

Volume 3

Winter 2000



Newsletter



Dr Belinda Stummer and Dr Eileen Scott prepare Powdery Mildew - affected chardonnay for fermentation.

Inside

- CEO's Report **2**
- Black goo research **3**
- PhD students **4 - 5**
- Peter Barnes profile, Royal visit **6**
- Environmental appointment **7**
- Education and Training & Diary dates **8**

Cooperative Research Centre for Viticulture

Adelaide University

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

(Wine Industry National Education
& Training Advisory Council Inc.)
WINETAC Inc.

Simple test for powdery mildew infection being developed by CRCV

The CRCV has begun a project aimed at developing a rapid and simple test to detect and quantify infection levels of Powdery Mildew and Botrytis in grapes, juice and must (**Program 1, Project 1.5.2**).

This project is led by **Dr Bob Emmett** of DNRE based at the Sunraysia Horticultural Centre and involves researchers from this agency as well as Adelaide University, SARDI, AWRI, CSIRO Plant Industry and CSIRO Food Science Australia.

Drs Eileen Scott, Belinda Stummer and **Andrew Markides** at Adelaide University, are working on the Powdery Mildew component of the project. This is a natural progression from previous research in the CRCV in which Eileen and Belinda were involved in molecular approaches to study Powdery Mildew in grapevine tissue.

"We will be applying the DNA tools developed in the earlier CRCV project to berries, juice and wine in the new project," said Eileen.

Other than visual inspection, it is difficult for growers and wineries to estimate levels of Powdery Mildew in a consignment of grapes.

This research project is designed to produce a method for quantifying levels of Powdery Mildew, determine the critical levels at which it impacts on wine quality and develop specifications for acceptable levels of contamination.

Minimal research has been conducted overseas into the effects of Powdery Mildew, however researchers there have found that an infection level of three per cent can be detected as a wine taint. This level will be verified by CRCV research.

Feedback positive on CRCV's progress

First Year Visit

On Tuesday 21 March the Commonwealth CRC Program conducted its First Year visit to gain an appreciation of progress toward establishment of the CRCV. The panel, chaired by **Prof John Coghlan**, was fulsome in its praise for progress and was favourably impressed by the detailed presentations of the Executive Management Group. The report of the panel has since been received, it highlights 'excellent progress', the 'highly targeted', objective-driven research programs and the genomics and genetic technologies research as 'an important national contribution and an investment in the future'. This is a welcome endorsement of the extensive planning that went into the

bid for a new CRCV and the subsequent contribution of CRCV participants since receiving notification of our success. I congratulate and thank all those who have helped us reach this point.

CRCV Board Review

The CRCV Board will meet on June 7 to approve the budget for the coming year, review its own performance and assess progress in meeting the CRCV's performance targets. This will be an important event in identifying opportunities to improve the governance of the CRCV and address any shortfalls in progress toward our challenging goals.

Industry Reference Groups

The CRCV's Industry Reference Group, formerly 'Viticulture 2000', is extending invitations to leading industry participants, including grapegrowers, winemakers, wine writers and marketeers, to be a part of it. The invitation seeks their involvement in Industry Reference Groups that are being established for each of the CRCV's research programs, its education program and the Viticare Initiative. The groups will provide the CRCV with necessary feedback concerning the direction of these programs and the impact that their outcomes is having and is likely to have on industry practices.

Jim Hardie CEO

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

Simple test for powdery mildew infection being developed by CRCV cont.

Dr Scott, Stummer and Markides have been producing wine this vintage from Shiraz and Chardonnay grapes with known levels of Powdery Mildew. The first step was to grade the grapes based on a thorough visual inspection, backed up by observation under a microscope. **Dr Trevor Wicks**, SARDI, also a participant in the project, assisted with disease assessment.

Two batches of Shiraz were made from grapes with different levels of infection (low, less than three per cent, and medium) and Chardonnay made from grapes with five different levels of infection.

Fermentation has been monitored and data collected to enable the researchers to compare the effects of various levels of Powdery Mildew infection on the vinification process. Particularly important have been juice settling characteristics, fermentation profile, control of oxidation and the effect of infection on pH, titratable acidity (TA), volatile acidity and alcohol levels.

