2002 season showed that applied water was not adequately supplying the rootzone.
- Variation within the vineyard was a big problem and even with the extra water applied there was a distinct lack of uniformity... maturity sampling was difficult to say the least.
- In March 2003 a vigour index map was received from the Phylloxera and Grape Industry Board SA and this confirmed the nature and extent of the variability (see figure 1).
- The existing overhead system was incredibly labour intensive! The sleepless nights prior to harvest, removing sprinkler heads, were becoming less and less appealing.
- The vigour, health and productivity of the vines did not reflect the level of water inputs being given.
- The 'Ultimatum' – " We were on an annual purchase agreement with the Yalumba Wine Company. We valued this relationship and knew that conversion to drip was required to continue our arrangements" David acknowledged.

## Planning

A professional irrigation designer was consulted; soil maps, budgets, logistics, ordering, quotes and design were all compiled and assessed. Planning was pertinent to the whole process. If something was to be done, it had to be done properly. Capital costs were important but the longer term running costs, practicality, flexibility and the overall ability of the system to perform the required duty had to be considered. Cutting costs and taking short cuts could have lead to major head aches down the track.

## Installation

The installation process, in full, is beyond the scope of this article but access to David's presentation can be gained by logging onto the Riverland Wine Industry Development Councils website ([www.riverlandwine.org.au](http://www.riverlandwine.org.au)).

In echoing the points made when referring to planning, David further asserted the issue of cost considerations over the longer term when outlining the decision making process regarding the purchase of a new pump or converting the old pump. Given that the old pump had recently been overhauled and was working perfectly, there was a reluctance to replace it. The pressure had to be regulated for it to conform to the standards of the newly installed drip system (shift sizes etc.). The cheapest option, with regard to initial capital outlay would have been to restrict the pressure at the pump but this would have increased longer term running costs. The option that was decided upon, involved the purchase of a VFD (variable frequency drive) at a cost of \$21,153.50. This was the most expensive option in terms initial outlay but the longer term benefits with regard to energy consumption and flexibility swayed the decision in its favour.

## Costs

Variations	\$ / hectare	\$ Total
Our full cost as a private irrigator to convert from a manual overhead irrigation system to an automatic drip irrigation system	5,080.73	140,228.29
Less Automation and Fertigation (If it is already installed)	4,636.14	127,957.57
Less pump costs (irrigator on a scheme)	4,314.30	119,074.79
Less Automation, Fertigation and pump costs	3,869.71	106,804.07

## Results

Year	Type of year	Area Bearing hectares	Total Tonnes	Average tonnes per acre	Total Megalitres per bearing hectares	Average Megalitres per hectare	Average kilolitres per tonne
Overhead irrigation							
2001/2002	Good	22.4	401	7.2	190	8.5	473
2002/2003	Dry	24.3	331	5.5	238	9.8	717
Drip Irrigation							
2005/2006	Good	25.6	628	9.9	141	5.5	225
2006/2007	Dry	29.4	518	7.1	118	4	228

	Average ML/ha	Average Tonnes/ha
Overheads (5 years data)	9.05	17.8
Drip (3 years data)	4.75	21.5

## Summary

The changeover began after harvest in April 2004 and was completed and operational across the whole of the vineyard by the end of August 2004. All other vineyard duties such as machine pruning had continued during the same period.

Since having the drip installed:

- Water use has halved.
- Yield has increased.
- Variation has decreased (see figures 1 & 2)...improvements in the uniformity of the patches continue, making management and maturity sampling easier.

- Automation has meant considerable time savings...you can't put a price on extra sleep at harvest!
- Herbicide, fuel and pumping cost all significantly reduced.
- Timing of sprays is not an issue anymore. Sprays can be applied while irrigating.
- More controlled water and nutrient application – increased vine response from inputs.
- Estimate around \$100 per tonne saved in production costs.
- Ability to lease out surplus water for extra income.
- Planting opportunities by the winery have been given that we may not have otherwise had.
- Better positioned when it comes to decision making on reduced allowances.

