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Primary Industry Management

THE OFFICIAL JOURNAL OF THE NEW ZEALAND INSTITUTE OF PRIMARY INDUSTRY MANAGEMENT INCORPORATED

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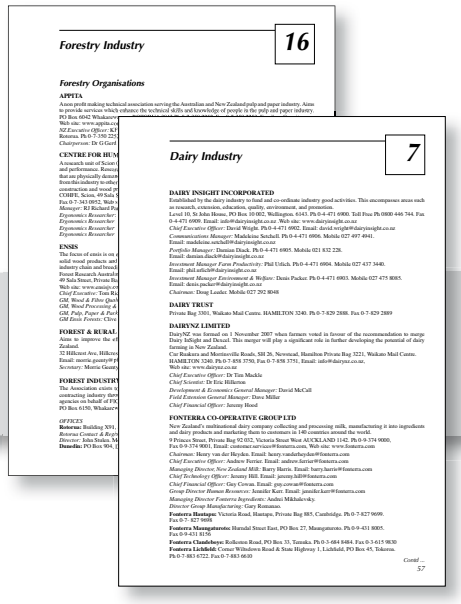
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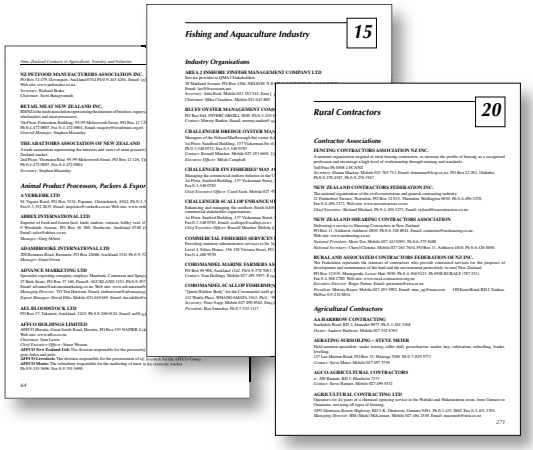
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Primary Industry Management is dedicated to the publication of articles on all aspects of agricultural science and the management of primary industry resources.The opinions of the contributors are their own and not necessarily those of the publishers or editor.

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Contents

Julian Bateson

Dual purpose journal

I am writing this editorial shortly after the devastating second earthquake in Christchurch. As we go about our daily business in Wellington virtually as normal, it is difficult to believe the disaster which has hit those living in and around Christchurch.

It is going to take a long time and a lot of money for the recovery process. Whatever the result, Christchurch will never be quite the same again. I am sure that New Zealand will pull together, as they already are, and will come out of it stronger and better. However, this is little comfort to those who have lost relatives or friends, or to those who have lost houses and jobs. It will be a long haul and we wish them well.

Dual purpose issue

This issue of *Primary Industry Management* has a dual purpose. It is the regular March issue of the journal, but is also part of the information pack for attendees at the International Farm Management Congress. We have tried to keep the journal in its usual style so that recipients from overseas see a fairly typical journal.

This issue has a regional feature on Southland and looks at the changes in farming in this, the most southern part of the mainland. There is another feature on research and development as well as a perspective on the opportunities in Russia for dairy farming.

The niche article is about the production and export of blackcurrants. Perhaps these are not a totally forgotten fruit after all, with New Zealand producing about 10,000 tonnes a year making it the largest producer of blackcurrants outside Europe. The final article gives an insight into Maori farming where we have some of our largest and most successful agribusinesses. They offer lessons to all farmers aiming for excellence.

Southland feature

The main regional feature is on Southland which has seen a lot of changes in recent years. As the first article indicates, Southland has moved from being heavily dependent on sheep in the 1980s to a much more diverse economy which is now more reliant on the dairy industry. Dairying is not new to Southland as there was a dairy industry there in the 1950s. But now the change is significant and it has been quite rapid.

Change happens, but can this and the associated growth in Southland be sustainable? Abe de Wolde in his article reckons this is possible and uses a comparison with the Netherlands to back up his claim. The Southland demonstration farm set up in 2007 has sustainability high on the priority list. The aim is to provide a link between practical farming and theoretical solutions on a commercial dairy farm.

One farmer made the change in the mid 1990s – Mike Horgan. He explains why he moved to farm in Southland from Taranaki and why he would not return. He finds the Southland weather is very agreeable and nothing like the cold and wet that he had been told to expect.

Graham Cooney notes, in his article about the future of sheep meat in Southland, that the only thing humans learn from history is that they do not learn from history. However, he hopes that past mistakes can be avoided and that the sheep industry in Southland, which will involve a smaller number of farmers, will develop strong relationships with a meat company.

What about the future?

Usually the more we know, the better we can do the work. We can see a little of what is happening in planned future developments in the group of articles on aspects of research and development. In one of these Andrew West explains that primary industries are New Zealand's largest scientifically based enterprises, but asks if the rate of adoption of new technologies is fast enough.

DairyNZ came into being just over two years ago funded by a levy on milk production. A main part of DairyNZ's function is research and development and at the heart of this is provision of extension services to farmers. The article by David McCall and Alex Fear outlines the context of the strategy they plan to use, and the links with Federated Farmers. Beef +Lamb is an even newer organisation and the article by Scott Champion outlines its new direction to find more efficient and effective ways of benefitting farmers.

If you are from overseas and are reading this issue of *Primary Industry Management* because you were given a copy while attending the international congress, I hope you are able to learn a little more about where New Zealand is positioned in the primary industry world. If you are not a member of the New Zealand Institute of Primary Industry Management and would like a regular copy of this journal, which is produced four times a year, you can subscribe using the information on the contents page.

Andy Macfarlane

Welcome to the New Zealand experience

This issue of the journal Primary Industry Management is being given to every attendee at the International Farm Management Congress held in Christchurch in March. This article is a special welcome to overseas guests attending the Congress.

The New Zealand Institute of Primary Industry Management is honoured to have the privilege of organising and hosting the bi-annual International Farm Management Congress in New Zealand. We welcome the chance to promote the profession of farm management.

At a time when international attention is refocusing on primary sector production of food, fibre and energy, the importance of farm management specialists to harness our base resources into farming systems capable of sustainable and profitable outcomes for producers and consumers is often under-rated.

What are the key resources we work with?

- Water – our lifeblood, and a resource increasingly under pressure in many parts of the world
- Energy – renewable energy in the form of solar radiation is the main resource for our biological systems. Other forms of energy, both renewable and non renewable are essential to harvest, transport and store food.
- Climate – the combination of circumstances nature throws at us which drives our ability to use water and energy resources.
- Nutrients – water and energy is incapable of producing life without nutrient support.
- Plants – whether food for us or forage plants for animals, the combination of plants we grow use the primary resources of water, energy and nutrients
- Animals – providers of meat, milk, fibre, leather, fertiliser, energy and many other co-products are an essential part of modern society
- Human resources – without labour and management expertise, the above resources cannot be used for the benefit of consumers.
- Capital – it is the mechanism by which we trade, apply value and measure risk and performance.

The farm management skill base

The skill of farm management lies in the art of integrating those resources listed above into the farming systems best suited to the environment, and in a manner capable of producing consumer needs in a profitable manner. In other words, farm management specialists have to have a working knowledge across a diverse range of subjects and skills. Then they have to be able to package that knowledge in a manner capable of being understood and accepted and to produce the results in a timely manner.

To do so requires a thirst for knowledge, one that participants at the IFMA congress obviously have. We hope to be able to add to that store of knowledge while congress attendees are in New Zealand. At the same time, we hope that New Zealand attendees will learn from the experience of overseas specialists.

The New Zealand experience

How does New Zealand fit into the agriculture supply chain? What makes New Zealand a unique producer?

We are a small maritime country, roughly the size of the United Kingdom, sitting at a Mediterranean latitude of

around 40° but with a cold sea current, and a strong westerly trade wind influencing a mountainous topography. These maritime features of a westerly wind on a mountainous backbone create reliable rainfall on the west coast, and large braided rivers at a consistent slope on the east coast. These bring water for irrigation, energy and recreation along with environmental and consumer needs.

Christchurch is one of the few cities in the world where the fresh water arrives at the tap without treatment. At the same time 90 per cent of the electricity generation is from hydro electric power. One of our major challenges is getting the balance right between those uses for water.

New Zealand's latitude, tempered by cool sea currents, means we generally avoid the extremes of continental climates associated with 40° north, or even the only other major southern hemisphere land mass at that latitude such as the Patagonia desert in Argentina.

That typical lack of extreme enables us to grow pasture all year round, albeit slowly in winter. It has encouraged us to value electric fencing as a tool to manage grazing. It has also encouraged us to base our pastures around a legume, white clover, to lower use of artificial nitrogen. This all enables us to farm our ruminant animals outdoors all year round.

Ideal climate

The climate in Canterbury is ideal for multiplication of herbage and vegetable seeds, making Canterbury one of the world's major seed nurseries and the largest in the southern hemisphere. It suits the production of temperate horticulture crops, and notable crops grown successfully in New Zealand include kiwifruit, apples and blackcurrants.

With only four-and-a-half million people to feed, we export 95 per cent of what we produce, making us subject to greater risk in global markets and exchange rate variables. Therefore New Zealand farmers have to be more conscious of global trends and problems. The lack of a local market encourages less innovation in individual market entrepreneurship, but a greater incentive in production innovation.

New Zealand farmers debate strongly the merits of various marketing entities to compete in the global market place. Around 70 per cent of New Zealand food exports are sold through farmer co-operatives. Perhaps surprisingly, New Zealand is one of the most urbanised countries in the world, with 83 per cent urban dwellers compared to 47 per cent in Europe. Many New Zealanders, particularly recent immigrants, have no contact with farms. Despite that trend, as a nation New Zealanders fiercely protect their right to freedom of movement in New Zealand's outdoors, and relish the opportunities to hunt, fish or relax.

Destructive influence

New Zealand has only been influenced by human settlement for approximately 700 years, the time when Polynesians arrived and Maori settled here. It was only 170 years ago when European settlers arrived.

At that time it was an isolated island with no natural land predators, no land mammals and many flightless birds. Man has had a massive destructive influence on New Zealand in a short time, particularly with accidental introductions, such as the ship rat, and intentional introductions, such as rabbits and deer.

Hindsight would perhaps suggest it is fortunate for our environment that there were few humans in New Zealand at a time when the world was still learning of the negative effect of the industrial revolution. Despite that positive, we have a number of weed and pest challenges from species that have found New Zealand's climate to their liking.

Gorse and broom, being legumes, have adapted well as weeds. Ferrets and stoats were introduced to kill the rabbits brought in earlier, but they are severely destructive of native birds. Rats are also major pests. Other less severe introductions such as deer, Himalayan thar and wallabies now have managed populations.

Luckily, New Zealand is too cold for most things that bite – there are no snakes or crocodiles, although our offshore waters are home to many shark species given the abundance of seafood.

Global importance

Despite our small size, the export nature of our primary industries out of season to northern hemisphere producers, means New Zealand is of global importance to a number of supply chains. We represent a significant proportion of global trade in the following –

Milk	Globally
Lamb	Mainly UK, Europe and Middle East
Venison	Mainly Europe
Deer velvet	China and Korea
Bull beef	Lean beef mainly for the US
Crossbred wool	Globally
Fine wool	Globally
Kiwifruit	Globally
Apples	Globally
Blackcurrants	Mainly Europe
Herbage seeds	Temperate climates
Vegetable seeds	For New Zealand and overseas companies
Softwood	Japan, Korea, China, Australia and US
Wine	Globally

It is not surprising, that primary production directly contributes 64 per cent of New Zealand merchandise exports. A proportion of the remainder are manufactured goods originating in the primary sector.

