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A Partnership Approach to Environmental Stewardship in Langhorne Creek, SA.

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ABSTRACT

Irrigators in the Langhorne Creek region of South Australia are leading the way in monitoring irrigation efficiency auditing and are now scoping options for environmental auditing at the property and regional levels with assistance from the Murray Darling Basin Commission. Since 1996, irrigators in the region have participated in a voluntary Irrigation Annual Reporting Scheme conducted by the Angas Bremer Water Management Committee (ABWMC), a publicly elected community group. In 2001, the Angas Bremer Code of Practice for Irrigators was introduced requiring irrigators to 1) monitor their irrigation efficiency and groundwater levels and 2) plant and/or maintain 2 hectares of deep-rooted perennial vegetation for every 100 ML of water on allocation to offset their irrigation drainage impacts. The Code of Practice has now been linked to a statutory Water Allocation Plan in partnership with the River Murray Catchment Water Management Board. The local ABWMC manages the accreditation service and random secondary audits will be conducted by the SA Department for Water, Land and Biodiversity Conservation (DWLBC). The next step is to develop additional tools for environmental management in viticulture and incorporate these with the existing Code of Practice for Irrigators. A range of regional biodiversity and catchment health indicators and targets will also be developed and evaluated. Ultimately the objective is to test whether community-based auditing schemes can cost-effectively deliver environmental outcomes and develop a template for adoption of improved environmental management tools and techniques in the viticulture industry.

INTRODUCTION

The Langhorne Creek region is one of the fastest growing viticultural areas in Australia. It is an area rich in alluvial soils that overlies a regional aquifer at the terminus of the Angas and Bremer River catchments and abuts the shores of Lake Alexandrina approximately 60 km south-east of Adelaide. The irrigation community has been actively involved in environmental stewardship for more than twenty years as they adaptively manage the highly variable groundwater levels underlying the irrigation district. This paper explores the importance of the partnership between landholders, Government agencies, natural resource managers and industries that underlies the success of this irrigation community.

HISTORY OF REGIONAL WATER MANAGEMENT

The Angas Bremer Water Resources Committee was formed in the late 1970's as a statutory body pursuant to the *Water Resources Act 1976*. This committee included local irrigators and specialists from Government agencies among its membership and was responsible for the development and delivery of policies to coordinate management of the Angas Bremer Proclaimed Wells Area (ABPWA), a groundwater resource that had been developed beyond its sustainable limit when it was proclaimed in 1981. In 1981, the annual usage of groundwater in the ABPWA was four times the annual rate of recharge from flows down the Angas and Bremer Rivers. This excessive water use led to the formation of cones of depression in the high quality groundwater lens, drawing in saltier groundwater from the margins and causing a decline in the quality of the prescribed resource. Over the subsequent 20 years the Angas Bremer community have achieved a reduction of 95% in groundwater use and have recovered the groundwater pressures to approximate those seen in pre-development times whilst simultaneously increasing farmgate returns. The changes in water use and crop area between 1981 and 2001 are summarised in Table 1.

Table 1: A comparison of ABPWA groundwater and River Murray water use (volumetric and areal) in 1981 and 2001. Data sourced from ABWRC (1996) and ABWMC (2001).

	1981	2001
Groundwater Use (GL)	26.6	1.5
Recharge (GL)	6	2-6?
River Murray Water Use (GL)	negligible	16
Total Irrigation Water Use (GL)	26.6	17.5
Irrigated Area (ha)	3,400	6,800
Lucerne Hay (ha)	c.1,700	471
Total Areal Water Use (ML/ha)	7.8	2.6
Vines Areal Water Use (ML/ha)	n/a*	2.1

*n/a = not available; Irrigation Annual Reporting did not commence until 1996.

