



Australian Wine Industry Stewardship 2009 NATIONAL REPORT

Introduction

The Australian Wine Industry Stewardship project (AWIS) commenced in 2004, in response to emerging trends towards environmental assurance in markets and governments. Between 2007 and 2009 inclusive vignerons across the country reported on their environmental stewardship practices in the national AWIS survey.

The 2009 vintage marked the third and final industry-wide roll out of the AWIS grower survey. The survey was issued by participating wine companies to their contract and company growers. The AWIS report provides a snapshot of environmental stewardship practices and approaches across the country. Significantly, even though 2009 can be characterised as another dry, hot year with falling market expectations, participation and engagement in stewardship practices and training remained strong.

AWIS was the precursor to EntWine Australia, the new national environmental assurance scheme, officially launched in December 2009. EntWine Australia addresses both vineyard and winery production processes, through a combination of environmental practices certification and resource use monitoring and reporting. From 2010 a new National Report will be provided using data collected from EntWine Australia participants.

2009 AWIS Participants

In 2009, participating companies have collated and returned results for 1839 growers. This is compared to 2,361 in 2008 and 2610 participating growers in 2007. Slightly declining numbers can be accounted for as 2009 is the final year of AWIS hence some operators have moved away from AWIS focused their attention on EntWine Australia.

Although, the large number of respondents is a good statistical representation of the industry (roughly 20%) it should be noted that there may be some variation between those participating. Additionally regional differences may be significant and will not be reflected in national reporting. Therefore, this data should only be used as a broadly indicative snapshot of the industry. In the table below (results snapshot) a percentage change of 3% or less is considered to be negligible. A regional report is available on request to WFA and EntWine Australia members.

The AWIS Survey

With 157,290 hectares of wine-grape vines (ABS, 2009), wine grapes are grown in 34 of Australia's 56 natural

resource management regions. This means that there are 34 natural resource plans relevant to the industry.

Survey responses are used by wine companies to provide a snapshot of sustainable land management practices used by their growers. The results can assist in identifying training needs, accessing support for infrastructure improvement and for tracking changes in behaviour over time.

The most common method of distribution of the 2009 AWIS survey was as a one page insert in company spray diaries. Smaller companies accessed the AWIS survey from the WFA website and submitted their survey directly to the WFA for use in national reporting. Several large companies also collected the data of their contract growers and submitted it to the WFA.

AWIS Survey Results Snapshot

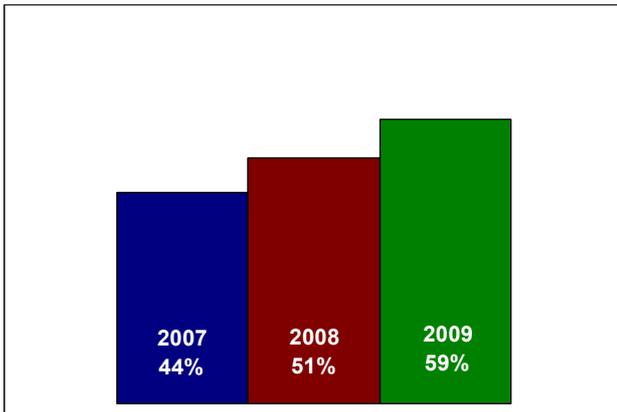
Indicator	2007	2008	2009	% Change
Participation in sustainable vineyard management training	44%	51%	59%	+8%
Growers with property management plans	59%	64%	69%	+5%
Use of current recommended practices	59%	58%	61%	+3%
Pest exotic weed control	94%	90%	93%	+3%
Pest feral animal control	79%	76%	78%	+2%
Participation in on-farm natural conservation programs	21%	22%	22%	0%
Mid-row vegetation for all/part year	98%	80%	85%	+5%
Mid-row vegetation is native plants	17%	60%	53%	-7%
Native trees/shrubs maintained along waterways	68%	77%	72%	-5%
Soil moisture monitoring	69%	67%	64%	-3%
Drip irrigation	62%	70%	79%	+9%
Soil/petiole analysis informs fertiliser use	60%	70%	68%	-2%
Renewable energy sources used on-farm	25%	22%	29%	+7%

2007/2008/2009 AWIS Survey Results

Minor changes to survey questions were made between 2007 and 2008. This was mainly to resolve confusion around some ambiguous questions, to simplify data entry and to make the survey more user friendly. The 2009 survey questions have not been altered.