Breakdown of primary production exports	
Dairy	27 per cent
Meat	13.5 per cent
Wool and hide products	3 per cent
Wine	2 per cent
Fruit	4 per cent
Vegetables, seeds	1.6 per cent
Forestry products	8.2 per cent

Our second largest export category, tourism is also highly dependent on our countryside brand, branded internationally as '100% Pure'. Exports are not distorted by government subsidies or incentives, which were abolished in the 1980s. Subsidies are not part of our economic landscape and a main reason for very low New Zealand government debt.

The farm management profession in New Zealand

The NZIPIM is the body representing the interests of farm management professionals in New Zealand. Originating as the New Zealand Society of Farm Management, it was instigated by a new group of young professionals in the 1960s.

Led by Vince Ashworth, Professor Sir James Stewart and other luminaries such as Rusty Firth, who organised the 1999 IFMA conference, they were graduates of Lincoln and Massey Universities. They were trend setters in working in the private sector, charging for advice.

They formed into Farm Improvement Clubs, one of which still operates very successfully in Canterbury, and were governed by the farmers paying for the advice. Within a few years private groups were formed, self governed by advisers. Such groups, varying in size from one man bands to multiple offices, are now the common model.

Free advice was contributed by the Ministry of Agriculture, who competed with the Farm Improvement Clubs from the 1960s. They proved a good training ground for the private sector until the consultancy arm, which was then fee charging, was sold to Pyne Gould Guiness Wrightsons in 2000.

Advise and consult

The adviser and consultancy model was, and still is, very much the whole farm approach. It was developed by Flay and Garret at Lincoln before World War II, and promoted and taught by Professor Stewart and his contemporaries in the 1960s. The teaching approach is built around case study analysis and while expensive and time consuming to teach, leads to graduates with well developed analytical and multi-disciplinary skills.

The success of this teaching approach, while challenging for universities to fund, is undergoing new recognition as industry-good organisations work to build farm business management capability. The New Zealand farm management professional may have skills in agronomy, animal husbandry, finance, risk management, succession planning, supervision, and in some cases valuation. A main skill for such multi disciplinary professionals is to be able to assimilate and communicate large amounts of research.

Important corporation

It is fair to say that over the last 20 years, when agriculture has been out of political favour, our agricultural research base, like other countries, has been scaled down. A new mind set, around collaborative research and education, is taking hold in New Zealand.

Such collaboration is evidenced by the joint support of this conference by Lincoln and Massey Universities, in conjunction with ANZ bank. Specialist rural bankers are important members of NZIPIM, and are well trained by the universities and banks in their understanding of farm management. All today's rural bankers have a compulsory practical farm component to their degree.

The ANZ group, which has the largest share of the lending market in New Zealand and is also very strong in Australia, has growth aspirations in Asia which is our highest growth market.

Massey and Lincoln universities have a strong culture of research and teaching. This is increasingly harnessed in partnership with our own research institutions, such as AgResearch and Landcare Research, and put into practice by their graduates in the farm management and business sector. It will lead to New Zealand continuing to demonstrate leadership in the international farm and agribusiness sector.

For our valued visitors to New Zealand, we hope you enjoy your time here. Ask plenty of questions, and continue to make attendance at IFMA conferences a habit.

Andy Macfarlane is a Registered Farm Management Consultant and Immediate Past President of the NZIPIM.

Ivan Lines

From wool and dags to milk and beyond

Twenty five years is such a short period of time in history but over these years there has been a significant change in Southland society, its economy and landscape. Since the mid to late 1980s Southland has moved from being heavily dependent on the sheep industry to an economy that is much more diverse but now heavily dependent on the dairy industry.

Southland is New Zealand's southern-most province of approximately 1.7 million hectares, or seven per cent of New Zealand's farmed area. Average rainfall is approximately 1100 mm which is evenly distributed throughout the whole year. Pasture production is characterised by low growth rates through the winter of around five kilograms per hectare per day, but reliable summer growth producing between 50 and 60 kilograms a day. Total production is around 12 to 14 tonnes of dry matter per hectare.

Sheep and arable

In the mid to late 1980s Southland had a very mono agrarian base. Whilst there was some horticulture, most of the agriculture carried out in the region was based around the sheep industry. Before this there had been some small changes. In the 1970s there was a significant arable industry and even further back in the 1950s there was a significant dairy industry.

There were 78 dairy factories in operation in the 1950s and there are not many properties that do not have an old dairy parlour as part of their outbuildings. Nevertheless in the 1980s the region's agriculture had progressed to a point where there were 7.3 million ewes, with the highest level of productivity in the country. Lambing percentages in the late 1980s were 112 per cent versus the national average of 101 per cent.

Subsidies go

The mid 1980s, as with the rest of the country, brought the removal of supplementary minimum prices. But because of Southland's agrarian base, nowhere was their removal felt so keenly. Invercargill became almost like a ghost town, economic development went into recession and there was significant population decline.

The dairy industry at that time was very small and quite archaic, characterised by good production but very low per hectare production. There were only 100 dairy farms with an average herd size of 120 cows. There was one dairy factory producing mainly just cheese. This factory was old and in need of upgrading. Production was three per cent of New Zealand's total.

Started by sheep farmers

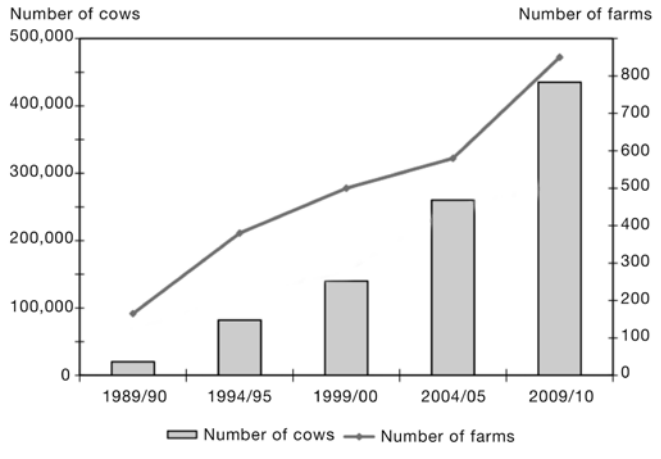
The earliest pioneers of the dairy resurgence were local sheep farmers which contradicts the more commonly held assertion of North Island dairy farmers invading the greener pastures of the south. While some might say their giant step was disillusionment with the sheep industry, in reality it was more basic and founded on economics. One of these was trying to drive trucks full time while trying to farm 1800 ewes. The only way that the farmer was able to stop working off farm was to convert to dairy.

In those early days these pioneers had little information or experience on which to base their life-altering changes. Comparisons with the existing dairy industry were unbelievably conservative. The success of these early conversions resulted in a wave of dairy farmers from the North Island, and sheep farmers converting their own farms. Growth was phenomenal, with the industry almost doubling every five years.

The dairy industry in Southland now boasts some 850 dairy properties, with 420,000 cows producing approximately 160 million kilograms of milk solids, or 15 per cent of New Zealand's total production. Its contribution to the economy is now in excess of $1.2 billion with the sheep industry contributing approximately $680,000.

Although Southland is still New Zealand's most productive sheep producing region, numbers have dropped

Dairy industry growth



47 per cent to four million ewes. Productivity, however, has improved significantly with lambing percentages rising from 115 per cent to 140 per cent and total meat production improving from 180 kg per hectare to 255 kg per hectare. While the sheep industry has done much to improve its performance, most of the increase in Southland has been as a result of sheep farmers looking over the boundary fence at the dairy industry. To remain competitive, regular pasture walks and intensive production monitoring are now common place.

Significant changes

Although much of the productivity improvements in the dairy industry have been due to increased scale, production per head and per hectare has improved as well. Since the late 1980s milk production has improved from approximately 560 kg of milk solids per hectare, or 280 kg milk solids per cow, to 1,150 kg milk solids per hectare, or 380 kg milk solids per cow.

Agriculture has always been a major part of Southland's economy but it is now 24 per cent of local GDP compared with 17 per cent nationally. Invercargill is now a vibrant city and a stark contrast to that of the mid 1980s. Its economy is now much more diverse and less reliant on the fortunes of any single product or sector.

While the change in the landscape has undoubtedly brought positive economic development, there have been some other significant changes. Southland's unemployment rate is now the lowest in the country at just over four per cent. Although on the surface this is positive, it has caused problems when trying to attract staff of sufficient quality, not only dairy farm workers but also for servicing the industry.

Although population growth has been modest there has been a change in its makeup. It is now a much more multi-cultural society. Tolerance and acceptance of other customs and nationalities is gaining momentum.

Southland is in danger of losing its competitive edge. As the dairy industry has grown the opportunities to source low cost feed are diminishing. It was once a region of high cost wintering and low cost summer milk production but this is now no longer the case as the ever increasing demand for feed grows. Land price increases have also reduced returns on capital invested. While they are still very competitive in relation to the rest of the country, they are not as good as they were four to five years ago. Land prices have since fallen further than most other parts of the country so this should restore the advantage.

Milk production continues to improve on a per hectare basis but it is now arguable that most of this increase is due to increased feed inputs rather than any true productivity increases. It is important to ensure that increased production is backed by increased profitability.

Change in land price

	Waikato	Canterbury	Southland
September 2006 to September 2008	+33%	+29%	+60%
September 2008 to September 2009	-20%	+13%	-9%
September 2009 to September 2010	-10%	0%	-5.5%

All grass versus concentrate feeding 2006/07

	All grass	Concentrates
Kilograms of milk solids per kilogram of live weight	0.83	0.88
Kilograms of live weight per tonne of dry matter	89.9	93.3
Kilograms of milks solids per hectare	1129	1266
Empties	9.3%	8.4%
Concentrates fed in kilograms per head	34	467
Bought in feed per kilogram of milk solids	2.02	3.17
Utilised pasture tonnes per hectare	11.6	11.7
Margin per hectare	$5,264	$5,372
Margin per hectare at $4.55 per kilogram of milk solids	$4,540	$4,585

With more intensive land use in both dairy and sheep comes a greater environmental foot print. There are increased pressures on water quality and quantity. Undoubtedly practices of all land uses have to improve to minimise this footprint but it was gratifying to learn that Southland's water quality has, on average, improved over the last five years.

Irrigation is growing in northern areas of the region and this demand is likely to increase. Some confined aquifers, however, are showing definite signs of being over-allocated already, so it is likely that the potential of irrigation will be limited by supply and management.

The future

So what of the future? It is probable that further land use change to dairy will continue but it is also likely that this will be at a much slower rate. It is important that the region's economy retains a balance of land uses or we will end up in a similar situation as the mid 1980s.

Another likely land use change will be more cereal production to provide feed to the dairy industry. Vegetable production, while currently small, is likely to grow as soil types and climate are ideally suited to such land use. Productivity levels will continue to improve. Up to this year there are some dairy farmers that have never had a drop in production.

There will be improvements simply from greater culling and improved genetics. Growth in the use of indoor wintering will continue. While difficult to justify from an economic point of view currently, increased demand for land, reduced feed availability and environmental effects will see more sheds being built.

Probably more than any other region, Southland's agricultural landscape, economy and society have changed dramatically over the last 25 years. By almost all measures these changes have been positive and Southland is a much better place for them.

Rachael Millar

Environmental effects of land use change in Southland

A public perception survey conducted by Environment Southland last year identified that over half of those surveyed thought the effect of dairy farming on land and water was the main environmental issue facing Southland. This is perhaps unsurprising given the most significant land use change in the region in recent years has been the conversion of dry stock farms into dairy farms.