Most notably these data show a reduction in total water application across the region from 7.8 ML/ha (c. 780 mm/y) in 1981 to 2.6 ML/ha in 2001 (c. 260 mm/y). This was achieved by introducing innovative water management policies that resulted in a 30% cut to licensed water allocations and a widespread exchange of groundwater for River Murray water licenses facilitated by the installation of locally funded pipelines that carried water up to 14 km from Lake Alexandrina. During this time there was also a significant increase in the price of wine grapes that stimulated a change in crops across the region from relatively thirsty crops such as lucerne hay to more water efficient wine grapes. Current groundwater use is likely to be equivalent to or less than the annual rate of recharge from the Angas and Bremer Rivers although a lack of modern stream flow data prevents quantification (NB: new stream flow and salinity gauging stations are being installed by DWLBC and River Murray Catchment Water Management Board).

In 1997, a new *Water Resources Act* was instituted and the ABWRC was superseded by the pursuant formation of the River Murray Catchment Water Management Board (RMCWMB). This meant that the highly successful ABWRC no longer had statutory powers nor a defined role in developing and implementing the Water Allocation Plan that now had to be developed for the ABPWA. The community held public meetings and decided they still wanted a role in policy development for their water resource thus the publicly elected, voluntary community group known as the Angas Bremer Water Management Committee (ABWMC) was formed to lobby for local involvement in policy development. A new partnership was then formed between RMCWMB and ABWMC, facilitated by another local community group the Goolwa to Wellington Local Action

Planning Board (GWLAP), to develop and implement the Water Allocation Plan for the Angas Bremer Prescribed Wells Area (AB WAP). Today the ABWMC membership includes eight local irrigators (some of whom were on the original ABWRC in 1979) representing a range of irrigators including family and corporate wineries and vegetable and lucerne growers as well as technical staff from DWLBC, RMCWMB and GWLAP. This partnership approach ensures that innovative policies can be developed and implemented in a technically robust manner whilst remaining under community ownership.

ANGAS BREMER CODE OF PRACTICE FOR IRRIGATORS

More than twenty years of local water resource management experience has culminated in the production of the Angas Bremer Code of Practice for Irrigators (see www.rivermurray.sa.gov.au for details). The Code of Practice has been developed as a vehicle for the implementation of the AB WAP. The AB WAP was necessarily written in legalese and is difficult for irrigators to interpret. The Code of Practice has been deliberately written to be as easy to follow as possible. It is complemented by detailed instructions of how each component of the Code of Practice must be executed in the Land and Water Management Plan for the ABPWA, a community driven process for managing regional natural resources in a conjunctive manner.

The Code of Practice has four major components:

- Quarterly monitoring of groundwater levels at one or more location(s) under the major crop;
- Monitoring of irrigation application volumes and irrigation drainage under the major crop at each irrigation event;
- Planting and/or nurturing of two hectares of deep-rooted, perennial vegetation for each 100 ML on allocation and;
- Reporting on their year's irrigation activities through the Irrigation Annual Reporting Scheme.

A regional risk assessment conducted during the development of the Code of Practice showed that the greatest risk to the region is the potential for groundwater levels to rise under irrigation with imported River Murray water. The policies embedded in the AB WAP and Code of Practice are designed to combat this risk. Each irrigator has installed at least one groundwater monitoring well on their properties and are now installing the the CSIRO FullStop soil-wetting- front detection device which flags a warning to *STOP* irrigating when the root-zone is *FULL* of water. The FullStops resulted in changes to irrigation practices immediately upon installation on the trial properties due to the rapid and visual response they give following each irrigation. The requirement for each irrigator to plant and/or nurture two hectares of deep-rooted perennial vegetation for every 100ML on allocation is a particularly forward thinking and innovative policy. The objective is to increase the total rate of evapotranspiration from the region to compensate for the increase in recharge through native vegetation clearance and irrigation, particularly in winter when the grape vines are dormant. It is unlikely that a Government body could have implemented such rigorous policies so rapidly without community leadership and involvement. The successful development and implementation of the Code of Practice has required the cooperation of all 160 irrigators in the region and is admirably administered by the ABWMC.

