



Impact Summary

This document reports the impact of outcomes derived for the benefit of the Australian wine industry through the GWRDC – AWRI Investment Agreement 2006-2013. The impact assessment was conducted using a couple of approaches:

- The CRC Impact Benefit-Cost Analysis tool available from the CRC Program’s public website at www.crc.gov.au.
- Independent economic assessments conducted by Econsearch (www.econsearch.com.au), an independent company that provides economic research and consulting services in the agricultural and resource industries throughout Australia.

In addition a summary of the Intellectual Property (IP) developed and Third Party IP Rights used is also provided.

1. The CRC Impact Tool Impact Assessment:

In 2012, the GWRDC undertook a review of the impact of outcomes arising from the GWRDC-AWRI Investment Agreement. AWRI was requested to provide a written submission featuring among other things a version of a modified CRC Impact Tool completed to include the Inputs, Activities, Outputs, Usages and Impacts of activity.

As part of its submission, AWRI used a modified version of CRC Impact Tool as a qualitative assessment of impact for the funding period July 2006 to May 2012. The CRC Impact Benefit-Cost Analysis tool determined a benefit:cost ratio (BCR) in the order of 15:1. A description of this tool and the assumptions made in this analysis are provided in AWRI’s submission to the review panel, (AWRI Review 2012).

As part of preparing this final report for the full 2006-2013 period, the modified CRC Impact Tool analysis was revised to account for activities across the entire funding period to July 2013. A benefit:cost ratio (BCR) in line with the previous finding of 15:1 was determined, with the primary impacts being:

- Development of smoke diagnostic assays and industry support activities;
- Knowledge for improving wine colour and mouth-feel;
- The WineCloud grape and wine portal and the grape to wine extractability assay;
- Starter cultures for improving wine complexity and accentuating desirable sensory attributes;
- Avoidance of reductive aromas in wines through low H₂S yeast, yeast nutrition and oxygen management;
- Improved ferment productivity through informed yeast strain selection, improved yeast nutrition and the ferment simulator;
- Avoidance of *Brettanomyces*;
- Knowledge and tools enabling improved packaging choices and processes;
- Quality control measures for mitigating risk of taints in winemaking additives;
- Troubleshooting of winemaking problems and technical support; and
- Consumer preference evaluation findings.

By way of comparison, the former CRC for Viticulture was found to have an aggregate BCR of 5.6:1, and a portfolio analysis of GWRDC’s investments in 2001 revealed a BCR of 9:1. A series of projects and economic assessments of other CRCs suggest that BCRs are typically in the order of 8:1. (The Allen Consulting Group 2007, eSYS Development and BDA Group 2001)



2. Commissioned Impact Assessment:

An independent economic assessment of benefits derived from AWRI activities into resolution of common faults and taint, helpdesk and microbial research was conducted by Econsearch (www.econsearch.com.au) in 2012. The cost benefit analysis had the following key characteristics (based on the approaches taken and recommended by, among others, ACIL Tasman 2009, Department of Finance and Administration 2006a, Department of Finance and Administration 2006b, Chudleigh et al. 2007):

- Findings were presented relative to a base case or counterfactual scenario, that is, the benchmark against which the 'with AWRI project/activity' scenario was compared. The base case was defined as what would have occurred without the AWRI project/activity.
- Results were expressed in terms of net benefits, that is, the incremental benefits and costs of the 'with AWRI project/activity' scenarios relative to those generated by the base case scenario, over a 30 year time period.
- Costs and benefits were specified in real terms (i.e. constant 2012 dollars). Past and future values were converted to present values by applying a discount rate of 5 per cent.
- A sensitivity analysis was used to evaluate uncertainty in key variables.

The results obtained were extremely positive, yielding a net present value of ~\$1,001 million on an incremental RD&E investment of ~\$21.6 million, comprising:

- *Brettanomyces* management and avoidance from 1998 to 2009 (~\$49 million per RD&E investment of \$3.2 million);
- Halophenol taint mitigation and avoidance from 2004 to 2011 (~\$124 million per RD&E investment of \$1.5 million);
- Smoke taint mitigation and avoidance from 2003 to 2011 (~\$41 million per RD&E investment of \$1.5 million);
- General help-desk services (~\$50 million per RD&E investment of \$2.4 million);
- Mitigation of microbial taints (~\$259 million per RD&E investment of \$3.4 million);
- Flavour enhancement through microbial technologies (~\$215 million per RD&E investment of \$3.2 million);
- Ferment productivity (~\$248 million per RD&E investment of \$3.7 million); and
- New-product categories enabled through microbial technologies (~\$14 million per RD&E investment of \$4.7 million).