Included in the research is an examination of the total microflora of the berries. Fungi and bacteria have been isolated and will be used to test the specificity of the DNA probes to enable the researchers to conclusively identify Powdery Mildew. Knowing what else may be present in the berries will help ascertain what other organisms could be influencing wine quality.

"In subsequent years we hope to work with commercial wineries and have more, large-scale lots so we can get a better representation of what's happening and make the process as close as possible to what actually takes place in a commercial environment," said Eileen.

Researchers **Dr Amanda Hill** and **Dr Vicki Taylor** from CSIRO Plant Industry, Canberra, will be taking an immunological approach to detecting Powdery Mildew and bunch rotting organisms, to be incorporated into a simple, rapid field test.

A comparison of both methods, DNA-based and immunological, will be evaluated as a preliminary step in developing commercial diagnostic kits for Powdery Mildew and for studies to develop a quality specification for such infection.

Improving our understanding of Black Goo Disease

Black goo – it has a strange name and has had researchers and grapegrowers baffled for some time.

In fact it still does, but the CRCV has dedicated a national research project to managing grapevine trunk diseases (**Program 2, Project 2.2**), led by **Ian Pascoe**, from Agriculture Victoria's Institute of Horticultural Development in Knoxfield, Victoria, which is set to unravel some of the mysteries of Black goo.

Black goo decline occurs in Europe, North and South America, South Africa, Australia and New Zealand (under various different names) and while the disease has been around for some time, the fungus, *Phaeoacremonium chlamydosporum*, which causes the disease was only identified in 1996.

Ian said Black goo, Eutypa dieback and Esca are diseases that do not so much threaten the productivity of a vineyard in a given season (like powdery and downy mildews do) but threaten the long term survival of the vineyard itself.

"For this reason we see the research as very important to the long term sustainability of the grape industry," he said.

Black goo causes stunting in young grapevines and produces a black tar-like substance in the trunk of the vine but no specific leaf symptoms.

Ian readily admits that there are more questions than answers about the fungal disease but says a year from now the research should yield some useful early results.

The research team, which includes Ian, **Dr Jacky Edwards** and PhD student **Eve Cottral**, is part of a larger national grapevine trunk disease project, and believes that vines that become infected through pruning wounds do not tend to suffer as much as those that carry the disease in the base of their trunks when planted.

For some unknown reason, the disease is not as damaging when it moves downward through the plant as it progresses more slowly than the upward movement which develops from infected planting material.

Black goo is found readily in old vines and has been detected in almost every grapegrowing region in Australia. It is habitually a wound invader and older vines have more wounds so opportunities for it to get into the vine accumulate over time.

Ian said while his research team was able to isolate the disease from vines it was unsure how cuttings became contaminated.

"We want to determine whether the disease grows systemically inside canes produced on infected vines or whether the cuttings become infected once cut, through the contamination of the outside of the cane with fungal spores," he said.

"This is an important issue for us because if infection occurs by contamination in a source block or in the nursery after a cane has been cut, then it is easier to manage than if the problem is systemic."

Ian said there appears to be a correlation between vine stress and the disease, with anecdotal evidence suggesting Black goo can be managed, although to what extent is unknown. He said if young vines are not grown under optimum conditions and vines become stressed, the disease can take hold. Conversely, infected vines grown in ideal conditions may perform quite well, at least in the short term.

"We have to be careful about the advice we give because while improving irrigation and nutrients may help sustain the vines, they may succumb in, say, 10 years time. We really don't know yet," he said.

Ian said trials will be set up with growers who appear to have successfully managed Black goo and certain sections of vineyards will be subjected to stress events, to get the disease "to rear its ugly head".



Black goo in the trunk of a Schwarzmann rootstock vine.

"We will do the opposite in young vineyards where conditions are less than optimal and the disease is serious, to see if we can manage the disease by improved nutrition and irrigation," he said.

