


# AgScience



## Inside

Investment  
in science –  
every dollar  
spent  
is well spent





*Jon Hickford*  
President

## Every dollar spent is well spent

THE FAILURE OF SHEEP farmers to strike a levy to support wool research and marketing last year led to some extraordinary claims about the benefits, or lack of them, of funding research. It was claimed, for example, that “farmers have invested money in science but have not gained sufficient reward”. These are naive words to most of us who are involved in science, but sadly they express a view that seems to prevail at times in the “instant-gratification” world in which we now live. As a society we seem to have short memories about the incredible improvements seen in agricultural and horticultural production, based in no small part on sound investment in research, science and technology. Accordingly, we have devoted some of this *AgScience* to a few short lessons in history.

Dr Ross Ferguson gives us an account of developments in the kiwifruit industry including the revolutionary development of Hort16A (the fruit of which are sold as ZESPRI® GOLD Kiwifruit). He modestly undervalues his role in this work, which has been recognised with the award of the 2010 NZIAHS Jubilee Medal.

Professor Tony Connor and his Plant & Food Research colleagues talk about more than a century of development in potato breeding. They cover among other things the current production of a staggering 240,000 tonnes of French fries (from potatoes that are now less likely to go brown when cooked) and culminate by describing the recent sequencing of the potato genome. This new research platform will provide immense opportunities for a greater understanding of genes controlling key traits in potatoes and a huge resource for the faster delivery of new elite cultivars to the industry. NZIAHS has recognised Tony's work in science and this industry with the recent award of a Fellowship. He too deserves our congratulations.

Dr Richard Spelman, of the Livestock Improvement Corporation (LIC), provides us with succinct evidence for the role that improved genetics has played

in increasing dairy production in New Zealand. In under 20 years, milk solid production per cow has increased by nearly 25%, and Richard – like others – thinks there are even more gains to be made, but only if we have “ongoing investment in long-term research programmes”. It is great to have this commentary from one of our leading rural sector companies.

Dr John Palmer, from Plant & Food Research, describes New Zealand's world leadership in the introduction of new apple cultivars and the contribution scientists have made to the building of the \$400 million-a-year pipfruit export industry. He tells, too, of innovations in tree training planting systems and roots stocks and work that enhances the post-harvest storage of fruit.

Those who think that investment in research, science and technology gives little reward, need to read the commentary from these leaders in their respective areas and realise good things take time, but when the rewards do come, every dollar spent is well spent!

Continuing on the theme of investment, our past-president, John Lancashire, contributes an article originally written for the Dominion Post newspaper in which he says New Zealand's creaking agricultural 'backbone' is in dire need of reform. He claims the industry is primarily based on ever-inflating land values, suggesting the average annual return on capital for many years has been about 1-2% for sheep and beef farms, and often no more than 2-3% for dairying. Against that, you would have to wonder why anyone would choose to invest in these industries, and given that rural real estate values, like their urban counterparts, have stagnated in recent times, you do need to wonder what our future holds economically. Should this economic reality check mean we stop investing in new research, science and technology. I would hope we have already answered that elsewhere in this issue of *AgScience*.

POLITICALLY, THE MERGING OF MoRST and FRST seems to be a protracted process that some have equated to an arranged marriage. We will certainly have a new ministry, the Ministry of Science and Innovation, and applications have opened for the position of Chief Executive. However, we await details on how the respective policy and investment functions of the parent agencies will be merged and what that will mean for those of us at the laboratory bench. In the meantime, Minister Wayne Mapp has assured us that “investment is going to the right areas, enable more strategic funding decisions to be made, and simplify the system so that researchers can focus on their work instead of funding applications”. Let's hope this is all true.

FOLLOWING ON FROM THE release of the CRI Taskforce Report, new appointments have been announced at most of the CRIs and at both the board and managerial level. Dr Tom Richardson has taken over from Dr Andrew West as CEO of our largest CRI, AgResearch, while a new chairman, Michael Ahie, takes over at Plant & Food Research. Dr Richardson's credentials have been honed over a number of years at the New Zealand Forest Research Institute Ltd (Scion), while Mr Ahie has held senior executive roles at PGG Wrightson and the New Zealand Dairy Board. Among the other appointments to the CRI boards, it is pleasing to note the names of a few more career scientists. Long may this trend last!