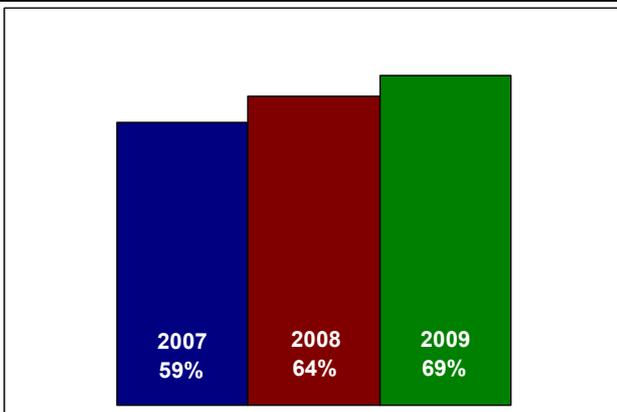
A comparison between each year's results is outlined below and enables the WFA to compare AWIS data and provide feedback to the industry on some of the observed trends.

Participation in sustainable vineyard management or environmental management training



It is hoped that with the introduction of the EntWine Australia program will result in even greater numbers participating in this form of training in the future.

Vineyards covered by property management plans



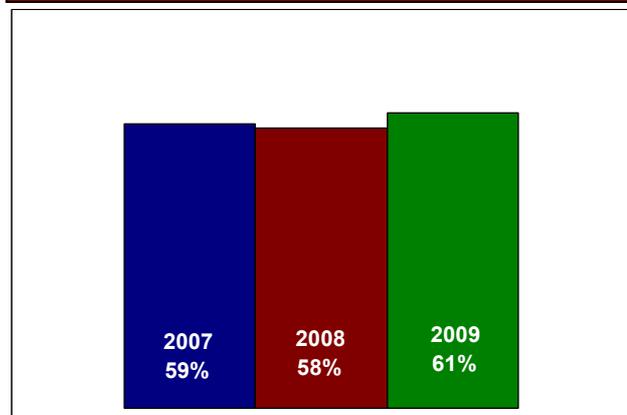
The clear trend of increasing use of property management plans highlights growing acknowledgement of the importance of these plans across industry. This has no doubt been assisted by promotion from state governments and would be related to the management training figure presented above.

Property plans provide documented evidence that a grower is aware of the natural resources of their property and has given due consideration to property management options. These include the location of agrochemical storage areas, identification of sensitive areas and required buffer zones, location and management of remnant vegetation and controlled traffic and access points across the vineyard.

In some regions, property management plans can be 'accredited' by state government agencies, NRM Boards/CMAs or irrigation boards. This can then provide growers with enhanced access to funding assistance and financial incentives for sustainability and land management projects.

Environmental practices certification is required for EntWine Australia membership, generally this requires participants to develop an in depth property management plan, for example using the Freshcare Environmental Viticulture code – A code which outlines all of the potential risks involved with viticulture and requires participants to develop an Environmental Action Plan.

