

New Zealand Winegrowers Research Projects 2012

Project	Research Organisation and Researcher	Project code	Total Funding (NZW and Other cash and in-kind)	Length of project	Project Objectives	Project Outcomes
Designer Vines						
Identification of natural genetic variation in grapevine contributing to pathogen resistance	Lincoln University (C Winefield)	09-104	\$364,461	Three years (Aug 09-Aug 12)	To assess the level of genetic variation in key genes involved with resistance to necrotrophic pathogens within individual vines in NZ vineyards (such as lipoxygenase, hydroperoxide lyase or allene oxide synthase) and to determine whether identified genetic changes in these genes is capable of conferring increased resistance to fungal pathogens in a model system.	The major outcome of this project is the characterisation of the level of between-vine genetic variation that exists in commercial plantings in New Zealand. The focus of the project will be determination of levels of genetic variation that exist in a number of key enzymes of the Lipoxygenase/oxylin pathway that are responsible for the formation of key aroma compounds and key pathogen responsive phytohormone Jasmonic acid.
Unlocking New Zealand Pinot noir aroma through aroma reconstitution approach	Auckland UniServices Ltd (T Rutan)	10-103	\$171,602	Two years (Jul 10-Jul 12)	Reconstituting the Pinot Noir wine matrix and identification of Pinot Noir key volatiles using omission and/or addition tests	This study will enable viticultural research to be targeted more appropriately by simplifying the assessment of aroma quality and contribute to creating future tools to be used for the assessment of viticultural management of PN wine aroma.
Potassium nutrition of grapevines	Plant and Food Research (M Trought)	11-108	\$38,000	One year (Sep 11-Aug 12)	Review and identify the issues of potassium nutrition in New Zealand vineyards	Provide direction to industry on the importance and timing of potassium fertilization. In particular: the influence of vine potassium nutrition on juice potassium concentrations, pH and malic and tartaric acid concentrations, colour development and stability in red wines and flavour and aroma compounds in aromatic wines

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Early defoliation: carryover and hand versus mechanical	Eastern Institute of Technology (EIT) (M Krasnow)	11-109	\$150,814	One year (Nov 11-Dec 12)	To analyse the carry-over effects of preflowering defoliation on fruitfulness in the subsequent season and to determine if mechanical defoliation prior to flowering can be as effective as hand defoliation for the reduction of bunch compactness and/or rot incidence/severity.	Bunch number per vine, berry number per bunch, bunch weight, and harvest yield of vines defoliated prior to flowering in the 2010-11 season compared to the control (prebunch closure defoliation) will be looked at to investigate the effect of preflowering defoliation on yield parameters the year after defoliation. The analysis of the carry over effect on fruitfulness will be carried out in Chardonnay, Pinot gris, Sauvignon blanc, Merlot, Cabernet Sauvignon, and Syrah—all varieties of economic importance to Hawke's Bay.
Sauvignon blanc						
The effect of post harvest defoliation on carbon and nitrogen balance of high yielding Sauvignon Blanc vines	Plant and Food (M Greven)	08-337	\$267,800	Three years (Sept 08-Sept 11 Extended to Apr 12)	To quantify photosynthetic production during the post harvest period and investigate whether it is possible to maintain high crop yields without post harvest photosynthesis. And to evaluate whether post-harvest management practices such as frost protection are cost effective long term.	The primary objective of the research described in this proposal is to provide New Zealand winegrape growers with the information they need to manage their vineyards during the post-harvest period to assure a consistent supply of high quality of fruit year after year.
Identification of metabolites in high-thiol grape juices	Auckland UniServices Ltd (Silas Villas-Boas)	09-102	\$387,790	Three years (March 09-Feb 12)	To establish methods for comprehensive metabolite profiling of grape juice and screen Sauvignon blanc juices to identify those producing wines with a range of volatile thiols. To profile metabolites in a set of juices and correlate them with thiol yields in the resulting wine and to reassess any correlations between juice metabolite profile and thiol production in a wider set of juices in subsequent seasons.	Improved methods for detailed chemical analysis of grape juice and wine and increased knowledge of variation in the constituents of grape juice and wine, both between vineyards and between seasons.