Irrigation Annual Reporting and Auditing Scheme

Irrigation Annual Reporting (IAR) was introduced in 1996 to ensure that the impacts of importing River Murray water into the ABPWA were closely monitored by the irrigators themselves. Since then, each irrigator has collected and recorded data including their annual water meter readings and the area of each crop type under irrigation. The data has been collated locally into district Irrigation Annual Reports and circulated to each irrigator. Public meetings and training workshops are held each year to present and analyse the data and to seek community endorsement for the next set of investigations under the Angas Bremer Land and Water Management Plan process.

The Irrigation Annual Reporting Scheme has become the vehicle for irrigators to report on their compliance with the Angas Bremer Code of Practice for Irrigators and the AB WAP (and hence against their water license conditions) each July. The ABWMC provide the initial auditing service and the Community Data Manager works closely with individual irrigators to assist with the completion of the reports and interpretation of the Code of Practice. The district Irrigation Annual Report and a list of those irrigators who did not achieve accreditation under the Code of Practice are sent to the Minister for Water Resources via the RMCWMB. A DWLBC field officer then visits the properties of each non-accredited irrigator and assists them to improve their practices such that next year they will achieve accreditation. The DWLBC (the Government Department responsible for administering water licenses) also conduct random audits of 10% of the accredited irrigators' properties to

ensure the primary auditing process by the ABWMC is robust. The whole ABWMC accreditation process is under trial during the 2001-02 irrigation season but it is envisaged to become the model for implementing the Irrigation Annual Reporting process embedded in the Water Allocation Plan for the River Murray Prescribed Water Resources across the SA Murray Darling Basin.

IMPROVING ENVIRONMENTAL STEWARDSHIP IN VITICULTURE

The success of the ABWMC in developing and implementing the Code of Practice has attracted the attention of the Murray Darling Basin Commission (MDBC) who are utilising the AB PWA as a pilot region for the MDBC Watermark Environmental Stewardship Program (ESP). Four regional trials, which are based on different irrigated agriculture industries (Shepparton, Victoria – dairy; Langhorne Creek, SA – vines; Coleambally, NSW - rice and Narrabri, NSW, also involving Qld. growers - cotton) will test whether increasing environmental standards and the process of farm and environmental management will provide a cost effective increase in environmental outcomes. The timing of this project is ideal given that the Public Meetings in Langhorne Creek have shown that the AB PWA community are keen to develop the Code of Practice into an accredited EcoLabel scheme through which to market their high level of environmental stewardship.

A Partnership Approach

It was recognised at the outset of the MDBC ESP vines trial that all stakeholders from the grape grower to the market place, and including natural resource managers, needed to be involved to make the ESP vines trial work. A Steering Committee with membership from the nine organisations shown in Figure 2 was formed to ensure stakeholder and technical input occurred at all levels during the project development.

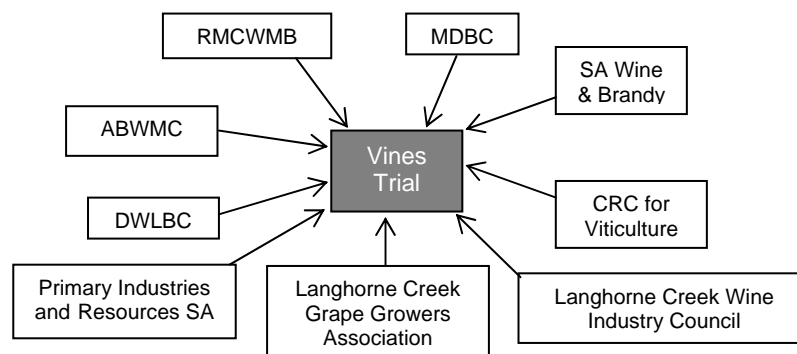


Figure 2: A diagrammatic representation of the nine partners involved in the MDBC Environmental Management Systems in viticulture trial.

