

Volume 2

Autumn 2000



Newsletter



Shannon Pudney

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Cooperative Research Centre for Viticulture

The University of Adelaide
The National Wine and Grape Industry Centre
(Charles Sturt University, NSW Agriculture)
The Australian Wine Research Institute
CSIRO
Department of Natural Resources
and Environment, Victoria
Primary Industries & Resources SA
The Australian Dried Fruits Association Inc.
Winemakers' Federation of Australia Inc.
Winegrape Growers' Council of Australia Inc.
Grape and Wine Research
and Development Corporation
The Dried Fruits Research and
Development Council
WINETAC Inc. (Wine Industry National
Education & Training Advisory Council Inc.)

Learning to better manage saline water

A major CRCV experiment is underway in the Barossa Valley to determine how to manage marginal quality irrigation water on vineyards – in some instances four times saltier than River Murray water.

The research, one of four of the CRCV's regional studies in its Integrated Crop Management (ICM) Approach to Grape Production project, is being conducted at Nuriootpa on a block of 15-year-old clonal Chardonnay.

Two different qualities of irrigation water will be tested on the site – River Murray water and bore water – with the latter widely used throughout the Barossa region.

"We hope to generate some information on the long-term vineyard sustainability of using River Murray water and bore water and if problems are emerging determine what we can do to minimise those," said CRCV Project Leader **Dr Michael McCarthy** from the South Australian Research and Development Institute (SARDI).

Four levels of irrigation treatment will be applied to the vines using normal application rates and the innovative irrigation technique Partial Root-zone Drying (PRD).

Research Officer **Shannon Pudney** has been appointed for 2.5 years to monitor and assess vine performance such as growth, yield, berry weight, bunch weight, vegetative growth, weight of prunings, canopy size, density and light interception using a range of state-of-the-art equipment.

She will also assess grape composition, in particular sodium and chloride levels in juice.

Dr McCarthy said the project will be the first in-depth look researchers have taken at PRD and the use of marginal quality water in the Barossa Valley.

PRD is a technique which involves watering one half of a grapevine's roots while drying out the other half for 10-14 days and then alternating the process.

CRCV news highly valued

The response to our questionnaire concerning the CRCV Newsletter and other aspects of communicating the Centre's progress and outcomes was comprehensive and most positive. To the many respondents may I say thank you for your time and the thought given to your replies. Your comments have been integrated into a new communication strategy for immediate implementation and designed to strengthen effective communication of all aspects of the CRCV's operations. You will notice that the strategy includes further modifications to the newsletter and will provide for more active management of the CRCV web site.

New Appointments

The CRCV's national Viticare Initiative is set to roll with the appointment of **Noel Ainsworth**, as the Viticare Coordinator. Noel's last position was with the Queensland Department of Primary Industry as Senior Viticulturist.

His challenging task will be to identify or establish regional groups interested in bringing this innovative concept to reality. Within this initiative we also welcome **David Baker** as Environment Systems Management Officer. David comes to the CRCV with experience in a similar role in the fishing industry.

Over the last few months the CRCV has awarded eight PhD studentships and made 18 scientific research appointments. We expect to progressively introduce all these people in future editions of the newsletter.

First Year Visit

The CRCV has been advised that the Commonwealth is to conduct its First Year Visit on Tuesday 21 March. The Visit is intended to inform the Commonwealth on progress toward the development of the new Centre. The Visiting Panel will comprise **Professor John Coghlan**, **Dr Shirley Lanning** (Centre Visitor) and a member of the CRC Secretariat. They will meet the Chairman **Peter Barnes**, Business Manager **Paul O'Reilly** the Executive Management Group and myself.

Praise for AusVit™

It was gratifying to hear that **Senator Minchin** praised the first CRCV's AusVit™ software at the recent National Innovation Summit. The much-anticipated Version 3 with several new and improved features has now been released. Negotiations for full commercialisation are taking place.

Jim Hardie CEO

Learning to better manage saline water cont.

The dry roots produce a chemical signal to the shoots that drought might be approaching causing the plant to slow down its vegetative growth.

Dr McCarthy said one of the concerns with PRD was whether it would result in an accumulation of salt in the root-zone.

A PhD student will be appointed in the next few months to investigate the interaction between PRD, marginal quality water and the physical and chemical properties of the soil.

He said one of the main features of PRD is that it can significantly reduce water usage and also may have the additional benefit of helping growers to better manage saline water.

The experiment at Nuriootpa is being carried out using the latest monitoring equipment which has been donated generously by several companies.

