Developing tools and demonstration sites that integrate biodiversity into vineyard production systems, promoting sustainability



FINAL REPORT to

GRAPE AND WINE RESEARCH & DEVELOPMENT CORPORATION

Project Number: RT08/03-2

Principal Investigator: Jodie Pain

Research Organisation: McLaren Vale Grape, Wine and Tourism Association, in conjunction with Barossa Grape and Wine and the Adelaide and Mt Lofty Ranges Natural Resources Management Board

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14 October 2010

Contents

1. Summary 2
2. Background 2
3. Performance Targets 3
4. Method 4
5. Results 5
6. Outcome 5
7. Recommendations 6
Appendix 1: Communication 7
Appendix 2: Staff 18

1. Summary

The aim of 'Developing tools and demonstration sites that integrate biodiversity into vineyard production systems, promoting sustainability' (Project No. RT08/03-2) was to engage with the wine industry and individual growers to encourage the integration, and increase the area of, native vegetation into vineyards in the Adelaide and Mount Lofty Ranges Natural Resources Management Board (AMLRNRM) Region. The project developed a workshop with a range of tools and templates for use by vineyard managers to develop biodiversity action plans for their vineyards.

A collaboration between the Adelaide and Mount Lofty Ranges Natural Resources Management Board, McLaren Vale Grape, Wine and Tourism Association (MVGWTA) and Barossa Grape and Wine Association (BGWA), the project was also managed by Retallack Viticulture (which was funded by the AMLRNRM Board).

The project successfully engaged grapegrowers across the McLaren Vale and Barossa wine regions, holding a total of five workshops with 94 participants. The project also developed a range of information and tools to assist grapegrowers integrate biodiversity into their vineyards, including:

- Background information for winegrape growers
- Biodiversity action planning for the vineyard
- Biodiversity Action Plan – Managing remnant vegetation and revegetation projects
- A Step-by-Step Guide to Managing Remnant Vegetation and Revegetation Projects
- Biodiversity Action Plan – Establishment of Native Grasses
- A Step by Step Guide to Establishing Native Grasses
- Identification of Demonstration Sites (Case Studies)
- Identification of Native Grasses found in Vineyards - Ute Guide

This information and tools are documented in the manual 'Enhancing Biodiversity in the Vineyard-Workshop Notes: Information for McLaren Vale and Barossa Winegrape Growers' which can be downloaded from the AMLRNRM Board and regional websites. The 'Native Grasses ID cards' are also available for download on the same websites.

2. Background

The intention of this project was to extend the collaboration and research into the area of biodiversity benefits to vineyards in Australia to on-ground management.

Originally the project was to be a collaboration between the Department of Environment and Heritage Bush Management Advisors, the AMLRNRM Board, the BGWA, Eden Valley Wine Grape Growers Group, Yalumba Wine Company and MVGWTA to develop a workshop and associated materials and utilise four existing demonstration sites to support the viticulture industry with increasing areas of native vegetation within vineyard systems.

After some staff changeovers and delays, the project was reinvigorated and focused on the collaboration between the AMLRNRM Board, BGWA and MVGWTA. The SAR 04/02 project looking at 'Integrating Native Biodiversity into Vineyard Production Systems: A Review of Literature and Current Research' provided the background and materials for workshop notes and presentations.

Project Aim and Outputs

The original project aim was to engage with the wine industry and individual growers to encourage the integration, and increase the area of, native vegetation into vineyards in the AMLRNRM Region. The project aims to develop a workshop with a range of tools and templates for use by vineyard managers to develop biodiversity action plans for their vineyards. This workshop will aim to build the capacity and skill of vineyard managers and will utilise the expertise of Bush Management Advisors from the Department of Environment and Heritage, as well as vineyard management expertise from consultants with experience in incorporating native vegetation into vineyard management, including the outcomes from research and the researchers mentioned above.

The project will also utilise four existing demonstration sites (2 in the Barossa and 2 in McLaren Vale) to demonstrate how native vegetation can be incorporated into vineyards. Field days will be conducted on these sites to demonstrate successes, issues, problem solving and benefits.

The project will also link participants to the incentives schemes available through the AMLRNRM Region. These incentives schemes provide financial support to land managers to implement their biodiversity plans and will fund such activities as fencing, vegetation planting, weed control and access to expertise. This incentive support is linked to the Regional NRM Plan target of achieving 30% native vegetation cover in the Adelaide and Mount Lofty Ranges region by 2018.

3. Performance Targets

Performance Target

The original performance targets are shown in Table 1 below.