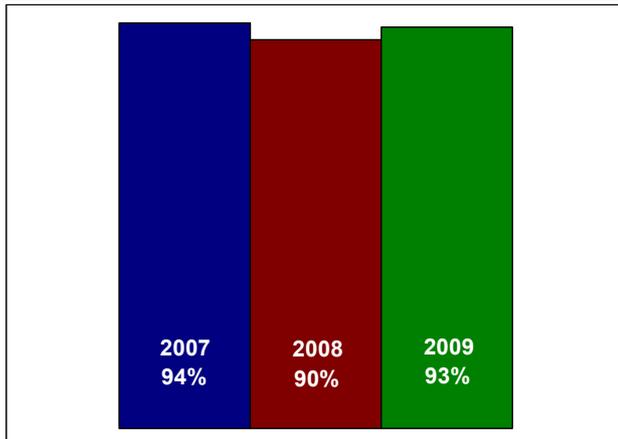
Using current recommended practices issued or endorsed by the local natural resource management board/catchment management authority or wine/ grapegrower industry association



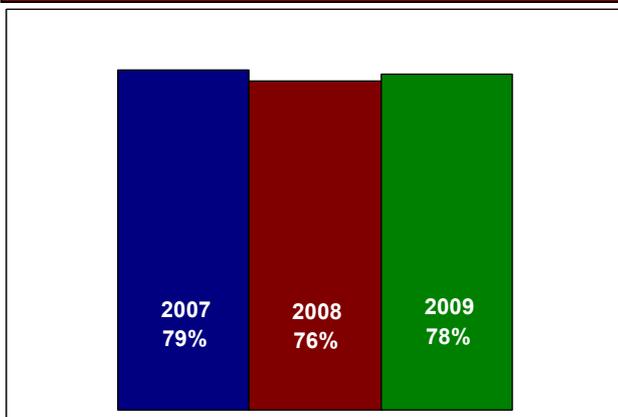
The number of operators using recommended best practice has had little movement between 2007 and 2009. Almost all regional CMAs and NRM Boards identify 'improving the adoption of Best Management Practices (BMP's) as a recommendation in their regional environment plans. Some of these organisations are hoping to achieve this by providing best management practice manuals or guidelines to land managers in their regions. Not all regions have published current recommended practice documents in place, however national recommendations are available through groups such as the Australian Wine Research Institute, who also hold the resources developed by the defunct Cooperative Research Centre for Viticulture (CRCV).

Regional wine and horticultural industries also have developed best management practice documents that are suitable for use in the wine industry. Existing resources are listed at the end of this document and are available from the publishing organisations.

Pest exotic weeds are actively controlled



Pest feral animals are actively controlled



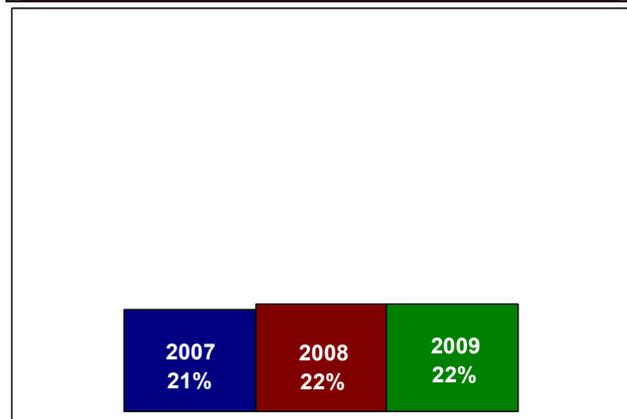
Pest animal and weed control is an essential part of agricultural production and is already a widespread practice in the vineyard. On-farm control activities can make an even bigger impact if they are carried out as part of a strategic broader regional control program, which might be managed by the CMA/NRM Board, local council or rural lands protection board.

An excellent example of the potential of strategic pest control has been documented for the management of starlings and feral olives in McLaren Vale. Historic starling control methods have been to hire shooters or use scare machines preceding harvest, however a more cost-effective and strategic approach would be to minimise starling numbers before veraison through a coordinated effort to cull starlings during their breeding phase earlier in the season and to remove feral olive trees that compliment the starlings' diet (Paton, 2005).

Landholders have a legal obligation to control declared weeds on their properties. Declared weed lists are available from state primary industry departments and CMAs/NRM Boards. Pest animals vary between regions but include feral animals such as starlings, rabbits, and foxes. Feral animal pests are both a problem for viticulture, and have an impact on the broader Australian environment, especially biodiversity.