While fundamental research is the main focus of research, the team is also carrying out some applied research. A Hot Water Treatment (HWT) trial is underway which has involved treating cuttings from known infected mother vines. They have been planted out and are awaiting analysis.

One major difficulty with the disease is that it occurs inside the trunk, thereby making an effective diagnosis almost impossible without cutting the vine down. Developing a rapid, non-destructive test to detect the fungus is a high priority for the CRCV. The team will link with similar research on Eutypa dieback being carried out by the other part of the national trunk disease project, led by SARDI's Dr Trevor Wicks, and Adelaide University's Dr Eileen Scott.

New talent to underpin technological innovation

A number of young people have joined Australia's viticulture industry in the past few months to take up PhD studentships within the CRCV.

Through this initiative, the CRCV aims to provide high-quality training to produce scientists with a combination of world-class research abilities, industry knowledge and management and communication skills.

In the next few editions of the newsletter, we hope to introduce them all to you.



CRCV PhD students (left to right): Adam Clay, Stephanie Vaughan, Louise Clark, Richard Lardner and Mohammad Motiul Quader.

Louise Clark

Louise grew up in Hobart and obtained a Bachelor of Agriculture Science (Honours) at the University of Tasmania in 1998. Following her degree she began work with Forestry Tasmania as a manager of a soil surveying program. After six months of mainly fieldwork, she moved into research and extension.

After completing her contract she moved to South Australia to start her CRCV PhD studentship in Program 2 based at Adelaide University's Department of Soil and Water at the Waite Campus. She will be investigating, both in the field and the laboratory, the interaction between irrigation management (using techniques such as partial rootzone drying) water quality and soil as part of **Program 2, Sub-Project 2.3.1**. Louise will also be determining the effects of rainfall on the soil properties of vineyards irrigated with moderate saline water.

Mohammad Motiul Quader

Motiul is from Bangladesh and has a Bachelor of Science (Agriculture) Honours from Bangladesh Agricultural University and has a Master of Science in Plant Pathology from the Institute of Postgraduate Studies in Agriculture, Bangladesh. Following his studies he spent eight years working on plant parasitic nematode and plant disease management. He moved to Australia in 1994 and completed a Post graduate Diploma in Science in Molecular Genetics from the University of Queensland and a Master of Science in Biology from the University of Southern Queensland.

Motiul is part of **Program 2, Sub-Project 2.1.5** and is based at Adelaide University's Department of Applied and Molecular Ecology, at the Waite Campus.

His research involves developing sample handling and DNA extraction methods for the detection and quantification of nematode parasites of grapevines.

He is also using DNA-based quantification to determine economic thresholds and/or impact risk categories for the most prevalent and important nematode species affecting grapevines.

Stephanie Vaughan

Stephanie has a degree in Medical and Applied Biotechnology and completed an Honours research project investigating the molecular mode of action of the fungicide Scala at Charles Sturt University in Wagga Wagga.

She has taken up a CRCV PhD studentship in **Program 3, Sub-Project 3.1.3** and is based at CSIRO Plant Industry (Adelaide), working on the genetics of Botrytis resistance with **Dr Ian Dry** (CSIRO) and **Dr Robyn van Heeswijk** (Adelaide University).

Stephanie is busily preparing materials to start experiments in the laboratory and glasshouse over winter.

Adam Clay

Adam holds a Bachelor of Biotechnology (Honours) from Flinders University where he developed a strong interest in plant molecular biology. As part of his Honours year, Adam produced a business plan assessing the commercial viability of genetically engineered nematode resistant grapevines - ideal preparation for his CRCV PhD studentship which focuses on potential strategies for genetically engineering nematode resistant grapevines.

Specifically, Adam will be working on "The molecular characterisation of the interaction between grapevines and the root-knot nematode", part of **Program 3, Sub-Project 3.2.1**. It is root-knot nematodes which currently have the greatest impact on the Australian viticulture industry.

Richard Lardner

Born and brought up in New Zealand, Richard holds a Bachelor of Science in biological sciences and Master of Science from the University of Auckland. The research component of his masters consisted of analysing variation within New Zealand populations of the fungal plant pathogen *Colletotrichum acutatum*, using both molecular and traditional techniques. Following his masters degree, he spent six months in England working as a molecular biology technician at the International Mycological Institute. He has also travelled extensively throughout the UK and Europe.