FINALLY, A \$321 MILLION commitment to the dairy and red meat sectors was recently announced through the Primary Growth Partnership (PGP). Heralded by some as primarily an investment in research, science and technology, other commentators seemed to be suggesting that business and market development were the primary motivation for the investments. Time will once again tell, but any new money into our key agricultural (and horticultural) sectors is to be welcomed.

# The decline of the pastoral sector and the economy's backbone

THE MYSTERY CREEK FIELDDAYS this year were accompanied by the usual announcements that New Zealand is the world's leading pastoral economy. Given that the average annual return on capital over many years has been around 1-2% for sheep and beef farms, and often no more than 2-3% for dairying, these pastoral farms can hardly be described as successful businesses. They survive because of the massive appreciation in land values, which benefit owners when they exit the industry and sell their properties.

Many farmers work extremely hard improving their properties, believing that they are simply the temporary holders of the land "borrowed from their children". But most are little different from land speculators. They are supported by banks, eager to lend money on the cast-iron expectation that land values will continue to escalate, rather than the possibility that the business may show a reasonable profit.

Figures from Massey University banking studies show that in the past ten years total rural indebtedness to banks has risen from \$12 billion to \$45 billion, which is certainly not connected to a massive increase in farm profitability in that period.

Apart from repeated claims that the pastoral sector is the "backbone" of the New Zealand economy, which has been in relative decline for 50 years, it does not make sense that we are so dependent on an industry which is largely based on non-productive, continually inflating land values.

There is little evidence that the industry and government are ready to take the hard decisions to improve the situation. Few would disagree with Craig Norgate's view that "people clearly understand what needs to happen and it's only industry politics that are holding it up". As meat works continue to close, the failure of the meat industry to rationalise its operations is seriously damaging our economy. But all we get is a highly public spat between the leaders of Silver Fern Farms and ANZCO about who runs the better company.

On a recent mission to China led by Trade Minister Tim Groser, nine companies from the highly competitive New Zealand mussel industry agreed to cooperate on marketing green lipped mussels in that country. Conversely, one meat company, Silver Fern Farms, talked about its proposed strategy of targeting niche products and "going it alone".

The situation in the wool industry is even worse. The annual export value of wool has been declining for years – it's now around \$500 million, down 33% from \$750 million a decade ago. Talks to set up a single farmer cooperative collapsed recently, partly

because the players involved had different commercial strategies. Agriculture Minister David Carter nevertheless has claimed that a new industry body will be set up in an attempt to unify the industry. Research has ceased since farmers voted last year not to pay a levy for wool research.

One bright spot is the relative success of Merino New Zealand, which has developed strong interactions with manufacturers and consumers. But fine wools make up only 15% of the total value of the wool clip.

As a result of the monopoly held by the old Dairy Board and the extreme dominance of Fonterra, which processes 90% of our milk supply, the dairy industry has avoided much of the frequently pointless competition which has dogged the meat and wool sectors. Despite optimistic forecasts of prices as high as \$8/kg of milk solids, however, prices are expected to remain volatile. With dairy farm sales at a virtual standstill and the sector carrying

a debt of \$30 billion, prospects are probably average at best. Although there has been a proliferation of new small dairy companies, most are largely involved with commodities and therefore are directly competing with Fonterra's main business, rather than developing new added-value products.

A recent KPMG agri-business report confirmed that New Zealand's long-held

advantage of being the world's lowest-cost producer of commodity pastoral products is rapidly becoming a myth. The main difference is in the price of our land, which may be up to ten times more expensive than equivalent land in Brazil, Chile and the mid-west of the USA. Other farm costs such as fertiliser, fuel and interest rates, outside farmers' control, have risen 40% in the past decade, while product returns and the proportion paid to farmers have fallen.

The tragedy is that most of the pastoral sector's deficiencies have been apparent for years. It is appalling that the President of Federated Farmers, Don Nicolson, can say that in 30 years in the sheep industry, "I've made as much or better than the average wage just three times". The obvious solution of increasing the proportion of higher-priced pastoral products has been discussed for years but has gone nowhere. The stimulus to make this happen, by gradually reducing the guaranteed returns on land inflation by a land tax, has again been rejected by government. Recent gung-ho forecasts by MAF for commodity prices will only maintain the status quo in the industry, further inflate land values and delay essential reforms without which the decline and eventual fall of the pastoral sector will continue.