Netafim donated all the irrigation equipment for the experiment (three drip lines per row and controllers); Agrilink donated 12 sets of soil moisture sensors (cprobes); and Sentek have contributed six Enviroscan probes.

Specialised plant growth sensors, known as a Phytomonitors, have also been donated by Netafim. Dr McCarthy said results from the data collection and analyses should be available this Spring enabling researchers to provide initial advice to growers on what they should do in terms of irrigation management next season.

The other three sites being established as part of this project are in the Sunraysia, Central Victoria (Tatura) and the Murray Irrigation Area.

For further information about Project 2.3 contact Dr Michael McCarthy on (08) 8568 6409.

Newsletter

The Cooperative Research Centre for Viticulture Newsletter is produced bi-monthly. All contributions are welcome, especially reports from conferences, seminars and international trips.

Editorial: Anne Cope
Peter Fuller & Associates,
PMB 1, GLEN OSMOND 5064
Phone: (08) 8303 7337
Fax: (08) 8303 7136
Email: anne.cope@adelaide.edu.au

Published by: The Cooperative Research Centre for Viticulture, Plant Research Centre, Hartley Grove, URRBRAE SA
Phone: (08) 8303 9405
Fax: (08) 8303 9449

Graphic design by: de Masi jones design
263 Waymouth Street ADELAIDE SA
Phone: (08) 8212 9065
Fax: (08) 8212 9064

Precision viticulture could be key to higher yields and better quality

The CRCV is developing low-cost precision viticulture techniques for growers to achieve both high yields and wine grape quality in vineyards.

The project, which Southcorp Wines and CSIRO Land & Water started prior to the 1999 vintage in a 6.5 ha Coonawarra vineyard of 13-year-old Cabernet Sauvignon, is being continued by the CRCV and expanded to include a second site in Sunraysia.

It is revealing that grape yield and fruit quality can vary widely within quite small areas of vineyards, with this variation likely to be due to changes in soil properties, such as nutrient supply, depth and moisture.

"As a result, while some parts of a grape block being managed conventionally may be highly profitable, others only meters away may be making a substantial loss," said Dr Rob Bramley, a senior research scientist with CSIRO Land & Water and a member of the CRCV research team.

"The aim of our research is to establish to what extent yield and quality are influenced by manageable variations in soil properties."

Dr Bramley said the industry's conventional wisdom that higher grape yields mean lower quality may not always be the case as subtle changes in fruit quality may well be influenced by subtle variations in soil chemistry and nutrient availability which could potentially be controlled by careful management.

"In other words, there may be a good opportunity to optimise both yield and quality to achieve the best financial outcome for the producer or the best environmental solution, if that is the goal," he said.

The precision viticulture project involves the use of a yield monitor, attached to the conveyer belt of a harvester, which measures fruit depth on the belt.

The monitor records yield every three meters along a row and is linked to a differential GPS (Global Positioning System) to give a spatially referenced measure of yield accurate to within a metre.

A geographical information system is then used to spatially represent the data and turn it into a map.

Close to the 1999 harvest, several vine and fruit quality indices were also assessed on 190 vines and a detailed soil analysis conducted to give a comprehensive picture of the vineyard.

Early results from the Coonawarra site indicate a significant variation in yield, crop maturity and key quality indicators such as colour and acidity according to the nature of the soil the vines are grown on.

"These early findings encourage us to believe that fruit quality is a more controllable factor than many people assume," said Dr Bramley.

However, Dr Bramley cautioned that an analysis of these indices suggests that not only is the degree of spatial variation in parameters such as baumé, colour and vine vigour highly significant, but also that the inter-relationships between these indices may vary in different parts of the vineyard. "Therefore we believe that appropriate adoption of precision viticulture will be dependent on a coordinated research effort aimed at developing an understanding of the relationships between the inputs to the production system and grape yield and quality," he said.

Dr Bramley said precision viticulture offered a low-cost means of improving the grape and wine production process with downstream benefits which could ensure the continued growth and competitiveness of the industry.

The cost of setting up precision viticulture is not as high as many imagine. It requires the purchase of a yield monitor using satellite navigation (about \$26,000) and some diagnostic analysis of soil and plants, which over five years would work out to around \$4 to \$5 per tonne of grapes.