Richard has joined **Program 2, Sub-Project 2.2.3** focusing on Eutypa dieback, caused by the wood inhabiting fungus *Eutypa lata*, which is widespread in Australia. Infected vines gradually die causing significant reductions in yield.

The aim of his research is to develop a rapid, non-destructive diagnostic procedure which will allow early detection of vines infected with Eutypa.

Eve Cottral

Eve recently graduated with a Bachelor of Agricultural Science from Melbourne University. As part of her assessment she undertook a research project in 1999 studying the fungus *Phaeoacremonium chlamydosporum* (causal organism of Black goo decline of grapevines) in tissue-cultured grapevine plants.

She started her CRCV PhD studentship in March this year and is a part of **Program 2, Sub-Project 2.2** "Managing grapevine trunk diseases (Black goo Esca, Eutypa dieback and others) that threaten the sustainability of Australian viticulture".

Principal research for the PhD component of the project will cover studying the host-parasite interaction between the fungus *Phaeoacremonium chlamydosporum* and grapevine wood to determine how the fungus infects grapevine tissue and induces the black goo symptom observed in cut sections of infected wood.

Jessica Wade

Jessica has a Bachelor of Science and Honours in Botany from the University of Queensland and has had experience working as a laboratory and research assistant.

She took up a CRCV PhD studentship in February this year and is part of **Program 2, Sub-Project 2.3.4** "Nutrition and irrigation strategies to minimise vineyard inputs, reduce environmental impact and improve grape quality". She is based at Charles Sturt University, Wagga Wagga, and has a field trial at McWilliams Wines, Hanwood, NSW.

The field trial is in a drip irrigated vineyard and will investigate different irrigation and nutrition strategies.

Karen Herbert

Karen Herbert comes from North-East Victoria and completed a Bachelor of Science at La Trobe University, with majors in Biochemistry and Botany, and Masters Preliminary at Monash University. She has a forestry background having worked for CSIRO - Forestry and Forest Products in Melbourne, as well as The University of Melbourne, School of Forestry at Creswick, Victoria.



Eve Cottral

Jessica Wade

Karen began her CRCV PhD studentship in April this year. She is part of **Program 2, Sub-Project 2.1.6** and is working on a collaborative project between Agriculture Victoria - Rutherglen and the Adelaide University jointly supervised by **Dr Kevin Powell** and Dr Robyn van Heeswijk.

Karen will work alongside the Phylloxera Research team who are currently investigating the root grapevine pest, Phylloxera. Her research project is entitled "The early detection and alternative management of grapevine phylloxera in ungrafted vineyards".

Chairman focused on outcomes



Peter Barnes

Peter Barnes has flirted with the wine industry several times during his career and he has been lured by its charm once again.

"It's been very kind to me over the years," said Peter, who has spent 27 years of his life working for Philip Morris International, five as President of Philip Morris Asia Inc based in Hong Kong.

"It's an industry that has always sorted itself out, found a way forward by debate and discussion and got behind a long-term strategy," he said.

Peter first became acquainted with the industry in the 1970s when he took up the roles of finance then marketing director at Lindemans, returning to the company between 1986 and 1990 as managing director.

He was also quite extensively involved in discussions that led to the formation of the Winemakers' Federation of Australia and was a former member of the Australian Wine and Brandy Corporation.

Forming some firm friendships and no doubt gaining respect for his business acumen during those periods in the industry, Peter was approached to take up the role as chairman of the new CRCV, a position well-suited to his background.

"I have a commitment to ensuring that what's promised is delivered," he said. I have been able to show in the past,

to the satisfaction of the industry, that I can work towards making sure that issues are resolved and that we're able to find a consensus so as to deliver promised results," he said.

With the CRCV being a joint venture, he said it is important to be able to ensure all parties are content with the structure, the quality of work being conducted and the outcomes that are delivered.