Table 1: Performance Targets from Regional Innovation and Technology Adoption Application

Survey growers in each region to identify barriers to increasing native vegetation in vineyards and use this information to develop the workshop	Nov/Dec 2008
Workshop material developed including biodiversity action plan templates for different areas of the vineyard	Nov 2008 – April 2009
Awareness sessions (minimum of 2 in each region) conducted in conjunction with partners of the project to provide vineyard managers with information about the project and identify workshop participants	May 2009
4 workshops conducted (2 in each region) resulting in 5 biodiversity action plans developed for implementation	June – July 2009

4 Demonstration sites identified (2 in each region) and plans developed and implemented and monitoring activities conducted	Aug – Nov 2009
Minimum of 4 articles written and published in newsletters, magazines etc	Jan 2009 – June 2009
Final report written and delivered to GWRDC	September 2009

4. Method

As previously mentioned, after the funding for the project was approved there were some delays in executing the project due to staff changes within all organisations. In October 2009, a project team consisting of Gayle Greiger and Claire Stephenson from AMLRNRM , Elise Heyes from BGWA and Jodie Pain from MVGWTA reinitiated the project. After considering the budget and available resources, the AMLRNRM Board appointed Retallack Viticulture to manage the project in addition to the GWRDC funds approved for the project.

In consultation with the Project team, Retallack Viticulture assessed suitable case studies for the field components of the workshops, and interviewed and scribed the case studies. The workshop notes and presentations were sourced from information such as the SAR 04/02 project looking at 'Integrating Native Biodiversity into Vineyard Production Systems: A Review of Literature and Current Research' by Retallack Viticulture in collaboration with the Project Team.

An awareness session was held in McLaren Vale to provide vineyard managers with information about the project and identify workshop participants, and both MVGWTA and BGWA included information about the workshops in their communication to grape growers.

Winegrape growers were surveyed in each region to identify barriers to increasing native vegetation in vineyards. A copy of the McLaren Vale questionnaire is in Appendix 1. Results from these surveys were used to inform presenters at the workshops.

A range of support materials have been developed, including a 'step-by-step' guides on how to manage remnants, carry out revegetation, and incorporate native grasses into a vineyard setting; biodiversity action templates and a 'ute guide' for identifying native grasses for presentation at the workshops.

Originally four workshops (two in each region) were scheduled for May, including site visits to key demonstration sites in each location. The workshops were held in McLaren Vale on Wednesday 12and Thursday 27 May 2010 and in the Barossa on Tuesday 18 and Wednesday 26 May 2010. Due to popular demand, a third workshop was held in McLaren Vale on Thursday 24 June 2010.

Through the project a series of 'deliverables' were produced including:

- Background information for winegrape growers
- Biodiversity Action Planning for the Vineyard
- Biodiversity Action Plan – Managing Remnant Vegetation and Revegetation Projects
- A Step by Step Guide to Managing Remnant Vegetation and Revegetation Projects
- Biodiversity Action Plan – Establishment of Native Grasses
- A Step by Step Guide to Establishing Native Grasses
- Identification of Demonstration Sites (Case Studies)
- Identification of Native Grasses found in Vineyards - Ute Guide

These deliverables are documented in the manual 'Enhancing Biodiversity in the Vineyard-Workshop Notes: Information for McLaren Vale and Barossa Winegrape Growers' which can be downloaded from the AMLRNRM Board and regional websites.

The 'Native Grasses ID cards' are also available on the website.

5. Results

The project resulted in a total of five workshops, with a total of 94 participants across the wine regions of McLaren Vale and Barossa. The workshops were very well received by the participants with many providing positive feedback. From these workshops, many participants have subsequently developed Biodiversity Action Plans for their property and have contacted their local NRM Officers for further assistance and advice.

The project also generated considerable publicity, with an article in the MVGWTA's newsletter *Growers' Voice* in March 2010, an article by Jones, L (2010) 'Working together to protect remnant vegetation in South Australian vineyards', *Australian Viticulture*, March/April, V14, No.2. , 'Growers learn biodiversity techniques' featured in *The Bunyip* on 16 June 2010 and a follow up article by Jones, L (2010) 'Vineyard landholders take action to better manage natural resources' in *Australian Viticulture*, July /August, V14, No.4. Copies of these articles are shown in Appendix 1.

A considerable amount of information and tools have also been generated and distributed to workshop participants. These will also be available to other members of the MVGWTA and BGWA through respective websites and offices and on the AMLRNRM website as outlined in section 4.

6. Outcome

This project has delivered against the original aims of the project, and met or exceeded all performance targets. The valuable tools that have been produced will continue to be of use and relevant to those involved in the wine sector, and the broader community.

Through the process of executing this project, there has been greater cohesion and capacity building between the AMLRNRM Board, regional associations, and industry stakeholders.

7. Recommendations

This project has created a cohort of more knowledgeable grapegrowers specifically in relation to enhancing biodiversity, who now have a comprehensive range of tools to implement practical biodiversity integration into their vineyard. Considerable momentum and interest in the wine industry has been generated, and it is hoped that this will continue on through future projects across the regions and other wine regions across the state. The deliverables from this project have the capacity to be adapted and utilised by others involved in the wine industry.