# Research and development, and the kiwifruit industry



SCIENTISTS WORKING IN HORTICULTURE are fortunate in that the industries they serve are keen to take up technical innovations.

This is certainly true of the kiwifruit industry.

Growers, packhouses and marketers say that they believe in innovation. For example, the ZESPRI Annual report for 2005/6 stated, "Innovation – the key to the future ... Innovation is a partnership.

Knowledge alone has little value and innovation only occurs when new knowledge is applied." This indicates the need for collaboration between research workers and the industry and for research workers to be aware of commercial priorities and realities. Significantly, the kiwifruit industry is also prepared to "put its money where its mouth is" and supports research financially.


Science played little part in the initial establishment of kiwifruit in New Zealand but as the industry became more important through increased exports, greater scientific investment was justified. A few of the notable successes from this investment include:

- establishment of the relationship between fruit maturity and fruit quality after storage to ensure that customers receive that meet their expectations;
- development of maturity indicators to determine harvest date;
- definition of strategies for long-term storage of fruit, allowing fruit to be exported by ship to the other side of the world;
- introduction of growth regulators to ensure adequate budbreak even when winters are warm;
- selection of good male plants;
- better understanding of honey bee management, essential for good pollination;
- control of fruit fungal rots.

Scientists can also claim credit for initiating two of the most important recent innovations in the kiwifruit industry by carrying out research in anticipation of changing requirements and then assisting with the application of research results:

- introduction of the KiwiGreen programme minimised the use of dangerous pesticides, reduced fruit residues and reduced the costs to growers. Implementation of the programme was possible because of the scientific work that had already been carried out on the behaviour and ecology of particular pests. It allowed the industry to meet the challenging requirements imposed by the EurepG.A.P (now GlobalG.A.P) standards and ensured continued market access. The adoption of the programme over a remarkably short period was possible only because of the collaboration between scientists, the industry and growers.
- identification of the need for new cultivars to complement the existing successful cultivar. Breeding programmes resulted in the release of the new gold kiwifruit, 'Hort16A'. Making this new kiwifruit commercially successful required combining the scientific and technical skills of research providers with

the commercial and marketing skills of the industry. In the ten years since it was launched, 'Hort16A' (the fruit of which are sold as ZESPRI® GOLD Kiwifruit) has earned about NZ\$3 billion dollars in sales and has ensured the financial viability of many orchardists. That the industry now believes that its future depends on continual innovation is demonstrated by the over-subscription for planting licences for recently released new cultivars.

The important benefits of the KiwiGreen programme and of 'Hort16A', the gold cultivar, are described in more detail in *Growing Futures* ([www.growingfutures.com](http://www.growingfutures.com)). 



*Te Puke orchard in preparation for grafting to ZESPRI's new varieties*

ZESPRI Chief Executive, Lain Jager, said the industry's input into new variety commercialisation and licence allocation decisions had been valuable.

"The strong collaboration and communication across the New Zealand kiwifruit industry is one of the reasons we, as an industry, are so successful. Grower debate and discussion is a crucial part of ensuring we are getting it right," he said.

ZESPRI's kiwifruit breeding programme with Plant & Food Research is the world's largest and most advanced, and will deliver substantial new variety opportunities for growers in the future.

#### KEY POINTS:

- ZESPRI received 817 applications for 1800ha of new variety licences
- ZESPRI has approved 600ha of new variety licences for grafting/ planting this year
  - 200ha of Gold3
  - 250ha of Gold9
  - 150ha of Green14
- 556 ZESPRI growers are growing new varieties
- 773 ZESPRI growers are growing ZESPRI GOLD

# Dairy production owes plenty to genetic improvements

THE NEW ZEALAND DAIRY industry has seen milk production increase by 55 kilograms of milksolids per cow over the past 15 years, according to *New Zealand Dairy Statistics 2008-09*. Improvements in both farm management and the genetic level of the dairy herd have driven this.

It has been estimated that up to 60% of the improvement has come from genetic improvement. The economic impact of this genetic gain is estimated at \$35 million a year, which is cumulative and permanent.