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Fruit yield management of Sauvignon blanc: The use of Mechanical thinning	Plant and Food (M Trought)	10-106	\$169,027	18 months (Sept 10-Feb 12)	An aim is to measure the effect of mechanical thinning on yield components of Sauvignon blanc and evaluate the Botrytis response of Sauvignon blanc to mechanical thinning. Also to determine the influence that mechanical thinning has on chemical and sensory properties of Sauvignon blanc and compare and report on the cost: benefit alternatives for fruit thinning.	To develop preliminary protocols that make recommendations regarding the degree and timing of thinning in order to ensure target yields are achieved. An evaluation of the plausibility of using mechanical thinning as a non-chemical alternative to Botrytis control by investigating the three proposed mechanisms by which the shaking may confer resistance of berries to infection and provide costings on the effectiveness of mechanical thinning as an economic alternative to hand thinning.
Understanding the accumulation of fruit based green aromatic methoxypyrazine compounds in Marlborough Sauvignon blanc grape berries	Plant and Food (J Bennett)	10-109	\$85,455	One year (Dec 10-Jan 12)	The aim is to characterise the evolution of berry based methoxypyrazines during early berry development through to fruit maturity at harvest in Marlborough Sauvignon blanc and to describe the influence of fruit exposure and vineyard site on methoxypyrazine levels in Sauvignon blanc berries. Also to explore and measure the expression of two methoxypyrazine genes (methyltransferase) associated with the formation of IPMP and IBMP (iso-propyl and iso-butyl methoxypyrazines respectively) in developing berries.	Develop a foundation of basic understanding on methoxypyrazine production in Marlborough Sauvignon blanc grapes. This foundation will provide a platform for future physiological and biochemical research leads; proposed biosynthetic pathways, primary precursors and the origin/source of substrates utilised in methoxypyrazine synthesis. This one year project will fast track critical information on the methoxypyrazine physiology of Marlborough Sauvignon blanc berries into the design of new experimental projects for the new 'Novel Sauvignon blanc wines' research FRST programme. Future collaborative projects with Lincoln University will follow these leads and the findings of this study.

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Investigation of perceived minerality in white wine	Lincoln University (W Parr)	10-115	\$79,476	One year (Apr 11-Jun12)	To delineate the nature of perceived “minerality” in Sauvignon blanc wines from NZ (Marlborough) and from central France and to associate via multivariate analyses the sub-components of the term “mineral” (e.g., those pertaining to soils such as flinty, chalky, marl, clay, silex; those assumed to have other sources such as sulphide reduction (e.g., burnt, rubber, smoky, graphite, pungent)) with other sensory phenomena including key flavour descriptors, palate & mouth-feel characteristics, varietal typicality and perceived complexity.	Provision of sound sensory and physico-chemical data to both scientists and wine industry personnel that can assist in providing an understanding of the nature of perceived minerality in Sauvignons from Marlborough and central France, and a direction for future research.
New opportunities for sustainable grape thinning	Plant and Food (M Trought)	11-101	\$928,967	Year one of three years (Jul 11-Jun 14)	To develop and disseminate guidelines on how to set up a machine harvester to achieve the desired level of thinning. To investigate if there are consequences on wine shelf life resulting from mechanical thinning and evaluate any consequences on wine style of mechanical thinning. To assess mechanical thinning as a disease control measure.	The outcomes of this programme will provide: New Zealand grape growers with cost-effective yield management tools to enable them to reliably achieve target yields. We anticipate that this will reduce the cost of fruit thinning by 60%. Results will give winemakers confidence to use fruit from mechanically thinned crops, knowing it will not adversely affect wine quality ageing or sensory properties. Novel, non-chemical methods of disease control will reduce the number of fungicide applications in the vineyard and enable industry to progress to a goal of zero chemical residues in wine.
Tools for manipulating Sauvignon blanc wine flavour and aroma: Harvest and processing of grapes	Plant and Food Research (C Grose)	11-118	\$150,737	18 months (Dec 11-Aug 13)	The overall objective is to focus research in areas showing promise within the SBII programme in order to accelerate the delivery of outcomes to industry.	Processes associated with harvesting and postharvest handling of grapes not only affect wine flavour but potentially can be manipulated to ‘dial up’ flavour. Strong support for this line of research is provided by results from the SBII programme, suggesting decisions on how to process grapes into juice can elevate the concentration of thiols responsible for some of the characteristic flavour of Marlborough Sauvignon blanc.