It is expected that this collection of partners will be able to provide input on stakeholder needs. For example, the Co-operative Research Centre for Viticulture, SA Wine & Brandy and Langhorne Creek Wine Industry Council can provide links back to broader industry initiatives (for example, *Sustaining Success*, SA Wine & Brandy, 2002), thereby assisting the project by ensuring the industry drivers are well defined and robust. Similarly, RMCWMB and DWLBC representatives can provide a feedback mechanism for natural resource management policy makers. The ABWMC and the Langhorne Creek Grape Growers Association have the all important role of facilitating community involvement in and understanding of the project. All four ESP trials are technically supported and project managed by URS Corporation to ensure the projects develop in a complementary fashion.

7 Tiers by 8 Modules

Using the seven-tiered environmental management framework developed by CRC for Viticulture (Baker and Boland, 2001) and the Environmental Management System template developed by URS Corp. (URS, 2002), the MDBC Vines Trial Steering Committee have prepared a seven tiered environmental stewardship model (see Table 2) which will be trialled on 18 properties in the AB PWA over the next three years.

Table 2: The seven tiers for environmental stewardship being trialled in the Angas Bremer Prescribed Wells Area under the MDBC Environmental Stewardship Program.

	Level	Activity
1	Non-accredited	Status quo
2	Awareness of requirements	Attend training in relevant Codes of Practice, Environmental Management and Legislative issues
3	Risk assessment and action plan	Property-level register of environmental aspects and impacts. Identification of stakeholder requirements and plan actions to meet these requirements.
4	Self-declared EMS	EMS in place based upon ISO 14001 principles. All issues identified as priorities in action plan being addressed. Compliance with relevant Codes of Practice and legislation.
5	2 nd party EMS	EMS audited for nominated 2 nd party's requirements
6	3 rd party EMS	EMS audited and certified by 3 rd party for all stakeholder requirements
7	Certification of product	Sustainable operation dealing with all issues on aspects and impacts register to a standard acceptable to an independent body = EcoLabel

The participating irrigators can choose where they enter the continuous improvement pathway of environmental management detailed in Table 2 and how far they proceed along it. To simplify the process the range of environmental issues under consideration have been grouped into eight modules: Water Management, Hazardous Materials Management, Workshop and Machinery Management, Waste Management, Biodiversity stewardship, Community Considerations, Land Use and Energy and Resource Use. Currently baseline data on the activities of participating irrigators is being collected. This will provide the basis for the development of an Environmental Stewardship Handbook that will detail how an irrigator can move from Level to Level under each management module. The successful introduction of the Angas Bremer Code of Practice for Irrigators means that all the participating irrigators are at Level 5 for the Water Management module at the beginning of the project but performance against other modules is more variable ranging from Level 1 to Level 5. One of the major objectives articulated by the participating irrigators is to streamline current environmental reporting into one system that is easy to implement at the property level. For example, the trial will examine the potential for developing one spray diary that will satisfy all wine makers to avoid the current situation where growers may be required to fill in up to six different winery spray diaries for one property.

CONCLUSION

In closing, it is important to reflect on the key components behind the successful implementation of environmental stewardship programs in the Angas Bremer region. These are:

- Long-term access by the community to technical support;
- Partnerships between irrigators, industries and Government agencies developed over 20 years based on mutual trust and understanding of the regional natural resources and their associated risks;
- Strong leadership within the community, local industries and Government agencies;
- Support for community groups by paid project officers;
- A core group of committed local volunteers representing a broad range of irrigation interests;
- A viable, profitable industry that allows irrigators to have the resources to do more than merely survive; and
- The geographical features of the ABPWA mean that any impacts of inefficient irrigation will be realised on-farm or on neighbouring farms within one generation.

The combined bottom-up/top-down model utilised in the AB PWA only works because there has been strong leadership and commitment to sustainable natural resource management at all levels from irrigator to policy makers. The success of other regional environmental stewardship programs will be dependent on the formation of effective partnerships between all stakeholders from grower to market. When these types of partnerships form, concepts such as Ecologically Sustainable Development and Triple Bottom Line Accounting cease to be rhetoric and become reality.

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