Livestock Improvement Corporation (LIC) is a key player in the genetic improvement of the national dairy herd and scientific research is an integral component in the development of LIC's dairy genetic products. Three major research programmes funded by LIC and the wider dairy industry have been key to the rate of genetic improvement on dairy farms.

Artificial insemination is a key component of genetic improvement. With more than 90% of cows inseminated over a 8-10 week period the demands on bull power are immense. The development of liquid semen technology through the 1970s and 1980s has allowed semen to be distributed at 1-2 million sperm per-straw, which is 5-10 times less than the commonly used deep frozen technology. The impact for farmers is that they can generate more daughters from the genetically elite sires and thus have a higher rate of genetic gain.

The selection of the elite sires has been improved by statistical

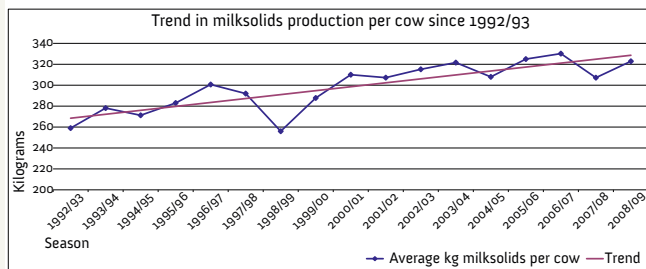
and computational developments in the evaluation of dairy animals. In the 1990s a new evaluation system was developed that utilised all relationships in the national herd and evaluated the different dairy breeds in the same system. Further enhancements have been undertaken in the past decade with new statistical techniques and also the introduction of new traits that have an economic impact on the New Zealand dairy farms. This evaluation system enables breeding organisations to select the best sires for commercial use and allow farmers to make more informed selection and culling decisions. The evaluation system relies on utilising milk production, fertility and health records that are recorded by New Zealand dairy farmers.

Over the past two years the genetic evaluation of animals has been enhanced through the use of DNA technology. Farmers' options now include purchasing semen from bulls that are one year of age rather than the traditional progeny-tested sire of five years

of age. This allows farmers to access the best genetics earlier and the rate of genetic gain is estimated to increase by over 50% from this advancement.

Developments in DNA and other technologies will offer opportunities to the dairy industry to increase the on-farm profitability. To

harness these opportunities ongoing investment in long-term research programmes will have to continue to build upon the successes that have been delivered in the past 20-30 years.



## An obsession with genes leads to Leading Graduate Award



Sarena Che Omar has won the NZIAHS Lincoln University Leading Graduate Award 2009.

SARENA CHE OMAR HAS WON the NZIAHS Lincoln University Leading Graduate Award 2009.

SARENA, FROM KUALA LUMPUR, had been sponsored by the Malaysian government to complete a BSc (Biotechnology) degree at Lincoln.

Her first research publication (Australasian Plant Pathology) stemmed from a summer scholarship project. The project led to her Honours work - with publications in Mycologia - involving the distribution and the genetic diversity of a fungi belonging to the Botryosphaeriaceae species which infect blueberries. This pathogen causes dieback, stem blight and canker, resulting in an estimated 12% yield loss to growers.

Sarena used molecular tools to identify the fungal isolates at species and sub-species level. A key finding is the distinctive species distribution in New Zealand compared to other countries, with *Botryosphaeria australis*, *B. ribis*, *B. parva* and *B. lutea* being the most common species.

She found co-habitation (two or more species in one host) and infection site preference (crown vs stem) among the species. This suggests the potential for integrated pest management approach on blueberry farms, as studies have shown that different Botryosphaeriaceae species vary in pathogenicity and infection behaviour.

*B. parva* isolates were further selected for a sub-species genetic study. This revealed the species to be genetically diverse and not limited to region, farm or even plant. Single hosts were found to harbor several genetically different isolates of the same species. This means growers are up against a pathogen that is non-clonal, unlike other fungal pathogens (such as *Phaemoniella* sp), with a higher ability for the occurrence of disease resistance against fungicides. Sarena also revealed the potential for cross-host infections.

Sarena graduated in April this year with first class honours and this has paved the way for a fully sponsored D.Phil in human population genetics at Oxford.