In 1990, there were approximately 38,000 dairy cattle in the region. By 30 June 2010, this had increased over 12-fold to 458,000 dairy cattle, with Southland changing from being a relatively minor dairying region to a significant one.

No simple answers

However, is perception reality? Is the conversion of dry stock land to dairying having adverse effects on Southland's environment? And what effects are other land uses and activities having? Unfortunately there are no short, straightforward answers to these questions. The reality is that there are multiple and complex factors influencing the state of Southland's environment and many knowledge gaps remaining in our understanding of the effects of land use and management on that environment.

Other sources of contaminants are important when assessing the effects of land use change on water quality. While agricultural activities can release nutrients, faecal bacteria and sediment into our water bodies as diffuse discharges, other activities also give rise to these contaminants. Examples include direct discharges of human wastewater from septic tanks and community wastewater treatment systems, stormwater and industrial and trade discharges.

Grazed winter forage crops have relatively high nitrate losses

There are also background levels of contaminants from natural sources present in our water bodies from wild animals and birds. At present we do not know how much of the contaminants detected in our water bodies come from each different source, although there are emerging technologies that will help with identification and various models that can be run to give estimates.

Variation

Variation also needs to be taken into account when considering the effects of land use change on water quality. The amount of contaminants lost from agricultural activities can vary widely depending on soils, topography, climate and management practices. Similarly, water quality can also vary widely depending on the dilution capacity of the receiving environment. For example, an aquifer that is predominantly recharged by rainfall will have a low nutrient dilution capacity compared to a riparian aquifer which is recharged by the adjacent river as the river will in effect flush the aquifer.

Variation in the amount of contaminants lost from agricultural activities and in the capacity of receiving environments makes it a complex problem to determine the effects of land use change, and there is a high degree of uncertainty. Models are important tools to use for these variations but need a lot of information if they are going to produce quality results.

A further complicating factor when considering the effects of land use change on water quality is the delay between cause and effect. Things we are doing now might not show up immediately in our water quality measurements. Groundwater quality is a good example. Overall, Southland's aquifers have a mean residence time of 30 to 40 years. However, residence time varies depending on the aquifer. This means we are now only just recording evidence of the effects of historic land use practices, and the extent of the effects of more recent land use is yet to be fully realised. In

the same way, monitoring our surface water may not yet show the effect of recent changes to land use practices far upstream, such as hill country land development.

Elevated nitrogen

Like the rest of the country, a general trend throughout Southland is that water quality decreases from the headwaters to lower catchment areas. Most lowland rivers and streams frequently breach water quality standards and guidelines for nutrients, faecal bacteria and sediment. Groundwater quality is generally potable with the majority of groundwater sites sampled by Environment Southland meeting the drinking water standards for the indicators measured. However, elevated nitrate concentrations are found in localised areas, while faecal contamination is encountered in 22 per cent of bores. This faecal contamination is thought to be restricted to the area immediately adjacent to the wellhead, and caused by poor bore siting and construction, rather than overall contamination of the aquifer.

Trend analyses being undertaken by Environment Southland show that levels of phosphorus, faecal bacteria and sediment at the surface water sites monitored have generally not got any worse over the last 10 years and in some cases have improved. Faecal bacteria levels in groundwater have improved in recent years. However, there are increasing levels of nitrate contamination in both ground and surface waters and the median nitrate level of groundwater is now one of the highest in the country.

Some confusion

Given the significant land use change and intensification that has occurred in Southland, it may seem confusing that levels of phosphorus, faecal bacteria and sediment have generally held steady or improved over the last 10 years. A report *Land use and land management risks to water quality in Southland* compiled for Environment Southland by AgResearch last year reviewed land use and land management risks to water quality in the region. It identifies that stock access to surface water and the application of effluent to land are key sources of these contaminants in terms of agricultural activities. It also identifies that generally there is little difference in terms of losses of phosphorus and sediment for different agricultural land uses.

On average, a dairy farm will lose roughly the same amount of these contaminants each year as a sheep or deer farm. However, this is where differences in soils, topography, climate and management practices can introduce significant variance between farms. For example, a deer farm with unrestricted access to streams and wet areas will have very high phosphorus and sediment losses compared to other farms.

Improving land management

In light of the above, it could be suggested that improved land management practices are influencing levels of phosphorus, faecal bacteria and sediment in Southland water bodies on a regional scale. However, this needs verification from site investigations into the correlation between land management practices and water quality trends.

It should also be noted that the clean-up of point source discharges in recent years, such as industrial discharges directly to surface water, could be masking some of the effects of land use intensification. Again, this needs investigation. In terms of decreasing faecal contamination levels in groundwater, Environment Southland considers that this is probably due to improved bore construction standards and an education campaign on wellhead protection.

Why so much nitrate?

So, why are there increasing levels of nitrate contamination in Southland's ground and surface waters? There is no unqualified answer to this question at present. This is due to the complexities and uncertainties associated with determining the effects of land use change on water quality outlined at the start of this article. However, the report by AgResearch mentioned above identifies that, compared with most other agricultural land uses, nitrate leaching losses from modern dairy farms are high.

It is therefore likely that the land use change in Southland which has occurred in recent years will be at least partially responsible for the increasing levels of nitrate contamination in ground and surface waters. While nitrate losses from dairying are high, again the actual amounts leached vary considerably depending on factors such as soils, climate and management factors.

Nitrate losses from free draining soils tend to be greater than from poorly drained soils. This is because sub surface drainage, as opposed to overland flow or direct deposition through stock access to surface water, is the main pathway for the transfer of nitrate from agricultural land to water. This means that land management practices such as stock exclusion, riparian buffers and wetlands for intercepting contaminants from flows are less effective in reducing nitrate losses than they are in reducing phosphorus, faecal bacteria and sediment losses.

The AgResearch report states that effective strategies for reducing nitrate losses need to target the nitrate deposited in animal urine patches in the paddock. This is why technologies such as nitrification inhibitors and off-paddock grazing strategies have been developed and researched in recent times. Grazed winter forage crops have been identified as having relatively large nitrate losses on a per hectare basis and are the subject of current research.

Health risk

The problem with increasing levels of nitrate contamination is that high nitrate levels can pose a risk to human health if the water is consumed. It can also cause excessive weed growth and have toxic effects on aquatic life in surface water. Health issues mainly relate to a rare condition, methemoglobinemia or blue baby syndrome, in bottle-fed infants.

It is recommended that pregnant women and nursing mothers avoid drinking water with elevated nitrate concentrations. Many rural properties in rely on untreated groundwater for drinking water. Groundwater also provides a significant base flow in Southland streams and rivers. Elevated nitrate concentrations in groundwater can therefore also affect surface water quality.

Water quality degradation is often focused on as the main environmental effect of land use change. However other potential environmental effects include increased water consumption, loss of biodiversity, soil degradation and increased greenhouse gas emissions.

Water consumption in Southland has increased significantly in recent years, mainly as a result of irrigation. Before 2000, irrigation was not considered to be necessary for reliable agricultural production in the region. However, with land intensification and the need for more efficient production to remain competitive, irrigation is increasingly being used to increase reliability and production, particularly in the drier northern parts of the region.

Production is also being increased by the transformation of marginal land such as wetlands or hill country covered with native grasses, tussocks and scrub, into new pastures. This type of land development has always been a part of Southland agriculture. However, it has been accelerated by the high value of agricultural land in recent years with areas being developed that would have previously been considered too costly to develop. This can result in a loss of biodiversity.

Poorly planned development in steep hill country can also result in soil erosion and sediment loss. In addition, the piping or infilling of waterways as part of land development activities can result in a loss of freshwater habitats and biodiversity. However this needs to be counterbalanced against the potential for water quality improvements as a result of stock exclusion. Greenhouse gas emissions are linked to the other environmental effects of land use change. The management these emissions falls outside Environment Southland's mandated functions. However, the council's policies and programmes need to take into account the potential for interventions to increase or decrease emissions.

More marginal areas such as hill country and wetlands are now being converted into pasture

Around Southland, efforts to address the environmental effects of land use change are being encouraged by individuals, landowners, groups, industry, iwi and government. Those efforts take a range of forms including promotion and adoption of improved land management practices, planning and regulation, research and investigations, along with monitoring and reporting. Behind these programmes is the work of many other organisations, groups and individuals who make a significant contribution, some in partnership with Environment Southland, some independently. The success or failure of efforts to protect our environment ultimately depends on the collective initiatives and actions of individuals, communities, landowners, resource users and government.

Protecting the environment

Environment Southland works directly with farmers and landowners to support land management practices that will protect the environment. Land sustainability officers visit sites in rural areas and provide advice on land management. This can include advice on soil capabilities, environmental farm plans, nutrient budgeting and land development. They provide individual advice, hold field days and participate in landcare groups.

Environment Southland's soil moisture monitoring network identifies and classifies soil conditions so that farmers can apply effluent when it is most likely to be absorbed by pasture and not enter a tile drain or water body. The council employs a specialist dairy liaison officer who helps dairy farmers with resource consents, effluent systems and other aspects of environmental management.

The Living Streams programme provides free on-farm advice and financial incentives for fencing and riparian planting in selected catchments. Staff work with communities and landowners to take ownership of environmental problems in their catchment, act to prevent pollution and to fence off stream banks.

Environment Southland also provides environmental

information and guidance on land management practices to the wider community. This is via press releases, regular advertisements in the daily newspaper, website updates, consultation partnerships, brochures and publications, and a specific dairy publication called *Enviromoos.* Work is currently underway on land development guidelines.

Regional review

In terms of planning initiatives to solve the environmental effects of land use change, a review of the regional policy statement is underway in conjunction with the Southland district council's review of its district plan. The regional policy statement provides a framework for sustainably managing resources and highlights regionally significant matters, including the effect of land use change on the region's environment. The regional water plan for Southland gives effect to the direction set by the regional policy statement.

The current plan became operative in early 2010 and contains the community's water goals for the region, and rules and methods to help achieve them. A main focus of the plan is protecting the quality and quantity of surface and groundwater resources. It sets out the water allocation framework for the region and covers activities that affect water quality such as discharges and stock access to surface water.

A project is underway to review the regional plans dealing with discharges to land, and to merge these with the water plan, so that there will be one document which covers all discharges to land and water. This is viewed as a way of achieving the water quality goals contained in the water plan.

Matters being looked at include discharges to land from agricultural, industrial and human sewage activities, as well as the cumulative effects of land use change and intensification. In relation to the latter, the focus has been on compiling the scientific information needed for a policy process with stakeholders and communities about how to respond to these effects. This has just got under way. Questions that will need to be answered as part of this process include –

- What is the effect of current land use activities?
- Is water quality going to get better or worse?
- What is the effect of different future land use scenarios?
- What limits might be needed to achieve better water quality?
- How can the limits be achieved?
- What is the cost?
- Are current water quality goals still the desired result given the above?

Regulation activities related to agricultural activities and land use change include the rules around stock access to surface water which were tightened in 2006. They also include new requirements for effluent application to land to reflect advances in science and technology and consent requirements for land development. These regulations are supported by an associated compliance monitoring programme and Environment Southland continues to issue infringement and abatement notices, and to prosecute where necessary.

Research

Research and investigations produce the information for the decisions made about environmental management. Current research being conducted or supported by Environment Southland on agricultural activities and land use change includes the risks related to microbes from burying carcasses and offal, the effects of silage leachate on groundwater, the safe application of dairy sludges and slurries, the environmental effects of winter grazing and other wintering systems, and nitrate pollution of groundwater.

A strategic water study is also underway in the Mataura catchment, which is looking closely at the effects of land use change on water quantity and quality. In addition, Environment Southland continues to undertake monitoring and reporting to assess the state of the environment and the effect of land use activities and land management practices.