Dr Rob Bramley

8 Key benefits of precision viticulture

- More efficient use of inputs such as fertiliser, sprays, water etc
- Ability to show that best-practice has been used in grape production
- Improved quality control leading to segregation of crops at harvest
- Harvesting according to quality specifications
- Improved harvest scheduling
- More precise sampling of vineyards to aid management decisions
- An improved basis for paying grapegrowers
- Improved vineyard design

For further information about this project contact Dr Rob Bramley (08) 8303 8594 or Rob.Bramley@adl.clw.csiro.au

CRCV Program Update

Program 1:

Vineyard Management to Meet Grape Quality Specifications



Program Manager – Dr Elizabeth Waters

Since July last year, 10 appointments have been made in Program 1 ranging from technical officers, PhD students and post-doctoral research fellows. These people will take up positions with the CRCV's collaborators: CSIRO Land and Water, CSIRO Plant Industry, Charles Sturt University, The Australian Wine Research Institute, Adelaide University and Flinders University.

There are nine projects within Program 1 and it is pleasing to report that eight are already underway. Project teams have had regular meetings, several involving industry collaborators who have provided valuable feedback and expressed a keen interest in applying project outcomes.

In August last year we began a project which involved a national survey of sampling parameters in the vineyard and at the weighbridge. The results of the survey demonstrated:

- Many growers and wineries are measuring many different quality parameters
- Many different methods are used to measure the same quality parameter
- A lack of understanding in sampling for a particular quality parameter
- Lack of knowledge about the variation in particular quality parameters within a vineyard.

An article on the results of the Winery Survey is being prepared and will be publicised when completed.

Program Two:

Sustainable Vineyard Systems



Program Manager – Dr Rob Walker

All projects are well into the establishment phase with new staff appointments and several projects in the process of making appointments.

Planning meetings with industry have occurred in the main project areas including a preliminary focus group

workshop on VineLOGIC, a new computer software package to enable 'smarter' decisions in relation to vineyard site selection, design and management. The workshop was held in Griffith and involved input from wine industry representatives and people with experience in decision support systems in other industry sectors. It provided valuable guidance on the planning process for the wider focus group process to occur in May-June this year.

A planning meeting was also held at CSIRO Merbein in February for teams on partial rootzone drying, water use efficiency, sustainability modelling and regional site projects. This was the first opportunity for industry members of the Program reference group to assess progress so far.

Members of the 'wood infecting pathogens' Project 2.2 team have had two planning meetings, one in October, 1999, and another in January, 2000. Two visiting overseas-based researchers with experience in grapevine wood infecting pathogens also attended the January meeting to explore possible collaboration.

A significant new initiative has been the combining of resources from the Murray Darling Basin Commission (MDBC) and the CRCV in a new project addressing "Development and adoption of best management practice for improved water use efficiency and effectiveness for irrigated vines".

Three CRCV projects with a focus in the Sunraysia-Riverland region will be core projects in the new initiative which will be enhanced by an injection of some \$715,000 of MDBC funds over 3 years.

Program 3:

Molecular Improvement of Grapevines



Program Manager – Dr Simon Robinson

Ten new positions in Program 3 were advertised in September and assessment and interviews were conducted in November and December. The standard of applicants was generally very good and we have now made excellent appointments to a number of the positions, most of which commenced in February. The remaining positions (two Postdoctoral Scientists and three PhD Studentships) have been readvertised.

The first transgenic grapevines have been planted out at the CSIRO Plant Industry research station at Merbein for field evaluation. Some of the genetically modified vines contain reporter genes to evaluate which tissues express the introduced gene and check that the gene remains expressed over time. The remaining Sultana vines have been engineered to switch off the gene responsible for browning of dried fruit and these will be assessed when the vines produce fruit, in 1-2 years time.

A presentation was made to the CRCV Board in September, describing the aims and anticipated outcomes for Program 2 and detailing the projects involved.

A similar presentation was made to the GWRDC Board in October, which included a discussion of the role of molecular biology in viticultural research.

In response to the growing media attention, a statement on the use of gene technology in the Australian wine industry was prepared in collaboration with industry and distributed by the Winemaker's Federation and via web sites in October. Scientists from this program have also addressed meetings of growers, winemakers, and consumers at a number of regional sites on the role of gene technology in the Australian wine industry.

Program 4:

Education & Training



Program Manager – Ms Libby Boschen

The PhD student researchers currently being recruited for the new CRCV research projects will soon be receiving the first leg of their development program: their 'Orientation Guide'. In addition to welcoming the students to the CRCV, the guide aims to ensure that each student has been provided with all the information and resources required for them to settle in quickly and perform their role in the CRCV as effectively and smoothly as possible.

The Guide covers the basics familiar to all of us when starting a new job, such as occupational health and safety, Q.A.

procedures, how and where to access information, workplace harassment policies and so on. In addition, the guide also focuses the students' attention on the viticulture industry's objectives (e.g. Strategy 2025).