### Scenarios

Before concluding the presentation David considered the following scenarios. Bare in mind the figures used are estimations calculated on hypothetical circumstances and represent variables that are particular to the JF Zadow & Son vineyard.

#### What if I only had 40% of allocation?

- 40% of allocation = 161ML

	Average ML/ha	Average Tonnes/ha	Hectares available for irrigation on 40% allocation	Potential crop (tonnes) at 40% of allocation	Potential income at 40% allocation & \$425/tonne
Overheads (5 years data)	9.05	15.06	17.8	324.1	\$137,743
Drip (3 years data)	4.75	21.5	33.9	728.9	\$309,783

- This is only a rough calculation but it does give an indication of the potential benefits of drip in my circumstance.
- An extra \$6,233/ha ( \$309,783 - \$137,743 / 27.6ha) could be potentially be achieved across the entire property.

Would I convert to drip in the current circumstances?

- YES!
- The alternative of leasing water may assist with developing a crop in the year of purchase but leaves me with no infrastructure improvement on my property for the longer term.
- I could potentially use water trade to help finance the conversion.

#### What have I learnt?

In concluding David reflected on the experience of converting his property to drip irrigation, making note of the importance of staying informed and basing decision making on sound information. To this end, David finished with the following remarks:

- Budget – know your costs and be sure to include your own labour.
- Installation of soil moisture monitoring has allowed irrigation scheduling to be fine tuned. I maintained the rootzone profile with 4ML/ha this season (2006/07).
- Drip irrigation has increased the level of flexibility I have in managing the vineyard.
- My confidence and ability to make decisions has been strengthened greatly throughout the process.

#### The Last Word

*“The reduction of our cost of production and the ability to trade the water saved, has helped us remain viable with the lower grape prices and tougher market conditions.”*

Figure 1: Normalised Difference Vegetation Index (NDVI) map showing the variability across the JF Zadow & Son property in 2003. Map provided courtesy of the Phylloxera and Grape Industry Board SA.

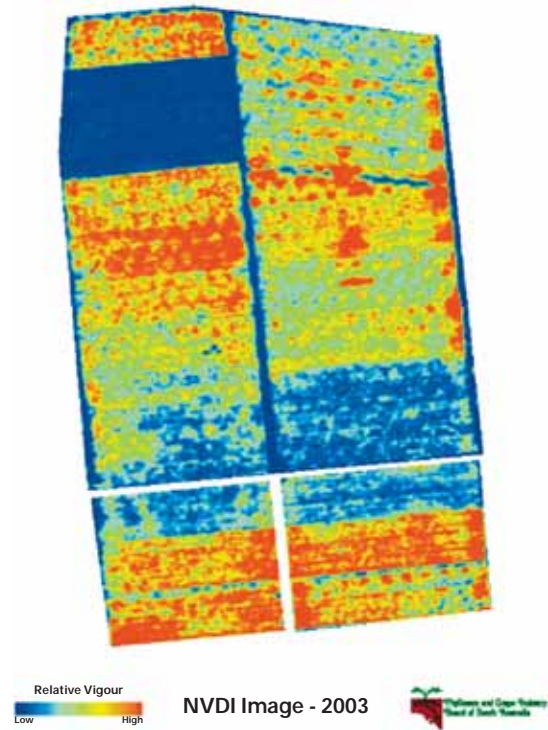
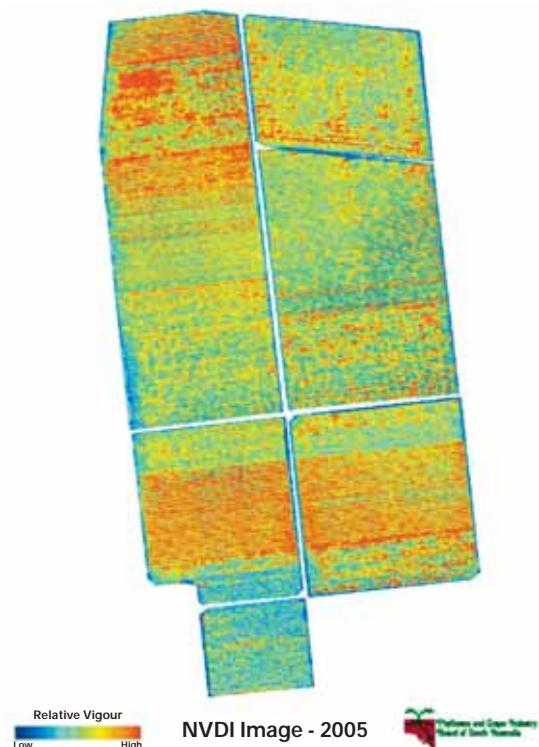