The consistently high level of engagement in this area suggests a good appreciation of its importance within the industry.

Participation in on-farm nature conservation programs



The percentage of operators participating in on-farm nature conservation programs has remained static since the 2007 AWIS survey. These low numbers may be a result of lack of financial incentive and other perceived negative aspects associated with increasing on-farm biodiversity (e.g. increased pest or disease pressures). Some growers may not have areas of remnant vegetation, or not be aware of opportunities to include biodiversity considerations within the vineyard.

There are several very positive aspects of being involved in on farm nature conservation and improving the sites biodiversity. Increased native species can provide:

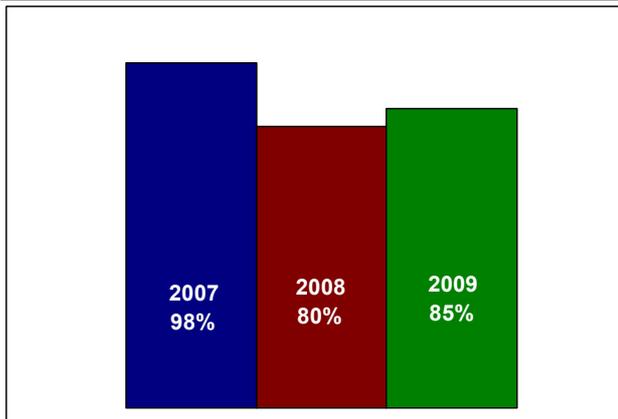
- Greater erosion control
- Wind breaks
- Habitat for beneficial bird and insect species
- Improved soil health
- Increased soil biological matter
- Salinity control
- Nature corridors and landscape linkages
- Aesthetic appeal

These low numbers are disappointing and highlight an area that should be given greater consideration in the future.

Programs such as *Land for Wildlife*, *Heritage Hectares* and *Voluntary Conservation Agreements* all promote the protection of remnant natural areas on the farm. Participation in these programs is an important way to contribute to protecting the biodiversity of the region. These programs often have financial incentives attached and signage is usually provided for easy identification of participating growers.

On-farm conservation focusing on areas of native trees is not possible in all vineyards, because either there are no vegetation remnants on the property, or because existing farm infrastructure leaves no room for tree planting. However, biodiversity - the variety of native plants, animals and their habitats - can still be integrated into the vineyard because soils and the vineyard floor can also be managed to promote native flora and fauna. Biodiversity is present at different scales - the variety of soil organisms is generally higher in soils with high organic matter content, the variety of grasses and native groundcover species on the vineyard floor, and the protection of natural vegetation along waterways and other areas not suited to vine planting. All vineyard managers could contribute to biodiversity protection in at least one of these ways.

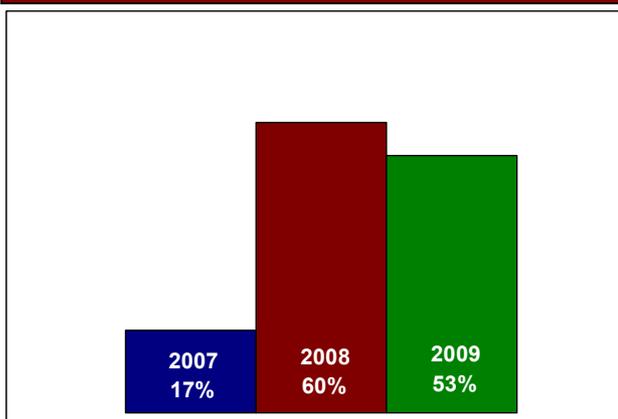
Mid-row vegetation maintained in the vineyard for all or part of the year



The vineyard inter-row, or mid-row, is important for a number of reasons. Mid-row groundcover can prevent soil erosion by wind and water, reduce vineyard temperatures, provide habitat for beneficial insects, increase soil organic matter, add to the aesthetic appeal of the vineyard, and also incorporate native plants into the vineyard as a biodiversity conservation measure. Where mid-row vegetation is only maintained for part of the year, it is usually sprayed out, plowed in, or annual crops are allowed to die as the vine's growing season commences. Whilst this practice reduces the biodiversity value of the mid-row, it does retain protection against soil erosion and increases soil organic matter.

