

AgScience



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John Lancashire
President

Was This a Big Day for the Primary Sector

This is my fourth attempt to finalise this issue of AgHort Talking, because our deadlines coincided with the government announcement of New Zealand Fast Forward. The debate that followed meant there were daily changes to what the implications were believed to be for the primary sector. At time of writing the debate was still going on so I apologise if what follows is woefully out of date.

On 10 March the government launched New Zealand Fast Forward, announcing it would make a capital investment of \$700 million for research in the pastoral and food industries to be spent over the next 10-15 years. This was to be matched by the private sector, so it was expected that – with interest – there could be up to \$2 billion available for research. It was explained that, because the fund would be wound down at the end of the period, all the capital plus interest would be spent. After years of relative neglect of the agricultural sector – which has been described more than once as a “sunset industry” – it was not surprising that the announcement of the government/industry partnership, with its emphasis on medium and long-term research, was received by the vast majority of the sector with great enthusiasm. Although the actual sums were clearly dependent on the contribution obtained from industry, it appears that after a relatively slow start more than \$100 million would be available annually for the next 10-15 years. That’s a very significant improvement. It was surprising, therefore, to hear John Key, leader of the National Party, announce that a National government would scrap the scheme. The implication was that he would come up with something better, but this announcement would be made closer to the election. If, as has been suggested, this were to take the form of extra annual budget allocations to the existing

structures, the science community would regard the arrangement as potentially unstable. That’s simply because many factors influence budget allocations, and if as predicted we are moving towards an economic slowdown, or even a recession, then undoubtedly budget decisions will be affected. In the past science has certainly NOT rated a priority when compared with demands for increased spending on health, education, welfare, crime and so on.

As most of you are aware, we did ask members by email what they thought of the current situation around New Zealand Fast Forward. This was not a randomised statistical survey, but the feedback did show that 75% of the respondents were very concerned about the National Party wanting to scrap the scheme. Most were also concerned about the way the funds would be allocated, because they have had a gutsful of the current system. The high transaction and compliance costs of this system have been commented on by both sides of the political spectrum, with Labour’s Steve Maharey and National’s Bill English concerned about the enormous amount of time spent by senior scientists on a process whereby 90% of bids fail. If the National Party wants to regain credibility with many in the primary sector it should match the proposed long-term funding; ensure that it is stable and not driven by the annual budget round, and reform the current allocation process. Our **Political Forum on Tuesday 8 July** at Massey University Palmerston North should be a lively debate so I hope as many members as possible will attend.

NATIONAL SCIENCE PANEL

I am asked frequently: whatever happened to the National Science Panel? Some panel members have also asked that question as we finished our initial set of projects last

October. These include a 10-point manifesto for science and background papers on a number of topics including a strategy for science and public and private funding of science. Hopefully the impasse is now broken and the Royal Society will organise a function on the evening of 14 April in the Great Hall of Parliament, to launch the NSP findings. The new organisational structure of the Royal Society will also be announced at this function, which will be hosted by the Minister of Research, Science & Technology, Pete Hodgson.

SUBMISSIONS

We recently made critical submissions on the Ministry of Research Science and Technology research agenda and the Royal Society paper on the future of science publications in New Zealand. It’s hard to understand how MoRST could present its paper without really confronting the major issue, which is simply a lack of investment in science in New Zealand. The Royal Society paper suggests that all the six specialist science journals published by the society should be amalgamated into one, perhaps titled “Southern Nature/Science”. This proposal has received an avalanche of criticism, and as one of our members has pointed out means that the new journal could cover topics ranging from the social life of snails to the movement of the tectonic plate. Who would read that? You can read our submissions on the Institute website: www.agscience.org.nz

John Lancashire
President

Rural/urban split: myth or reality

There appear to be conflicting views on whether a damaging town/country split is developing in New Zealand. Morgan Williams, the former Parliamentary Commissioner for the Environment, has described the rural/urban divide as the country's biggest single emerging political problem. On the other hand, political commentator Colin James in a recent address did not see this as a serious issue. At a recent conference at Lincoln I discussed the issue with long-time consultant Bob Engelbrecht, who was highly concerned with the "aggro" attitudes of townies in Ashburton towards the rural sector. That's fairly extraordinary, considering the dependence of that town on the local wealth-generating rural sector.

Ruth Rainey, president of Federated Farmers Manawatu/Rangitikei province, recently pointed out that only 7.7% of New Zealanders live in what Statistics New Zealand describe as "rural areas with low urban influence" and "highly rural/remote areas". As Ruth says, rural people are a very small minority and have most to lose if the rural/urban divide widens.

I believe there are some important issues here, although many of them are linked to demographic and political changes over the past 50 years. In the 1960s half the National Party cabinet under Keith Holyoake were farmers, whereas in recent times even National cabinets have contained only a few farmers. Back then, of course, many New Zealanders were from a rural background, or at least had relatives who lived in rural areas. In the 1980s New Zealand went through a period when the rural economy was regarded as a "sunset industry". Our recent economic growth figures and the farm sector's contribution to them have certainly disproved that, and many commentators believe we are on the verge of a new "golden age" for our primary exports. If this were to happen, it is important that the issues dividing the two rural and urban communities are resolved, or at least discussed.

Unfortunately, many of the campaigns aggressively pursued by farmers' organisations – including attacks on environmentalists, the Resource Management Act and freer access to the countryside – involve issues on which many townies hold contrary views. Clearly, there are many farmers who believe in protecting the environment and put this into practice on their own farms. The Ballance Environmental awards and many case studies published in the rural press show how profitable farming need not be divorced from good environmental protection. However, there does not seem to be a general understanding in the rural community, or by most of its leaders, of the great strength and influence of the environmental movement in urban areas. This is demonstrated by the continuing strength of support for the Green Party; it is the only minor party to continually poll over

5%, and will almost certainly be part of a coalition government in the future.

Many urban dwellers, particularly in areas where development threatens to limit access to and even destroy unique coastal environments, landscapes and even a local view see the RMA and the Environment Court as their one protection against the unacceptable "raping" of their local environments. When the loss of 46,000ha to lifestyle blocks of 4ha or less last year (much of it our best soils) in countryside adjacent to urban areas is taken into account, it is conceivable that the two communities have enough in common to work together on many issues rather than in opposition.

The recent report on access to privately owned farms by the general public, which has been regarded as a victory by many in the rural community, does not solve the problem and is bound to resurface in the future. That's because an important component of the physical and mental health of the urban community is dependent on access to the countryside. But there is reduced availability of land for this purpose in urban areas.

As Ruth Rainey has pointed out, 14% of New Zealanders live in rural areas and occupy 97.3% of the land. The pressure for greater access can only increase.

So what's the answer?

First, the leaders of farmers' organisations need to tone down their rhetoric. They also need to check out how representative their views are of the rural community as a whole. The natural home of farmers is the National Party, but National will never regain power without capturing a large chunk of the urban vote. Conversely there is a big job to do to remind (or persuade) the urban population that their generally affluent life style is largely dependent on primary sector exports.

How can this be done?