Appendix 1: Communication

Managing Biodiversity in Vineyards – upcoming project in McLaren Vale

Over the coming months, MVGWTA is conducting a biodiversity project in conjunction with the Adelaide and Mount Lofty Ranges Natural Resources Management Board (AMLRNRM) and the Barossa Grape and Wine Association. The project provides an opportunity to address some of the biodiversity actions in the MVGWTA's Environmental Management Plan, forge closer links with the district officers of the AMLRNRM and for growers to come out with some practical information and action plans for biodiversity in their vineyards.

The concept behind the project is to provide information and tools to grapegrowers about:

- managing remnant vegetation
- establishing native species mid row
- revegetation strategies to complement viticulture business

The project will include a half day workshop for grapegrowers in May 2010, presented by the AMLRNRM. This workshop will include:

- technical information such as native grass identification
- site visits
- developing an action plan

The AMLRNRM will also provide follow-up support from district officers to guide grapegrowers through their action plans.

To assist in developing the workshop materials and register your interest in the workshop, the AMLRNRM is asking growers to complete the attached survey. For further information or to return your survey, please contact **Jodie Pain, Viticulture Coordinator** at the MVGWTA on **8323 8999**, email **jodie@mclarenvale.info** or fax **8323 9332.**

Adelaide and Mount Lofty Ranges NRM Board Managing Biodiversity in Vineyards – Survey

	Yes	No
1. Do you have;	*please tick*	
a. remnant vegetation		
b. native grasses in your mid row		
2. Are you interested in;		
a. Re-vegetation		
b. Managing remnant vegetation		
c. Establishing native species in your mid row		
3. What are the issues that would make it difficult to conduct any of the activities listed in questions 2?		
a. Time		
b. Cost		
c. Information about how to do it successfully		
d. Access to equipment		
4. Would you be interested in attending the workshop?		

Are you interested in the Board's incentives program? Please provide your name and contact details if you would like further information.

Name: _____

Phone Number: _____

Free Workshop: Growers can reap rewards with natives

Government of South Australia
Adelaide and Mount Lofty Ranges
Natural Resources Management Board

Workshops demonstrating some of the latest natural resources management techniques for long-term production and landscape preservation are on offer for McLaren Vale grape growers in May.

The Adelaide and Mount Lofty Ranges Natural Resources Management (NRM) Board is holding the workshops to explain the benefits and demonstrate techniques for introducing native grasses into vineyards. Planting natives mid row protects soil from erosion, abates weeds, eliminates or reduces manual cultivation, fertiliser and herbicide use.

Increasing biodiversity is crucial for long term production and a healthy environment. Native vegetation provides important habitat and food sources for native insects, butterflies, birds and small animals, to build a natural ecosystem – a self-regulating, healthy cycle of life.

The NRM Board has been working with a number of growers who've established inter row natives and are seeing the rewards. Claire Stephenson from the NRM Board said, "the growers who've taken up natives have told us the benefits have far outweighed the initial work in getting them established and they cohabitate really well with vines."

Natives only draw moisture during winter and spring when it's naturally available, they shut down over summer, therefore don't take any irrigation.

"We know a number of growers that are weaving biodiversity into single species production, and are seeing great results" said Mrs Stephenson.

"We'll provide case studies and explain the benefits of co-planting natives with production vines. Small and large growers can all benefit and are welcome to attend," said Mrs Stephenson.

The biodiversity in viticulture workshops are supported by the Grape and Wine Research and Development Corporation Board and the McLaren Vale Grape, Wine and Tourism Association. To register your interest, please contact **Jodie Pain** on **8323 8999** or email **jodie@mclarenvale.info**

Natural resources management is caring for our land, water, plants and animals – balancing people's needs with those of nature.

Working together to protect remnant vegetation in South Australian vineyards

By Lauren Jones

The Adelaide and Mount Lofty Ranges Natural Resources Management (NRM) board has focussed on vineyard biodiversity as part of a project to extend its support to viticultural landholders in maintaining remnant vegetation.

The NRM board's scope takes in metropolitan Adelaide and the Adelaide Plains; Wild Horse Plains and Kapunda to the north; the ridge of the Western Mount Lofty Ranges; and the Fleurieu Peninsula to the south. The Barossa Valley, McLaren Vale and Adelaide Hills winegrape growing regions lie within the boundaries. Acting manager of sustainable agriculture and training Claire Stephenson told *Australian Viticulture* that the three major wine districts and other pockets of vineyard in the area led to viticulture being chosen as a key production system for the project, which is now in its second year and is due for completion at the end of 2009-10. The project is co-funded by the Grape and Wine Research and Development Corporation via its Grassroots program.