Figure 2: Normalised Difference Vegetation Index (NDVI) map showing the variability across the JF Zadow & Son property in 2005. Map provided courtesy of the Phylloxera and Grape Industry Board SA.



# HOW WELL DO YOU KNOW THE MURRAY DARLING BASIN SYSTEMS AND THE RIVERS THAT SUPPLY THE WATER?

The following information has been extracted from: Kirby M., Evans R., Walker G., Cresswell R., Coram J., Khan S., Paydar Z., Mainuddin M., McKenzie N. and Ryan S. (2006). *The Shared Water Resource of the Murray Darling Basin (Part1)*. <http://www.csiro.au/resources/pfdn.html>

## The Murray Darling Basin (MDB) – The shared water resource.

### Rainfall

Average annual rainfall across the MDB = 408mm (This ranges from approximately 2000mm in the wetter, less variable eastern parts to approximately 200mm in the drier, more variable western parts of the Basin.)

### Area Occupied by MDB

The MDB covers approximately 14% of Australia and occupies some 1.06m square kilometres.

Total average annual water input to the MDB – 508,000GL  
(1GL = 1,000,000,000L)

### Average runoff

Approximately 24,000GL or 5% of the total average annual input remains as runoff and flows into streams and reservoirs of the MDB.

Quantifying ground water recharge is much harder and in the north of the system it relies on the ephemeral nature of the rainfalls (as does run off and flow).

### Flow

Under natural conditions, discharge at the Murray Mouth has been estimated to have been on average 12,000GL. Over the last ten years (report published February 2006) average discharges at the mouth have been measured to be 2,700GL.

Storage and extractions from the MDB system have altered flow characteristics substantially. Peak flow now occurs

in summer (previously it was spring) when demand for irrigation water is at its greatest. The frequency of moderate flood periods has decreased (deterioration of wetlands) and the system now experiences low flow regimes more often (increased algal blooms and salinity).

### Evaporation

The average annual evaporative losses from the MDB open water sources equates to approximately 3,000GL. Of this the Lower Lakes in South Australia are the greatest contributor with annual average losses of approximately 750GL.

Note: Large private storages are not included in these figures.

### Irrigation

Irrigation is the largest water user in the MDB. Of the 11,000GL diverted from the system, irrigation makes up 95%.

Irrigated agriculture occupies approximately 1.5million hectares.

- Pasture is predominant in the south east of the basin – 550-700mm of applied water is delivered mainly through flood and unlined channels. There is good potential for improving conveyance (currently 80%).
- Rice in the Murray & Murrumbidgee – 1000mm of applied water via standing flood (3 months) with many unlined channels. There is good scope for improvement.
- Grapes and perennial horticulture in the Lower Murray – there is a large variation but on average 600mm of applied water is used and delivered mainly through sprinkler and micro-systems. Unlined channels on sandy soils result in some of the lowest conveyance efficiencies in the Murray-Darling Basin (56% in Wimmera Mallee), with much scope for gains. Other areas have piped delivery and conveyance efficiencies of greater than 90%. Much of the system is being upgraded.