Well, here on the Kapiti Coast the community has recently obtained, courtesy of the government and DOC, a 450ha moderately steep to steep coastal hill country property. This gives the chance to profitably manage a farm, largely sheep, in accordance with modern sustainable farming technology without compromising environmental values. The experience will involve retiring the steepest hill country; restoring the bush and repairing the catchment. This will show how a modern New Zealand farm operates, and restore the vision of the original Lands and Survey owners in the 1980s of an educational resource for the whole community. Because more than 400,000 visitors, largely from the Wellington region, come to the adjacent Queen Elizabeth Park every year, the exposure of this urban group to a modern working farm should be a positive step in healing the rural/urban split. ☐





WAIPARA HILLS

Making Waipara better known as a wine region

Spreading the word about Waipara Valley wines and making them better known is among the aims of the Greening Waipara community project, a venture stemming from initiatives by Lincoln University, local wine growers, the Hurunui District Council and Landcare Research. There was a general awareness that the wines of the Waipara Valley did not have the high profile of those of Marlborough, Central Otago, and other notable wine-growing regions.

Increasing this awareness could be done by recognising and developing the role that living things can play in the vineyard, thereby combining fine wine with a balanced environment, giving a clear “point of difference” for the valley.

The project is research-driven and will try to calculate the dollar-value of services provided for free by nature in the arable, pastoral and horticultural sectors. These services include biological control of pests, pollination and keeping soils fertile. The project also aims to enhance those services through “ecological engineering”. The first part of the research is identifying such things as “what a worm is worth”. The “engineering” element aims to boost nature’s overall contribution to agriculture.

This is a win-win situation where research on nature’s services provides added value through biocontrol and other environmentally-friendly practices, including the reduced reliance on herbicides and pesticides, creation of swales and wetlands with native species to filter



contaminated storm-water and vineyard effluent — all done through the restoration of habitat using species which were once common. These practices enhance the natural character and resilience of the district. Shelter belts, entranceways, stream and pond edges, vineyard borders and even the vine rows themselves are all receiving an ecological make-over.

This involves inter-disciplinary research which draws heavily on the knowledge and experience of the land owners. They have, after all, been working the land for decades — even generations — and need only the right type of help from ecologists to make their management plan a success.

Many vineyards are planning a biodiversity trail near their winery/restaurants, allowing people to experience the relationship between the winemaker and the environment as they digest their lunch.

This project also will form the basis for new stories to be told about our natural history which will enrich our understanding of natural processes and the experience of enjoying the region’s bounty.

It will serve as an extraordinary example of how a rural community has grasped an ambitious project and empowered itself to create a lasting legacy.





Graham Wesley Butler (Phil Dr Lund; RSNZ; QSO) 1928-2007

in clover root nodules and the mechanism of its transfer to grass in pasture; the iodine content of pasture and the effect of plant genotype; the effect of iodine injection on the growth of lambs grazing pasture; the mineral element content of ryegrass genotypes; the biosynthesis of cyanogenic glycosides; the uptake and metabolism of selenium by plants and its availability to animals in plant tissue.

Graham was a great collaborator and worked with many scientists in other Divisions of DSIR such as Grasslands, Massey University, as well as colleagues in the Plant Chemistry Division like Peter Peterson on selenium uptake and John Robertson on nitrogen fixation. He also published with Beris Boyce (later to become Graham's wife) in *Nature* in 1960 on cyanogenic glucoside biosynthesis in white clover. He worked closely with Eric Conn at the University of California on this topic and they published a review in 1969. He also published a review of the Mineral Nutrition of Plants with Ted Bollard (*Ann. Rev. Plant Phys.* 1966). In 1966 Graham was elected a Fellow of the Royal Society of New Zealand, at that time the youngest ever recipient of the honour.

In 1965 Graham was appointed Director of the Plant Chemistry Division and this was perhaps where he exhibited his greatest skills. He fostered research in DNA sequencing; the role of the rumen and its microbes in ruminant nutrition; plant insect interactions and the chemical composition of meat odours. He was likeable, supportive of young researchers and easy to get along with. His favourite phrase "how's it going?" addressed to anyone around when he came into a lab.

Inevitably, Graham was destined for higher things and in 1974 was appointed as an Assistant Director General in DSIR Head Office. In this role he served on a very wide range of Councils, Boards and technical advisory committees. These included the Pesticides and Animal Remedies Board; Medical Research Council; Massey University Council; Dairy Research Institute; Wool Research Organisation; Leather and Shoe Research Association; the Royal Society; NZ Futures Trust and NZIAHS. He was also active in

the management of his church. During this period (1974-1983) Graham bore the brunt of ongoing discussions about the future role of DSIR and MafTech and criticisms that there was considerable overlap and duplication of work programmes. This eventually produced a Ministerial statement that there would be no amalgamation of the two Departments, but increased cooperation was essential. Not really a surprise given Graham's track record of collaboration. In 1983 Graham was appointed Director-General of DSIR, but tragically had to retire because of ill-health in 1985, before he had been able to make much of an impact. It is interesting to speculate if the science reforms of 1992 would have followed the same route if Graham had seen out his term as Director-General.

Graham was active in his retirement particularly with the NZ Futures Trust where he served on the board between 1990 and 1998. He authored a number of significant reports including one on how the emerging information technologies could change New Zealand by 2001, which was widely used by policymakers. He was working on a panel looking at possible impacts of peak oil on agriculture and rural life in New Zealand right up to the time of his last illness. This report was published in *Future Times 2007 Vol 4*.

Graham Butler will be greatly missed by the science community and his vision and wisdom are sorely needed today. Our sympathies go out to Beris, Martin, Neil and Kaia.

Acknowledgement

Many of Graham's colleagues helped with this tribute. Peter Reay, Graeme Russell and John Robertson contributed to the research summary. Peter Peterson, John Robertson, Eric Conn, Ian Baumgart, Yvonne Curtis, NZ Futures Trust and Beris Butler provided many personal memories of Graham.

Tributes to Graham from Peter Peterson and Eric Conn, his principal collaborators, can be found on the Institute website.

—John Lancashire

Graham Butler died on 25 December 2007 and will be sadly missed by his many friends and colleagues and members of our Institute of which he was a member for over 30 years.

Graham was born in Auckland, moved to Palmerston North, aged 10, and attended Palmerston Boys High School. He went on to Auckland University, majoring in Chemistry. He was a Senior Scholar in 1947 and graduated with MSc (Hons) in 1948. In 1949 he joined the Plant Chemistry Laboratory of Grasslands Division, DSIR, Palmerston North. He then studied biochemistry at Otago University for a year, before travelling by ship to Lund, Sweden where he studied under the plant physiologist Professor Burstrom. During the six week voyage Graham taught himself Swedish, which demonstrated both his intensity of purpose and superb memory. In 1953 he graduated Phil Dr with his thesis on the mechanisms of mineral uptake by plant roots, generally regarded as being an outstanding piece of work.

On his return to Palmerston North he undertook research in a direction explained in a comment from a paper by him and Alan Johns. "It is also obvious that the consideration of plant-animal relationships is a vast and profitable field for study, both for purely scientific and agricultural reasons" (*Aus. Inst. Agric. Sci.* 1961). This fitted very well with Graham's philosophy of the importance of a strong science base for New Zealand agriculture in its widest sense. In the next 25 years, he published around 100 papers (many jointly) on ryegrass composition and hogget ill-thrift; the metabolism of nitrogen

Wine Industry Response



When I talk about the New Zealand grape and wine industry and our environment, I don't mean the environment for New Zealand grape growers and winemakers. I mean the environment, which is owned by all New Zealanders, and our responsibilities towards it.