Rachael Millar is Environment Southland's Principal Planner.

Example of riparian fencing

Abe de Wolde

Southland demonstration farm
Trying to lead the way for the south

People are funny creatures. In politics and in the media they quarrel about the existence of human induced climate change. There is significant concern and debate if the world is going to warm by half a degree or more.
In the meantime the real elephant in the room is the increasing human population, its increasing food demand and the effect that will have on our planet. Funnily enough, no one really doubts that this is actually happening, people just do not talk about it a lot.
Bickering about details of climate change, while ignoring big global problems such as the doubling of human food requirements, is not very sensible. It is a bit like driving your car over a cliff while worrying that your vehicle is overdue for a service.

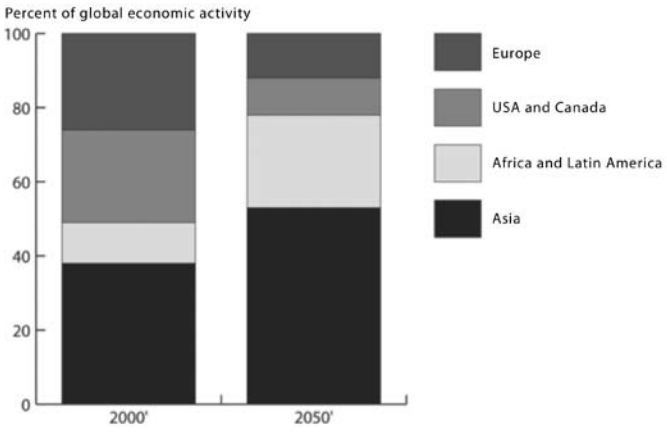
Big global trends will determine future land use in Southland. In the book *Common Wealth - Economics for a Crowded Planet*, Jeffrey Sachs, a renowned thinker on world economics, identifies six trends that will shape the world's future –

- The world population will grow with more and more people living in urban centres
- Income in poorer countries will rise faster than income in richer countries
- Economic growth and the spread of economic prosperity are on the way
- Asia is becoming the centre of gravity of the world economy
- The environment will suffer as nearly every ecosystem in the world is under threat from human activities
- One billion people are still caught in a poverty trap that they cannot escape and most of the population growth is expected in these poorest countries.
- Worldwide food demand is expected to grow by 50 per cent by 2030 and double by 2050.

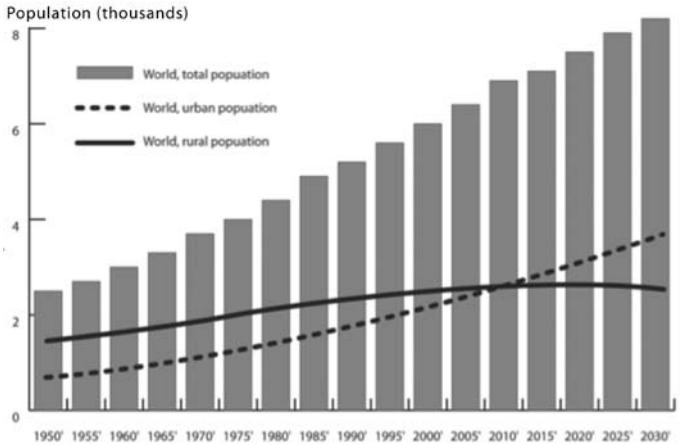
An estimated 1.4 billion people live in river basin areas where water use exceeds recharge levels, with examples including the Yellow River in China and the Murray Darling Basin in Australia. At the same time, wild fish stocks are expected to fall and a growing sector of the world population is expected to grow wealthy enough to demand access to protein from meat and dairy.

I do not know what to think of climate change and the effects that might have on food supply. If it is happening, it is likely to make matters even worse. These factors will result in an intensification of land use in regions with fertile soils

Economic activity by region in 2000 and 2050 (projected)



The urban and rurual population of the world, 1950-2030



and reliable rainfall – such as Southland. The most likely dominant land use will be the one that needs lots of water, which at the moment is dairy farming.

Growth and sustainability

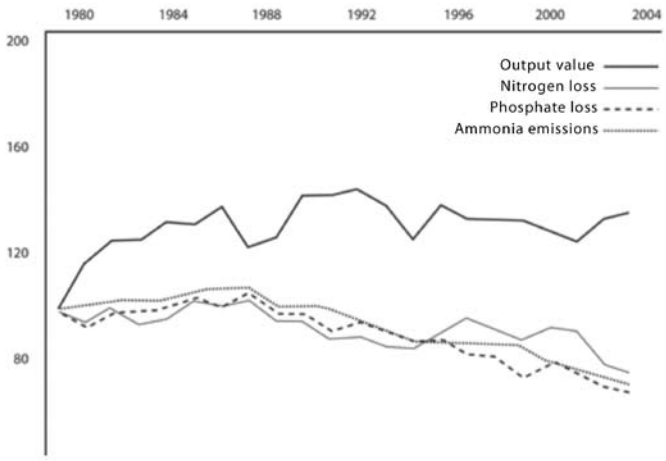
The Southland dairy industry has a tremendous growth path in front of it, provided that this growth will be sustainable. Can this be done? Will the dairy industry be able to continue its growth while avoiding unacceptable damage to our environment? Will it be possible to have a healthy, prosperous dairy industry co-existing with a healthy, well managed local environment in Southland?

I believe this is achievable. To illustrate this, I would like to make a comparison between Southland and the Netherlands.

- Southland has 496,000 dairy cows, the Netherlands 1,420,000 dairy cows, three times as many
- Southland dairy production is 128,634,000 kg of milk solids, the Netherlands 886,080,000 which is nearly seven times as many
- Southland has a population of 90,000, the Netherlands 17 million.

Area, rainfall and general climate between Southland and the Netherlands are similar. While being a lot more intensive than the Southland dairy industry already, the Dutch agricultural sector has been able to lower its environmental impact while increasing total value of production.

Environmental pressure
Dutch agriculture 1980 to 2002



There must be a way for the southern dairy industry to intensify and prosper while negating or minimising the negative effects on the environment and on the wider society.

Ultimately the aim should be to guide dairy growth and development in such a way that the Southland community can enjoy the benefits of increased prosperity. At the same time there is a need to avoid the negative effects on its social and environmental environments, and in the meantime contribute nutrients to an increasingly hungry world population. If that can be achieved, everyone will be a winner.

Demonstration farm

With that aim in mind a number of local dairy farmers got together in 2007 and came up with the idea of forming a demonstration farm in Southland. Reliable data would be collected, research would be carried out and information could be sourced to enhance the local dairy industry and to improve sustainability.

A charitable trust was set up and a 295 hectare dairy farm close to Wallacetown was leased. With the help of sponsors DairyNZ, South Island Dairy Development Centre, Ravensdown, Livestock Improvement Corporation and PGG Wrightson we started farming.

Right from the start sustainability has been high on the priority list. In the early days we likened it to a three legged stool – economic, environmental and social sustainability. When one leg is not there the whole thing falls over.

It has been an interesting journey so far, and the challenges we have encountered have been typical for any new business. We make no apologies for that, and we even believe that our experiences help people identify with us when they decide to take part in the Southland dairy industry.

In our short history I believe we can identify some distinct phases, each with their own challenges, requiring different leadership skills.

- Start-up by setting things in place properly, finding people and cows,
- Settling-in phase when the management team has to get used to the farm and all the people in the organisation have to find their place and understand their role
- Defining direction and culture with motivation and focus
- Tidying up loose ends with work on relationships outside the farm gate.

Equity partnerships and absentee owners play a large part in the Southern dairy industry, and I am sure they can relate to what we have done. Often people embark on the journey before everyone is clear on what is involved. After three years in existence we have by no means arrived, but I am happy to report that we are getting there.

Structure

In brief, our structure is as follows. The trust employs the board to run the company. A management team existing of the farm supervisor, farm manager and a DairyNZ representative runs the farm and reports to the board. A business advisory group, consisting of local farmers and sponsor representatives meets five to six times a year to stimulate interaction and to find creative solutions to farming problems.

Of the 295 hectare property, about 35 hectares is sown out in winter crops and about 20 hectares is required to grow baleage to supplement these winter crops. We aim to winter the bulk of our dairy herd on the farm. Last year we managed to keep all the cows at home.

It could be argued that it would be easier to achieve our sustainability goals and to get excellent production results

if we wintered our cows off. But we have decided that a significant impediment to the environmental sustainability of the dairy industry in Southland is the management of the dairy cows during the winter months. We feel that we should be at the forefront of developments and that we should tackle these challenges head-on.

A better proposition

We milk about 775 cows and our targeted production is around 310,000 kg of milk solids. The young stock is grazed off and our targeted nitrogen use is 170 kg per hectare. The farm staff consists of the manager, a second in command and two farm assistants.

Now that we are finding our feet and getting reliable base data, we are also starting to become a better proposition for local research. Already the cultivation of fodder beet has been tried and analysed, and extensive research has been conducted by DairyNZ on the effects of southern style wintering on dairy cows. More projects, such as research into clover root weevil, deeper burrowing earthworms and solar energy for our milking shed might also be in the pipeline.

In addition, Ravensdown, one of our main sponsors, is investigating ways to monitor the farm's effects on surface water. There is a stream running through the property and plans are in place to install monitoring equipment to determine the changes in water quality from when the stream enters and when it leaves the farm.

We invite research and hope to provide a reliable, consistent platform to conduct it. However we will have to be conscious that we are a commercial dairy farm and that the day-to-day operations have to continue without too much disturbance.

Getting it right

We have spent a lot of time getting our mission right. We believe this is very important for any organisation, but in our situation even more so, because we want to set a template that can be followed on an individual basis and for the southern dairy industry as a whole. Defining our mission has been a process of discussion and consultation to make sure everyone involved is comfortable with it and feels part of it.

The whole thing is built one layer on top of the other, reinforcing the whole. We started off with our core values and beliefs – rules of engagement we do not want to violate. From there we worked out our purpose statement. The next layer is our how we will work out our purpose and how we will define progress. All we need after that are the strategies to work out the mission.

The mission is a three page document with firm targets and key performance indicators we monitor - it is a bit too cumbersome to present here. In it social, environmental and economical sustainability can be found in the form of three P's. The fourth P, platform, defines the role we want to play as a dissemination point of reliable information for the southern dairy industry. Additional information can be found on the SIDDC website by clicking on Southland Demo farm.

With help from our sponsors we organise focus days and we publicise weekly farm information on www.siddc.org.nz.

In all of this we are determined to keep our farmer-flavour. We believe that it is important that farmers can easily relate to us and that we are perceived to be part of the southern dairy community, reaching out to scientists and local authorities. We hope to create a platform where farmers, scientists and authorities can creatively find ways to improve farming methods.

We try to provide a link between the practical farming challenges and their higher level theoretical solutions.

Abe de Wolde is a Winton farmer and chairman of the Southland Demonstration Farm Ltd board of directors.

Core values and beliefs

We believe that both in our operation and in the southern dairy industry as a whole –

- Profitability is necessary and important
- Sustainability is to be pursued and ultimately attained
- Honesty and fair play are not negotiable.

We endeavour to instil working relationships built on respect and synergy both on-farm and in our dealings with the dairy support industry and local authorities. In order to achieve this, the Southland demonstration farm will operate in a framework of trust, open mindedness and accountability.

We exist to strengthen the southern dairy industry of New Zealand by –

- Leadership by creating a template for others to follow
- Innovation and creativity around problem solving
- Research applicable to local dairy farming situations
- Gathering local climate, soil and pasture growth data
- Open sharing of all the information we accumulate.

