Participation at the IX International Symposium on Grapevine Physiology and Biotechnology and viticultural academic visits to Chile and Argentina





FINAL REPORT to

GRAPE AND WINE RESEARCH & DEVELOPMENT CORPORATION

Project Number: **GWT1212**

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1. Executive summary

The main goal of this travel was to attend the IX International Symposium on Grapevine Physiology and Biotechnology and viticultural academic visits to Chile and Argentina. During the symposium I gave an oral presentation entitled "Elevated temperature and water deficit accelerated berry mesocarp cell death and shrivelling, and decoupled sensory traits in Shiraz berries" (Bonada et al. 2013c). This work resumes part of my PhD project at the University of Adelaide recently published elsewhere (Bonada et al. 2013d, Bonada et al. 2013a). Furthermore, participation at the Symposium gave me the opportunity to establish networks for future collaboration with international scientist working in a similar research area.

One technical visit and one seminar were carried out during the technical visit to the National Institute of Agricultural Technology of Argentina (INTA) in Mendoza. The visit to Dr. Perez Peña and his research team at the INTA gave me the opportunity to further discuss about my project and strengthen collaboration between our research groups.

2. Background

The Symposium on Grapevine Physiology and Biotechnology is an internationally renowned meeting bringing together vine physiology researchers from many fields and countries. Its main goal is to show the latest advances in research across all the disciplines dealing with viticulture; from the applied physiology to the molecular biology, it focus on new techniques aiming to increase the present understanding of vine physiology. This was a unique opportunity for me to present my research to an international scientist community, to interact with renowned researchers and to establish contacts that will hopefully lead to collaboration and/or further research.

During my stay in Mendoza, I visited the National Institute of Agricultural Technology of Argentina (INTA). INTA is a federal agency in charge of the generation, adaptation and diffusion of technologies, knowledge and learning procedures for the agriculture, forest and agro-industrial activities. Focus on Viticulture and Enology, Mendoza's research station has more than 60 ha of vineyards and an experimental winery where researchers and students from different educative centres perform their research. I had the opportunity there to visit Dr. Perez Peña and his research team to further discus about my PhD research-project and to visit their lab facilities and field trials.

3. Project objectives and performance targets

3.1 Objectives

The objectives of this travel were:

- To present results of my PhD research project via oral presentation at the IX International Symposium on Grapevine Physiology and Biotechnology (Grapevine Chile 2013)
- To communicate results from my research project and obtain feedback from colleagues. Discuss about local experiences in Chile and Argentina in similar research areas
- To meet distinguished researchers and academics from different Universities and research institutions
- To establish networks/collaborations from the international scientific community at the symposium and research institution in Chile and Argentina

3.2 Outputs and performance targets

Output	Performance Targets	Date
1.Oral presentation and paper publication	Related papers were published elsewhere (Bonada et al. 2013d, Bonada et al. 2013a, b)	Completed May 2013
2. Grape grower & winemaker article	From the academic visits. Alternative approaches to investigate climate change effects on vine physiology	Submitted July 2013
3. Seminar at Waite Campus, School of A,F&W	On symposium attendance and academic visits	Scheduled for September 2013 (Yearly seminars, School of A, F & W)

4. International Symposium on Grapevine Physiology and Biotechnology

The symposium was hosted in La Serena city from the 21th until the 26th of April 2013. La Serena is the capital of the Coquimbo region one of the most important viticulture regions of Chile. Famous for the traditional cultivation of aromatic varieties for the production of Pisco (aromatic spirit), this region is also reputed for its high standard table grape production and its modern wine industry. More than 300 international grapevine physiology academics, researchers and professionals were present. The symposium covered ten grapevine research key areas of physiology, molecular, genetic and biotechnology that brought together approximately 290 presentations (oral and poster) by scientists from more than 30 different countries.