# The benefits of research and development for the potato industry

THE NEW ZEALAND POTATO industry involves about 270 growers on 10,000 ha and produces about 500,000 tonnes of tubers a

year. More than 60% of the harvested crop is processed (about 75% as French fries and almost all the rest as crisps). The remainder is sold as fresh produce.

Potatoes consistently rank as the second most preferred fresh vegetable in consumer household spending surveys. There is a small export industry, earning about \$80 million a year, 80% of this involving shipments of frozen French fries mostly to Australia and the Pacific. Most of the balance comprises fresh exports to the Pacific.

Potato selection and breeding in New Zealand began in the early 1900s. The first major cultivar of New Zealand origin was Auckland Short Top selected in 1910. Over the following 30-40 years several privately bred potato cultivars were released, focusing on tuber shape and yield. The most successful cultivar during that time was Ilam Hardy bred by R.G. Robinson in 1951.

A government-supported potato breeding programme was initiated in the DSIR in 1934, targeting improved yield and late blight resistance, with virus resistance of lesser importance. After World War II, this resulted in several improved New Zealand-bred cultivars responding to the industry's need for yield increases, improved quality and changing spectrum of important diseases and pests.

The former DSIR potato breeding programme now is continued at Plant & Food Research. This has been highly successful over the past two decades with a constant stream of new cultivars released both here and in Australia to meet industry expectations involving ever-increasing demands for performance across a range of production and quality traits. Key international successes have involved nematode (PCN) resistance, powdery scab resistance, and the global standard for the processing trait of cold-induced sweetening resistance.

The planting of high-quality commercial seed is ensured by an industry-wide seed certification scheme derived from several pathogen-tested seed multiplication systems. This was established with the help of considerable research associated with the development of efficient systems for the detection and elimination of pathogens (especially viruses) from potatoes, in vitro multiplication, and the monitoring of pests and diseases in the field during seed multiplication. Although more than 70 cultivars are currently listed in the seed certification scheme, fewer than ten cultivars account for 90% of the area planted. The most popular current cultivar is Moonlight, bred by Plant & Food Research, which accounts for 15% of total seed sales.

The spectrum of cultivars grown by the potato industry has always been in flux. The reasons for this include changing industry production and quality specifications; changing spectra of pests and diseases; and cultivars sometimes not performing as anticipated, especially in changing environments. Two recent

new challenges for New Zealand potato breeders have involved cold-induced sweetening in tubers and the recent invasion by the tomato-potato psyllid. Cold storage of potato tubers is used, often in conjunction with sprout inhibitor chemicals, to maintain tuber quality until processing. The withdrawal of these inhibitors means that tubers must now be stored at even lower temperatures. This exaggerates the problem of sugar accumulation in tubers and leads to severe processing problems and the need to breed for resistance to this cold-induced sweetening. Resistance to the tomato-potato psyllid is urgently needed in potato cultivars and current research work for potato breeders involves screening of available germplasm to find sources of resistance to provide a long term solution to this problem.

Maintaining an active breeding programme is essential to the ongoing delivery of improved cultivars and to allow rapid response to the demands placed on plant breeders. This requires a substantial research commitment focused on the continual maintenance, ongoing characterisation and improvement of large germplasm resources. Nowadays, the key underpinning research involves understanding the basis of 'new traits', including inheritance and gene function, coupled with development of high-throughput assays for rapid screening of plants. This incorporates research covering the breadth of plant pathology, entomology, agronomy, physiology, biochemistry and molecular biology.

Other areas of research that play a key role in the New Zealand potato industry's success have involved plant pathology, agronomy, food science and nutrition. Research on new approaches to pest and disease control has continually contributed improvements for potato growers, including the gradual movement toward integrated pest management systems. The importance of this research has been highlighted by the monitoring and control measures put in place in response to the recent outbreak of tomato-potato psyllid that threatened the very existence of the potato industry.

Another recent research success implemented in the New Zealand potato industry is the development of a decision support system for potato growers. This followed detailed agronomy research on building models of potato growth under constraints of nutrient and water inputs. With the knowledge of soil type and live climate information, the decision support system allows growers to predict the yield outcome of nutrient and water inputs, and to proactively manage environmental impacts associated with groundwater and carbon-footprint. Recent research on the nutritional quality of potatoes has increased consumer demand for high quality fresh market tubers.