Purpose

We aim to collect and disseminate relevant knowledge in order to find and demonstrate ways to help a prosperous, growing dairy industry co-exist with a healthy, well managed local environment and economy.

Mission

To identify for the Southland demonstration farm what success means in the four P areas – people, planet, profit, platform – for the benefit of southern South Island dairy farmers, while embarking on a journey of continuous, balanced improvement.

Graham Cooney

What is the future for a sheep meat industry on the Southland plains?

When predicting the future, the only viable method is to consider the past. This always reinforces the view that the only thing that humans learn from history is that they do not learn from history. So let us consider some history and see if past mistakes can be avoided in the future.

Starting with wool

The New Zealand sheep industry was originally wool based. Once the wool producing animals had provided sufficient meat for the local population, the surplus animals were disposed off. A favourite method was to drive them over a cliff into the sea. Refrigeration changed everything and New Zealand became a supplier of frozen meat to one market – the UK. Many meat companies were foreign owned and they required frozen carcasses and in general, the size and type did not matter.

The entry of the UK into the EEC in the early 1970s produced a new challenge for wool and meat. Volume quotas for meat were imposed. New markets were required and in the 1980s a major move began to carry out more processing in New Zealand. Until that time processing companies were regionally based. Under a licensing system there was minimal competition for stock to both process and market. De-licensing allowed companies to expand and merge into different geographic areas.

Problem policies

This was the catalyst for innovation from technology and labour agreements. However it also led to intensive price competition for livestock, including policies that at times had little relationship to market reality. The worst of these is spot market pricing.

These latter policies are to the detriment of individual and collective profitability and reinforced opportunistic behaviour from many farmers. Lack of profitability, supply uncertainty and competition for lambs has worked against market development, product innovation and research.

Under a further processing model which is led by the market, a specific size of meat cut is required. In the New Zealand sheep meat industry there is often a mismatch between market needs and product characteristics. This can happen in animal type and in farmers' demanding space due to climatic pressures. The demand for a year-round supply of chilled meat conflicts with the seasonal nature of traditional New Zealand pastoral systems.

Industry organisations deal with industry wide issues and individual firms make their own strategic decisions. Processors try to meet the needs of a multitude of markets. Individual producers pursue business strategies suited to their properties. The two are not aligned, communication is often based on the wrong issues and trust can disintegrate. There is no tightly coordinated industry strategy geared to market requirements.

Despite all of the above the industry has made significant progress in all areas. In the decade from the mid 1990s, the annual real percentage price change paid to farmers at 6.2 per cent a year was considerably ahead of any other sector, including dairy.

Why land use change?

There are six major reasons in Southland why dairying has taken back land which was traditionally used for sheep and cropping for the last 40 to 50 years.

Milk as a product is homogeneous, allowing for efficient forward planning of manufacturing decisions. That in turn leads to better communication of forward prices to suppliers. This ability to plan manufacturing decisions is not available to the sheep meat industry as there is a wide range of raw products which can arrive at a processing plant and in an inconsistent pattern.

Contracts with suppliers are for a complete season. In the sheep meat industry this applies in a minority of cases although the percentage is higher in Southland. Dairying has achieved economies of scale which are a long way ahead of sheep. This is confirmed by national figures showing a large increase in cow numbers at the same time as a decrease in the number of dairy farms.

The advantages resulting from increased production have led to similar economies of scale at the manufacturing

end. The sheep meat industry suffers from the opposite trend.

Dairy farmers are able to make management decisions, such as changing rotation length for their cows, and see the result 24 hours later in milk production. That speed of decision making is not available in the sheep industry. And of course until the very recent price increases, the wool price has failed dismally to keep pace with other primary products.

Meat industries and customers

There are international examples of successful meat industries which have some things in common, particularly in poultry and pork. These industries are –

- Profitable
- Predictable
- Consistent
- Sustainable.

In some cases sustainability may be coming under pressure. These successful meat industries have three main participants – customers, manufacturers and producers.

The customer, who sells to the consumer, wants clearly identified products that are always consistently sized and always arrive on time. This is generally non-negotiable.

The customer works alongside the manufacturer on the development of new products and improvement of existing products to meet identified consumer needs. They work together to improve prices, thereby adding to the industry profit.

Processor and producer

Successful processors have some things in common. They keep a low inventory as they are only producing what has been agreed in advance in type and size and send it to the customer soon after manufacture. Virtually 100 per cent of the animal goes into the products and there is a guaranteed continuous supply of animals. In addition there are –

- Minimal numbers of specifications
- Predictable size and type of animals
- Plant use for at least 300 days of the year, 24 hours a day, seven days a week
- Innovative labour agreements
- Investment in new products
- Minimal transport costs from manufacturer to customer.

Successful producers also have a lot in common. Forward supply contracts with the processor specify the date of supply, number of animals and size and type of animal and total period of the contract. There is a guaranteed price, a premium if all of the conditions in the contract are met, penalties if conditions are not met and minimal costs from producer to processor. Everyone involved is well aware that agreements in this chain are legally enforceable and, if purposely broken, they would expect the legal process to be followed.

Comparisons

Arguably the sheep meat industry was a good deal closer to the successful model when it was shipping frozen carcasses to the United Kingdom. However that is not an option now.

The industry meets none of the successful producer requirements. It meets very few of the successful processor requirements and the ones it may be partly getting correct are the ones where there is no direct interface with producers. As a result it is not getting the relationship with customers correct, despite the best of intentions. Where that relationship is correct it is for only a minority of the overall product.

The main obstacles to success

If acceptable profitability at all levels is to be achieved the industry must continually try to meet all of the identified requirements above. Rearing animals in an uncontrolled environment means it is impossible to get them all correct and New Zealand's geographic isolation and reliance on exports pose unique challenges. However there are a number that can be dramatically improved.

While all agree to make slaughter decisions based primarily on availability of feed, the industry will meet none of the requirements for progress. Individual farmers and their meat company should work together to select the appropriate size and type of animal that each farm can produce and on what dates, enter into a contract, and receive a premium if they meet the specifications. It must be accepted that droughts are not an excuse for not meeting contract conditions. Under

these contracts farm management decisions will be first, am I a breeder or a finisher? Second, if I am a finisher, what changes are necessary in my farm management.

Meat companies must be encouraged to develop and honour more grade specific contracts that cater for specific cuts to certain markets. In a successful meat industry there will be premiums for producers who meet the pre-agreed specifications as well as penalties for those who do not. There needs to be a commitment from killing animals early because of a drought, or late because of good growing conditions. This is not an option – at the very least the price for these animals will be severely discounted.

Everyone should agree on a policy which reduces costs between the farm gate and the processor. In return for agreeing on all of the above, producers should demand that companies confirm they are developing the necessary relationships with customers that make all of the above happen.

The chances of this happening

Many suppliers are not interested in an organised industry and it is fair to say this group has not thought about, and may not care about, an industry collapse. This group can be recognised by their insistence that the industry woes are someone else's fault. Company shareholders, boards and senior staff must work with the significant group of farmers who are interested in a better industry strategy.

Despite stock being reared in an uncontrolled environment, the farm management knowledge needed to make the industry into a profitable market-led one is available. It would take the form of specialised finishing properties. Features of these properties will include –

A range of specialised forage crops may be grown

- Irrigation will be used in most cases
- Animal growth rates will be gradually improved
- Stock will be weighed regularly.
- Slaughter decisions will be based on contract requirements and growth rates.
- There will be constant feedback to breeders about growth rates and carcass confirmation.

In the Southland region, with its reliable climate, some farmers will continue as breeders and finishers. However, a handy supply of extensive country relationships would evolve between finishers and breeders.

Meat companies and their ownership

So far in this article no mention has been made of the structure of the industry. That is because history shows that structure in any New Zealand primary industry goes through cycles and will continue to do so.

Blue Sky Meats (NZ) Ltd exists because of a strong dissatisfaction in the 1980s with cooperatives. Future success was considered to be around small innovative companies. Arguably that has gone full circle and cooperatives are now again in favour with a bigger proportion of the sheep producers than 10 or 20 years ago.

The fact remains that this will be a never ending argument amongst producers in all industries, including the dairy industry. As soon as an industry structure is put in place a group will always be attempting to change or undermine it. That is called the free market. So there is no point in spending time and energy setting up a different structure that will not last and will not fix the basic problem.

Conclusion

There will be a sheep industry on the intensive farm land in Southland. What is debatable is the size and shape of that industry. A betting person would put money on it being mainly based on high quality pasture and other feeds which respond to a regular rainfall, being used to finish stock under fixed price contracts for delivery to slaughter on pre-agreed dates and under pre-agreed animal specifications.

This will probably involve a much smaller number of farmers who have strong relationships with the meat company of their choice. Then, and only then, can the companies do their job properly. The farmers concerned should demand that they do so and that the relationships the company has in the marketplace are open and transparent to those farmers. What is certain is that any industry will not be the same as in the past 40 years – to do that would confirm that we have not learned from history.

Graham Cooney is the founder and current chairman of Blue Sky Meats (NZ) Ltd.

Mike Horgan

Making the big shift south

Our venture, or should I say our adventure in 1994 moving south to the nation's most southerly province, began after taking a very tearful farewell from Te Kiri, Taranaki, a district our family had been part of for four generations. It was not difficult to say farewell to a land that had at times tested our resolve with its rocks and swamp, but we were going to miss a very generous community of caring, hard working people.

Why go south?

Why did we move south and not look at North Island farm purchase opportunities? It was a question of finding productive land at a sensible price. We sold 130 hectares (320 acres) in Te Kiri for around $2,500 a hectare – close to $6,000 an acre. Quality Taranaki land at the time was selling for more like $5,000 a hectare whereas Southland's top land was only a quarter of this. Why would you not buy twice as much for half the price?

We had to convert the mainly sheep properties at that time. This came to around $600 a hectare to set up the ideal dairy farm, rotary shed and shares.

The land price across the province varied considerably according to location and contour. After the demand from the north subsided slightly in the mid-1990s, the ever increasing prices levelled off at around $1600 a hectare for quality land.

Dairy prospects began to improve and dairy company politics began to stabilise. Prices and a resurgence in interest in the south from the North Island and beyond our borders sent bare land prices soaring, to peak around $6,500 a hectare during 2007/2008. Higher quality, up-and-running dairy units were making $8,000 a hectare. Currently there is very little movement around land sales, and any sales have seen pricing down 20 to 25 per cent on pre-recession peaks.

Agreeable climate

Our arrival at the partly converted farm in May 1994, after a very eventful journey south with my Dad – Mum had died two years earlier – six children in tow and as much useful gear as we could pack into a van, ute and car, was one of trepidation. It had been a very wet May and the rain continued as we splashed across the driveway with our furniture. I think if there had been a vote under the wet, cold, darkening skies that afternoon, there would have been a stampede back across Cook Strait.

The Southland weather has always been a sore point, with many led to believe it must be atrocious, with Antarctica the next major land mass to the south. Nothing could be further from the truth. We find the climate very agreeable and have no wish to return to the Te Kiri weather.

Southland in 1994 was not prepared for the demands of dairying and we were not welcome. At times when I extolled the virtues of Southland's potential to the locals, they responded by saying 'Don't tell too many of your North Island mates, there's enough of you bastards here now'.

Many of the locals thought the North Island immigrants were going to pillage the place. Many did not realise the commitment required to relocate to the other end of the country and develop a dairy farm.

I would like to think that as dairy farmers we have become accepted into Southland, but it is still not uncommon to hear the locals comment about bloody dairy farmers.

More milk

Edendale was the milk processing site for the ever increasing milk supply in 1994. There were around 70 new suppliers in that season. Cow numbers in 1994 were a touch over 100,000, by 2010 this had reached over 500,000. Peak milk intake by Edendale in 1994 was 1.7 million litres. This season about 12 million litres have been supplied from a base of just under 900 suppliers.