The high use of mid-row vegetation indicated is an excellent sign that growers are aware of the benefits this vegetation provides. The decrease in number of growers between 2007 and 2008 who indicated that they retain mid-row vegetation could be attributed to drought conditions across many of Australia's grape growing regions.

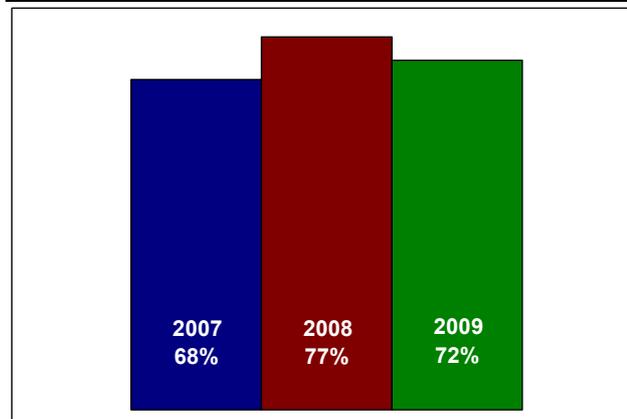
Mid-row vegetation is made up of native grasses and other native plants



In 2008 the majority of growers indicating that they retain mid-row vegetation also indicated that the mid-row vegetation was made up of native grasses and groundcovers. The 43% increase from 2007 to 2008 is a significant improvement, however it is acknowledged that there may be some confusion between native species and the opportunistic sward that grows in the vineyard without being sown.

Increasing the use of native species in vineyard floor management is an important contribution that growers can make to protecting native biodiversity.

Native trees and shrubs are maintained along natural waterways flowing through vineyard properties



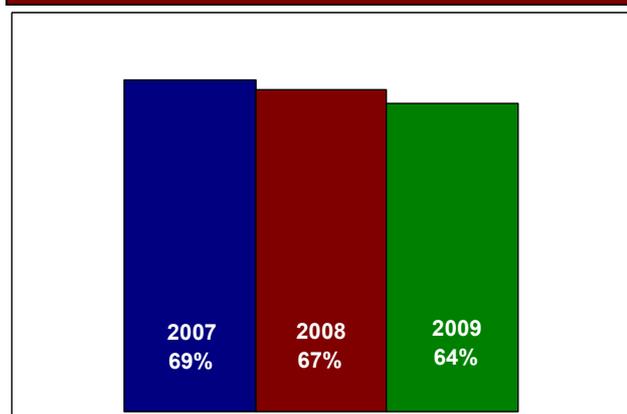
This survey question was changed slightly after the 2007 rollout because there was some confusion as to whether or not irrigation supply channels were included, hence the reference to natural waterways.

Generally high levels of native vegetation levels on waterways is a good sign, however there is still room for improvement in this area.

Sustainable waterway management practices such as protecting/replanting native vegetation and maintaining grassy buffer zones are less problematic on properties that don't carry livestock. This negates the need for fencing the waterway to control stock access, although some growers have also suggested that fencing is useful in keeping people and vehicles out of sensitive areas.

Native vegetation along waterways, in addition to controlling erosion, is also a valuable way of improving biodiversity on vineyard properties. Waterways may require ongoing management, such as exotic weed control, to maximise the native biodiversity values of these areas.

Soil moisture monitoring used to decide when to irrigate



Excessive applications of irrigation water can cause soil erosion and transport nutrients out of the vineyard and into waterways, resulting in reduced water quality. Excessive irrigation can also lead to poor quality fruit. Avoiding waterlogging of soils can reduce emissions of nitrous oxide, a significant greenhouse gas. These emissions typically occur just prior to soil saturation.