In summary, the activities conducted as part of the GWRDC – AWRI Investment Agreement 2006-2013 have generated significant benefits for the Australian wine industry. The substantial benefits derived relative to the incremental level of funding can be directly associated with the world-class technical expertise that was fostered through, and the productive use of the research funds enabled by the Investment Agreement funding model.

3. Intellectual Property:

The Australian grape and wine industry's position on intellectual property management articulated in the Winemakers' Federation of Australia's R&D policy (further information about this document available from the Winemakers' Federation of Australia's on request) states that priority must be given to the timely dissemination of research results and uptake of research. As such, throughout the investment period the AWRI favoured the extension of research outcomes into the Australian wine sector through a range of publication and dissemination programs.

Intellectual Property that was developed or enhanced throughout the investment agreement includes:

- Policies and procedures;



- Subject matter and technical know-how across all technical aspects of grape-growing and winemaking, including chemistry, microbiology, molecular biology, wine processing, engineering, sensory science, mathematics, spectroscopy and the practical application of information, methods and technologies;
- Know how in experimental design, data generation, analysis and interpretation including:
 - technical expertise in sensory evaluation methodology;
 - systems biology experimentation and integrations of metadata;
 - chemometrics and spectral calibration development techniques; and
 - methods for establishing the identity of target compounds, producing a reliable analytical method, and determining their sensory significance and importance to wine flavour.
- Publications, reports, presentations, data and their interpretation, expertise, knowledge, methods, training materials, website content, web and mobile-enabled tools, and fact sheets.
- Systems and processes involved in collating and packaging information for dissemination, and the developing and staging of seminars, courses and workshops including:
 - roadshow, workshop and webinar frameworks;
 - AWRI library;
 - eNews and eBulletin;
 - Advanced Wine Assessment Course;
 - Events management systems; and
 - Internal information management systems.
- Collections of training manuals, images, bacteria and yeast including a collection of bacterial and yeast strains, many of which were isolated prior to the investment agreement or secured under MTA for research purposes from universities and commercial suppliers, and a wine yeast gene deletion library.
- Tables of information raw and assembled genome sequences, and databases including those for eNews and eBulletin contacts, helpdesk, library and trade regulation enquires, and permitted additives and processing aids for winemaking and wine importing countries.
- Custom-made materials, synthesised templates/target molecules and chemical compounds, analytical standards, enzymes, substrates for enzymes and their application.
- Experimental protocols, measurement and detection methods and techniques, the ability to develop new methods and techniques, and the expertise and technical skills to undertake those methods and interpret the results including:
 - capacity to modify industrial yeast, generate mutants and hybrids;
 - methodology for high throughput screening, high throughput assays and phenotyping of yeast technology;
 - methods for tannin and phenolics extraction and characterisation.
 - The WineCloud grape and wine portal; and
 - The PinotG Style Spectrum.
- Indicia, patents, trademarks and associated domain names including:
 - Research to Practice trademark;
 - AWRI Roadshow trademark;



- Advanced Wine Assessment Course trademark;
- PinotG Style Spectrum trademark;
- WineCloud, GrapeCloud and Grape and Wine Cloud trademark; and
- Modified Industrial Yeast Strains, Patent number 2008310299, owner AWRI and Mauri Yeast Company.

Use of third party IP rights:

- Range of bacterial and yeast strains secured under MTA for research purposes from universities and commercial suppliers;
- Rights owned by the manufacturers of the Bevscan instrument; and
- Rights owned by the manufacturers of the Bruker A250/D Alpha FTIR Spectrophotometer;

4. References:

ACIL Tasman 2009, *Guidelines for Evaluation*, a report prepared for the Council of Rural Research and Development Corporation Chairs, April.

AWRI Review 2012

http://www.awri.com.au/wp-content/uploads/AWRI_2012_Review_Submission.pdf

Chudleigh, P., Simpson, S. and Schofield, N. 2007, *A Methodology for Evaluating Return on Investment from Natural Resource Management Research and Development*, a report prepared for Land and Water Australia, March.

Department of Finance and Administration 2006a, *Introduction to Cost-Benefit Analysis and Alternative Evaluation Methodologies*, Financial Management Reference Material No. 5, January.

Department of Finance and Administration 2006b, *Handbook of Cost-Benefit Analysis*, Financial Management Reference Material No. 6, January.

eSYS Development and BDA Group 2001, *Economic Evaluation of GWRDC Portfolio*, March.

The Allen Consulting Group 2007, *Grape Expectations. The Economic Impact of the Cooperative Research Centre for Viticulture February 2007*. Report to Cooperative Research Centre for Viticulture (CRCV).

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