The factory at Edendale was immediately under pressure as it became apparent that the hard sell on the virtues of farming in Southland had been too successful. It was not long before we were obligated to increase our shareholding to allow further plant expansion. These were the days before the myriad of meetings across the nation establishing the Fonterra co-operative. As Southland dairy company suppliers back then, we stood alone.

The production of many of the cows brought south far exceeded many of our expectations. It was not exceptional that cows peaking at 18 litres in the north were now achieving 28 litres. After the Edendale site expansion today it operates one of the largest powder drying plants in the world. Plant performance is outstanding and the peak flow from a 500 cow herd is processed in less than four minutes.

Still land available

Of course the dairy company amalgamation process culminated in the establishment of Fonterra. New Zealand

should be proud of its world-respected dairy co-operative, from humble beginnings in 1873 through to the world leader in manufacture and marketing of dairy produce. My one concern around our dairy excellence is the current poor quality of products exported by our local subsidised dairy competitors. Riding on the back of Fonterra's renowned reputation they could put our nation's economy at risk.

While the cow number and production increase has been significant, it must be realised that dairy farms in Southland still only involve 10 per cent of the land area. I was always amused at potential Southland dairy converters from the north saying they were too late and all the good land had gone. There is still a significant amount of more than suitable land available.

Diverse agriculture

We love the diversity of agriculture in Southland. To farm alongside sheep, deer, beef and grain has many advantages and I for one would be saddened if dairying was to completely dominate the Southland rural scene.

Southland now provides almost 15 per cent of the nation's total milk flow, the South Island providing 45 per cent, a dramatic increase over the past 15 years. These days, apart from the weather, many of those interested from the north who ask about Southland, raise the environmental sustainability issue as one of their leading questions. It is true our regional council has high expectations around dairying's environmental effect. Recently, after discussions involving farmer advice, compliance regulations have allowed for a farmer and advisor based strategy in achieving sustainable expectations. This approach avoids the 'one size fits all' of earlier regulation and allows a more appropriate set-up according to an individual farm situation around soil types and location.

Sustainability is an evolving process, and unfortunately dairying has been regarded as the ugly duckling for too long, especially in the south. Much of the banter has come from the emotive environmentalists, much of the science we are seeing today can rightfully put some responsibility in the lap of many other urban and rural contributors.

Water quality in Southland has improved in the past five years, mainly as result of dairy farming diligence around effluent management, but more particularly as a result of the vast waterway fencing effort untaken by Southland dairy farmers. Water quality will only continue to improve if there is some form of obligation to control stock around streams undertaken by non-dairy neighbours. For some reason many sheep, beef and deer farmers feel they are innocent of any detrimental environmental influence. Perhaps it is this concern around compliance for non dairy farmers that has seen a no vote for a dairy representative on our regional and district councils.

Other problems that cloud the issue are the apparent lack of common approach around compliance between dairy farmers. It was very refreshing to see the results of a recent United States university study reveal that New Zealand's waterways are second only to Iceland as the cleanest in the world. I am not surprised. A recent visit to Europe revealed to me just how precarious water supply and quality is in that part of the world.

More work available

Earlier I mentioned the development of the Edendale manufacturing site. The number of businesses established or evolving around the need to provide the skills and service to such a site is quite high.

One particularly well known Southland electrical firm had seven employees and four service vehicles operating in 1994. This firm now has a staff of 100, over 60 vehicles and makes excuse about the fact that it has expanded on the crest of the milk wave. If you look at most of Southland's agricultural service industries over the past 15 years, increasing cow numbers have seen an almost identical rise in service industry employment.

I was taken aback on an occasion in 1994 when a truck pulled in to drop fence posts off to complete a farm conversion. I was confronted by the driver and his colleague suggesting they would be out of jobs as dairying chased all the lambs from Southland. I did not argue the point. A year later those same men were complaining that as an industry we worked around the clock, seven days a week and they would need to upgrade their plant.

Culture diversity

Dairying has brought a diversity of culture into Southland. Families from the Philippines now share the work load on many dairy farms. Our local Catholic church has had a significant increase in its congregation as a result of the contribution of these people. South African, Dutch and Romanian have all been willing to share in the opportunity Southland offers. Their appreciation of this opportunity and the advantages of our great country should shame many of us who take it for granted.

Despite the significant dairy influence in Southland, there still seems to be an underlying distrust or resentment toward the dairying community, particularly by some sheep farming neighbours. I am not sure why. I have raised the attitude problem with sheep farmers who have become involved in dairying either from leasing, grazing, supplement supply or conversion. Many say that they now feel ostracised after making the farming change by some of those who were previously their friends and colleagues.

It is unfortunate that such an attitude exists. Dairy farmers have always been only too willing to share their expertise and effort to further the agricultural cause. New Zealand will only prosper if we all face the future positively around the potential of our land, whatever way we farm.

I attended the local primary school pet day as a the calf rearing judge. It was with pride that I walked among the children and their pets, confident that the mingling of the cattle and sheep was what our future is about. I am sure our children will sense that opportunity and want to be involved in the privilege of working the land in Southland.

Mike Horgan has seven dairy units in central Southland, milking about 3,900 cows.

Ian Turk

Extreme blackcurrants

As with many of the introduced plants and animals being farmed in New Zealand, the first blackcurrant bushes were brought to this country by European settlers. Blackcurrant bushes were planted into the back yards of European settlers and the berries used as ingredients for jams and juices as well as home health remedies.

At a time in New Zealand when health care and medicines were rudimentary, families had to rely on the knowledge of the day relating to natural remedies. It is believed that blackcurrant bushes were brought to New Zealand particularly because of their known health benefits.

Herbalists have known blackcurrant as quinsy bent because of its curative action on mouth and throat ailments and for its ability to strengthen the gums. Blackcurrant has long had a place in folklore as a cure-all infusion for gout, cystitis, nephritic and renal dropsy, eruptive fevers, albuminuria, aenarnia, oedema, incipient miscarriage and general fatigue, rheumatism, dysentery and inflammation of the stomach or bowel. An impressive list, and science is now catching up with folklore, and beginning to explain some of the alleged health benefits.

Growing the industry

Today it has grown into an industry with about 50 commercial growers producing up to 10,000 tonnes of the fruit. The industry is tightly organised under New Zealand legislation and with wide grower co-operation.

The basis for the commercial industry in New Zealand arose from the need during World War II to address a lack of vitamin C in the diet of soldiers. Blackcurrant juice was an obvious source, and its cultivation in the UK was encouraged, leading to the establishment of the Ribena brand. Ribena remains, of course, well known today as a healthy family drink.

The blackcurrant industry grew successfully in UK on the back of the Ribena brand and grew to a point when offshore sources were considered. New Zealand proved to have a suitable climate and environmental features for further development of blackcurrant growing. Blackcurrants require winter chilling, strong sunshine and daily significant temperature ranges, and so we now see the industry concentrated in Nelson and Canterbury.

With Ribena as the initial backbone to the New Zealand industry, it continued to grow through to today to the point where there are many well known New Zealand brands which have blackcurrant in their product ranges. This includes drinks, snack foods, energy food and bakery goods. Further information on the product range is available from the Blackcurrant NZ website. It is a range which now takes a significant amount of supermarket shelf space.

The industry today

In 1990 the blackcurrant industry voted to become recognised under the New Zealand Horticulture Export Authority, and was amongst the first horticultural industries to follow this path. The authority had only been established three years earlier, with the objectives of promoting the effective export marketing of horticultural products. The blackcurrant industry saw that it needed such disciplines if it was to expand and become more profitable.

Once an industry decides that this is what it wants, then it is effectively able to set rules by which all of its participants in the export of the product must comply. It is the industry's role to determine its goals or objectives and the pathway by which it will achieve those. Once approved by the Horticulture Export Authority then all participants in the export industry are bound by those strategies and rules.

For the blackcurrant industry this legislation is used to provide a legal framework behind –

- The rigorous maintenance of quality standards, including the residue-free status of concentrate
- Adherence to the international marketing plan which is developed by the industry
- Attention to servicing overseas market in a coordinated fashion
- Requiring all growers to meet grade standards and food safety standards.

Exporters of the base products – fresh, frozen, or concentrate – must hold a licence from the authority so they must meet industry requirements for communication, co-operation and provision of industry information. Growers are therefore only able to sell blackcurrants for export to marketers who have made a commitment to the industry by becoming licensed and agreement to the industry plans.

Critical commitments

All of these expected commitments are seen as critical if we are to have credibility as a producer of high quality and traceable fruit – particularly when we are such a small part of total world trade. New Zealand may be the largest producer of blackcurrants outside Europe, but we produce only three per cent of total world supply.

The industry rules are available in the industry's export marketing strategy which anyone should read before considering entering the industry. The strategy also sets out industry plans and the roles of particiants in meeting the objectives. The industry's vision is that it will be the world leader supplying the world's best blackcurrant products.

Industry snapshot

The main growing regions are Nelson, and Canterbury. Total New Zealand production of blackcurrants has expanded significantly over recent years. Output will continue growing from improved management and as areas of new and replacement planting of higher yielding varieties come on stream.

Blackcurrant bushes need to be regularly cut back to maintain production levels, and this encourages the uptake of newer varieties. About three quarters of New Zealand blackcurrant production is Ben Ard and Ben Rua, released in the 1980s, and favoured for flavours and health property values. New varieties are now coming out of the blackcurrant breeding programme and are being keenly taken up. We expect the New Zealand industry to remain one whose output is varieties specific to New Zealand which have been bred for properties that the market wants.

Funding from levy

Funding for the blackcurrant industry is mainly through a compulsory levy on all production, which is raised under the Commodity Levies Act, and is currently set at four cents a kilogram. It also receives significant funding for specific science programmes from the MAF Sustainable Farming Fund and Foundation for Research Science and Technology. Glaxo Smithkline Ltd also contributes annually to industry research.

The main traditional product for export is concentrated juice which is used as an ingredient for beverage and jam manufacturers. Concentrate amounted to 80 per cent of exports by value in 2010 which reflects the strong partnership that continues with Ribena. Other major exports are individually quick frozen and block frozen blackcurrants, and there has been considerable investment in New Zealand to increase and improve the value-added wholesale blackcurrant product range.

The industry exports around the world. Biggest by value for the wholesale range is Malaysia, followed by Australia, China Japan and USA in that order. Japan is a relatively new entrant on the table of export destinations, having risen from zero in 2003 to $1.8 million in 2010, based around interest in Japan in blackcurrant health benefits and functional food products.

Health benefits

An important development for the New Zealand industry has been the growing library of information on health benefits available from the consumption of blackcurrants. This work was originally spearheaded in Japan where the market for nutraceutical products is growing quickly – with strong emphasis on bilberry extract products.

The challenge here is to build a profile among consumers for a product which compares extremely well with the information available, but which does not yet have wide recognition. The New Zealand industry is maintaining a focus on the Japan market, the intent being that this is one where we expect higher preparedness for uptake of a new product which will then become more acceptable in our other markets.

The industry has strong links with the Japan Cassis Association whose role is to promote blackcurrants in Japan and to give information to consumers about the health benefits. We are developing a collaborative approach to research which will continue to provide supporting

evidence from clinical trials about the health benefits of blackcurrants.

Using the International Blackcurrant Association we also have industry level links to growers and manufacturers throughout the world. This is a movement which was started at the 2008 international conference held in Christchurch.