The drop in use of soil moisture monitoring use may actually reflect a response to drier conditions during 2008 and 09, where the decision whether or not to irrigate may have been more straightforward.

Type of irrigation system	2007	2008	2009
Drip	62%	70%	79%
Under-vine sprinkler	22%	23%	26%
Overhead sprinkler	19%	15%	15%
Furrow/Flood	16%	12%	5%
No irrigation or alternative method	4%	2%	3%

Over all years a large number of growers indicated that they use multiple irrigation methods on their property, and hence the percentages reported add up to more than 100%. Further, growers often use overhead sprinklers for frost control, and a separate method for irrigation.

Water use efficiency is important in Australia's dry climate. Figures from the Australian Bureau of Statistics (2008) indicate that 83.7%, or 157,401 ha, of Australia's vineyard area receives supplementary water (2009 ABS statistics not available at time of publication).

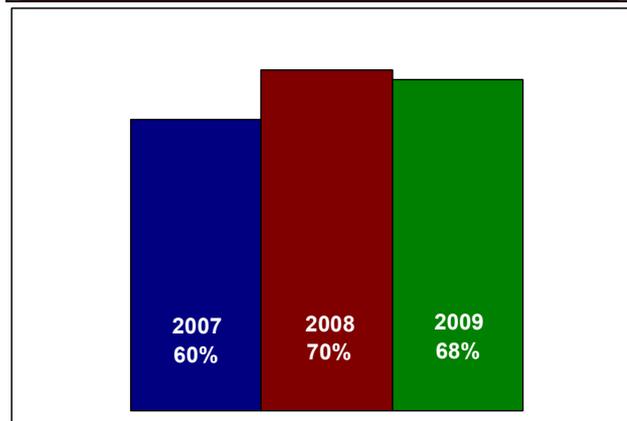
Best practice irrigation method will vary between regions and against different varietal requirements. This is reflected in the variety of irrigation methods used within the Australian wine

Industry Innovations in irrigation management mean that irrigation efficiencies of over 80% can be achieved for all types of irrigation used in vineyards.

Furrow/flood irrigation is a declining yet still common practice in the Murrumbidgee Irrigation Area in the NSW Riverina. However, sophisticated sub-surface tile drain systems are used to prevent irrigation water from seeping into groundwater, improving the efficiency of this method.

A reduction in the percentage of vineyard operators using flood/furrow irrigation (considered to be one of the least efficient methods) and an increase in drip irrigation for 2009 are clear indicators of operator's response to scarce water availability and a changing climate. In addition this technique can support improved fruit quality. These irrigation trends are very positive and highlight an industry that is conscious of the need to reduce water use and increase efficiency.

Fertiliser is applied in response to soil testing and/or petiole analysis



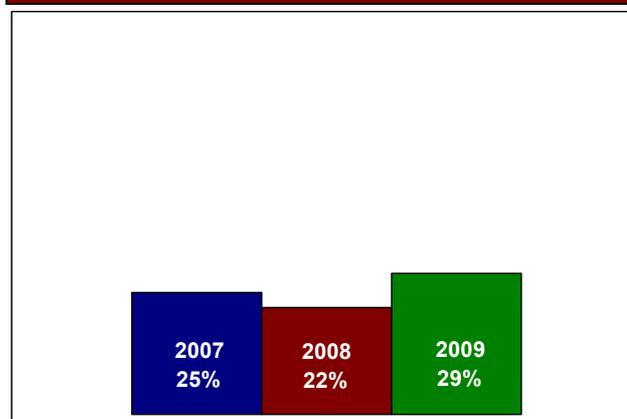
As a greenhouse gas, nitrous oxide has a global warming potential 310 times greater than carbon dioxide. Nitrous oxide is produced within soils naturally through nitrification and denitrification processes. The release of nitrous oxides from the soil is increased by the addition of nitrogenous fertilisers (FIVS, 2008) and through waterlogging.

