Berry Sensory Analysis: Manual and Training Package



FINAL REPORT to

GRAPE AND WINE RESEARCH & DEVELOPMENT CORPORATION

Project Number: **DNR 03/05**

Principal Investigator: **Erika Winter**

Research Organisation: **DPI Victoria**

Date: **7.6.04**

Winegrape Berry Sensory Assessment in Australia

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and

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France

[w]
winetitles
2004

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Australian Government

Grape and Wine Research and Development Corporation



Department of Primary Industries

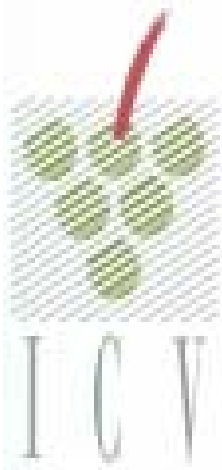


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ABSTRACT
The objective of the project was to initiate change amongst grape growers and winemakers in providing a uniform language on crucial berry attributes as a basis for fruit quality determination and harvest scheduling. The objective was achieved by providing a Berry Sensory Assessment (BSA) Training Manual which is *unifying* (the language and interpretations have been approved by growers, viticulturists of small and large wineries, winemakers, researchers and funding bodies), *clear* (through precise explanations and photos of crucial berry attributes) and *useable* (it has been indispensable for quality discussions and harvest decisions between growers and winemakers) .
The Training Manual " Winegrape Berry Sensory Assessment in Australia", by Erika Winter, John Whiting and Jacques Rousseau, will be available from Winetitles and launched at the AWITC in Mid July 2004.

EXECUTIVE SUMMARY
Wine industry practitioners have in the past regularly tasted wine grape berries prior to harvest. However, when growers were producing grapes for various companies or for different winestyles, the descriptions on what berry characteristics were required became somewhat confusing and unprecise (apart from sugar, acid, pH and colour measurements).

The method of Berry Sensory Assessment was developed by the Institut Cooperatif du Vin (ICV) in Monpellier, France. It is a formalised process of examining winegrape berry criteria which have been proven useful for determining the state of crop maturity and attributes required for certain wine quality outcomes for vineyards in southern France.

This method was piloted in 2003 in three Australian States by Erika Winter of the Department of Primary Industries (DPI), Victoria, and the method's main founder (as a visiting guest), Jacques Rousseau from ICV Montpellier. The pilot project was funded by the Cooperative Research Centre for Viticulture (CRCV), the Grape and Wine Research and Development Corporation (GWRDC), DPI, with wine company and grower contributions.

In the current project, the method was adapted to Australian conditions whereby GWRDC and DPI provided partial salary support for Erika Winter (20%) and John Whiting (10%). Operating for the domestic travel of Jacques Rousseau, Erika Winter and John Whiting and the consultancy fee of Jacques Rousseau was financed through income from six workshops with 177 participants. International travel of Jacques Rousseau was financed through the ICV.

The modified scoresheets were discussed with an Industry Reference Group (IRG) comprising representatives of five large wine companies, research institutions, consultants, winemakers and growers. These scoresheets were piloted in six workshops in three climatic zones in March 2004, The feedback obtained from participants and from selected members of the IRG led to a series of changes and improvements to the manual.

The Training Manual was written with close cooperation between the three authors. Drafts were discussed individually with some members of the IRG and in a meeting with the IRG and funding bodies in Adelaide on 18 March 2004.
Out of those discussions a number of changes were suggested:
-the title should not include the word "Analysis", as per the original Project Application, but rather "Assessment",
- explanations about the origin of berry traits should be confined to one page per trait,
- a basic language should be used,
- the method to explore berry characteristics should be explained thoroughly, stepwise and be supported by photographs,
- particular Australian berry traits should be included in the field berry characteristics chart,
- berry faults and maturity indicators can be mentioned but explicit correlations between Australian berry traits and wine quality would be withdrawn due to lack of regional research,
- the BSA book should be a self training manual, which made the production of a separate training package (as in the original Project Application) obsolete.

A cooperative agreement was prepared between ICV and DPI for rights to publish the material, and a publisher's agreement is in place with Winetitles for the production of the BSA Training Manual.