Industry structure

The industry structure is governed by Blackcurrant New Zealand, an incorporated society which has six grower and five processor representatives. The industry has in recent years increased the off farm representation on the executive. The industry's future is closely intertwined with a successful marketing programme to raise New Zealand blackcurrants on the world wide commodity market, operating on prices that are not viable for New Zealand conditions and the quality standards that we set.

As mentioned earlier, the blackcurrant industry places great value on its reputation as a producer of high quality blackcurrants and blackcurrant products. Its mission is to have sustainable growth and profitability in the blackcurrant industry, and to differentiate New Zealand blackcurrants as premium products. Achievement of this depends on consistently achieving high quality output.

Communication amongst growers and exporters is encouraged with regular forums for discussion along with grower days. These are always well attended, and the September annual meeting is the focal point for industry debate on science and marketing issues. Blackcurrants NZ are affiliated to Horticulture New Zealand which represents the interests of all growers. Its role is to tackle key generic issues for the benefit of all berryfruit growers and their industries. These include, for example, the lobbying of grower issues such as market access, and food safety.

BlackHort

BlackHort represents the industry's breeding programme which successfully developing new cultivars to meet the programmes objectives but which lie mainly unrecognised outside the industry. BlackHort is a formal entity set up to manage the New Zealand blackcurrant breeding programme.

This programme is jointly funded by Blackcurrants NZ and Plant and Food Research, with funding also from the Foundation for Research Science and Technology. BlackHort was established in 2002 as a joint venture which recognised the growers investment in variety development to that time, along with Plant and Food Research experience, knowledge and investment, and the development of plant material which was still in the various selection stages.

BlackHort also now administers and collects royalties from plant and fruit sales. The industry has moved to collection of royalties on fruit produced from licensed varieties, having moved away from a plant based royalty. Being fruit based, the income stream will take longer to come through, but now with new varieties coming on-stream, the royalty income is becoming more significant.

Hope for asthma sufferers

Research from New Zealand continues to support and grow our knowledge of blackcurrants health benefits, and to provide important information on the selections which show greatest potential, and which should therefore be marked for further development. Over the last year, New Zealand research has been in the news for work which demonstrates possible benefits related to asthma and muscle recovery after exercise. Pathways for these benefits have been explored in laboratory tests, but clinical trials are required to show an actual and effective result in humans.

Scientists have isolated a compound in blackcurrants called epigallocatechin, which controls lung inflammation associated with asthma. It brings the inflammation to an appropriate level so that the cells are behaving normally again. This can give hope to the one in five who suffer from asthma.

A further preliminary study by the Institute for Plant & Food Research suggests that natural chemicals found in blackcurrants may also help balance the effects that exercise can have on the body. Researchers have found signs that an extract derived from New Zealand-grown blackcurrants has three potential effects. It minimises muscle damage by modulating oxidative stress, modulating inflammation and enhancing the body's natural defences against disease.

The future

Growers are confident in the future for blackcurrant growing as the body of science information that supports the folklore is increasing. There are still quite a few steps in front of the industry to access the potential that we see for blackcurrants. But there is enough to give the New Zealand industry, and major manufacturers across the world, confidence that blackcurrants are a valuable and natural functional food ingredient.

Until the position is reached where we have achieved a comprehensive library of clinical test results which will enable authoritative claims about blackcurrants to be made, the industry is looking for coordinated and gradual growth. We want to keep a healthy equilibrium between the demand for high quality New Zealand blackcurrants and growing demand, so that we retain a healthy industry until the benefits of blackcurrants can be fully appreciated.

Daniel Rutledge, John Dymond, Suzie Greenhalgh, Robyn Sinclair, Robbie Andrew, Anne-Gaelle Ausseil and Alexander Herzig

Ecosystem services for multiple results

Primary industries depend directly and indispensably on services provided by ecosystems. Examples of such ecosystem services include the capture and storage of energy via photosynthesis, cycling of nutrients and water, pollination of flowers required for plant growth and reproduction, and regulation of diseases and pests.

We modify ecosystems to varying degrees to suit our purposes and maximise the production of desired services. In New Zealand nearly half the land area has been transformed to support primary production to produce a range of goods and services. In the case of cities and towns, we have constructed novel ecosystems that provide us with valuable cultural and social services. As a result we often need to import ecosystem services that we used to obtain locally such as food, or re-create services that no longer exist such as wastewater treatment.

Natural and complex

Ecosystem services occur naturally from the complex interactions among plants, animals and their environments, and at no cost to us, and so we tend to take them for granted. Over-use and pollution of some ecosystems have reduced the service they provide, leading to a corresponding reduction in production or a need to create man-made substitutes for natural services. These lessons have taught us that, just as we must continually invest in a farm to maintain production, we must also maintain our ecosystems to ensure the continued availability of services both now and in the future.

Maintaining and enhancing ecosystem services needs a sound knowledge of ecosystems and the associated services that they provide. We need to know how these change as ecosystems are managed and modified, develop new or improved management practices, and consider services in policy development, planning and resource management.

This presents a new learning and management challenge for land managers and their advisors on how to apply this knowledge to individual properties. It also presents a challenge to scientists. They have to develop practical, easy-to-use tools to help land managers make smart, long-term decisions that maintain ecosystem integrity and guarantee that future generations enjoy the same range of options as we do today.

What are ecosystem services?

Ecosystems result from a complex interplay among climate, water, soils, plants and animals. They perform the functions needed to support life on Earth, such as the capture and transformation of sunlight via photosynthesis into a useful energy form. They also process and recycle necessary raw materials such as water, carbon, nitrogen and phosphorus, as well as maintaining suitable environmental conditions.

Ecosystems can be defined across a range of scales and extents, from a single tree in a paddock to the entire world. Despite their complexity and diversity, ecosystems also show regularity and pattern. Even if we do not know their structure or processes in detail, we can easily recognise forests, wetlands and grasslands. We also recognise where people exert a strong influence in the form of pastures, orchards and vineyards, as well as in towns and cities – urban ecosystems.

Ecosystem services are defined as the benefits that humans derive from ecosystems. Some are obvious to us, such as clean water or fertile soils. Others are less apparent but still essential, including availability of oxygen or maintenance of tolerable climatic conditions. Still others, the scenic quality of a landscape or a place holding special cultural significance, reflect our values and opinions and are therefore more challenging to describe or define.

Assessing the consequences

In 2005 the United Nations published a landmark study called the Millennium Ecosystem Assessment or MEA for short. The MEA assessed the consequences of ecosystem change for human well-being and identified actions needed to conserve and enhance ecosystems for sustainable human use.

The MEA involved more than 1300 experts worldwide who evaluated the best knowledge and information available at the time. The findings, contained in five technical volumes and six synthesis reports, provided a scientific appraisal of the condition and trends in the world's ecosystems and the services that they provide such as clean water, food, forest products, flood control and natural resources. Also outlined were options to restore, conserve or enhance the sustainable use of ecosystems and the continued availability of ecosystem services.

A framework was developed that classified ecosystem

services into four categories – supporting, provisioning, regulating and cultural. The table below provides more detailed descriptions of those four categories and includes examples of several services for each category within a New Zealand context.

Classification framework for ecosystems services

Provisioning services	Regulating services	Cultural services
Products obtained from ecosystems	Benefits derived from regulation of ecosystem processes	Non-material benefits obtained from ecosystems
Food and fibre	Air quality maintenance	Cultural diversity
Fuel	Climate regulation	Spiritual and religious values
Genetic resources	Water regulation	Knowledge systems
Biochemical, natural medicines and pharmaceuticals	Erosion control	Educational values
Ornamental resources	Water purification and waste treatment	Inspiration
Freshwater	Regulation of human diseases	Aesthetic values
	Biological control	Social relations
	Pollination	Sense of belonging (Turangawaewae)
	Storm protection	Cultural heritage values
		Recreation and ecotourism
Supporting services		
Services necessary for the production of all other ecosystem services		
	Soil formation and retention	
	Nutrient and water cycling	
	Primary production	
	Production of atmospheric oxygen	
	Provisioning of habitat	

Global context and trends

The MEA studied historical trends in 24 ecosystem services and also evaluated examples of future trends. Over the past 50 years, human modification of ecosystems has proceeded more rapidly and affected a larger area than any other period in human history. Most of the changes were to meet demands for food, fibre, wood and other products. Of the 24 services evaluated, four were found to be enhanced, five showed no definite trend and 15 were degraded

While we have benefitted from some of those changes, the risks are increasing. Over the next 50 years, growth in demand, resulting from the combination of rising population and rising affluence, will place even greater pressure on services. Some services may become permanently impaired or degraded. Some groups will be affected more than others, raising important and challenging questions about intra- and inter-generational equity.

Trends in global ecosystem services during the latter half of the 20th century

	Enhanced (↑)	Equivocal (↓↑)	Degraded (↓)
Provisioning	Crops Livestock Aquaculture	Timber Cotton, hemp, silk	Capture fisheries Wild food Wood fuel Genetic resources Biochemicals, natural medicines, and pharmaceuticals Fresh water
Regulating	Global terrestrial carbon sinks	Water regulation Disease regulation	Air quality Regional and local climate regulation Erosion Water purification and treatment Pests Natural hazards
Cultural		Recreation and ecotourism	Spiritual and religious values Aesthetic values

Actions could be taken to reverse degradation and restore and enhance many services. However, doing so would require substantial investments in appropriate technologies, adaptive and proactive management, education, health or further actions to reduce poverty. Regardless of the actions taken, the expectation is for continued loss of the biodiversity that provides the supporting services on which provisioning, regulating, and cultural services depends. Therefore there is considerable uncertainty about the future prospects for the maintenance or enhancement of some services.

Policy and resource management must develop new approaches that prevent the 'tragedy of the commons' where a few benefit at the expense of the broader society. For services such as climate regulation, we have adequate knowledge and information to begin developing economic markets in which participants can trade commodities, such as carbon credits. For other services, such as the supporting services that biodiversity provides, other approaches will be needed to accurately identify costs and benefits and internalise them equitably into business models and societal practices.

Ecosystem services in New Zealand

Each day decisions made and actions taken across a range of scales affect ecosystem services. Central government passes laws and develops policies concerning ecosystem services that are national in scope, such as the Resource Management Act, or international, such as the Emissions Trading Scheme. Regional and local councils formulate policies and plans and

then grant or deny requests for resource consents within the context created.

Businesses develop strategies and implement practices to manage services in particular ways to reach the desired objectives. Within this complex sphere of governance and management, individuals take actions that directly affect ecosystem services. Our collective choices determine whether we sustain and safeguard ecosystem services or exploit them for present benefit or profit.

Planning holistically

Historically the decisions made and actions taken have focused on a single issue or ecosystem service, usually with incomplete or minimal information. We have made progress towards governance and management of particular services such as water quality or air quality. However studies like the MEA highlight the need for more integrated approaches that consider the implications for multiple ecosystem services simultaneously.

Continuing a fragmented and piecemeal approach will threaten both New Zealand's environmental integrity and tarnish our reputation. This will have serious repercussions for our quality of life – culturally, economically, socially and environmentally. We need to move away from decision making based on consideration of a single resource or service to the simultaneous consideration of a broad range of services critical to the overall well-being of citizens both now and in the future.

The ecosystem services for multiple outcomes programme is a four-year research programme being undertaken at Landcare Research. The aim is to assess current and future trends in ecosystem services in New Zealand, and to develop a policy framework under which ecosystem services can be incorporated into decision making. The programme started in September 2009 and is funded by the Foundation for Research, Science and Technology.

In this programme we want to help a move from current thinking in the field of natural resource management towards a more unified concept of natural resource management. To achieve that, the programme has three objectives –

- Characterise, assess and map ecosystem services nationally
- Explore future scenarios for New Zealand' development, especially land use and land cover change, and understand the resulting implications for the composition and availability of ecosystem services
- Integrate multiple ecosystem services into planning and policy decisions and reporting protocols.