Following the *Natural Resources Management Act* being legislated in 2004, the NRM board developed its business plan, which was updated in 2007. The plan includes actions and strategies to be met in order to satisfy the plan's requirements which, in turn, meet the 20-year regional condition targets.

The current project involves working with viticultural landholders to discuss the maintenance of biodiversity on their properties and was catalysed by the NRM board staff review of the value of biodiversity in agricultural production systems, which was an action within the NRM business plan.

"The project is acting as a starting point to talk to vineyard managers to help them to know more about the NRM board and to engage with us about protecting vegetation and biodiversity in vineyards," Stephenson said.

"There is a suite of free advice that the NRM board can give to landholders. An onsite visit by a NRM staff member can be arranged to talk about whole-of-property management including soil, pasture, weed identification and control, remnant vegetation protection, watercourse management, dams and water quality. The board has a financial mechanism in place to support landholders, which is graded according to the value it places on a property's asset."



Adelaide and Mount Lofty Ranges Natural Resources Management Board acting manager of sustainable agriculture and training Claire Stephenson.

Following an onsite visit by a NRM board staff member, the landholder is provided with an aerial photograph of the property to highlight areas worthy of preservation or improvement.

"For example, if there was an extensive weed infestation on the property, a weed management plan can be drawn up for the landholder that would help to identify priority areas of management and control options," Stephenson said.

Best practice in maintaining biodiversity has been the crux of the NRM board's discussions with landholders to this point, including fencing off watercourses, establishing shelter belts and protecting areas of remnant vegetation.

"Maintaining inter-row groundcover in vineyards is important and native grasses are considered to be ideal. However, there is limited scientific research and data on trials, establishment methods and species selection for rainfall and soil types," Stephenson said.

As part of the project, the board conducted a literature review in the hope that it would provide some real facts about native grasses in vineyard inter-rows.

"The results came back as being good and worthwhile, but didn't provide the facts that were first anticipated. Instead, we gathered accounts of landholders' personal experience, hearsay and knowledge of what crops had been trialled on vineyards, but nothing that had been scientifically documented, trialled or tested," Stephenson said.

One of the key results from the literature review was the ability to identify that vineyards possess a vast amount of biodiversity, which was possibly not being managed to its full potential or seen as a valuable asset in vineyards.

"Remnant vegetation is seen as being a key asset to protect and, as such, the NRM board offers incentive money based on its quality on the property. A lower value is placed on areas such as soil testing, which is seen as being in the vested interest of the vineyard manager to maintain soil nutrients."

The NRM board's training program includes field days and workshops that are operated at no cost to attendees, and practical rural land management courses are held across the region each year.

In late April and early May this year, two half-day specialised viticulture-focussed workshops will be conducted by the NRM board in both the Barossa Valley and McLaren Vale. A range of tools and information will be presented to attendees including a 'ute guide' on identifying native grasses in their vineyard, and an aerial photograph will be provided to each registered participant, as will the opportunity for one-on-one assistance from a NRM board staff member.

At each workshop, the group will visit properties with experience in the management of remnant vegetation and native grasses.

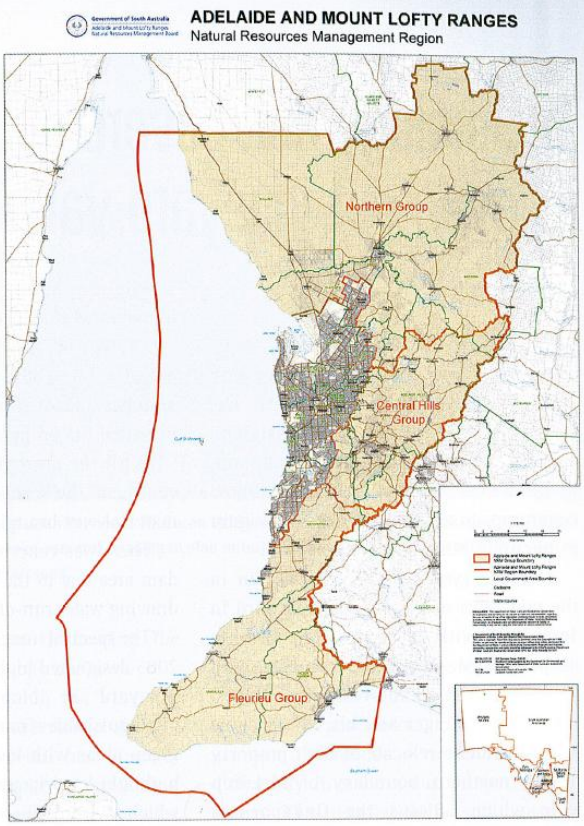
"The onsite visits during the workshops need not necessarily highlight the optimum management of remnant vegetation and native grasses," Stephenson said. "I am keen to talk to people with real limits to time and budget, and I'm seeking examples of how people have made amendments to production systems in an effort to protect their properties' natural assets."