Fertilizer applications over and above the grape vine's needs can be avoided by applying fertilizers in response to soil and/or petiole analysis – i.e. when the plant has an identified need for additional nutrients. This is particularly the case where a history of soil or petiole analyses is used to develop a nutrient management plan or nutrient budget, as test results are not always returned in time to inform fertiliser application decisions.

Routine applications mean that nutrients are added whether or not the vine actually requires them, and there is an increased likelihood that these will remain in the soil instead of being taken up by the plant.

Excess nutrients not only increase the likelihood of greenhouse gas emissions from the soil, but also increase the likelihood of nutrient-rich runoff moving off the vineyard and into adjacent waterways. This can lead to water quality problems in the waterway, including promoting algal blooms.

Renewable energy sources are used on the property



Renewable energy sources can be used on-farm in a number of ways. These include the use of biodiesel, solar

panels, small wind turbines or purchasing 'green energy' from electricity providers.

The use of renewable energy sources is one way that wineries and growers can contribute to reducing greenhouse gas emissions arising from the use of fossil fuels. Other methods include identifying opportunities for energy use efficiencies, such as minimising vineyard agrochemical treatments and investigating 'multi-row' application methods to reduce vehicle use in the vineyard.

Government subsidies (focusing on providing renewable energy at low cost) coupled with increased consumer and grower awareness of the importance of reducing greenhouse emissions could be a contributor to the gradual increase in participants using renewable energy sources. Often these forms of energy are seen to be very cost effective once the initial start up costs have been recouped. It is expected that these numbers will increase further in the following years as the technology improves.

AWIS In The Future

The 2009 AWIS National Report is the final report for this program. AWIS has now been replaced with EntWine Australia, a program that encapsulates much of the practices assessed as part of the AWIS surveys into requirements for independent environmental certification and resource use reporting.

EntWine Australia was officially launched in December 2009. The Wine Industry National Environment Committee (WINEC) continues to work on EntWine Australia, which is founded on the development of environmental management plans by grapegrowers and winemakers.

EntWine Australia will require the collection of similar data now referred to as EntWine Australia Indicator questions as well as carbon footprint data. It will also expand to include winery operations as well as vineyards.

All industry operators wanting to be involved in EntWine Australia in 2010 should visit the website for more information - www.wfa.org.au/entwineaustralia

Resources

- The Green Book: A guide to managing the environment for perennial horticulture in the Murrumbidgee Irrigation Area (*Murrumbidgee Horticulture Council*). Available for purchase from Murrumbidgee Horticulture Council.
- Guidelines for Environmental Assurance in Australian Horticulture (*Horticulture Australia Ltd*). Available for purchase from Horticulture Australia Ltd.
- Regional Environmental Best Practices for Viticulture – Yarra Valley (*VIC Dept of Primary Industries & Yarra Valley Wine Growers Association*). Available for purchase.
- Regional Code of Environmental Best Practice – Sunraysia Region (*VIC Dept of Primary Industries*). Available free of charge at www.dpi.vic.gov.au
- Good Environmental Management (GEM) Guidelines (*CRC for Viticulture*). Available free of charge at www.crcv.com.au/resources/Environment/

References

ABS Catalogue No 1329.0 Australian Wine & Grape Industry (2009).

Australian Bureau of Statistics (2008), 'Australian Wine and Grape Industry 1329.0 2007'.

FIVS (2008), 'International Wine Carbon Calculator Protocol Version 1.2'.

Ecology and Management of the Common Starling (*Sturnus vulgaris*) in the McLaren Vale Region. Paton, D, Sinclair, R. and Bentz, C (2005). GWRDC research

For More Information

Australian Wine Industry Stewardship is an initiative of the Winemakers' Federation of Australia.
Please contact:

Jonathan Green
Manager Natural Resources
jonathan@wfa.org.au.

Damien Griffante
Natural Resource Management Coordinator
damien@wfa.org.au.

Winemakers' Federation of Australia
PO Box 2414
KENT TOWN SA 5071
Ph 08 8222 9255
Fax 08 8222 9250