At the end of their orientation period, each student is invited to input into their personal training and development plan. The Guide explains this process and provides ideas for future careers and development opportunities.

On 3 February Taylor's Wines in the Clare Valley held its Graduation Night. The evening was a well-deserved opportunity for everyone at Taylor's, whatever their role, to celebrate their team's success – 80 employees in the vineyard, bottling hall and cellar achieving their Certificate II in Food Processing (WINE).

It is easy for me, as Program Manager of the CRCV's Education and Training Program to get bogged down in the daily grind of politics, strategies, policies, meetings and reports; dealing with governments, training providers and committees. The celebrations at Taylor's was a timely reminder of why I, indeed all of us involved in training, are doing it all!

The faces of the trainees clearly demonstrated their joy and pride in their achievement and the speeches and informal discussions with Bill Taylor and General Manager, Neil Jericho, confirm the organisation's delight in the successful implementation of the company's training and development plan over the last three years.

The result is a team of confident, competent, knowledgeable employees. A team who know exactly what to do, to what standard and why they're doing it. A team that is clear about where their company is heading and how they personally contribute to the achievement of their company's goals on a daily basis.

Workplace training can be hard work, but is always a sound investment – suck it and see!

The Australian wine industry's position on genetic manipulation

Gene technology is providing the capacity for a much greater understanding of how grapevines function and it is expected that the technology will eventually lead to more effective vineyard management techniques and to better grape varieties. The CRCV, through Program 3 'Molecular Improvement of Grapevines' intends to keep the Australian viticultural industry strategically positioned, alongside other countries, in terms of capturing the benefits of this technology.

But the whole issue of gene technology has been a hot topic in the media and the cause of much speculation. Late last year, the Australian wine industry decided to issue a statement clearly outlining its position on the matter. This is what it had to say.

The Australian wine industry produces some of the best wines in the world at affordable prices. It is a vibrant, efficient and forward-looking industry with a strong interest in remaining at the forefront in a very competitive world market.

Its success has been built through cooperation, determination and focus on quality, purity and efficiency.

Underpinning this success is a culture of innovation and willingness to improve the way we grow grapes and make wine. The industry will continue to explore new developments in all areas of science and apply these where there are clear benefits to consumers and acceptance by society.

As part of this endeavour, Australian scientists are using gene technology in research to advance our knowledge of how both microorganisms and grapevines function. These efforts form part of an ongoing, long-term program of scientific research and are not unique to Australia, or to the wine industry.

Research organisations in France, the USA, Israel and South Africa are also investigating the use of gene technology for potential application in the food industry, including grape and wine production.

No genetically modified grapes or yeasts are used in the production of Australian wines.

There will be no commercial use of genetically modified organisms to produce Australian wine until it is clear that they are safe, of high quality and beneficial to consumers.

Gene technology is giving researchers and the industry a better understanding of plant processes, and may one day help in developing better varieties and more effective vineyard techniques.

If genetic modification were to be used in the future, possible outcomes of such research could be to modify grapevines, or their management, to make them resistant to diseases, and to improve berry quality.

At present, this work is at the research stage and further development and testing is likely to take another 5-10 years.

The wine industry is monitoring progress in this research with interest. While there are potentially great benefits in employing gene technology – particularly in areas where conventional methods have failed – we are also conscious of the need for safety, openness and quality assurance.

Adoption of this research would only occur after a thorough assessment of the technology and its products.

For further information please contact Dr Simon Robinson at CSIRO Plant Industry on (08) 8303 8600.

Research to Practice™ 2000-2001

The development and delivery of the Research to Practice™ program has been a collaborative effort of staff from Agriculture Departments, viticulture consultants, growers, commercial suppliers, universities, and many others over the past 4 years.

In the last six months, the Research to Practice™ team has held more than 40 training workshops in South Australia, New South Wales, Victoria, Western Australian and Tasmania. Four different workshop packages were offered to viticulturists this season, including: Water Management for Grape Production, Integrated Pest Management in Viticulture, Grapevine Nutrition and Spray Application in Viticulture.

The first two days of the Research to Practice™ workshops are held within the growing season so that a practical outdoor session can be included. The Third Day meeting is held after harvest which gives participants an opportunity to discuss their experiences in the vineyard after trying ideas developed in the initial two days of the workshop program.

Participants often report that the Third Day is the most useful part of the workshop program. They feel that understanding of practical applications of the information presented and local relevance are key to making changes in management practices.