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Virus						
Control and Elimination of GLRaV-3	Vino Vitis Ltd. (R Andrew)	08-116	\$1,172,723	Year three of three years (Aug 09-Aug 12)	To research, develop and design simple guidelines for vine removal and replanting strategies to remove Grapevine Leafroll-associated Virus type 3 (GLRaV-3) from infected vineyards. Tech Transfer to wine grape growers about GLRaV-3 by demonstration of mealybug control and grapevine removal techniques in model areas.	This project goal is to develop user friendly and easy to follow guidelines for growers to use when they are wondering how to remove vines, how and when they should replant, and what the best courses of action are to prevent re-infection.
A sex pheromone as a mealybug monitoring tool, 2011-12	Plant and Food Research (J Walker)	11-107	\$67,872	One year (Sep 11-Oct 12)	To determine the influence of ground cover weeds versus grapevines on the male citrophilus mealybug response to pheromone-baited traps and to determine if different management practices for the understorey influences citrophilus mealybug populations on grapevines.	Underpinning the proposed research is the aim of providing practical benefits to growers by developing monitoring protocols using the citrophilus mealybug sex pheromone. In particular, the researchers are looking to collect data that positions them at a point where they can use this pheromone to assist growers and managers to make mealybug control decisions that ameliorate the impact of leafroll virus.
Managing Botrytis in New Zealand Viticulture	Vino Vitus Ltd	11-116	\$24,000	Five Months (Oct 11 - Feb 12)	To collect, condense synthesise and publish New Zealand research into Botrytis cinerea with regard to grapevines and viticultural management and to interview key New Zealand researchers to capture their impressions on (1) the context for their research into botrytis, and (2) the key outcomes for New Zealand viticulture. When this is done a single document will be created, in booklet form that provides a clear and cogent summary of the research work on botrytis and its management, written in plain language.	The completed document will capture the past 20+ years of active investigation into the nature and control of botrytis in New Zealand viticulture.

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Low Impact Disease Control						
Tendrils as a source of seasonal carryover of Botrytis cinerea in vineyards	Plant and Food (D Mundy)	11-103	\$25,000	One year (Aug 11-Jun 12)	To evaluate the risk tendrils pose for disease in vineyards and to make and disseminate a recommendation to industry on the whether or not the practice of removing tendrils is warranted	The main outcome of this project will be a recommendation regarding the benefits of the practice of tendril removal during pruning in relation to reducing disease risk in the vineyard. This recommendation will be disseminated to industry through popular articles and fact sheets.
Improving management of grapevine trunk diseases in New Zealand	South Australian Research & Development Institute (M Sosnowski)	11-105	NZ\$ 81,056	18 months (Jul 11-Dec 12)	Evaluate pruning wound treatments for cost-effective control of eutypa dieback and develop a proposal for optimising control of trunk diseases in New Zealand.	The primary outcome of this research will be information on the efficacy of five fungicides applied to pruning wounds at three rates for control of eutypa dieback in New Zealand conditions. In addition, results from Australian trials will be made available for comparison.
Other						
Cryopreserved grapevine: a new way to maintain high-health germplasm and cultivar imports with less rigorous quarantine regulations	Plant and Food (R Pathirana)	10-107	\$53,450	Year one of two years (Aug 10 - June 12)	Develop a simple cryopreservation method applicable to a range of Vitis species and confirm that virus infections are eliminated in the process of cryopreservation.	Establish a robust, repeatable protocol to cryopreserve grapevine that can be applied by the NZ wine industry and has potential to: be a more efficient and quick method for virus elimination, reduce time in quarantine for imported cultivars, resulting in the NZ wine industry introducing novel wines to the market in shorter periods than at present and reduce the vulnerability of the NZ wine industry to the introduction of new pathogens via germplasm imports.

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Organic Focus Vineyard Project	Organic Winegrowers New Zealand (R Reider)	11-102	\$374,810	Three years (Jul 11-Aug 14)	Provide growers nationwide with demonstration of best practices for converting a vineyard to organic management and provide data on the economic costs and benefits associated with organic vineyard management as compared with conventional.	Through this project, winegrowers in the project regions and nationwide will gain a deeper understanding of the management decisions and the learning process associated with organic production. The project will establish a complete data set for the financial costs and benefits associated with organic conversion. It will also establish data comparing results of organic and conventional vineyard management as seen in the vineyard itself, through soils, pest and disease incidence, and grape quality.
Residue profile in grapes leaves and sheep meat and offal from leaf plucking in vineyards	Agrivet Services Ltd (B Vlaming)	11-114	\$250,150	One Year (Dec 11-Nov 12)	To establish the consistency, or otherwise, of the residue profile between seasons in the same region. To determine the residue depletion profile of several fungicides and insecticides in a worst-case scenario where all spray active ingredients are applied at maximum label dose and GAP timing (chemicals as recommended by MAF-Residues section) To enable MAF to establish a withholding period (preferably two months) for sheep used for leaf plucking. To report the results in a form suitable for direct presentation to research, science and regulatory bodies.	This study will be used to determine the residue depletion profile of various agrichemicals used in vineyards in Hawke's Bay, as well as in a worst-case scenario. While there are several advantages to using sheep to pluck leaves, the potential for "contaminated" meat to be exported and detected in overseas countries could have a major impact on sheep meat exports and potentially damage the integrity of all New Zealand exports.