The industry talks a lot about balanced grapevines. Ultimately, that's because we believe we will produce higher-quality wines if our grapevines are in harmony with the environment in which they are growing. For us, therefore, environmental management is about making better-quality wine, which is the key to our international success.

The wine industry has become New Zealand's biggest perennial horticultural crop – 24,000 hectares of vines. Our producing area has quadrupled over the past ten or so years and will continue to grow. We are regionally concentrated. We developed originally around Auckland and Hawke's Bay but around 48% of our grapevines today are in Marlborough, 20% in the Hawke's Bay, 8% in Gisborne

and a very new area, Central Otago, accounts for 6% of our grapevines and is growing quickly. Another 18% comes from places such as Nelson, Wairapapa, Waipara and Canterbury.

Sixty per cent of the country's vineyards operate under an industry environmental programme. The key feature is that it is entirely voluntary. We have no ability to enforce standards because of the nature of the industry.

In recent years our yields have declined markedly because our focus is on quality, not quantity. In an international marketplace such as the UK, we have the highest average selling price for any wine-producing country, and that price is miles ahead of anybody else's. In the UK our average selling price is £6 retail per bottle. Our nearest competitor is Australia at £4.30 and the average price in the market is about £3.70. We tried to join in the quantity game 20 years or so ago, but we went bankrupt trying to do it. It is important for us to focus on quality. We have some 1,300 individual business enterprises – grape growers and winemakers – operating in New Zealand. Some 800 of these are grape growers and 500 are wineries. They are all, typically, highly individualistic people with a great passion for what they are doing. They don't like being told what to do.

Our exports fetch around \$512 million a year, having grown over the past ten or so years from somewhat less than \$80 million ten years ago. We are proud of that success, given the huge competition in the international marketplace.

Domestic sales amount to around \$450 million. This means we are almost a billion-dollar industry.

Our brand positioning internationally emphasises the riches

of a clean, green land. It is not something we dreamed up. In the early 1990s we positioned ourselves – in a production-oriented statement – as the home of cool-climate wines. But in the early 1990s we went away and talked with our major customers in Britain. They wanted to be told about New Zealand, about New Zealand wine, and a bit about the individual brands. They talked about consistently clean and green, they talked about freshness and they talked about the beauty of New Zealand. In essence, we shaped our imagery to put back to them what they had told us and they loved it. They were right, too.

When you are selling into the northern hemisphere in particular, you can't under-estimate the impact when people fly from London or New York to New Zealand in January or February, when it is grey and cold in their home cities. They fly over the landscape here and it is green – whether it is trees or grass doesn't matter to them. They have a wonderful time, and we give them good food and good wine and a great New Zealand experience. They go back to their home countries as great ambassadors for our products.

We expect the vineyard area to grow another 25% in the next three or so years. We may well be under-estimating that. By 2010, consequently, we will have something like five times the vineyard area that was producing grapes in New Zealand in 1997. That's a massive increase. We expect to remain regionally concentrated – a huge amount of growth in Marlborough, Hawke's Bay and Central Otago, with other areas sharing the expansion to a greater or lesser degree. We expect our exports to be around \$1 billion by 2010, double the current value. We will hopefully be close to the kiwifruit industry's receipts – a great success story – at that time.

A major review of our brand positioning is under way, and again we are going to our customers in Australia, the United Kingdom, the United States and Canada to ask them what they think about New Zealand wine. Once we have been told, we will incorporate the findings in our brand position and, once again, they will be correct. We like to listen to our customers. But any changes will be evolutionary from where we are now, and clean and green will be part of the image.

Our size is among the issues facing us in terms of both our market and the environment. The number one reality is that we are no longer a small industry. We can't hide under a grape leaf because we are no longer a cottage industry. Our potential environmental footprint is obviously growing, too, as the industry expands. But I stress the word "potential". It doesn't necessarily have to grow, so long as we are smart about the way we grow our business. The clean green image remains important to us.

When we go out to sell our wines, we first talk about New Zealand because nobody much has heard about Montana or Wither Hills or Craggie Range. We have to talk about New Zealand and where it is, and then we talk about our wines, and then we talk about the individual brands. Talking about clean and green is an inherent part of that message because it is an important component of the overseas customer's perception of New Zealand, right or wrong.

Increasingly, as we interface with our neighbours in the wider rural community, this is critically important. As we grow, and put

on Growing For Good

our heads above the parapet, it becomes easy for people to have a go at us. Right or wrong, perception is all important.

We can leave out the Kyoto protocol and carbon balance from a discussion of key environmental issues for our industry. Under the Kyoto protocol, grapevines aren't regarded as trees because they are under six feet tall, so we don't count in the carbon sink, even though there is research to show we should be.

The issues include:

- **Water, water and water** – quality and quantity. Water is hugely important for us, both as a potential source of pollution and because we are a major user of it.
- **Sprays and air quality** – the most common sprays we use are copper and sulphur but we use other chemicals. Sometimes we simply spray water. A person driving along the road, however, has no idea what we are spraying and whether it is water, copper or diocoboxomide. They don't know, but they do see us spraying and they worry about it.
- **Soil health** – our grapevines grow in the soil or something that passes as soil in dry-land areas, such as Central Otago. Soil is very important to us.
- **Monoculture and bio-diversity** – if you have been to Marlborough recently, you will have seen grapevines and more grapevines. It is important that we do something to manage the biodiversity.

Research is the key, absolutely, to addressing these issues. Take water, for starters. A raft of research initiatives are under way. The fundamental question about irrigation is how much water does a grapevine need to produce quality wine. If we don't get that right, if we over-water our grapevines, then we end up using much more water than is necessary. Hence there has been a lot of work on vine requirements and deficit irrigation because we don't want an overly vegetated grapevine. Rather, we want a grapevine to be slightly stressed, because then it puts a lot of energy into producing high-quality fruit, not high-quality leaves which benefit nobody apart from the plant.

A code of practice for winery waste management has been in place since about 1995. This year we produced around 45,000 tons of winery waste. The volume of water used in wineries would be significant.

We have worked with the Hawke's Bay Regional Council in the Gimlet Gravels area, where our grapevines are situated above an unconfined aquifer. When pesticides are applied above an unconfined aquifer, there is the risk of polluting the water. So we looked at leeching grapes and so on, to try to identify safe levels of spray use in such situations, then advise vineyard operators on what they can and can't do.

Sprays are a big issue for us for the simple reason that our consumers don't like to drink products they suspect might contain spray residues.

But we grow grapes in an environment which is marginal, in crop-growing terms, and we need to use sprays. Botrytis, which causes rot, is the biggest disease to be combated and we work hard to find natural solutions. One we have identified is botryzen. There have been some very good results and it has been released widely for use this year. It has been used on other products, too.

We also have an extensive natural fungicide programme in place, trying to identify natural solutions. Our goal is zero residues on our wine. We also do some more basic things like trying to advise grape growers about their spraying operations. It is a fairly simple thing, but if sprays aren't going into the target zone, there is no point applying them.

Our industry uses copper. Copper accumulation in soils is an issue in Europe and we have done some work looking at copper accumulation in soils in New Zealand. The longer spray copper is used in a vineyard, the higher the level of accumulation you will get in the soil. We need to manage this carefully.


It is important we support the new agri-recovery programme that is coming into force. We welcome it as a great initiative.

Glass recycling is another issue. O-I in Auckland recycles about 70% of glass in New Zealand. This is welcome, but there are obstacles to recycling in some areas around New Zealand.

