Australian Government
Grape and Wine Research and Development Corporation

Comparison of bitter rot bunch rot fungi in the USA and Australia and associated study tour



Greeneria uvicola infection of *M. rotundifolia* (left) and *V. vinifera* (right)

FINAL REPORT to
GRAPE AND WINE RESEARCH & DEVELOPMENT CORPORATION

Project Number: **GWT 1010**

Principal Investigator: **Prof Christopher C Steel**

Research Organisation: **National Wine and Grape Industry Centre**

Date: **29th April 2013**

Abstract

This travel grant funded a period of research on bunch rots at North Carolina State University and an associated study of viticulture practices in North Carolina. The project complement prior GWRDC-funded research conducted at the NWGIC as part of the Winegrowing Futures Program. Nine representative Australian isolates of the bitter rot fungus, (*Greeneria uvicola)* were compared with 12 isolates from the USA for their pathogenicity on grapes. This resulted in one peer-reviewed publication in a scientific journal and several wine industry presentations. Overall the project has led to a better understanding of the biology of bitter rot of grapes and has provided insights into the origin of the disease in Australia. Knowledge gained of viticulture practices in the south eastern states of the USA has been incorporated into education packages delivered at Charles Sturt University.

PROJECT OVERVIEW

Name and Contact Details of Travel Grant Recipient

Name	Prof C C Steel
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Travel itinerary

20th August 2011 depart Australia

27th August – 16th September - North Carolina State University, Raleigh, NC, USA. Working with Professor Turner Sutton on the characterisation, epidemiology and management of bunch rot pathogens

17th September 2011 depart USA

Executive Summary

Objectives and Overview

The objectives of this travel grant were as follows.

- Conduct experiments to compare the properties of bitter rot fungal isolates from Australia and the United States of America

- Develop a peer-reviewed publication in a high ranking international journal dealing with the discipline of plant diseases, jointly authored by grapevine researchers from Australia and the USA

The project was conducted in collaboration with Prof Turner Sutton at the Department of Plant Pathology at North Carolina State University (NCSU) and arose from the GWRDC Winegrowing Futures Program NWG 06/01-2) on bunch rot of grapes. In September 2009 the chief investigator initiated a collaborative project with Prof Turner Sutton from North Carolina State University. This collaboration arose as a consequence of Turner Sutton's visit to Australia in September 2009 as part of a GWRDC travel grant (GWT 09/01).

Outputs

Fungal isolates of the bitter rot pathogen (*Greeneria uvicola*) from grapes were collected from vineyards in the US and Australia. Australian isolates were sent to NCSU as part of this collaboration and compared with isolates collected from American grapevines. Experiments were conducted on inoculation of American grapevines (*Muscadinia rotundifolia*) and the pathogenicity of isolates originating from *M. rotundifolia* and *V. vinifera* were compared. This project supplemented similar studies conducted concurrently on *V. vinifera* at Charles Sturt University in Wagga Wagga. At the conclusion of the project the work was accepted for publication in an international peer-reviewed journal. The details of the publication are as follows.

Samuelian, S. K., Greer, L. A., Cowan, K., Priest, M., Sutton, T. B., Savocchia, S. and Steel, C. C. (2013). Phylogenetic relationships, pathogenicity and fungicide sensitivity of *Greeneria uvicola* isolates from *Vitis vinifera* and *Muscadinia rotundifolia* grapevines. Plant Pathology, DOI: 10.1111/j.1365-3059.2012.02689.x (In Press).

While in North Carolina I visited several vineyards and wineries and improved my knowledge of American grape and wine production, particular with respect to the

culture of the American grapevine, *Muscadinia rotundifolia*. Three different Muscadine cultivars have now been acquired and are currently being grown at Charles Sturt University and will be used in future teaching and research programs.

Also while in North Carolina I attended a grape grower day held by the extension services of NCSU at their Castle Hayne Research station, near Wilmington. I met with Bill Cline, Hannah Barrack, Sara Spayd and other research and extension viticulturists as well as grape growers. These contacts will be useful in the future for further work. While at Castle Hayne I collected grape samples that were then used in subsequent laboratory experiments in the laboratory in Raleigh.

Conclusions

Overall this travel grant greatly enhanced the applicant's knowledge of viticulture practices in southern regions of the United States of America. This knowledge has been incorporated into education packages delivered as part of the viticulture and wine science teaching programs at Charles Sturt University. The research findings have increased our understanding of bitter rot of grapes, particularly in relation to strain characterisation, pathogenicity and the origins of bitter rot in Australia. Support from the GWRDC is gratefully acknowledged.