

Viticulture

– Winter 2011

INTRODUCTION

NSW DPI Viticulture Research is delivered through the National Wine and Grape Industry Centre (NWGIC) at Wagga Wagga, an alliance between NSW DPI, Charles Sturt University (CSU) and the NSW Wine Industry Association.

Research and extension activities support the development of consumer-preferred, Australian regional wine styles from ecologically-adapted germplasm, managed for sustainability of products and resources that will provide the core elements of increased demand and added value of Australian wine.

Specifically, the Centre has built strong research foci in grapevine pathology, grapevine physiology, environmentally sustainable viticulture, consumer-preference research, wine science and plant imaging technology. Excellent working relationships between research staff and extension, education and training staff ensure that research outcomes are effectively disseminated to industry directly and also through tertiary education and vocational training.

RESEARCH CAPABILITIES

- » 60 staff (including post-graduate students) with leading researchers in grapevine pathology, grapevine physiology, environmentally sustainable viticulture, consumer-preference, wine science and extension.
- » Excellent laboratory facilities for applied research, include: set of high quality, high light intensity growth cabinets, an experimental winery and a rhizotron for studying root growth and development in situ.
- » Good relationships with wine companies which allows researchers access to commercial vineyards in a complement to on-site facilities.
- » A strong focus on the adoption of research through links between researchers, extension and industry.

CONTACT US

For more information on our full portfolio please contact Gregory Dunn or gregory.dunn@industry.nsw.gov.au.

PROJECT UPDATES

BACTERIAL INFLORESCENCE ROT (BIR) OF GRAPEVINE (2007–2011)

INTRODUCTION: Bacterial inflorescence (young bunch) rot (BIR) has been a major problem in a NSW frost prone cool climate viticultural region, resulting in grape yield reductions of up to 60%. The region is prone to spring frosts so water sprinklers are commonly used to prevent frost damage, resulting in humid conditions in canopies.

FINDINGS: BIR is caused by *Pseudomonas syringae* pv. *syringae* (Pss) bacteria that move through water films on leaves. They cluster near leaf hairs and stomata (pores in leaves) and enter sub-stomatal cavities, move along veins into leaf stems, shoots and wood. Our research also showed that Pss may increase *Botrytis cinerea* (grey mould) infections, another serious grapevine disease.



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PARTNERS: Grape and Wine Research and Development Corporation (GWRDC), CSU (Wagga Wagga), NSW Wine Industry Association

YOUNG VINE DECLINE IN THE RIVERINA (07-11)

INTRODUCTION: Young vine decline (YVD) has been both stressful and costly for many growers who have planted or replanted wine grape vineyards during the past decade. Affected newly planted vines can die soon after planting. YVD affected vines that do survive fail to thrive and produce low yields for many years.

FINDINGS: YVD is caused by a fungal disease complex originating in mother vines and nurseries, especially when hot water treatment is not used. We have isolated pathogenic fungi and Petri disease fungi. There are no curative control strategies available but compost application and avoiding nematode damage is beneficial.

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IMPLICATIONS OF VINEYARD MANAGEMENT ON CARBOHYDRATE RESERVES AND PRODUCTIVITY IN SHIRAZ (2006–2010)

INTRODUCTION: Grapevine carbohydrate reserves are crucial for new shoot growth in early spring and also affect the development of grape bunches. This study provided a better understanding of the factors that determine grapevine yield in the following season, and showed that reserve levels could be managed for specific effects on yield, fruit and wine composition.

FINDINGS: Partial crop removal generally elevated carbohydrate reserves, whereas hedging after harvest lowered reserves. The yields were reduced by mid-season water deficit; while canopy size was decreased by late-season water deficit and post-harvest hedging. The fruit and wine composition was enhanced by partial crop removal and reduced when a water deficit was applied after harvest.



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CONSUMER PREFERRED WINE STYLES (2006-10)

INTRODUCTION: Researchers are helping grape growers and winemakers deliver what consumers want in the glass. From crisp acidity to floral notes, fit-for-purpose grapes lead to efficiencies that maximise profits throughout the production chain. This project has focused on Australia's iconic Hunter Valley Semillon (HVS) wine.

FINDINGS: Four distinct HVS wine styles have been identified and consumer demand for each measured. The luscious early drinking style was the most preferred with important niche groups liking the quintessential aged style with zesty citrus and complex honey, toast and orange marmalade characters. The results can be used to balance a 'portfolio' of wine to maximise profitability.



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SPRING VINE HEALTH FIELD DAYS (2010)

INTRODUCTION: The 2010 Spring Vine Health Field Days was a nationally coordinated extension program involving over 300 winegrowing businesses from 11 regions across the country. The Field Day proved pivotal in providing growers with a pre-season practical updates as 2010 proved to be a challenging year for grapevine health and disease management due to prolonged rains, associated flooding and fungicide shortages.

FINDINGS: Pre-field day reviews showed grower aspirations to improve in all areas of vine health. Evaluations showed changed management practices and an improvement in knowledge and capability in the topics presented. The Spring Vine Health Field Day program highlights excellent coordination and collaboration between NSW DPI researchers and extension officers.



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PARTNERS: GWRDC, CSU, NSW Wine Industry Association

GRAPEVINE LEAVES RESPOND TO CLIMATE CHANGE (2007–2010)

INTRODUCTION: Leaves are covered in stomata which are the gateway for carbon dioxide entry into the plant. Carbon dioxide is then converted to sugars using sunlight and these are used for plant growth. The amount of carbon dioxide that can enter into the plant is dependent on stomatal pore size as well as the number of stomata on the leaf. We were interested to see if stomatal density of grapevine leaves is affected by carbon dioxide concentrations and root temperature. Stomata also control water loss from plants.

FINDINGS: Stomatal density of grapevine leaves decreased when plants were grown in high carbon dioxide but increased when they were grown in warm soils. We believe this may be linked to the carbohydrate reserve status of the vines. Vines that are low in carbohydrate reserves may increase stomatal density so that carbon dioxide can be captured at a faster rate. These results have important implications for plant water use efficiency.

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PIS&R PROJECT UPDATES