The Manual comprises a number of sections relating to:

- An explanation of what to look for in producing mature and good quality grapes suitable for winery specifications and some hints on how to grow grapes to improve certain berry characteristics.
- A section on palate training for the discrimination of sweet and acidic fluids.
- A method to prepare grapes and tasting sessions for BSA self-training.
- A guide for undertaking BSA self-training in examining fresh winegrape berries according to 20 standardised questions judging the stalks, skins, pulp and seeds separately using the hands, eyes, ears and mouth with scoresheets using a 1, 2, 3 or 4 scale.
- A field assessment method comprising a scoresheet with four assessment criteria for faster analysis by a trained person.
- A section with some hints on how the field data can be used to compare sites, years and growing practices.
- A brief history of the development of the intial method in southern France and the work of the ICV to correlate their berry characteristics with their wine characteristics.
- Testimonials from people who have successfully used the method.
- Some suggestions for further reading.

In the book it is stressed that:

- The method of BSA should complement and cannot take the place of the more objective measures of grape quality assessment, ie. berry sugar concentration, acidity, pH, and (if required) colour assessment, or other laboratory measurements indicative of berry maturity and quality.
- Berry Sensory Assessment helps determine the suitability of grapes for specific winestyles, which in turn determines production methods and harvest timing decisions.
- The method is useful for viticulturists, winemakers and researchers alike.
  - ⇒ When using this method frequently in the field, viticulturists will develop a greater understanding of their grapes and an ability to communicate with their staff and the winemakers using a common language.
  - ⇒ Winemakers will be able to use BSA to document berry attributes with viticulturists and winery staff.
  - ⇒ Researchers can use BSA to complement grape physiological measurements in their research projects and may obtain early indications of changed berry characteristics as a consequence of different viticultural practices.
- The method of BSA is always semi-quantitative, since the ability of people to sense berry characteristics is variable. However, if the same person makes assessments over several years comparing vintages, sites and varieties, BSA can detect variations in berry development and the influence of management practice on berry sensory attributes.
- Berry Sensory Analysis is not meant to be the sole basis of grape payment.

Testimonials have shown that the BSA assessments in the field were useful in detecting sugar:acid ratio development, the state of skin disintegration, the presence of negative traits (eg. early detection of mould), as well as the phenolic maturity of skins and seeds which can only be measured with laboratory procedures. Furthermore, drought stress was seen to alter pulp consistency and delay seed ripening. (Ormond, pers. comm).

Further research is required to determine the effect of growing conditions, eg. water saving irrigation methods or bunch exposure, on BSA outcomes in order to manipulate ripening patterns and quality traits. It is recommended that the relationship between vineyard variability (measured by yield GPS based mapping) and optimum sample size for field BSA be determined. Furthermore, for some selected Australian winestyles, correlation studies should be undertaken between BSA berry characteristics and wine characteristics as has been done in ICV.

BACKGROUND

A method for berry sensory assessment was presented at the Office International du Vin Meeting in Adelaide in 2001 by Jacques Rousseau of the Institut Cooperatif du Vin in Montpellier, France. Erika Winter established contact with the ICV and received DPI funds (Enhancing Science Networks) to visit Jacques Rousseau in Montpellier in order to establish a cooperative relationship. In 2003, Jacques Rousseau was invited to present the ICV method under Australian conditions at 11 workshops spread out over three States. In the 189 feedback sheets collected from the workshops, 79% of workshop participants supported the development of an Australian score sytem (see Australian Viticulture Vol 7 No.3 pp 17, 19-22, 24-25 2003, and internal report on BSA Pilot Project to GWRDC/DPI).

The main difference between the ICV scoresheet and what was considered important for Australian conditions, was the fact that in Australia there were a greater number of different winestyles that require different quality criteria compared to southern France. Also Australia has traits such as gelatinous pulps, berry shrivel and salty skins that are not encountered in southern France and these needed to be included. It was also thought desirable to produce more self explanatory guidelines for the Australian industry.These changes were made in response to industry needs and with full agreement of the ICV and the funding bodies.

PROJECT AIMS AND PERFORMANCE TARGETS

The aim of the project was to write a self training Manual for growers, winemakers, consultants, students and researchers in order to improve the field assessment of grape maturity and quality, and to foster improved mutual understanding of berry quality attributes across the wine industry.

Predicted outputs and performance targets were met except for the second pilot phase which covered three States only (Jacques Rousseau was only available for 10 days) and a specific training package which has now been incorporated within the book.