McLaren Vale Grape, Wine and Tourism Association viticulture co-ordinator Jodie Pain said interest in the NRM board's workshops had been received from a small group of local growers, who were keen to learn more about managing remnant vegetation and undertaking revegetation programs.

"Growers with remnant vegetation on their property are keen to partake in the workshop, but due to the hands-on format, group numbers will be kept to around a dozen participants," Pain said.

Viticultural landholders who want to be involved in the workshops, provide information about their maintenance of natural assets, or volunteer their site as an example of best practice are invited to contact Claire Stephenson, phone +618 8391 7504 or email claire.stephenson@adelaide.nrm.sa.gov.au

For further information about the Adelaide and Mount Lofty Ranges Natural Resources Management board's landholder education program, visit www.amlrnrm.sa.gov.au/EducationTraining/LandholderEducation.aspx



The Adelaide and Mount Lofty Ranges region encompasses the Barossa Valley, McLaren Vale and Adelaide Hills winegrape growing areas, which have been the focus of a project by the Natural Resources Management board to protect remnant vegetation on viticultural farming land. Image: http://www.amlrnrm.sa.gov.au/TheNRMBoard/AbouttheBoard.aspx



Growers learn biodiversity techniques

BAROSSA grape growers are being taught biodiversity techniques to help manage the region's natural resources.

The Adelaide and Mount Lofty Ranges Natural Resources Management (NRM) Board ran two workshops last month, supported by the Barossa Grape and Wine Association, on how to increase biodiversity levels in vineyards.

NRM Board Barossa district officer Chris Madigan said growers were encouraged to plant native grasses to protect their soil from erosion, weed competition and reduce chemical use.

"Native perennial grasses between vine rows will reduce the need to apply traditional soil cultivation efforts, fertilisers, herbicides and dependence on irrigation," Mr. Madigan said.

"Native plants also attract insects and seed-eating and insectivorous birds, which in turn attract raptors such as hawks and falcons which help balance the natural life cycle."

Last year, local grower Dan Falkenberg planted perennial grasses between his family's Nuriootpa vine rows to out-compete weeds, improve water retention, provide soil cover, prevent soil loss and improve native habitat value.

"I am also hopeful that I will produce higher quality fruit as a result of these changes," he said.

"Over the past 10 years we have been working on improving the biodiversity values. I've noticed an increase in the number of native bird species such as red-capped robins, diamond firetail finches, thornbills, grey fantails, sparrow-hawks and falcons."

Native grasses are drought tolerant and draw moisture mainly during winter and spring when it is naturally present. Wallaby grasses shut down during summer, minimising competition for soil moisture with the vines.

Mr. Madigan said while Mr. Falkenberg's grasses have only been in for one season, they have already matured and dropped seed.

"Dan Falkenberg's family vineyard is an excellent case study of natural resources management. We are seeing some great results from growers who are weaving biodiversity into single species production," he said.

Growers interested in the workshops can contact the Gawler NRM Board office on 8389 6166.



Local grower Dan Falkenberg (left) and Chris Madigan of the NRM Board Barossa in the Falkenberg vineyard, Nuriootpa.

In the March/April 2010 issue of *Australian Viticulture*, we reported on the work being done by the Adelaide and Mount Lofty Ranges Natural Resources Management (NRM) board to improve biodiversity in local vineyards, encompassing Barossa Valley, Adelaide Hills and McLaren Vale, as part of a project to extend its support to viticultural landholders in maintaining remnant vegetation. This project is especially timely, following the United Nations declaration of 2010 as the International Year of Biodiversity.
At the invitation of the NRM board, *Australian Viticulture* attended a workshop in McLaren Vale at the end of June – the fifth and final workshop in a series held throughout the regions – to discover how the project was benefitting landholder delegates and the region as a whole.

Vineyard landholders take action to better manage natural resources

By Lauren Jones



Adelaide and Mount Lofty Ranges Natural Resources Management Board manager of sustainable agriculture and training Claire Stephenson and Barron Environmental owner Phil Barron were the key speakers at the 'Enhancing Biodiversity in the Vineyard' workshop held in McLaren Vale in late June.

The Adelaide and Mount Lofty Ranges Natural Resources Management (NRM) board hosted around a dozen viticultural landholders from the McLaren Vale region on 24 June at its fifth and final biodiversity-themed workshop in the series, after two similar workshops were held each in the Barossa Valley and McLaren Vale regions. The interactive workshop was designed to facilitate discussion between the board and landholders to discuss the maintenance and protection of biodiversity and vegetation in their vineyards, and to engage the attendees with the board's suite of freely-available advice.

The project was co-funded by the Grape and Wine Research and Development Corporation via its Grassroots program.

NRM board manager of sustainable agriculture and training Claire Stephenson told *Australian Viticulture* that registrations of interest in the workshops were so over-whelming that the 'spill-over' fifth workshop had to be held to accommodate the extra attendees beyond the four initially planned events.