- Cotton in the Darling – 700mm of applied water. Unlined channels on heavy soils are thought to have reasonable conveyance efficiency. Diversions are based on licences which: limit the volume that may be pumped in a year; stipulate the size of pumps and other pumping rules; and set a commence-to-pump threshold such as a river height. (100mm = 1ML/ha)

### Overall water account

The table below is taken from the CSIRO document and summarises the major components of surface run-off based on average annual figures from 1994/95 to 2002/03. (Kirby et al, 2006)

Table 1. Major Components of surface run off

Component	GL/year
Run off & transfers in	+25,000
Diversion	-11,000
Discharge at mouth	-3,000
Evaporation (open water)	-3,000
Other evapotranspiration*	-8,000

\*Other evapotranspiration includes consumption in wetlands and on floodplains

### Groundwater

The effects of over allocation of the surface water resource, salinity and change in land use take longer to reveal influence on the groundwater system and as a result are much harder to quantify. Over extraction is, however, recognised as a significant risk to the shared water resource.

Groundwater resources are poorly defined and undervalued. Saline groundwater has become a concern where it discharges into the river.

- There are 72 groundwater management units across the MDB including the Great Artesian Basin.



- In 2002/03, 50% of groundwater management units were over allocated and 15% of actual use was above sustainable use.
- 1632GL was extracted in 2002/03 – 724GL less than estimated sustainable use and 1236GL less than the volume allocated.
- Trend – there is ongoing development for irrigation using existing entitlements, either from transfer market and/or unused (sleeper) entitlements. Use has been influenced by drought and it is unclear if future use will decline to pre-drought levels. Infrastructure investment, however, is likely to mean higher levels of extraction.

### Salinity

When considering salinity within the MDB, 4 broad regions can be defined:

- The Lower Murray adds the largest salt load. The river here as always acted as a drain for saline regional groundwater. Irrigation development and land clearing has exacerbated the problem.
- On the Murray alluvial (soil deposited by water) plains, most irrigation areas are salt sinks relative to the River. The practice of irrigation introduces salt to the landscape. Some salt is returned to the river through base

flow or drainage but most salt remains in the soil, shallow groundwater and evaporation basins or diverted to wetlands. The Kerang area is an exception. Development here occurred on a natural discharge area and combined with drainage the salt exports far outweigh the salt imports i.e. a lot of salt has the potential to enter the river.

- In the Upland areas of the Murray the local fractured rock systems follows climatic trends – high rainfalls years increase salt exports. The larger intermediate alluvial systems have increasing ground water mounds that contribute salt to the river. In both cases salt exports exceed salt imports 3-15 fold.
- The Northern MDB shows no trends in stream salinity. Monitoring is generally too sparse to identify trends in dryland areas. The summer dominant rainfall, the heavier soils and differences in land use may all lead to salinity developing more slowly in this region.

### Summary

- Land use change has increased the run off to streams and recharge to aquifers (through removal of deep rooted native vegetation).

- Other changes such as increased farm dams threaten to decrease run off to streams;
- Storages, which are larger in the south, have changed flow regimes; fewer floods and low flows plus changes to the seasonal pattern of flows now exist.
- Irrigation is the largest water user.
- Evaporation from open water sources equates to approximately 12.5% of average annual inflows to storage.
- Groundwater use is at risk of being over allocated. Risk increases in areas where River flow is ephemeral (Queensland).
- There is a large variation in salinity impacts along the River but the Lower Murray, of which the Riverland is part, is generally considered to contribute the most.

Improved water resource management will require a better understanding of the hydrology within the MDB. Quantification of the various components of the water balance equation is fundamental to an improvement in management. From this, a more accurate water account needs to be established; a must if the terminology 'the shared water resource' is to impart a culture of sustainable practice and management.

# WEED CONTROL

## IS RESISTANCE MANAGEMENT PART OF YOUR STRATEGY?

Herbicides are a widely used weed management option in Australian horticulture. However, persistent use of a narrow range of herbicide groups can place significant selection (resistance) pressure on weed populations.

Herbicide resistance is broadly defined as a heritable (passed on from one generation to the next) reduction in the sensitivity of a population of a weed species to a specific herbicide. Over time, weed populations that were once predominantly susceptible to a specific herbicide can become resistant.