Outputs	**Performance Targets**
1. Produce a draft manual and training package	Describe the ICV procedure in Australian terms and the methods by which it will be taught by November 2003 and circulate for comments to IRG
2. IRG meeting report December 2003	Get consensus on traits/criteria for assessing berry quality. Revise draft manual by Feb 04
3. Pilot the draft manual and training package	Proof of the suitability, evaluate need for last changes with growers and winemakers in 4 States during vintage in March/April 04.
4. Second draft, have IRG meeting	Include revisions, colour plates, recirculate to IRG and have it back by end May 04, meeting for final approval in May**.**
5. Produce BSA book and training package	Deliver final draft to printers by mid June, finished product by July 04, deliver training package by end of July 04
6. Final report to IRG and funding body	By end of June 04 report on: • Adoption of the product by industry trainers. • Recommendations for BSA-Wine Quality and BSA-Growing Practices research. Evaluation of commercial potential of the package

METHOD

The method used to create a successful link between industry needs and new methodologies was to pilot the method with those who will use it, distribute and assess questionnaires, obtain testimonials, and adapt and evolve a training manual in a stepwise process.

In piloting the method and writing the Manual, relationships to industry priorities were considered:

- Reinforcing innovation culture – offering new and proven methods to assess berry maturity only two years after the method has been started to be widely used in southern France.
- Foster wine industry specific R&D skills and internationally competitive institutional capability – by being the first in the world to provide growers and winemakers with a BSA Manual
- Encouraging increasing investment from individual producers – through the financial contribution of growers and wineries to the pilot studies and the in kind commitment of a large industry reference group
- Developing and packaging R&D outcomes - by producing a manual tailor made for Australian conditions
- Disseminating R&D outcomes through demonstrating activities – by training trainers and growers in 18 pilot courses.
- Facilitating regional networks – by covering many regions with pilot workshops: Orange, Canberra, Wagga Wagga, Mildura, Nagambie, Melbourne, Adelaide, McLaren Vale, Barossa Valley, Bunbury, Capel Vale, Margaret River.
- Communicating in user-friendly formats – producing a self explanatory spiral bound handbook
- Stocktaking and articulating changes in best practice – collecting testimonials, issuing press releases and reporting to industry.

The book was discussed with the IRG and stakeholders, as well as future users who all have put in considerable time as an in-kind contribution to make this book a valuable tool across the industry. All contributors have been acknowledged in the Acknowledgment section of the book.
The project's success also relied on the in-kind contribution of Winetitles for layout and printing and the financial support from many individuals and organisations which made it a non-expensive project for either party.

RESULTS/DISCUSSION

The result is the book "Winegrape Berry Sensory Assessment in Australia". The success of the project will be partly assessed by the sales of the publication by Winetitles over several seasons. The extent of adoption of the method can only be assessed by surveying growers in a few years time.

OUTCOME/CONCLUSION

- **Economic:** This project will provide information on determining optimum ripening time. One major benefit will be that more consistent grape and wine quality can be achieved. This may provide improved cash flow to producers and allow better business management decisions to be made. Wineries will have more consistent fruit quality and less wastage of fruit and be able to reliably supply the wine styles/brands they are developing, particularly for the export market.
- **Environmental:** The production of better quality grapes often involves the use of more sustainable production techniques. For example, if the berry assessment analysis shows low quality, then management techniques would need to be implemented to improve quality. The Partial Rootzone Drying (PRD) technique for example may enhance quality in vigorous vineyards and can provide substantial water savings. Indirectly there will be environmental benefits from the project.
- **Social:** Wine grape growers will be empowered to assist wine makers determine the optimum stage of maturity for quality wine grape production. This should improve relations between growers and wineries and assist to develop long term relationships, which are essential for maintaining a viable industry in a rural area. On a macro level, if vineyards are meeting winery quality specifications on a more consistent basis then rural communities should be more sustainable.

RECOMMENDATIONS
It is recommended that further research will be encouraged to link grape-growing practices to berry characteristics, and berry characteristics to important traits in resulting wine styles.

It is also recommended that industries, through its funding bodies, review the manual in three to five year's time and, if appropriate, publish an improved version.

COMMUNICATION
The outcomes of the first pilot phase were published in Australian Viticulture Vol 7 No.3, pp 17, 19-22, 24-25, 2003.
The book will be launched and advertised by Winetitles at the Australian Wine Industry Technical Conference in July 2004 and thereafter.
Two BSA workshops will be held during the AWITC in July 04 by Erika Winter and a Geelong Winemaker (in one of which 30 places were sold out in March and for the other timeslot 26 places out of 30 were sold in May).
EW has been invited to talk on "BSA potential and limitations" at the McLaren Vale Grape, Wine & Tourism Association Quality Seminar in June 04.

INTELLECTUAL PROPERTY
ICV has, per contract of March 2004, allowed DPI to use and modify the ICV BSA method sourced from documents already published by ICV. ICV has been identified in the book as the original source of the BSA principles. DPI has paid Jacques Rousseau daily consultancy fees for his time spent during the pilot phases and during the composition of the manuscript.