"The Adelaide and Mount Lofty Ranges NRM board provide extensive financial incentives to landholders to manage biodiversity on their property, which includes fencing, weed control and on-site management advice," Stephenson said.

At the beginning of the session, landholders said they were looking for a range of outcomes from the workshop including assistance with changing over inter-row covercrop species, rehabilitating water courses, conducting a review of remnant vegetation, controlling pest olive and caltrop vegetation, better protecting existing biodiversity and recognising pest and beneficial species.

Keynote speaker at the workshop Phil Barron, of Barron Environmental, explained that biodiversity was "the sum of all living things in any given area".

"This is a motherhood statement, as greater diversity in the property's vegetation increases the likelihood of 'ecological balance'. It's about ebbs and flows in that balance, not a flat line, though we're looking for less extreme peaks and troughs as biodiversity improves," Barron said.

Biodiversity consists of flora and vegetation and is affected by conditions such as rainfall, soil type and the aspect of the landscape.

"Remnant vegetation is the original environment on a particular site, or it may exist through natural regeneration. Remnant vegetation provides habitat for wildlife and micro-organisms, and is the foundation of the ecological foodchain. Tree logs and bark provide homes for fauna; old, possibly dead trees provide great hollows for habitat. Planted vegetation (revegetation), such as windbreaks made of trees native to the site, has multiple benefits for the landowner and the overall ecology of the area.

Barron warned of some downsides to tree windbreaks, such as those comprising sugar gums, which he labelled as an aggressive, competitive tree. Sugar gums are tall-growing and can shade early vine rows, also attracting pest birds. Trenching the tree line or thinning the plantings could help alleviate potential shading or vine competitive problems.

"Design of a wind shelter is crucial, and

will be most beneficial in extremes of weather, such as strong winds. Airflow is important in frost-prone areas, so as not to dam up cold air," Barron said. "Biodiversity or vegetation can act as a buffer from neighbouring broadacre spraying, or other agricultural elements that are beyond the vineyard manager's control."

The workshop discussion taught the 'three Rs' of improving biodiversity:

- retain remnant vegetation, including native grasses
- regenerate native vegetation, protecting it from excessive grazing pressure or weed influx
- revegetate with native species.

"We are still working on the science of biodiversity and how different things work in different places. It is important for people to adapt and try new things to better manage their land. Humans, and our habitat, including buildings and other structures, are part of biodiversity. How we manage and plan out properties becomes part of the ecological structure and the way any space is used impacts on biodiversity.

"Individuals cannot do much towards creating improved biodiversity, but much more can be achieved as a collective. The more people in the region concentrating on biodiversity, the greater help you'll be to each other," Barron said.

Invasive, aggressive plant and animal species that attendees mentioned grappling within their vineyard land included olives, blackberry, bridal creeper, starlings and rabbits.

"A monoculture vineyard is an unnatural thing and invites a host of pests," Barron said, who advised landholders to "control weeds, but pick your fights".

"In managing weeds, accurately identify the plant and seek to remove it with minimal disturbance to the surrounding soil. Work from the least weed-affected areas first.

"Grazing pressure and weed control might be enough to have some natural regeneration occurring, which is the



McLaren Vale viticultural landholder Chris Burgan receives advice from Adelaide and Mount Lofty Ranges Natural Resources Management Board manager of sustainable agriculture and training Claire Stephenson about his plans to protect and improve biodiversity on his property.

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At the Adelaide and Mount Lofty Ranges Natural Resources Management Board's recent biodiversity workshop in McLaren Vale, Sami Gilligan, co-owner of The Wetlands Vineyard, talked about how he is managing remnant vegetation on the property.

easiest way to revegetate," Barron said.

Following Barron's presentation, attendees were given aerial photographs of their properties. Stephenson, Barron and James Skeer, of the NRM board's Willunga office, then provided each landholder with individual attention to discuss their personal and farm vision statements. These plans and the physical and permanent features of the land were marked with felt-tip pen on the sheets of clear film overlying the photograph.

Following the lunch break, the group moved to the nearby property of viticulturist Sami Gilligan, at the Wetlands Vineyard, in McLaren Vale. Gilligan had volunteered the site as a case study so that the attendees could look at a NRM board biodiversity project in action.

The work being undertaken at the nine-hectare site has involved revegetation of a dedicated 0.5ha of the area, which is adjacent to the California Road Wetlands, and a former strawberry farm. A grid of bamboo shelter belts previously ran through the property, which was identified as a priority to remove using an excavator prior to the 3ha vineyard being planted to Grenache, Mataro (Mourvèdre), Roussane, Marsanne, Vermentino and Tempranillo. Spot spraying of the bamboo is ongoing.