Reports of resistance (in a number of weed species) have become common in Australia, even with non-selective herbicides such as glyphosate (Group M) and paraquat (Group L). The development of resistance can be primarily attributed to continuous, uninterrupted use over many (15+) years.

The graph below shows the increase in number of confirmed cases of glyphosate resistance (predominantly annual ryegrass) in Australia between 1996 and 2007.

The CRC Weed Management, Australian Glyphosate Resistance Register has recorded 13 known vineyard sites within SA and WA as having resistant ryegrass populations. To find out more go to:

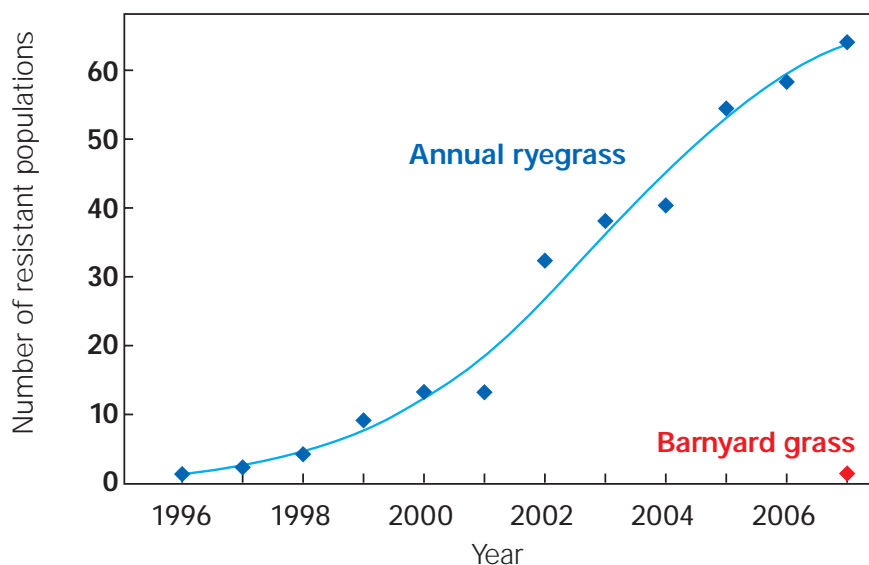
([http://www.weeds.crc.org.au/glyphosate/glyphosate\\_resistance\\_register\\_summary.html](http://www.weeds.crc.org.au/glyphosate/glyphosate_resistance_register_summary.html))

Herbicide resistance could have a significant negative impact on the Riverland industry. To minimise / avoid herbicide resistance, growers are advised to consider integrated weed management (IWM). As an industry it is important that herbicides are used in a sustainable way. New chemistries, with alternate modes of actions take significant time and resources to develop and as a result, are not regularly introduced to the marketplace.

CropLife Australia has developed a comprehensive guide of herbicide resistance management strategies. The guide is an excellent reference source and is well worth a read, to access a copy go to: [http://www.croplifeaustralia.org.au/default.asp?V\\_DOC\\_ID=849](http://www.croplifeaustralia.org.au/default.asp?V_DOC_ID=849) – guidelines for fungicide resistance management can also be obtained through this link.

Like any management plan, IWM involves identifying the target, implementing a procedure of control and evaluating the success of the control. Should a failure or partial failure result, action needs to be taken to assess its nature; in this instance, contacting a local agronomist is recommended. If resistance is suspected, a test on the remaining (escapée) population should be conducted. An alternate control needs to be implemented prior the setting of seed – this will act to reduce the number of potentially resistant individual seeds that contribute to the remaining seed bank. If the alternate control requires herbicide use, ensure the product chosen differs in its mode of action (Group) to the original product(s).

An understanding of the species of weed(s) is important with IWM. Many operators believe that they are alternating the mode of action but in reality they are not. Rotation between different modes of action is often implemented too late. For example, winter weed species are generally being controlled with glyphosate only. While summer weeds are being sprayed with Group L contact herbicides (paraquat / diquat). The switch between modes of action generally takes place in late spring to early summer when the species of weeds present have altered significantly.