A major recent global investment in potato research, in which New Zealand has been a key participant, has been the determination of the potato genome sequence. This has provided a new technology platform that will provide immense opportunities for a greater understanding of genes controlling key traits in potatoes and a huge resource for the faster delivery of new elite cultivars to industry.



# The history of delivery of science to the New Zealand pipfruit industry

THE HISTORY OF THE delivery of science to the our pipfruit industry.

Apples and pears have been grown in New Zealand from the beginning of European settlement. Rev. Samuel Marsden introduced the first apple and pear trees in 1819, and one pear tree from that original introduction is still growing in Kerikeri. Although the fruit were initially grown for domestic consumption, pipfruit growers were not slow in realising the crop's export potential.

The first export apples were sent from Christchurch to Chile in 1888 and exports to the United Kingdom began in the 1890s, although quantities at that time were small. Nevertheless the fledgling industry had both local market and export market opportunities in its sights. Today, about 60% of the crop is exported, 12% consumed domestically and the remainder processed, mainly into fruit juice. The annual export value of pipfruit in recent years has been around \$400 million.

New Zealand supplies most of its own consumption of apples and pears, as fresh product or as juice, but some fresh apples and pears are imported from the USA, China and Australia.

New Zealand has led the world in the rapid introduction of new apple cultivars: 'Royal Gala' and 'Braeburn' cultivars are important not only to New Zealand growers but also to growers overseas. 'Royal Gala', introduced in the 1970s, was a natural sport or mutation of the cultivar 'Gala', which was bred in 1934 by J.H. Kidd of Greytown but selected and named by Don McKenzie at DSIR, Havelock North. In contrast, 'Braeburn' was a chance seedling growing in a hedgerow in the Braeburn area of the Nelson region in the 1950s and championed by a small group of Nelson growers. It began to be widely planted in the late 1980s and early 1990s. These two cultivars now make up about 67% of apple exports.

More recently, new introductions of apple and pear cultivars have been trademarked to control the volumes of fruit in the market place, to try to ensure continued high prices for the fruit and to increase the financial return to the growers and the breeding programme. Apples from the New Zealand bred cultivar 'Scifresh', marketed as Jazz™, are attracting interest in the overseas markets and Jazz™ is being developed globally by ENZA. The next one in this series is 'Scilate', marketed by ENZA as Envy. Both of these cultivars were bred and developed by HortResearch (now Plant & Food Research). Further new cultivars of apples and pears are being released through Prevar™ from the Plant & Food Research programme.


Each new cultivar needs research on orchard management, fruit maturity and fruit storage characteristics to ensure the fruit reaches the consumer in its ideal condition.

In the early 1990s key overseas markets were becoming concerned at the excessive use of broad

spectrum insecticides and the New Zealand pipfruit industry developed their Integrated Fruit Production (IFP) programme. IFP was defined for New Zealand pipfruit as "the economic production of market quality fruit, giving priority to sustainable methods that maintain consumer confidence and are the safest possible to the environment and human health." IFP relied heavily on work done in the previous 20 years by DSIR and later by HortResearch and was introduced rapidly industry-wide within four years. This programme is continually being updated (now known as PipSure) as further work is done on pest and disease biology and new more selective spray chemicals become available. The pipfruit industry is developing a zero chemical residue programme as the next step in enhancing IFP, relying heavily on input from Plant & Food Research.

Tree training in the 1970s and 1980s changed from multi-leader vase-shaped trees to centre leader cone-shaped trees, with one central trunk and distinct tiers of branches. These came into cropping earlier and were easier to manage than the multi-leader trees. By the 1990s growers were beginning to plant more intensively on dwarfing rootstocks, particularly the rootstock M.9. This trend has continued into the new millennium and it is commonplace now to see trees planted at 1250-3000 trees/ha on dwarfing rootstocks. Much of the ongoing innovations on tree training, planting systems and rootstocks was done by DSIR and later by HortResearch.