There was little remnant vegetation on the site when it was first purchased, except for a few mature trees along the creek line and property borders. There was no mid-level vegetation or native ground cover. Previous management of the area involved slashing the volunteer weed growth, leaving a bare surface.

The NRM board (in its former incarnation as the Water Catchment Management Board) had previously helped Gilligan's parents with improving biodiversity on the property.

"It made sense to call on the NRM board again," Gilligan said. The NRM board has been able to provide expertise, develop a property action plan, and provide funding and volunteer labour to carry out the revegetation work on the ground.

Gilligan and the NRM board are working together to attract the right kind of bird activity to the site by targeting territorial species, such as magpies and lorikeets, that are mainly insect-eaters. The territorial nature of these birds helps to deter pest bird species from entering the vineyard and damaging grapes. Gilligan and his business partners are in the process of constructing a winery and cellar door on the site, so aesthetics of the surrounding vegetation is an important consideration to welcome future visitors.

"The native vegetation looks good and is nice for people to enjoy," Gilligan said. "Native vegetation means we are using minimal to nil insecticides on the property. A few hawks have started to hang around the wetlands in recent times, too.

"It a common trap to plant something and think that it hasn't grown at all in the first year. The next year, it all pops up, even without supplementary water. The trick with native plants is not to kill them with kindness. Watering them is actually doing a disservice," Gilligan said.

By chance, Gilligan detected crown-boring weevil eating into the heads of the Salvation Jane on the property. There are eight different species of bio-control agents for Salvation Jane, and crown-boring weevil is capable of spreading itself around the landscape.

The next stage in the Wetlands Vineyard project is to control phalaris and couch. Once these weeds are cleared, the area

will be planted to a mixture of native grasses to enhance the biodiversity value of the revegetation overall. Spot-sprayed applications of Roundup will progressively control other areas of problem weeds. A neighbouring olive grove means Gilligan needs to be on constant watch for small olive trees cropping up in his property. The NRM board recently assisted Gilligan with controlling pest olive trees by drilling and filling them.

"I am confident that plant species planted in clumps, growing in their right place, in the right environment, do a good job of combating weeds," Gilligan said, which was observed by all in attendance at the workshop.

A small amount of grazing pressure and rabbit damage was observed on the property, however, not enough to warrant additional fencing or tree guards.

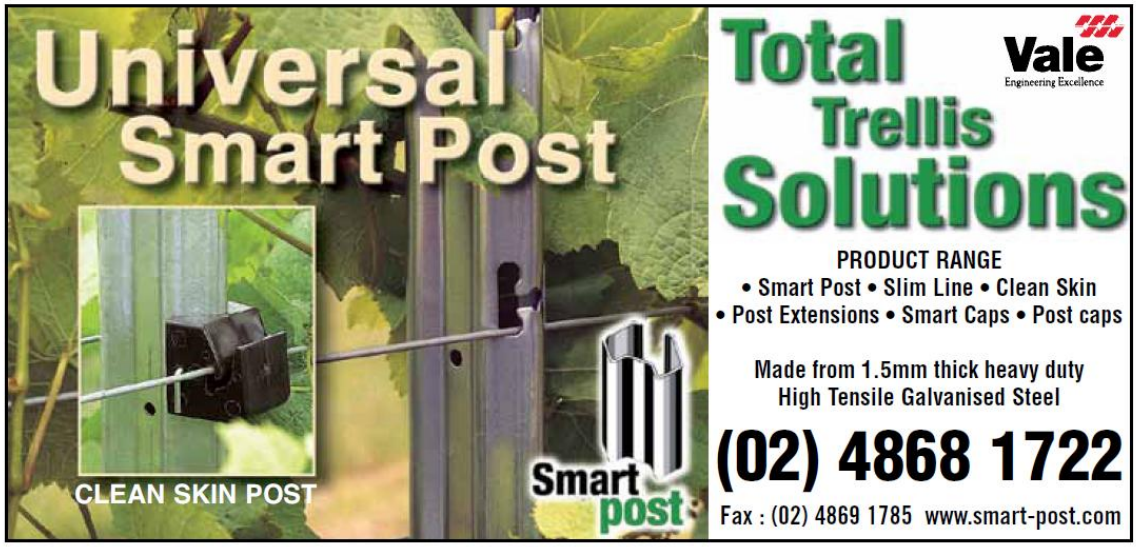
Completing the workshop program was a presentation by research officer Chris Penfold, of The University of Adelaide, about the specialised native grasses seeding equipment that he has developed. The quad-bike and Taege seeder combination has proven to be flexible, easily manouverable and cheap to operate.

Penfold explained that there had been significant advances in the understanding of native grass species for vineyard covercrops during the last three or four years.

"We know we can improve vineyard quality by planting native species as



The dead Salvation Jane plant in the foreground indicates the effects of crown-borer weevil on the weed. The weevils have been discovered on Sami Gilligan's Wetlands Vineyard, in the Tatachilla and Willunga area of McLaren Vale.