Taken from: Preston, C. (2005) Australian Glyphosate Resistance Register. National Glyphosate Sustainability Working Group. Online. Available [www.weeds.crc.org.au/glyphosate](http://www.weeds.crc.org.au/glyphosate)

Options to broaden the range of herbicide modes of action include the use of pre-emergent herbicides (if seasonal conditions are favourable – drought doesn't help!). Pre-emergent herbicides i.e. pendimethalin, simazine; applied in late winter and early spring can provide several months of weed control and reduce the number of knockdown herbicide sprays required. As with all chemical use it is critically important that product labels are referred to for specific application directions: in this case sandy soils and vine age are noted on a number of labels.

Weeds should be managed to reduce population densities. As more weeds are allowed to go to seed, an increase in the soil seed bank puts further pressure on future control measures. This is particularly important when considering the use of selective herbicides. CropLife Australia lists the Group A herbicides (Fusilade Forte, Verdict 520, Leopard etc.) as being high risk and Group C (Diuron WG, Surflan 500, Simazine 500 etc), Group D (Stomp 330, Tricon 480, Surflan 500 etc) and Group F (Zoliar DF) herbicides as being moderate risks – application to dense populations of grasses is not recommended. The simple reason for this is that larger populations of weeds will have greater genetic variability and are more likely to have individuals with a degree of inherent resistance.

Clearly, not all herbicide failures are likely to be the result of resistance but it is important that actions are taken to minimise the likelihood of it occurring. The vast majority of failures are the result of application errors. A number of general application issues are listed below:

- Water quality is often a forgotten part of the equation. Water should be checked for colloid, pH and calcium ion concentration as all can have deleterious effects on the efficacy of a product.

- Incorrect nozzle selection and general wear and tear can lead to poor coverage.
- Spraying in the wrong weather conditions can lead to spray drift and off target spraying.
- Products such as Basta® have specific humidity requirements that need to be adhered to if successful control is to be achieved.
- Spraying stressed weeds leads to inadequate uptake of chemicals and hence poor control.

As mentioned previously, label rates need to be adhered to. The consequences of off-label use, apart from being illegal, can lead to increased selection pressure for resistance and off-target impacts. Competent use of chemicals is a marketing issue as well as a farm management and social responsibility issue. The industry is placing greater importance on the review of spray diaries in an effort to ensure that they are complaint with food safety directives. It is easy to be satisfied that you are operating in a competent manner but when you have to satisfy the concerns of your customers, paper work becomes a great ally – spray diaries should not be seen as a burden.

#### **Where to from here...the RWIDC will continue to work with industry!**

It has been brought to the attention of the Riverland Viticulture Technical Group that there are some species of weeds that are becoming harder to control. While there is no direct evidence of resistance, members of the RVTG will work cooperatively with industry to identify best practice guidelines. To assist with investigations and as a matter of protocol, suspected problem weeds will be tested for resistance where possible.

In the meantime however, the best protection against resistance is to avoid the development of resistance in the first place. In the long-term, minimising herbicide resistance and maximising weed control efficacy depends on the adoption of an integrated approach to weed management.

#### **Useful Links:**

For an overview on how resistance is established via genetic mutation in a weed population go to: [http://www.weeds.crc.org.au/documents/understanding\\_hr.pps](http://www.weeds.crc.org.au/documents/understanding_hr.pps)

To visit the Australian Glyphosate Resistance Register go to: [http://www.weeds.crc.org.au/documents/glyphosate\\_resistance\\_register.pdf](http://www.weeds.crc.org.au/documents/glyphosate_resistance_register.pdf)

# UNI STUDY ADDS VALUE TO OUR POSITIONING

In a meeting early this year with the University of SA, the Riverland Wine Industry Development Council was introduced to the School of Marketing's Master of Marketing, Advanced Integrated Marketing and Firm Strategy' Course, were Masters Students undertake case study work which were practical engage in real-life case studies.