A sustainability programme for winegrowing was launched in 1995. Sixty per cent of the vineyard area is working through it. It performs well in international comparisons and most notably requires independent, third-party audits. Nobody else in the wine industry does that.

We have conducted a major review with consultants from Australia, looking at how we can improve the participation rate because we are not satisfied with 60% involvement. We can't enforce the programme. It must be adopted voluntarily. But the industry is vitally interested in it, whether businesses are in the programme or not.

We have a focused vineyard project, which is about taking research to practice. It is very successful and strongly supported and has been a hugely successful tool for us. We supported a new organic standard from Bio-Gro and we have seen a growing adoption of it. The industry conducts an annual Bragato conference, where we talk about our research results each year.

The industry is growing rapidly and with it is a greater environmental responsibility. Our industry is environmentally aware and from my organisation's position as an industry body, we are trying to work hard to give practical tools to growers and wineries to improve their environmental record because we know they want to have a good environmental record. We know it because they keep on telling us they are interested in sustainability issues. 



Hope for the best, plan for the worst:

The possible future for the New Zealand wine industry under climate change

Climate change has the potential to affect most forms of agriculture. But the greatest economic cost may be in perennial crops, such as grapevines, where a long-term investment in infrastructure may influence the industry's viability. Not only might the investment in vineyards be at risk, but also the processing wineries, traditionally located at or near the areas of production.

Grapes were first planted at Kerikeri by the Rev Samuel Marsden in 1819. Small vineyards were developed from Kerikeri to Central Otago over the next 80 years, many of them visited in 1895 by the viticulture scientist, Romeo Bragato, at the request of the New Zealand Government. He commented on the suitability of many vineyard sites for the production of fine-quality table wines. Unfortunately, little attention was paid to his recommendation, and the industry languished until the mid-1960s, when a group of industry people – particularly John Buck and Tom McDonald – initiated a programme in Hawke's Bay to lift the quality of New Zealand wines. In 1972, to develop a bulk white wine industry in this country, Montana Wines bought land in Marlborough. By chance, Ernie Hunter was growing Sauvignon blanc. Showing true entrepreneurial spirit, he presented his wine at the 1986 International Wine Challenge in London, to much acclaim. That was the turning point for the industry.



Romeo Bragato

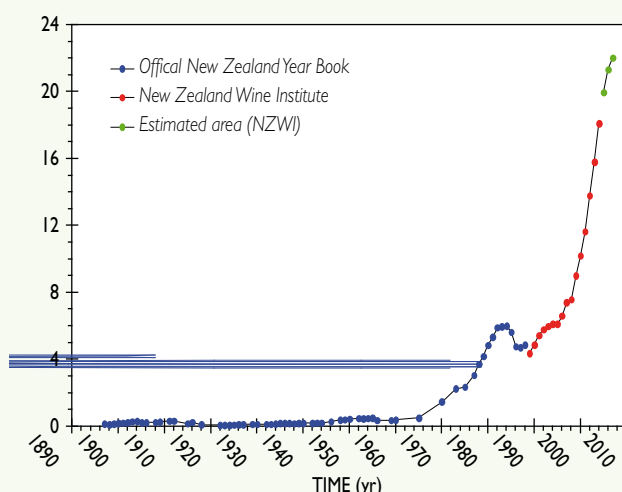


Figure 1. Change in New Zealand vineyard area 1895 to 2008. (AP Friend, pers. comm., 2006).

From those humble beginnings, the New Zealand wine industry – particularly the Marlborough industry – has become an international player in Sauvignon blanc production. From this has grown a recognition for other varieties, most recently pinot noir.

In the past 30 years, the growth in vineyard area, associated production and exports has been little short of spectacular (figure 1), with the industry aiming to export around \$1.5 billion by 2015. Much of this growth has occurred in the past 20 years, reflecting the apparently insatiable demand for Sauvignon blanc, predominantly from Marlborough. The ripe, herbaceous, “zingy” style, typical of Marlborough Sauvignon blanc, has become the benchmark of this style from the New World.

THE CURRENT NEW ZEALAND SCENE

Some 22,000ha of grapes are now in production in New Zealand, including 10,419ha in Marlborough alone. An estimated 15,000ha of grapes have been planted in Marlborough, with a further two million vines to be planted in the province this winter alone. Like much of the South Island planting, this represents a considerable long-term investment, not only in planted vineyard, but also in the processing capacity to vinify the fruit. With 15,000ha of grapes, it is likely the region will need to process more than 165,000 tonnes of fruit within three years or a regional winery investment of \$385 million. At the last vineyard survey, Canterbury/Waipara represented one of the smallest areas in production at 897ha (Anon 2006). But like many regions, the Canterbury industry is still growing rapidly. A single vineyard planted in 2006 will increase the area planted in Waipara by some 400ha.

The backbone of the New Zealand industry is Sauvignon blanc, representing 72% of exports, mainly to the UK (37%), US (24%) and Australia (23%) (Anon 2006). Marlborough has developed a style of Sauvignon blanc that is recognised internationally as a benchmark for this wine. Whatever the cause, one thing is clear, Marlborough wines have a typicity that is distinctive, even in geographic regions close to those of Marlborough (for example Hawke's Bay).

While subtle changes in climate may put this at risk, other factors may be equally important. For example:

- The consumer acceptance of wine style does change with time. This is clearly demonstrated by the increase in alcohol concentrations of many Australian wine styles in the past 20 years (Godden & Gishen 2005), which has affected the palate structure of their wine.
- Soil type is important. This is clearly demonstrated in many Old World regions, where vineyard classification is largely on soil type, within a small geographic region.



- People have an important part to play in the expression of the environment in the final wine. Management in the vineyard and winery has significant impacts on the style of wine produced. The potential of a particular environment to produce a particular wine style is demonstrated by the best wine produced in the region, and it is the activities of the grower and winemaker which express that potential in a particular season.

The distinctive character of Marlborough autumns, which are typically cool but frost-free, providing a drawn-out ripening period allowing fruit to ripen and flavours to develop, is often suggested as being one of the key characteristics in producing Sauvignon blanc. High-quality wine grapes are grown within a narrow climatic zone, often within climatic niches, which largely control the development of flavour and aroma in the fruit and ultimately the wine. Three climatic criteria are paramount for sustainable grape production:

- An optimum heat requirement during the season to ripen grapes to an appropriate level.
- Minimal frost risk during the growing season.
- A distribution of rain that allows appropriate soil moisture during the growing season, but low risk during ripening when rain may induce fungal diseases. Today, rainfall for growth may be supplemented by irrigation.

The sensitivity of grapevines to weather puts them at particular risk to both short- and long-term climate change, which may influence both the style of wine for which a particular region may be recognised, but also the vulnerability to pest and disease. In some areas – southern Spain, for example, and potentially parts of Australia – small increases in temperature may result in inferior and ultimately uneconomic wine production. New Zealand is in a fortunate position in that the cool-temperate nature of our climate would suggest that climate change and an associated increase in temperature might result in some regions becoming more suitable for the styles of wine grape production for which New Zealand is currently renowned, while in other areas, the style of wine produced may change. The impacts of potential changes in our climate are not necessarily going to be straightforward, but four factors may be of particular importance:

- The impact of an increase in temperature on the suitability of regions to produce styles of wine grapes.
- The potential changes in frost susceptibility.