Research to Practice™ Third Day meeting times (for those who have completed the two day workshop)

Spray Application

Location	Date
Pemberton	1st May
Kurri Kurri	9th May
Mudgee	11th May
Naracoorte	23rd May
McLaren Vale	24th May
Launceston	14th June
Griffith	20th June
Cowra	21st June
Loxton	6th July
Knoxfield	11th July
Wangaratta	14th July

IPM

Location	Date
Nuriootpa	26th April
McLaren Vale	27th April
Bridgetown	2nd May
Perth	3rd May
Denman	10th May
Mudgee	12th May
Yea	16th May
Bendigo	23rd June

Nutrition

Location	Date
Murrumbateman	27th May
Orange	24th May
Griffith	26th May
McLaren Vale (BRL)	5th June
McLaren Vale	6th June
McLaren Vale	7th June
Nuriootpa	8th June
Margaret River	14th June
Mildura	22nd June
Padthaway	14th June
Adelaide Hills	26th June
Wangaratta	28th July

Water Management for Grape Production

Location	Date
Mildura	28th January
Adelaide Hills	8th February
Cowra	23rd May
Griffith	25th May
Knoxfield	1st June
Margaret River	15th June
Albany	16th June
Wangaratta	3rd July

Next season's Research to Practice™ program

We are currently seeking expressions of interest from organisations, companies or grower associations interested in hosting a workshop in their region. The same four workshop programs will be offered:

- Water Management for Grape Production
- Integrated Pest Management in Viticulture
- Grapevine Nutrition and
- Spray Application in Viticulture.

Expressions of interest for regional workshop dates will be accepted until April 1, 2000. **Information on costs and conditions is available from Bronwyn Clarke on (03) 9210 9222.**

Viticare Coordinator appointed



Noel Ainsworth

Extensive experience in horticulture and viticulture will stand Noel Ainsworth in good stead for his new position with the CRCV.

Noel, who has worked in Queensland's grape industries for more than six years, has been appointed as Viticare Coordinator and will be based at the CRCV in Adelaide.

His role will involve helping to establish and support regionally-based viticulture groups made up of growers, winemakers, consultants, training and service providers.

Noel will also be working with Anne Maree Boland and DeAnn Glenn who will be coordinating two other components of the Viticare project, Environmental Management Systems and On-Farm Trials.

One of Noel's first tasks has been to appoint two Industry Development Leaders in integrated pest management and water use efficiency. These appointments were finalised by the end of February.

"This should not only add strength to the Viticare team, but also provide a valuable technical reference for their growers and leadership for their respective disciplines," he said.

Noel said he is looking forward to increased industry communication through the Viticare groups, in particular ensuring CRCV research results meet the pressing needs of the industry.

With a Bachelor of Agricultural Science from the University of Queensland (St. Lucia), a Masters of Applied Science in Extension and Rural Development from the University of Western Sydney (Hawkesbury) and a Graduate Certificate in Rural Systems Management from the University of Queensland (Gatton), Noel brings an extensive knowledge of science, agriculture and communications to the position.

He believes his strengths are in enhancing communication across a range of horticultural/viticultural industries using grower groups.

For further information about Viticare please contact Noel Ainsworth on (08) 8303 9304 or mobile 0408 924 544

What is Viticare and how will it benefit you?

Viticare will be a network of regionally-based viticulture groups which will encompass demonstration work, evaluation of new technology and assessments of grape quality and irrigation management techniques.

The three main ways in which it will operate include:

1. Providing groups with access to researchers to help them with their activities
2. Facilitating interaction between growers, winemakers, consultants and training and service providers through creation of a network
3. And giving companies, such as resellers and service providers, the opportunity to participate by subscribing to Viticare and

supporting groups by providing goods, services, time or money to their projects. One of the main features of Viticare is that it will give growers the first look at new research and the opportunity to adapt it to local conditions.

Two other components of Viticare include an Environmental Management project, to help regions and regional industry people define indicators of vineyard sustainability, and On-Farm Trials for designing and testing methods of field evaluation which will provide growers with practical techniques to determine whether a new technique is better than the old.

Diary Dates for 2000

Commonwealth First Year Visit to CRCV

Tuesday, 21 March

6th International Symposium on Grapevine Physiology and Biotechnology

11-16 June, Heraklion, Crete, Greece

To be attended by Dr Robyn van Heeswijck and Professor Peter Høj

American Society for Enology and Viticulture Annual Meeting - 50th Anniversary Celebration

19-23 June, Washington State Convention & Trade Center
Seattle, Washington

Email: society@asev.org

ASVO Viticulture Seminar

Friday, 28 July, Mildura Arts Centre

Topic: Managing Bunch Rot

For bookings and further information contact Val Rechner on (08) 8303 6607