University of Adelaide research officer Chris Penfold tells the attendees at the Adelaide and Mount Lofty Ranges Natural Resources Management Board's biodiversity workshop, held in McLaren Vale, about the native grass seeding machine that he has helped develop.

covercrops," Penfold said.

The group was shown winter-active native grasses (C_3) and summer-active grasses (C_4) in seed form. C_3 grasses actively grow during autumn, winter and spring and are also referred to as perennial cool (wet or dry) season grasses. If moisture is available during summer, these grasses, including spear grass, wallaby grass and fescue, will be green all year and tend to be frost tolerant.

C_4 grasses are active during spring, summer and autumn and are known as perennial hot (wet or dry) season grasses, which can be susceptible to frost when dormant in winter. Species including windmill grass, lovegrass and kangaroo grass are generally better adapted to higher temperatures, higher light intensities and lower (50ppm) CO_2 concentrations than their C_3 counterparts.

"Native grasses can be very difficult to establish. Some seeds are light and fluffy and are difficult to sow, as they are easily blown away," Penfold said. "I've had the most success with wallaby grass, as it appears to be more immune to upsets in any given site's biology.

"Broadcasting the seed by hand is difficult, which is why I sought to modify seeding machinery to better manage the task."

Penfold's machine works by using counter-reactive foam distribution rollers to embed the seed into the soil. Metal discs at the mid-point of the machinery cut a niche into the soil, before the chains behind drag a little soil back into the crevices. Pressing wheels give a nice amount of traction to the seed application.

Some of the grass seeds shown during the presentation could be pelleted for easier application, according to Penfold, who stated that the seed industry's code of practice was "quite casual".

"While seed pelleting technology is very advanced, the coating on pelletised seeds is unknown. It is a throw-over from the pasture and vegetable seed industries and likely includes gaucho insecticide and fungicide," he said.

The cost of having seed pelletised was estimated by Penfold to be $40-80/kg, with suppliers located in Victoria and Queensland.

"Landowners are looking at $700 per sown hectare to get the seeds into the ground, which works out to be similar in price to using a contractor to plant a conventional annual covercrop," Penfold said. "If running the equipment at 10km/hr, about 1.5ha/hr seeding rate is possible in suitable conditions, which will get a reasonable stand of native grass quite quickly," Penfold said.

"Native covercrops are best sown on established vineyards so as not to compete with vines and affect grape yield. The site needs to be pretty much grass free to allow the native grass to be the dominant species. Keeping nutrient levels low in the vineyard gives the grasses a competitive advantage over exotic species," he said.

The NRM board moved on from its vineyard focus at the end of 2009-10 and is now considering applying the biodiversity project to the dairy or olive industries. Viticultural landholders can contact the NRM board for further

information about the landholder education program, or seek advice about biodiversity-related matters, on telephone +618 8389 5923 or visit www.amlrnrm.sa.gov.au, following the link to Land and Biodiversity Services. Owner of Retallack Viticulture, Mary Retallack, prepared a report for the NRM board about the 'Enhancing Biodiversity in the Vineyard' project. To access a copy of the report, contact Claire Stephenson on telephone +618 8389 5923.

To purchase a PDF copy of *Australian Viticulture's* March/April 2010 article about the Adelaide and Mount Lofty Ranges Natural Resources Management board's work to improve biodiversity in local vineyards, contact Winetitles bookstore officer Stephanie Keoghan on telephone, +618 8369 9500 or email orders@winetitles.com.au

Reference

Retallack, M. (2010) Enhancing biodiversity in the vineyard – workshop notes, information for McLaren Vale and Barossa winegrape growers.



Claire Stephenson (far left) of the Adelaide and Mount Lofty Ranges Natural Resources Management Board, discusses bamboo eradication with workshop attendees.

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Appendix 2: Staff

Project Management
Mary Retallack, Retallack Viticulture (funded by AMLRNRM)

Adelaide and Mount Lofty Ranges Natural Resources Management Board
Claire Stephenson
Gayle Grieger
Chris Madigan
Andrew Raymond

McLaren Vale Grape, Wine and Tourism Association
Jodie Pain

McLaren Vale Grape Growers
Rachel Steer and Ian Janssan (Chapel Hill Winery)
Melissa Brown (Gemtree Vineyard and Wetland)
Troy Elliker (The Terraces)
Sami Gilligan(The Wetland and Old Rifle Range Vineyards)

Barossa Grape and Wine Association
Elise Heyes

Barossa Grape Growers
Daniel and Ian Falkenberg (Falkenberg Vineyard)
Prue Henschke (C.A. Henschke and Co)
Phil Lehmann (Lehmann's 'Boongarrie Estate' Vineyard)
Leon Deans (Deans Vineyard)