- How might an increase in atmospheric carbon dioxide concentration interact with temperature to influence productivity and wine style?
- Will water become an issue?

LATITUDE TEMPERATURE INDEX					
SITE	today	+0.5°C	+1.0°C	+2.0°C	+3.0°C
Auckland	460.7	472.3	483.8	507.0	530.1
Gisborne	401.7	411.7	422.4	443.7	458.3
Hawke's Bay	386.0	396.3	406.6	427.1	449.0
Martinborough	332.9	342.4	351.9	370.8	389.7
Marlborough	327.5	336.7	345.9	364.3	382.7
Waiau	305.4	314.0	322.7	340.1	357.4
Waipara	296.3	304.8	313.3	330.2	347.1
Lincoln	269.8	278.0	286.1	302.5	318.8
Winchmore	257.6	265.7	273.8	290.0	306.2
Adair	244.4	252.2	260.0	275.5	291.1
Waimate	239.7	247.3	355.0	270.2	285.5
Cromwell	264.9	272.4	279.9	294.8	309.8

Table 2. Influence of temperature change of the warmest month on Latitude Temperature Index for grapes in New Zealand.

Latitude Temperature Index = mean temperature of the warmest month \times (Latitude – 60). The shaded boxes are those where the calculated LTI = Marlborough \pm 10.

IMPACT OF A TEMPERATURE CHANGE

It is predicted that average temperatures are likely to increase by several degrees in the next 50 years. That's within the expected life of vineyards. We can anticipate that this will increase the length of the growing season (the time from the last spring frost to the date of the first autumn frost) and the effective growing degree days available for ripening. The optimum climate required

Group and Latitude Temperature Index (LTI)	Varieties
Group A: LTI < 190 1. very cool	Gewürztraminer; Reichensteiner; Müller Thurgau
2. cool	Pinot gris, Pinot blanc, Pinot noir, Pinot meunier, Chardonnay (all these varieties may be grown for sparkling wine base) Auxerrois, Aligoté, Sylvaner; Chasselas
Group B: cool-warm LTI 190-270	Pinot noir, Riesling, Chardonnay (Table wines)
Group C: warm LTI 270-380	Sauvignon blanc, Sémillon, Cabernet Sauvignon, Merlot, Malbec.
Group D: warm-hot LTI > 380	Carignane, Grenache, Thompson's seedless, Zinfandel

Table 1. Grape varieties grouped according to ripening ability in different climates.

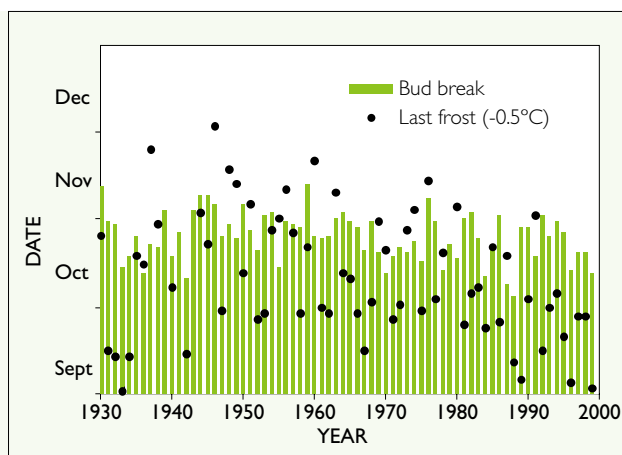


Figure 2. Calculated date of Pinot Noir grape budbreak and the date of the last frost (air temperature -0.5°C), Lincoln University, New Zealand.

estimated by using a phenology model to estimate the date of budbreak and relating this to the date of the last frost (Trought 2004). Over 70 years (1930 to 1999), the date of budbreak was estimated to advance by 0.11 days per year (or about one week over the period of the estimate) (Figure 2), ($R^2 = 0.067$; $P = 0.03$). In general, however, as budbreak was delayed in any season, so was the date of the last frost (Figure 3) and frost vulnerability

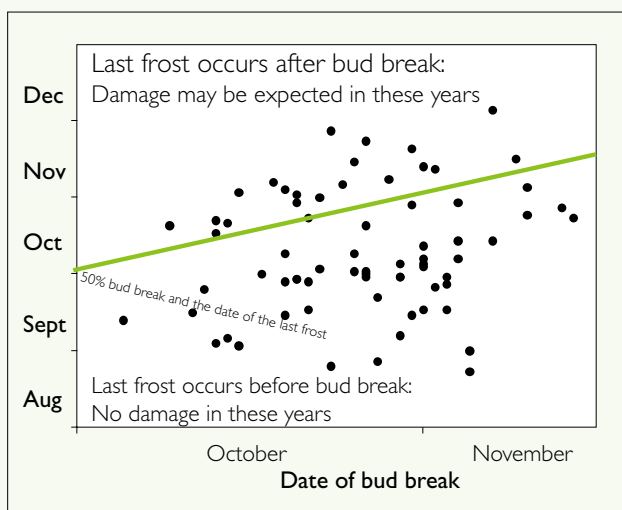


Figure 3. Relationship between 50% budbreak of Pinot Noir grapes and the date of the last -0.5°C frost, Lincoln University.

changed little between seasons. This scenario assumes that daily maximum and minimum will be influenced in a similar way. Should maximum daily temperatures be increased to relatively greater degree than minimum night-time temperatures, then budbreak may be advanced more than the date of the last frost, and as a result, the vulnerability of vineyards to spring frost damage may be increased.



IMPACT OF ATMOSPHERIC CARBON DIOXIDE CONCENTRATION

Many studies have demonstrated that, in general, higher atmospheric carbon dioxide concentrations result in changes in the functioning and growth of plants. Using free-air carbon dioxide chambers Bindi et al. (2001) have compared the growth of Sangiovese grapevines at three atmospheric CO_2 concentrations (ambient, 550 and $700 \mu\text{mol mol}^{-1}$). Increasing CO_2 concentrations to $550 \mu\text{mol mol}^{-1}$ caused total and fruit dry weight to increase by 40 to 45%, earlier ripening of the fruit and increased colour development. However, no detectable differences were observed when CO_2 concentration was increased further, suggesting that further stimulation of growth is limited by restrictions in transport of sugars within the vine and/or sink limitations. Of course, this research was undertaken at present temperature conditions. It is likely that as temperature rises, the ability of vines to utilise additional photosynthates would also increase. Bindi and his co-authors concluded that a rise in CO_2 concentrations may strongly stimulate grapevine production without causing negative effects on the quality of grapes and/or wine.

WATER AVAILABILITY

The predicted climate change is likely to reduce rainfall, but with good water management, this should not be a major problem to the wine industry. Compared with pastures or cereal crops, grapevines are relatively water efficient and the appropriate selection of deep, exploitative rootstock (e.g. *Vitis berlandieri* x *V. rupestris*; Richter 110) will maximise the soil water reserves. At the same time, trickle irrigation technology is widely used, and relatively small storage facilities are likely to be sufficient, which can be replenished during winter months for use at key development stages of the vine (at flowering and veraison).

It does seem likely that water storage will become more important, providing the opportunity to manage reserves. Storage enables growers to conserve water for future use, rather than losing the resource as rivers or aquifers decline during the summer season.