"I personally feel that the next phase will depend on the Centre delivering those outcomes identified in the bid to set up the new Centre that the industry recognises as worthwhile and important, hence my concentration in the near future will be on delivery of those outcomes," he said.

While acknowledging how vital outcomes are, Peter points out that investment in research is a long-term venture and outcomes were not expected in the first 12 months.

Royal visit to NWGIC

His Royal Highness, the **Duke of Edinburgh** visited the National Wine and Grape Industry Centre in March. During his visit, **Prince Phillip** toured Charles Sturt University's commercial winery and the recently completed sensory laboratory.

Prince Phillip met with several wine science students employed as trainees at the CSU winery. He discussed with them the advantages of being students, yet working full-time on campus in an efficient commercial operation.

"Prince Phillip put the students on the spot", said **Professor Geoff Scollary**, Head of the School of Wine and Food Sciences.

"He asked the students which rootstocks were used in the vineyard to protect the vines against phylloxera. Fortunately, he received a good explanation!"

From the commercial winery, the entourage moved to the new sensory laboratory housed in the NWGIC Wine and Food Industry Training Centre. Prince Phillip was fascinated with the concept of sensory analysis. Not content with observing the class from the front, he insisted in joining the students in the booths to understand the approach to wine evaluation.



Professor Geoff Scollary and His Royal Highness, the Duke of Edinburgh, share a laugh.

Industry to benefit from CRCV focus on environment

David Baker has been appointed as an Environmental Management Systems Officer with the CRCV's ***Viticare Initiative***.

Environmental Management Systems (EMS) help a business to manage its processes that impact upon the environment. They enable businesses, large and small, to conduct their activities and their interactions with the environment in a systematic way, aiming to ensure any adverse effect on the environment is minimal and managed. They also help provide documented evidence to stakeholders and society that these activities are being managed in an environmentally sustainable manner.

David's position has two major components to it. His first task is to identify a variety of EMS models which relate to viticulture and develop an optimal model for the industry which has the flexibility to be suitable for all in the industry from individual growers through to major wineries.

The second part involves identifying areas within the wine and viticulture industries that require best management approaches with respect to the environment, such as pest control and water management. Once these areas have been identified, he will work with other members of the CRCV

team to develop appropriate protocols. David's ongoing role will be to encourage, facilitate and promote the adoption of Environmental Management Systems and best management practices.

"Environmental management systems and best management practices have to be things growers want to adopt," he said. "It is not my role to force people to do something that they don't want to. My approach is to help winemakers and grapegrowers realise that it's good for their business."

David said Australia's viticulture industry was already seen as clean and green and the next step was to ensure that that impression remained and could be demonstrated with evidence of the industry's environmentally sustainable practices.

He believes if Environmental Management Systems are adopted in the viticulture industry through a consultative process then it will help establish Australia's reputation as a world leader in this area.

David, who holds a Bachelor of Economics and Graduate Diploma in Environmental Studies from Adelaide University, is quite accustomed to leadership on environmental management systems.

In his previous position as a Natural Resource Economist with SARDI,

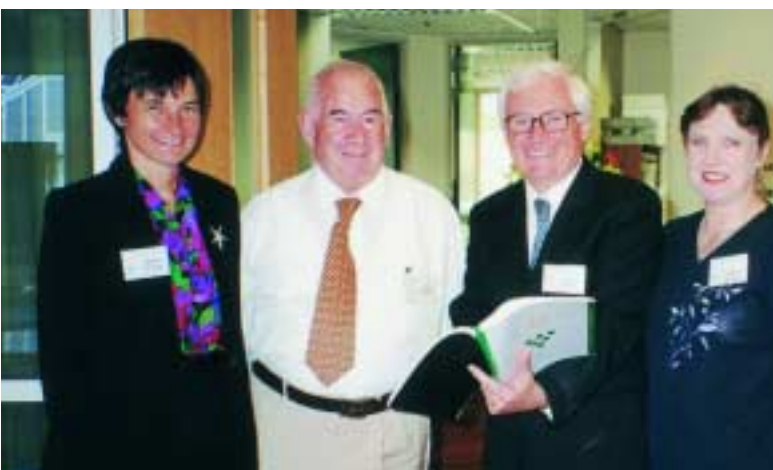


David Baker

he initiated, developed and helped implement an EMS for a whole fishery (The Lakes and Coorong Commercial Fishery in SA), a feat which had not been achieved anywhere else in the world.