Dr Hervé Remaud, supervising lecturer at the University of South Australia's School of Marketing proposed that the Riverland wine industry could form the basis of a Masters-level case study. The Riverland region had undertaken a series of projects to build a brand position, and to progress a marketing plan framework. It was agreed that these efforts could be further bolstered from additional recommendations to identify some triggers to fast track a regional branding campaign.

A project titled 'Branding the Riverland and its Wines' was set as one of the real live case studies of the Advanced Integrated Marketing and Firm Strategy course, supervised by Dr Hervé Remaud. Over a ten week period, nine Master students conducted the project as a group assignment and at the conclusion, provided their findings to the Riverland Wine Industry Development Council. Two questions the study aimed to address were;

- How could the region create extra awareness of and add value to 'Wine Brand Riverland'?
- Should the Riverland wine region pursue the awareness and appreciation of a regional variety?

The students' primary research referenced a number of current industry and academic reports which later formed the basis of a web-based questionnaire. The questionnaire addressed the specific research objectives and drew out the features that are 'most versus least' associated with the Riverland and its wines. Overall, 170 people participated to the survey including: 35 wine writers / wine journalists, 26 wine producers, 21 wine distributors wine retailers, 64 wine consumers, and 24 falling in the 'other category'.

The questionnaire participants reported that;

- 51% drink everyday or almost everyday, 27% once or twice a week, 10% once or twice a month.
- 89% had visited the Riverland at least once.

- 85% consumed a wine from the Riverland at least once.
- 27% of the respondents associated a specific grape variety with the Riverland and for half of those respondents, this grape was Chardonnay.
- Compared to other attributes such as brand and price, 53% of the respondents thought that the grape variety was more important when purchasing a bottle of wine for normal consumption.

- Compared to other attributes such as brand and price, 40% of the respondents thought that the region of origin was more important when purchasing a bottle of wine for normal consumption.
- For normal consumption, 62% of the respondents were willing to pay more for a wine with the region mentioned on the label
- 32% of the respondents agreed that Petit Verdot grows very well in the Riverland due to its warmer climate.

In assessing considerations around features that were 'most versus least' associated with the Riverland and its wines, the students used the Best-Worst Scaling method.

## Main Findings

The questionnaire showed that in the opinion of respondents in the categories of writers - journalist, producers, distributors and other (101 respondents);

- Two features 'Good value for money' and 'Murray River' were the most important features associated with the Riverland and its wines.
- Followed by 'Plenty of fruit', 'Generous People - Generous Wines', 'Wines for Relaxation', and 'Everyday Wines'.
- More industry-specific and environmental queues had a less strong association with the Riverland wine industry.

Using the Best-Worst Scaling allowed the project team to state that; 'Good value for money' is almost twice most associated with the Riverland and its wines than; 'Plenty of fruit'. A least important score does not mean that those regional attributes are negatively perceived but instead, that those features are least associated relative to those most associated with the Riverland and its wines.



The Masters students that prepared the report with Dr Hervé Remaud

## Recommendations

The students and their supervisor concluded the following recommendations from the survey results and the primary research findings;

- Creative Publicity: For Ehrenberg et al. (2002), 'Fairly few advertisements actually feature potentially persuasive inducements for their brand. Nor do they usually appear to change people's opinions'. Therefore, the Riverland needs to focus on the attributes people associate (most) with the Riverland: good value for money and Murray River; and build salience / stimulate awareness using those features.
- Wine tourism: tourism and wine are two crucial factors to the Riverland. Tourism in the Riverland increases awareness of the best fit attributes. The study notes the South Australian Tourism Commission "Recharge on the Murray" campaign and the Riverland Tourism Association's investment in promotion of the Murray River. The region has: the river + fantastic cliffs + the river boats = fantastic opportunity to combine all features with the wine experience. The region should consider a 'wine boat trail'.
- The Riverland Wine Industry evolve its current slogan of Riverland Wine, Australia's most popular wine to 'What is Australia's most popular wine?' to build interest and awareness concurrently.

This feedback is useful to add to our existing knowledge-base that supports our efforts to position Riverland wine in the most effective manner possible.