Riverland Wine Industry Development Council Inc.

Australian Government
Grape and Wine Research and Development Corporation

Converting to Drip Irrigation



FINAL REPORT to

GRAPE AND WINE RESEARCH & DEVELOPMENT CORPORATION

Project Number: RT 04/19-4

Principal Investigator: **Julie Sippo/ Tim Smythe**

Research Organisation: **Riverland Wine Industry Development Council**

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RITA Final Report – Converting to Drip Irrigation – Project Number RT 04/19-4

1. Executive Summary:

The wine industry in the Riverland would not exist if it wasn't for irrigation. Over the years irrigation has taken on many forms, from flood irrigation to overhead irrigation to micro sprinkler and drip irrigation. With each practice being an improvement on the previous (generally speaking), the industry has learnt much about the efficient delivery of water to the vines. There have however been concerns, in recent times, that in the pursuit of efficiency, the broader practicalities of delivery (to the vine) were being lost. To this end, it was decided that a review of drip irrigation systems within the Riverland would be of great benefit not only to determine if system design and performance was suitable to both soil and plant requirements but also, to develop some basic guidelines for those wishing to convert to drip irrigation.

The team from the Irrigated Crop Management Service (ICMS) based in Loxton, South Australia were commissioned to investigate 5 drip irrigation systems within the region, as selected by Mr. Shane Phillips - a member of the Riverland Viticulture Technical Group. The findings of this investigation were collated and with discussion, combined to make a report aptly named 'A Review of Drip Irrigation Systems in the Riverland''.

Initially the project had set out to produce a 'Guide to Drip Conversion' but it became apparent throughout the course of the investigation that conducting a thorough review of drip irrigation systems, that were already in the ground, was of greater importance to the region. Resources as such were directed towards this cause. To the credit of both Mr. Phillips and ICMS the final report fulfilled the requirements of project objectives and effectively nullified the need for the Guide perse.

The report identifies a number of issues of relevance to all drip irrigation systems and includes information on crop water requirement, understanding soils, system capacity, flexibility, design and maintenance - making it essential reading for irrigators.

The Riverland wine industry, in its continued drive towards a sustainable future, understands the need to review not only its systems but its practices to ensure that they are in harmony with the environment, society and economic viability. Projects such as these allow the industry to acquire knowledge, build capacity and foster an ability to respond to the dynamic nature of the environment in which it operates.

2. Background:

The Riverland Viticulture Technical Group (RVTG) meets regularly to discuss issues of importance to the wine industry in the region. The benefits of drip irrigation were well known to the group but concern had been raised about the ability of some of the systems to meet the peak demands of a growing season.

The RVTG believed that growers needed to be aware of the basic requirements of a drip irrigation system. A poor performing system could expose producers to a substantial risk of crop loss. Issues such as system capacity, maintenance, water quality and soil hydrology needed to be addressed.

Furthermore the RVTG recognised that concerns about the drought and climate change had many within the community enquiring about the responsible management of natural resources. The potential water saving that could be made by growers, not already on drip, could act as an enticement to convert. Growers would therefore need to be aware of how best to implement this change.

3. Objectives:

The project set out to review at least fives drip irrigation systems with the intent of identify differences and variability concerning system design and its potential impact on resultant crop production. The determination of management strategies to compensate for common drip irrigation system deficiencies (as per evaluation) in the context of climate and soil conditions of the Riverland were also considered as a part of this project.

The team at ICMS were asked to investigate the following:

1. *Crop Water requirements*

- A description of climatic conditions of the Riverland region in terms of annual and maximum daily ET_0 and the range of soil water holding capacity in vine root-zone soil types and their respective storage capacities under drip irrigation.
- Typical crop water requirements for Wine grapes of the Riverland noting particularly Shiraz and Chardonnay varieties.
- A review of the range of annual irrigation applications typically applied to commercial Shiraz and Chardonnay varieties in the Riverland from previous ICMS studies.

2. *Desktop review of five drip irrigation system designs to assess:*

- The capacity of the design and its ability to meet maximum crop water demand in the Riverland.
- The ability of the design to meet scheduled irrigations that match soil water holding capacity and crop type.
- If the design can be maintained to run efficiently in terms of system cleaning, considering the water quality available to the system.

3. *Field assessment of the five selected irrigation systems targeting the potentially worst shift for each system identified by the desktop study. Measured parameters of the field assessment included:*

- Lateral line flow rate, valve unit operating pressure and emitter operating pressure
- Water quality in terms of NTU (Nephelometric Turbidity Unit)
- System operating flushing velocity
- Pressure loss across the filtration system.
- User feedback on system performance and user friendliness etc

4. Method:

Please see page 6 of the document titled 'A Review of Drip Irrigation Systems in the Riverland' for a full description of the methods used to assess the drip irrigation systems.

5. Results/Discussion:

Please see tables 3 to 9 on pages 9 to 12 and associated discussion on page 6 of the document titled 'A Review of Drip Irrigation Systems in the Riverland'.

6. Budget reconciliation:

The project was completed within budget albeit with a slight alteration to the initial objectives.

The final agreed amount of GWRDC funding for the project including GST was $16,500, of which 50% ($8,250) has been received by the RWIDC.

The total expenditure of the project of $15,950 is $550 less than the final agreed sum.

The RWIDC will therefore invoice the GWRDC for $7,700 upon receiving notification of the approval of the projects final report.

On the following page is a budget reconciliation as it related to the original GWRDC application for $16,500.

Budgeted Expenditure

Budget	Original GWRDC Request	Original Local Contribution
Project Brief Development	$ -	$ 1,400
Project Coordination	$ -	$ 1,400
System field review	$ 4,000	$ 1,400
Review Report	$ 5,000	$ -
Guide Development	$ 4,000	$ 5,600
Guide design & formatting	$ 1,000	$ -
Guide Printing	$ 1,000	$ -
Guide Distribution	$ -	$ 1,000
Total	$ 15,000	$ 10,800
Goods & Services Tax	$ 1,500	$ 1,080
Total incl. GST	$ 16,500	$ 11,880

Actual Expenditure

Budget	GWRDC funds expended	Local contribution
Project Brief Development	$ -	$ 1,400
Project Coordination	$ -	$ 2,400
Systems review & report	$ 13,000	$ 6,240
Printing	$ 1,500	$ -
Total	$ 14,500	$ 10,040
Goods & Services Tax	$ 1,450	$ 1,004
Total incl. GST	$ 15,950	$ 11,044