His working life has also included six years working as a budget officer with the South Australian Government's Treasury Department.

David Baker can be contacted on (08) 8340 0506, mobile 0409 677 209 or email - dbaker@senet.com.au.



CRCV Chairman Peter Barnes (centre) welcomes the Commonwealth First Year Visit Panel (from left to right) Dr Shirley Lanning, Professor John Coghlan and Ms Heather Carswell.

The Visit informed the Commonwealth on progress toward the development of the new Centre.

Views on Education and training sought by CRCV

The Cooperative Research Centre for Viticulture is calling on anyone with a strong interest in the present and future education and training needs of the wine grape industry to have its say.

The CRCV will be visiting all major winegrape regions around the country over the next few months as part of "New industry-responsive education and training solutions, **Project 4.2**".

Dr Jim Hardie, the CRCV's chief executive officer, said it was important for the industry to be aware that its project funds were to be used for determining the content of education and training courses, industry policies and assuring the quality of delivery, not for running courses. "It's an important distinction," he said.

"This project gives the industry a great deal of influence as it is a mechanism by which industry can send signals to education and training providers and government about its needs and desired outcomes," he said.

Key elements of the project include:

- Reviewing and improving the WINE SECTOR component of the Food Processing Industry Training Package - the industry's nationally accredited qualification and standards which has been in operation for 18 months
- Broadening and extending the education and training offering with particular attention given to advanced certificate and diploma levels -qualifications which generally apply to supervisor and junior manager positions
- Identifying where gaps exist in the provision and standards of current education and training
- Examining the processes by which industry finds out about new technologies and determine how that can be improved

- Developing a national database of Commonwealth accredited education and training providers including details of what they deliver and how
- Producing a portfolio of best practice training methodologies to ensure the most effective and efficient training methods are available for everyone to benefit from.

The CRCV is keen to consult with large and small wineries, contract growers, harvesting companies, training providers and industry associations.

Dates are as follows:

SA

May 17-19, Riverland and Mildura
May 23-24, South-East

QLD

May 18-19

VIC

All major winegrape growing regions from June 5-8

WA

All major winegrape growing regions from June 13-16

NSW

June 20, Griffith
June 22, Mudgee/Orange
June 23, Hunter Valley

TAS

Mid-late July

For further details, contact Project Leader Peter Mansfield on (08) 8373 7090 or mobile 0413 751 218.

If you would like a copy of the CRCV's Annual Report, please phone the office on (08) 8303 9405

Diary Dates for 2000

Events

Phylloxera Identification and Management Workshop

Where: Agriculture Victoria, Rutherglen
Date: 6 June

Further details: Dr Kevin Powell on (02) 6030 4500 or email kevin.powell@nre.vic.gov.au

6th International Symposium on Grapevine Physiology and Biotechnology

Where: Heraklion, Crete, Greece
Date: 11-16 June

CRCV role: Presentation by Dr Chris Davies, CSIRO Plant Industry, on the molecular biology of grape berry development

Earthwatch seminar "Sustainable Practice - Sustainable Future: Water the Ultimate Resource"

Where: Cape Schanck, Mornington Peninsula

Date: 30 June

CRCV role: Presentation by Dr Brian Loveys

Third International Conference on Mycorrhizas

Where: Adelaide Convention Centre
Date: 8-13 July

Further details: Website: www.waite.adelaide.edu.au/soilwater/3icom or contact Dr Sandy Dickson on (08) 8303 6530

ASVO Viticulture Seminar - Managing Bunch Rot

Where: Mildura Arts Centre

Date: Friday, 28 July

Further details: Contact Val Rechner on (08) 8303 6607

International Visits/Visitors

Dr Peter Dry, Adelaide University, will be visiting vineyards, wineries and research institutions in California, Washington State and British Columbia

Date: Between 20 May and 12 June