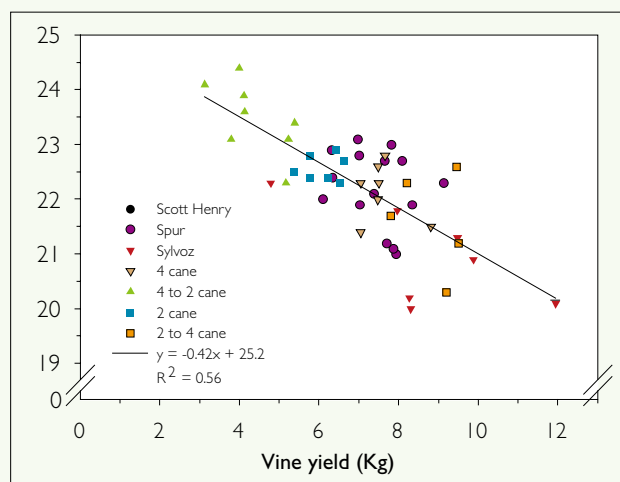


Figure 4. Influence of training system and grapevine yield on harvest soluble solids (Trought & Bennett, unpublished data).

HOW MIGHT CHANGES IN VINE MANAGEMENT MODERATE THE IMPACT OF CLIMATE CHANGE?

While climate is an important parameter in determining wine style, people and management decisions play an equally important role in the expression of the environment in the wine. Simple management decisions – how much crop do we expect vines to carry, for example – can have a significant impact on the timing of ripeness or the date at which a particular target is achieved. Increasing temperatures and CO₂ concentrations may cause viticulturists to change yield expectations upwards, and while these yields under the current environment may result in inferior wines, it seems conceivable that a new balance will result in wines that meet market requirements. While the optimum location for a specific variety may change, New Zealand can adapt and is likely to be less affected than some traditional Old World regions, where changes in management may require alterations to appellation regulations. Likewise, some wine regions of the world, such as South Africa, may have difficulty in coping as geographic limitations limit their viticultural industry moving south to cooler regions.

CONCLUSIONS

The history of grape growing in New Zealand is short and records of factors such as harvest dates are even shorter. However, it is interesting to consider changes in harvest date over time and the possible impact that weather patterns have on a particular site. Chuine et al. (2004), recently published grape harvest dates from Burgundy from 1370 to 2003 (that is 633 years!). The record shows periods since 1370 when harvests were consistently earlier (for example, in the late 1300s, early 1400s and mid to late 1600s) or later than average (for example early 1800s and mid 1900s) (Figure 5). While it is noticeable how exceptionally early (and warm) the 2003 season was, any impact that global temperature increases have had in the past 50 years does not appear to be

reflected in harvest dates, which until 2003 were within the normal scatter observed in the past 600 years.

New Zealand is recognised for distinctive styles of Sauvignon blanc. Changes in temperature and CO₂ associated with climate change may change the suitability of Marlborough as the home for this style, which may progressively move south to central and north Canterbury. However, when originally released in the 1980s Marlborough Sauvignon blanc was more pungent than most styles today, reflecting changes in consumer preferences. It is likely these subtle changes will be ongoing. Likewise, the increase in temperature and CO₂ concentration may enable vineyards productivity to increase, which in turn will delay the date of harvest, enabling fruit to be harvested in conditions not dissimilar to today. Research under way at the Marlborough Wine Research Centre, in collaboration with Auckland and Lincoln universities aims to quantify the relative contribution soils, climate, management and winemaking make to the Sauvignon blanc wine style. This research will provide tools to industry to manage environment change, whilst retaining recognisable wine style. In the meantime, we hope for the best and plan for the worst. ☑

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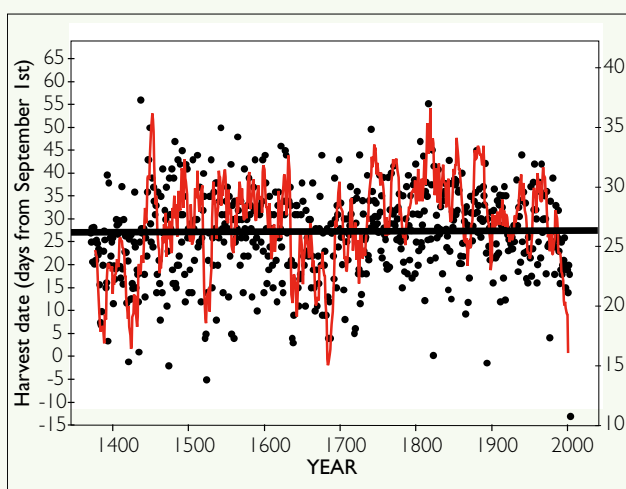


Figure 5. Harvest date series of Burgundy grapes from 1370 to 2003. The red line shows the rolling 20-year average (data sourced from <ftp://ftp.ncdc.noaa.gov/pub/data/paleo/historical/france/burgundy> 2004.txt)

What goes with fish?

The New Zealand Wine Company (NZWC) on 29 September 2006 announced an initiative with marketing and environmental implications. It had released the world's first carboNZeroCert™ wines, placing them among the world's first carbon-neutral consumer products.

carboNZero certification involves addressing climate change impacts with the aim of adding no net carbon dioxide (CO₂) emissions to the atmosphere during the production and distribution of company wines.

NZWC produces Grove Mill and Sanctuary wines. Participating in the carboNZero programme required it, first, to measure the energy use from all daily operations – distribution, vehicle use, lighting and heating, and so on. Energy sources such as electricity, natural gas and petrol emit CO₂ into the atmosphere through burning of carbon-based fossil fuels.

An emission profile of the company was compiled. The sources of emissions were identified and areas in which energy consumption could be reduced were highlighted. Energy-efficient initiatives were adopted, to save on electricity and fuel.

Mitigation was achieved by buying carbon credits from a local carbon farmer, Ron Marriott, who is rehabilitating native bush in the Marlborough Sounds. In effect, this means trees are planted to offset the effect of CO₂ emissions released into the atmosphere.

The carboNZero programme is managed by Landcare Research New Zealand and provides tools for organisations and individuals to take steps to reduce their impact on global warming. It is independently audited to ensure its integrity.

There is a commercial factor: most Grove Mill and Sanctuary wines are consumed by overseas customers. By offsetting emissions from production and international shipping, the company is hoping to make its wines the natural choice for people concerned about food miles and global warming.

Professor Ann Smith, from Landcare Research, congratulated the firm for releasing its carboNZero wines, saying it was setting "an excellent example for other producers and exporters, as it

shows how putting company environmental ethics into practice can add value to a product."

Dave Pearce, chief winemaker for Grove Mill and Sanctuary, affirmed this. From a business viewpoint, he explained, carboNZero certification focused the company on energy efficiency and reduced the risks of non-tariff trade issues, such as "food miles". It also was a major step towards the company's continual improvement in the area of environmental sustainability.

The carboNZero programme continues to be NZWC's major environmental focus (re-certification was achieved with an audit assurance issued by Deloitte). But NZWC is also working on becoming fully Green Globe certified. That would result in structured environmental management and reporting implemented internally within the company.

The supply chain is being "greened", too. All growers' vineyards are paid-up members of the "Sustainable Winegrowing New Zealand" programme, administered by New Zealand Winegrowers. SWNZ (as the sustainable wine-growing programme is branded) is one of three main environmental management systems operating in New Zealand. The others are Habitat Rehabilitation and Bio Gro. The SWNZ system is based on a Swiss scheme, but has been developed for New Zealand by extensively involving growers and winemakers. This makes it practical to implement – it makes concessions to green management without ruling out the use of synthetic chemicals.