The publishers contract as been approved by the legal department of DPI. DPI has obtained the rights to publish the book as consented to by all authors and the royalties from the sale of the finished product will be split between GWRDC and DPI on an equity basis (60/40).

REFERENCES
See "Further Reading" in the BSA Book

STAFF
Dr. Erika Winter (20% of FTE) and John Whiting (10% of FTE), DPI Victoria

APPENDIX:
BUDGET RECONCILIATION
Income and expenses Pilots 2004
Final Budget

GRAPE & WINE RESEARCH & DEVELOPMENT CORPORATION

Statement of Receipts and Expenditure - **FORM B** For the year ending 30 June 2004

Trust Fund :	RESEARCH TRUST FUND	FUNDING	$
		Salaries EW	17191
Project No :	DNR 03/05	Salaries JW	7892
Grantee :	Erika Winter		
Title of Project :	Berry Sensory Analysis		
	Manual and Training Package		
		Capital (- none)	
		Total Funding	25083

	EXPENDITURE									
	Salaries		Travel		Operating		Capital		Total	
	$	¢	$	¢	$	¢	$	¢	$	¢
A Uncommitted (c/f 1 July)										
B Outstanding Commitments (c/f 1 July)										
C Refunds of funding										
D Cash Received From Trust Fund										
E Approved transfers (from Form C)										
F Cash available (A+B-C+D±E)										
G Expenditure	17191 7892									
H Outstanding Commitments (30 June)										
I Total funds Committed (G-H)										
J Uncommitted (30 June) (F-I)										
K Other income (Paid to Trust Funds)										

Note : *Row B should be the same as Row H from the previous year and Row A the same as Row J from the previous year.*

I hereby certify that this statement of expenditure is correct.

……. ……. …….

Signature Printed Name Date

Income and Expenses for BSA 04 Pilots

Date	Activity	$100 pp Income	Fee JR	Flights Car Petrol	Accom BF	Lunch	Dinner	Cost
13.3.	JR Arrival from OS		30.7 $		112.00		51.16	**142.70**
14.3.	EW+JW Arrival in Syd			244.00			90.00	**334.00**
	Car SYD-Orange (4h)			100.00		22.77		**122.77**
	ON Orange				634.94		138.00	**772.94**
15.3.	WS Orange Uni	2400	1535			20.50		**1555.50**
	ON Orange			100.00	267.00	13.08	135.20	**515.28**
16.3.	To Canberra (4h)			53.58	27.00	18.90		**99.48**
16.3.	WS Canberra (pm)	2900	1535					**1535.00**
	ON Kythera			23.46	237.80		138.50	**399.76**
17.3.	To Wagga (4h)			100.00	30.00	8.80		**138.80**
	WS Wagga	3200	1535					**1535.00**
	ON Wagga			272.91	310.50	24.90	115.00	**723.31**
18.3.	Wagga MEL			417.00				**417.00**
	Seminar Adelaide			624.00				**624.00**
	ON McLarenV				262.60		116.20	**378.80**
19.3.	McLaren Vale	3200	1535			31.30		**1566.30**
	ON MLV				252.10	11.00		**263.10**
20.3.	ADE vineyards			281.35				**281.35**
	ON Noralunga Motel				263.25		$	**263.25**
21.3.	Travel ADE/Perth			555.00		23.85		**578.85**
	Travel to Cowaramup					23.24		**23.24**
	ON Kurri Kurri Downs			41.15 #			57.47	**98.62**
22.3.	WS Bunbury pm	3300	1535			10.30		**1545.30**
	ON Bunbury				201.00		80.00	**281.00**
23.3.	WS in Bunbury am	3300	1535	51.19				**1586.19**
	to Perth			247.05				**247.05**
	ON Fremantle			*		$	117.80	**117.80**
24.3.	EW JW back to MEL		51.16	532.00		$		**583.16**
	JR fee for editing		1535				97	**1632.00**
		18300	10796					**18361.55**

Sponsored by J&G Byrne $ from RtP

* Sponsored by ARM

Final Budget –changes in bold (GST Exclusive)	**2003/2004**		
		Agency Contribution	
	GWRDC	***DPI VIC, ICV Winetitles***	***WS income and sponsorships***
Salaries +overheads+site support			
Erika Winter 0.20 FTE	17191	9665	
John Whiting 0.10 FTE	7892	5592	
Travel, Operating			**18361.55**
Printing costs (Winetitles)		20000	
International Flight costs JR		**3000**	
TOTAL	25083	38257	18361.55
ADD GST (10% of the Total)	2508.3		
TOTAL FUNDS REQUESTED FROM GWRDC	27591.3		
TOTAL PROJECT COST	**84209.85**		