The ten key areas of research that were presented at the symposium were;

- Plant growth and development
- Flowering and fruit setting
- Fruit development and composition
- Plant management and nutrition
- Grapevine water relations
- Grapevine post-harvest physiology and biotechnology
- Environment interactions and grapevine responses to climate changes
- Plant -pathogen interactions and disease resistance
- New advances in grapevine genomics
- New advances in grapevine physiology including stress physiology

4.1 Summary of selected presentations

The project of my PhD aligns directly to one of the strategic RD&E theme established in the GWRDC Plan 2012-2017. This project belongs to Program 1, Environment and Sustainability, and address the impact of climate variability, as driving by elevated temperature and water scarcity, on plant physiology and grape berry and wine sensory traits. Some presentations identified at the symposium relevant for the core component of my project and to the Australian RD&E plan, are cited below:

- "Grape berry anthocyanin biosynthesis, an environmentally modulated process" by J. Martínez-Lüscher, G. Hilbert, M. Sanchez-Diaz, S. Delrot, J. Aguirreolea, I. Pascual, E. Gomès.
- "Direct impact of high temperature on Cabernet Sauvignon berries development and metabolism" by D. Lecourieux, J. Pillet, F. Lecourieux, C. Kappel, S. Claverol, P. Pieri, A. Egert, J. Charon, G. Hilbert, C. Renaud, M. Bonneu, F. Keller, E. Gomès, S. Delrot.
- "Adaptation of the Australian Wine Industry to Climate Change Phenological Trends and Managemen" by E.W.R Barlow, P. Whetton, L. Webb.
- "The use of kaolinite-based sunscreen vs. shading nets on Cabernet Sauvignon: Effects on plant physiology and fruit condition" by C. Acevedo-Opazo, G.A. Lobos, S. Romero, H.Valdés-Gómez, V. F. Lauri.
- "Warming effects on organic acid metabolism in berries of field-grown vines" by C. Sweetman, V. O. Sadras, K. L. Soole, C. M. Ford.

- "Heat waves: effects on budbreak date, shoot growth and xylem anatomy of *Vitis vinifera* cv. Malbec" by E. Galat Giorgi, J. Perez Peña, M. Keller, F. Roig.
- "Carbon balance in grapevine (*Vitis vinifera* L. cv. Tempranillo) grown under simulated climate change scenarios (elevated CO2, elevated temperature and drought) in temperature gradient greenhouses" by C. Salazar-Parra, I. Aranjuelo, J. Aguirreolea, M. Sánchez-Díaz, J.J. Irigoyen, J.L. Araus, F. Morales.
- "High temperature acclimation of berry ripening in Muscat Hamburg grapevine cultivar" by P. Carbonell-Bejerano, E. Santa María, R. Torres-Perez, C. Royo, D. Lijavetzky, G. Bravo, J. Aguirreolea, M. Sánchez-Díaz, M. C. Antolín, J. M. Martínez-Zapater.
- "High temperatures affect gas exchange, growth and ripening processes of Semillon vines" by D.H. Greer, M.M. Weedon.

5. Visit to the INTA's Research Station in Mendoza, Argentina.

Two visits were done to INTA. On the 1st of May 2013 I meet Dr. Perez Peña and his research team. They are seeking the effects of elevated temperature on grapevine physiology and berry traits from grapes growing in enclosed chambers. I visited their field trials and research facilities, and further discussed our findings. During the second visit to INTA on the 7st of May 2013 I gave a seminar presentation to local researchers and students covering different aspects of my research project in Australia.

6. Conclusion

Attendance to the "Grapevine Chile 2013" symposium provided me an ideal opportunity to make and renew contacts that will facilitate future collaboration in research. It also gave me the chance to show my findings to renewed researchers and keep adding knowledge in the field. My visit to the INTA allowed me to further discuss about my research, exchange experiences with colleagues and explore other research areas where potential jobs could arise.

7. Acknowledgments

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References

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Bonada, M., Sadras, V.O., and Fuentes, S., "Effects of elevated temperature on mesocarp cell death and shrivelling in Shiraz and Chardonnay berries", in Australian & New Zealand Grapegrower and Winemaker (Winetitles PTS. LTD., Adelaide, SA, 2013b), pp. 35-36.

Bonada, M., Sadras, V.O., Moran, A.M., and Fuentes, S. Elevated temperature and water deficit accelerated berry mesocarp cell death and shrivelling, and decoupled sensory traits in Shiraz berries. Proceedings of the Conference abstracts from the IX International Symposium on Grapevine Physiology and Biotechnology, La Serena, Chile. p. 54.

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