The programme focuses on a range of environmental issues affecting the country's wine industry.

It promotes a measured approach to use of sprays, water and energy and fosters staff awareness, safe chemical handling, plus waste reduction, reuse and recycling.

NZWC has not worked with the Enviromark programme for some time, regarding the Green Globe environmental management system as much easier to approach and work with. But it would participate again in Enviromark, if it had to give level of assurance similar to ISO140001 to enter certain relevant markets.

NZWC employs several organic practices alongside conventional agricultural practices. The switch to more organic practices is now the most important project for its vineyard teams.

The winery vineyard block has been audited by Bio-Gro and given "in conversion" status.

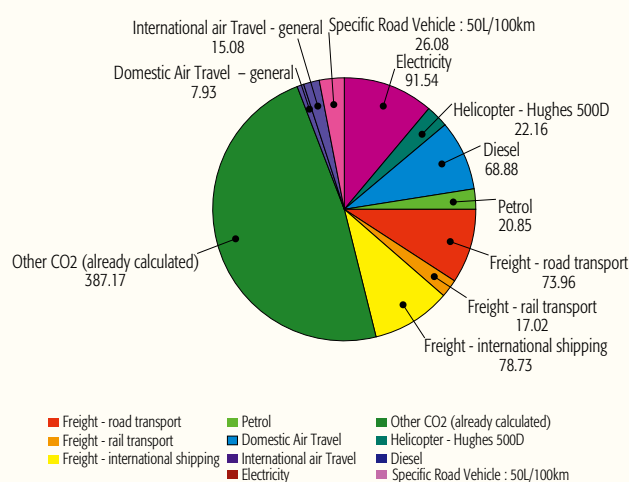
NZWC helped design the carboNZero product standard with Landcare Research and has aligned itself to British market requirements through the draft PAS2050 standard for carbon foot-printing of products. The standard is described as cutting-edge and will be used by the industry around the world for analysis of carbon emissions from winemaking.

It acknowledges several supply chain steps that weren't previously accounted for, such as packaging and the use of fruit from contract growers. These are being accounted for in the year in which a wine is bottled (thus they are not yet represented fully in NZWC's current footprint).

One issue of concern to the company was a refrigerant leak in one of its refrigeration compressors, a not uncommon occurrence. The leak omitted 113 kg of refrigerant gas into the atmosphere.

This significantly added to the carbon footprint. The HFC it

CO₂ EMISSIONS FROM BY PROPORTIONAL OF TOTAL FOR THE PERIOD JULY 2006 TO JUNE 2007



Let's try a bottle of green

uses, recommended for its low ozone-depleting properties, has a global warming potential of 3,300. This means 113 kg of gas has a CO₂ equivalence of 372 t/CO₂.

Trouble is, there is no better alternative for NZWC's current refrigeration system and most wineries and food-processing plants of a certain size around the country are still being advised to install this technology by refrigeration engineers. New Zealand Winegrowers has been advised of this issue in the hope the whole industry can encourage change.

NZWC's approach to environmental matters and sustainability, naturally, is reflected in the philosophies of Grove Mill and Sanctuary: to make great wine with minimal environmental impact.

Beside its Marlborough winery, a naturally occurring wetland has been restored, providing a sanctuary for pukeko to call home.

The commitment to reducing NZWC's carbon footprint and environmental impacts is reflected in a raft of innovations.

Waste heat system – tanks are hooked up to the waste heat system, allowing the winery to use reclaimed energy for heating purposes such as, preparing wine prior to bottling and raising the temperature of tanks for fermentation. The waste heat system will also be used to heat water for cleaning winery. The major benefit is reducing the amount of electricity used.

Packaging – Wine bottles are lighter and the glass is slightly thinner. Smaller cartons can be used for packing wines and more cartons can be fitted onto a pallet. Hence 10-15% more wine can fit into a container for shipping wine to the UK and USA. Overseas customers can order more wine per container, reducing a significant amount of carbon emissions thanks to the efficiency of the packing configurations.

Refrigeration and temperature control – Part of Grove Mill's refrigeration system has been upgraded. Insulated refrigeration lines means less energy is being used.

Tanks have been computerised to monitor temperature. This enables the company to control the temperature of the tanks, minimising fluctuations and increasing the temperature consistency.

Vineyard – A new organic protection against Botrytis is under trial. If successful it will be considered for use in all the company's vineyards.

Habitat restoration – Since 1996 a wetland beside the Grove Mill winery has been restored with the planting of over 4,000 native plants. The growth of the trees and shrubs has encouraged an increase in birdlife. The wildlife inhabiting this wetland provided the inspiration for the development of the company's wine labels.

Waste water – The company has developed a waste-water system whereby water is pumped to settling tanks,

processed in the filtration unit, then irrigated onto a coppiced tree block adjacent to the winery. The water is aerated by sprinklers where some of it evaporates, while the remaining water falls to the ground. As a consequence soil micro-flora chew up the nutrients.

Insulated warehousing – The winery and warehouse are fully insulated. Hence no additional energy is required to either heat or cool the warehouse. Insulation ensures a constant internal temperature suitable for storing wine. This means Grove Mill wines are given the best possible care from the time the grapes arrive at the winery to the time the wine is dispatched to market.

The "cold cellar" winery – In 2002 Grove Mill's new white wine winery, or the "Cold Cellar", was developed. It has been specifically and solely designed for white wine production and has increased Grove Mill's total winery capacity to 3100 tonnes. The cellar has been installed with a passive cooling system. The fully computerised system pulls in cold air from outside; it is then used to cool the winery down. Energy is conserved because the internal temperature of the winery remains constant, minimising electricity requirements for tank cooling. In 2003 the company's electrical contractor, Tyco Services Electrical, won the electricity industry's supreme award for innovation and technical excellence for its work on the Cold Cellar development, picking up the Electricity Contractor's Association Safepower Excellence Award.

Heat recovery – A huge amount of heat is lost through the refrigeration plant during wine-making. The installation of super-conductors on the plant recycles this heat, which is then stored as hot water in insulated tanks. This hot water is used within the winery for cleaning purposes and the warming of wine for fermentation.

Distribution of products – The installation of a pallet wrapper has reduced the amount of plastic going out of the warehouse by one tonne a year. The company's commitment to reduce packaging waste results in less waste to be disposed of in its markets.

Use of organic fertiliser – In 2006 the company used more than 500 tonnes of waste grape marc on its vineyards as a mulch. This provides the soils with increased nutrients and encourages the growth of organic matter. Chemical application of fertiliser was therefore not required on these vineyards.

Recycling – Plastic, paper, cardboard, aluminium and glass is recycled.

The Grove Mill philosophy is symbolised by the Southern Bell frog – the frog lives in the winery's wetland and features on the Grove Mill label. As the company explains, frogs are indicators of environmental quality in nature due to their semi-permeable skin.

–Bob Edlin



Submission by NZIAHS to the Royal Society on their proposal to amalgamate the New Zealand Science Journals

The NZIAHS is an organisation which has represented scientists and other professionals in the biological industries for over 50 years. Membership of around 700 covers a very wide range of scientists in the Crown Research Institutes, universities and the private sector, and related groups in extension, technical training and the supporting industries. Corporate supporters include Lincoln and Massey Universities; PGG Wrightson; Dairy Insight; Ballance Agri-Nutrients; Horticulture New Zealand; Agmardt; AgResearch; Ravensdown Fertiliser Co-op; Federated Farmers and Crop and Food Research.