Fruit destined for export markets must be stored for extended periods but emerge in markets in fine condition. Considerable advances into the post-harvest storage of fruit were led by DSIR and subsequently HortResearch and Plant & Food Research scientists. An excellent example is research into the fruit disorder bitter pit which in storage renders fruit inedible because of the development of small brown bitter pits in the fruit flesh. This disorder was eventually found to be associated with fruit calcium nutrition. Calcium is not a mobile element within the apple tree and research by DSIR and later by HortResearch showed that dilute calcium salts sprayed onto apple trees from November to harvest could largely prevent bitter pit, which is associated with low calcium concentrations in the fruit flesh.

The Apple and Pear Marketing Board was established in 1948 to provide stability and security to the pipfruit industry. From the mid-1990s increasing political pressure to deregulate the industry led to removal of the single desk selling monopoly in 2001. Despite these changes in industry structure, the New Zealand pipfruit industry relies heavily on research to justify its premium position in overseas markets. Thanks to long-term associations supporting the industry, there is a close relationship between growers, researchers and consultants to ensure that research is quickly taken up and implemented. 



## Obituary



## Dr Ross Beever was a lifelong naturalist

DR ROSS BEEVER JOINED the staff of the DSIR's Plant Diseases Division in 1968 and, when the CRLs were established, became a member of the team at Landcare Research. Apart from periods overseas, he spent most of his professional life at Mt Albert until Landcare shifted to Tamaki.

**Dr Beever was a** lifelong naturalist with a love of our native flora who contributed to our understanding of the biology of New Zealand plants through his study of variants such as large-leaved forms. He unravelled the self-incompatible breeding systems of cabbage trees and, through physiological manipulation, obtaining viable seed of the world's rarest tree, *Pennantia baylisiana*, a single female, thus enabling hundreds of offspring to be grown and ensuring its survival.

As a research scientist, he specialised in fungi and could be described as New Zealand's most distinguished mycologist. He drew on his strong background in biochemistry, chemistry and genetics to make major contributions to the biology of fungi, how they grow, how they behave and how they may be controlled. His work was of fundamental importance to our agricultural economy.

He worked on fungal physiology, especially the uptake of phosphorus by fungi, the genetics and mode of action of fungicide resistance, the genetics of fungal pathogens, on mycoviruses, phytoplasmas and taxonomic mycology.

One of his more important studies was that on cabbage tree decline. The unusual breadth and coherence of his vision proved to be a major strength. It was combined with a depth of analysis that enabled him to make outstanding scientific contributions.

He was also highly effective in seeing work through to publication.

Dr Beever was a Fellow of the Royal Society of New Zealand, a Fellow of the New Zealand Institute of Agricultural and Horticultural Science and a Fellow of the Australasian Plant Pathology Society.

Above all he was a trusted and reliable colleague and a good friend. His quiet determination, his insistence on quality and his commitment to science both for its own sake and for the community made him an excellent role model and mentor for younger scientists. He will be sadly missed.

— Dr Ross Ferguson

## THE NEW ZEALAND HORTICULTURAL SCIENCE ADVANCEMENT TRUST 2011 AWARDS

**Are you working in** horticulture and need financial assistance to develop your ideas, attend a conference, disseminate information or sustain a project that might advance horticultural science in New Zealand.

**If so, and you** are a member of NZIAHS (including a Student member), then you are encouraged to apply to the New Zealand Horticultural Science Advancement Trust for the year 2011 awards.

**Applications are considered on** their merits, including the benefits to New Zealand horticulture. In recent years individual awards typically ranged between \$1,000 and \$2,500.

**While most applications are** for assistance to attend international symposia and meetings, consideration is given to any project that advances horticultural science in New Zealand.

**Application forms are available** from:

Jenny Taylor, [secretariat@agscience.org.nz](mailto:secretariat@agscience.org.nz)

The closing date for applications is 5th November 2010

## New members We welcome

Jenkins Ogwaro (Auckland)  
Kathy Craw (Manawatu)  
Hamish Lowe (Manawatu)  
Noveline Vattiprolu (Manawatu)  
John McCartin (Nelson)  
Paul Cheng (Canterbury)  
Sarena Che Omar (Canterbury)

## Corporate members

- AGMARDT
- AgResearch
- Ballance Agri-Nutrients
- Catalyst R&D
- Plant & Food Research
- DairyNZ
- Federated Farmers of New Zealand
- Horticulture New Zealand
- Lincoln University
- Massey University
- PGG Wrightson Seeds
- Ravensdown Fertiliser Co-op

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