The Institute publishes a widely read quarterly AgScience, which covers a wide range of topics relevant to the science issues affecting the biological sector. Recent articles include "Maharey on R & D; Flawed PBRF; The Saving of Science; Parliament's Science Check; Nutrigenomics and The CRIs". The Institute also organises an annual science convention in conjunction with a number of scientific societies. It has also run two well attended workshops recently in conjunction with the Royal Society on a progress report on "Growing for Good" and "Productivity in the Primary Sector". Every three years prior to the election the Institute organises a political forum to expose the science policies of the parties to a critical audience of scientists.



THE PROPOSAL.

The Institute is astonished at the poor quality of this proposal, which suggests that all six New Zealand science journals published by the Royal Society should be amalgamated into a single publication possibly called "Southern Nature/Science". The authors do not seem to understand what science is all about in New Zealand and have a bizarre view of the current situation in our science system. How else could they suggest "associate editors" on an honorary basis. Where are these people to come from? There is just not this amount of slack in the system, where the vast majority are battling for survival – time is just not available. Or are we to believe that this pool of people will come from retired scientists. Surely not a serious option.

WHY DO SCIENCE IN NEW ZEALAND?

The bulk of science carried out in New Zealand is for the direct benefit of our country or how else can we possibly justify this expenditure by the taxpayer? Therefore, we must have a credible science publishing system within New Zealand that is easily available to the local users and consumers of that science. As science expanded rapidly in the 50s and 60s the flood and range of publications in the original NZ Journal of Science and Technology became nonsensical in a single publication and so the Journal was split up into the various disciplines AgResearch; Botany Geology and Geophysics; Zoology, etc, most of which survive today. Many of these journals established an international reputation, despite the fact that most of the published work was done in New Zealand.

What possible advantage is there in going back to a single publication, when the amount of science carried out in New Zealand is probably 100 times what it was when the NZ Journal of Science and Technology was terminated? This is a ridiculous proposal and will simply drive our specialist scientists to publish offshore when a range of specialist journals still exist, (or perhaps that is the agenda behind this proposal). Is it being seriously considered that most (if not all) New Zealand-funded science be published offshore? We believe that is a nonsense and would justifiably be rejected by the funders (mainly the government) of New Zealand science. So how does the consultative group justify such a naïve proposal?

SNAKE OIL

The credibility of science is under attack throughout the world. Not only on philosophical grounds such as from the creationists, but many entrepreneurs who use shonky data to support their products. These people are alive and well in New Zealand, particularly in the primary production and health sectors. There has never been a greater need for the results of good New Zealand science to be readily available to other scientists, policy makers and consumers. In a letter the Institute received recently from Hon David Parker, he said the government's response to climate change is – and will be – heavily dependent on science and evidence-based research. So where will this specialist work be published – not, we can assure you, in a grab bag of all New Zealand science.

APPLIED SCIENCE

The underlying competitive strength and productivity of our primary sector has been built on long-term fundamental biological research in areas such as bio-control; plant and animal breeding and genetic modification; endophyte and animal and plant metabolism. But there is also tremendous strength in more applied research which is the envy of many countries. Our suspicion is that this area will suffer most if dedicated journal titles are eliminated. This is perhaps not surprising as the land-based primary sector was not represented on the consultative group, even though this sector is not only critical to the national economy, but is currently markedly increasing its contribution.

NEW ZEALAND IS UNIQUE

We repeat science is funded in New Zealand largely to benefit our country. But a great deal of that science is of absolutely no interest to anybody else but us. So where does that rate in some mythical international journal in the Southern sky. Nowhere. Under this extraordinary proposal there will be no place for such information to be published. And so much funded research will have no outlet for peer-reviewed publication. Interestingly enough, of course, the discovery of a strange fungus called endophyte, the growth of a very odd plant called Chinese Gooseberry and the appearance of a "sport" apple which became "Royal Gala" did get published as notes in our specialist journals.

The Institute rejects most of the elements of the proposal, although in principle we have no objection to electronic publication. What we do object to is being asked to comment on a proposal without any information on what is driving these suggested massive and basically irresponsible changes. This needs a much wider and open debate with suitable media coverage. If MoRST/Royal Society can no longer fund decent comprehensive science publication of all New Zealand science (if required), then they should say so and we can ask why not? The Institute would be happy to publish in *AgScience* the arguments for and against.

*John Lancashire
President*

NB: I understand that there were a large number of very adverse comments on this proposal. There has been a response from the committee considering these views, but at the time of going to press there is no information on what will be their final recommendation.

NZ Institute of Agricultural & Horticultural Science & Primary Resources Forum

Tuesday 8th July 2008

Ag/Hort Lecture Block

Massey University, Palmerston North

9.00am to 4.00pm

RURAL/URBAN CONNECTIONS – NEW ZEALAND'S LIFE BLOOD

A series of papers given on this important topic.

4.00pm to 6.00pm

POLITICAL FORUM

Panel consisting of the science spokesperson from each of the political parties presenting their science manifesto and answering your questions.

7.00pm

NZIAHS AWARDS DINNER

NZIAHS members are invited to attend and present at the
**2008 AuSHS/NZIAHS National and Trans
Tasman Horticultural Science Conference**

to be held at the Gold Coast International Hotel,
Surfers Paradise from 21-23 July 2008

"Smart Science for Innovation in Horticultural Enterprises"

Abstracts deadline: 20th April 2008

The focus of the presentations, workshops and debate is to explore how innovation in science can benefit commercial enterprises faced with every-changing environmental influences. While there will be a number of keynote addresses relevant to the main topic areas, the main aim is to encourage participation from all conference delegates through workshops and an active debate. There will be opportunity for delegates to present their current work through oral and poster presentations throughout the conference programme.

Nominations and applications called

Closing date Friday 9 May 2008

This is your opportunity to nominate fellow members for their contribution to the industry.

All details and forms are on our website www.agscience.org.nz.

Alternatively, contact Jenny Taylor (09) 812-8506 or secretariat@agscience.org.nz for personal assistance.

Jubilee Medal	awarded for an exceptional contribution to primary resource science over a sustained career
Emerging Scientist Award	significant achievement and outstanding contribution by an emerging scientist dedicated to research and science leadership
Fellow	for significant contribution to agriculture or horticulture
Honorary Member	significant contribution to the Institute
Honorary Fellow	significant contribution to agriculture or horticulture and to the Institute
Doug Campbell Award	service to sections
Sir Arthur Ward Award	communication beyond the call of duty to the wider audience
AgResearch Technology Transfer Award	exemplary transfer of agricultural (interpreted broadly) information to the end user

Applications for funding are also encouraged:

NZIAHS Postgraduate Award	for a postgraduate research scientist to attend and present their research at an international conference
NZIAHS Science Award	for travel to do with research
NZIAHS Convention Travel Award	to encourage student members to participate at the annual convention

New members

We welcome

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 Stephen Hoyte (Waikato)
 Meredith Guy (Hawkes Bay)
 Emma Bermingham (Manawatu)
 Mark McCann (Manawatu)
 Janine Alfeld (Canterbury)
 Ros Lister (Canterbury)
 Andrew Maw (Overseas)

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- Massey University
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