Characterising, assessing and mapping

Building on the MEA framework, this research is developing methods to characterise, assess and then map ecosystem services nationally. The assessment and mapping will include both historic and present-day conditions, such that we can analyse recent trends of ecosystem services, similar to the global study, but specifically for New Zealand at a finer resolution.

Using the MEA framework as a starting point, we are developing a New Zealand-specific classification of ecosystem services. We are also developing a tiered framework to characterise and assess ecosystem services which is flexible and adaptable to local needs. The framework has three tiers.

- Tier I – ecosystem services for which we can only undertake a qualitative assessment
- Tier II – ecosystem services for which we can undertake a quantitative assessment based on general relationships with broadly defined ecosystems
- Tier III – ecosystem services for which we can undertake detailed quantitative assessments based on knowledge of more detailed ecosystem structure and function.

Initially, most services will fall into Tier I, some will fall into Tier II, and only a few will fall into Tier III. However as we accumulate and share more knowledge on ecosystem services within New Zealand, more services will progress from Tier I towards Tier III.

Scenarios and implications for ecosystem services

A scenario is a plausible story about possible future conditions based on a set of assumptions about selected trends. Scenarios are becoming more prevalent in research and policy planning. Perhaps the most well known are those resulting from the work of the International Panel on Climate Change.

In its most recent assessment, this panel developed four broad scenario families that explored the consequences of differing levels of climate change. The studies led to valuable insights on the range of potential effects to ecosystems and human well-being and generated debate and dialogue regarding the potential implications and what to do about them.

The research for ecosystem services will develop future scenarios for New Zealand 100 years into the future. We are examining key trends such as population, economic development, climate change and energy demand to understand how they could influence New Zealand's development in the future.

Land use model

A main aspect of our research is developing a model of land use and land cover change which can simultaneously assess the potential implications for a broad range of ecosystem services. Most land use and land cover change models depict a single land use or land cover at each location.

We are developing new methods to model multiple uses and covers at the same location. Our approach will aim to model land systems and corresponding changes, rather than single land uses or land covers. As a result we can model more comprehensively and accurately characterise the full range of ecosystems services provided across landscapes – natural, production or urban. We are especially interested in understanding and modelling the cumulative effects, positive or negative, resulting from a range of actions undertaken across landscapes, regions and the nation.

New directions

Other research focuses on providing a working template to enable integration and consideration of multiple ecosystem services into policy, planning and reporting. We are developing a framework outlining a series of steps for decision-makers to consider as they formulate policy, develop plans and strategies and monitor conditions within their jurisdictions. The framework will also contain references and links to existing relevant data and models.

We are currently examining what existing frameworks are available internationally and assessing their applicability in a New Zealand context. Examples include national policy statements, regional policy statements and long-term council community plans. As part of our review we are also exploring Maori perspectives on resource management and co-management to understand how they may be incorporated into decision-making processes related to ecosystem services.

National statement

Drawing on the results from the other two objectives and existing expertise within Landcare Research, we will design a proof-of-concept system for incorporating ecosystem services into the decision-making processes. We will explore the application of these ideas in two case studies. One is the Hurunui catchment in the South Island and the other the Kaipara Harbour catchment in the North Island.

These case studies share some features while contrast in others. For example, both areas have important issues surrounding water resources. Conversely, the Hurunui is a rural landscape dominated by primary production and within a single region, whereas the Kaipara involves both rural and urban issues, especially the continued pressure of urbanisation from Auckland. It also straddles the Northland and Auckland regional boundary and therefore provides an opportunity to study cross boundary issues.

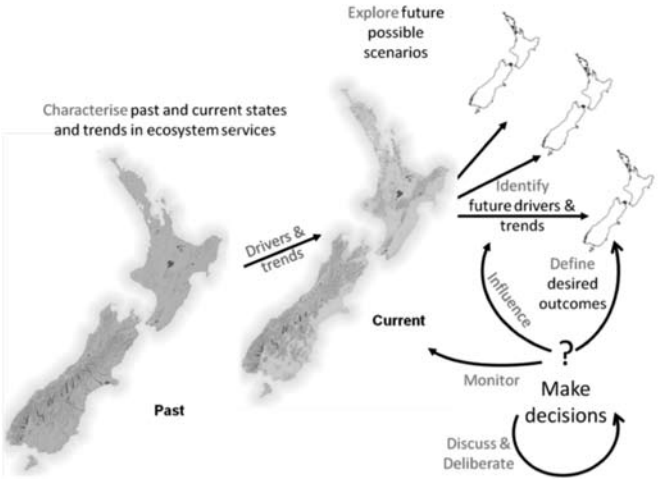
A main result of the research will be a national statement on ecosystem services. This will –

- Assess the validity of the ecosystem services approach for use in regional, national and international planning, policy and reporting negotiations
- Identify ecosystem services at greatest risk nationally and regionally
- Document the baseline conditions for each ecosystem service
- Provide methods that permit routine and consistent assessment of ecosystem services over time
- Recommend how an ecosystem services approach can be used more broadly for regional, national and international planning and policy decisions.

Integration and synthesis

The diagram on the next page illustrates how the research from the three objectives is integrated to help manage ecosystem services for multiple outcomes.

The first objective is to assess and map the condition and historic trends in ecosystem services. This both helps us understand the current situation and informs us how ecosystem services might change in the future based on observed trends.



The second objective is modelling future trends in ecosystems services using assumptions of future problems and trends to develop a set of scenarios. The scenarios are compared with defined goals or desired results, such as those identified as part of long-term council community plans.

The third objective involves policies, strategies and plans being developed and management activities developed or modified to try to influence the future trajectory of ecosystem services locally, regionally and nationally. Conditions are monitored to assess actual versus desired progress. The process is repeated and policies and plans are adjusted accordingly to meet changing goals, outcomes, or conditions.

Many benefits

The research will benefit land managers in several ways. It will help them assess, both individually and collectively, the consequences of management actions on a fuller range of ecosystem services – supporting, provisioning, regulating and cultural. Individually, managers can use that new knowledge to improve their operations to enhance stewardship of ecosystems services. This will increase the long-term viability of their business and creating opportunities for enhanced profitability. For example, this can be by reduced input costs or higher margins for products created to particular performance standards.

Collectively, land managers can work together and along with their advisors, policy makers, planners, resource managers and the broader community to understand and anticipate the cumulative effects of individual decisions on ecosystem services. This will lead to better recognition of who benefits from ecosystem services and who suffers from their degradation. If this is carried out properly, we can progress to a fairer, more equitable and more sustainable use of ecosystem services and move the commons away from tragedy towards triumph.

Daniel Rutledge, John Dymond, Suzie Greenhalgh, Robbie Andrew, Anne-Gaelle Ausseil, Alexander Herzig, Robyn Sinclair all work for Manaaki Whenua Landcare Research.

Andrew West

Technology adoption in New Zealand's pastoral sector – a personal view

I make the basic assumption that science and technology are important to the pastoral sector, which I define as farms, processors, transporters and retailers. In other words, the lamb, beef, venison, velvet, wool and dairy value chains. It is a reasonable assumption because technology is everywhere you look, from the milking shed, RFID tag or the robot cutting lamb carcasses to the genome of cattle or the fermentation of milk. The primary industries are New Zealand's largest scientifically based enterprises.

Developed by public research institutions

The rate at which primary industries adopt new technologies is a perennial concern. Are they doing so fast enough? Could and should they do better? The questions are usually asked not of the industries themselves – the demand side, but of the research institutes and universities producing science and technology using taxpayers' money – the production side.

Importantly, relatively little technology currently operating on New Zealand farms directly came from this source of public science. Improvement for animals, such as cow genetics research, can be from LIC or CRV Delta, grass research is often from PGG-Wrightson or Barenbrug, fertilisers form Ravensdown or Ballance Agrinutrients, milking sheds from Milfos, WMC or De Laval.

Farms and firms within each industry have adopted the use of a vast array of technology developed overseas or developed within New Zealand by the private sector. However, the science and technology developed in New Zealand's public institutions has a special place in the pastoral sector because often, maybe even usually, it is aimed at problems or opportunities unique to New Zealand.

Classic examples of such science and technologies include –

- The breeding of white clover
- The use of endophytes
- Genetic selection in sheep
- Bio-control of pasture weevils
- Accelerated conditioning and ageing of carcasses
- Electric fencing
- The transformation of whey into valuable intermediary products.

The old days of public research

Angst about present rates of technology adoption or claimed lack of it often refers to the years from the 1950s to the 1970s as a golden age. In those days government research and development for pastoral farming was centralised in two powerful departments – DSIR and MAF – supported by vibrant, industry-owned research associations. These were focused on processing further up the value chain of each product class – the Dairy Research Institute, the Meat Industry Research Institute and the Wool Research Organisation.

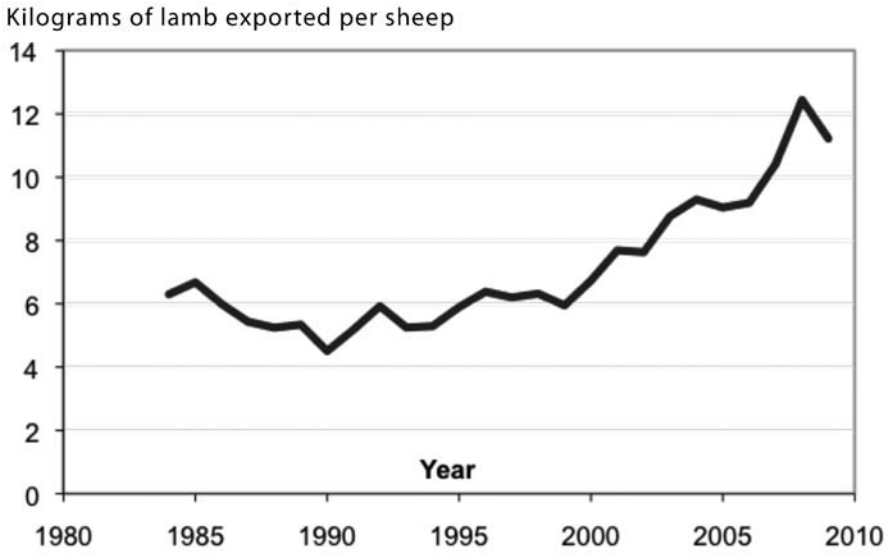
In turn, they were all supported by the University of New Zealand and later by Massey University and Lincoln College. The New Zealand government operated a significant number of field research stations such as Poukawa, Winchmore and Whatawhata, with each having up to 50 scientists and technicians.

Training academies operated at places such as Flock House. The government was responsible for technology transfer as well as research and development. In this centralised system I am told that the three highest paid public servants were the Secretary for The Treasury, the Director General of the DSIR and the Director General of MAF.

They worked closely with the leadership of sometimes single desk commodity producer boards, these boards having significant powers to regulate their industries. It was a sophisticated, integrated system that worked well for what it was designed to do, produce cheap animal fat and protein for the British working class. That all changed when Britain joined the Common Market in 1973. Thereafter, the system disintegrated.

Today's public research

In important ways, the farming world of 2010 is inconceivably different from that in 1960 or 1970. The most significant



change is in communication and information technologies. The technological information revolution has helped open up world trade and we now enjoy access to global trading blocs far superior to 50 years ago.

A subset of this is the scientific revolution in our understanding and management of biological information from our discovery of genomics and now epigenomics. Financial capital is movingly freely internationally and demand for ruminant-derived foods is rising with growing wealth. We are increasingly focused on our place within value chains and how we can return a greater share back to New Zealand of the total value represented in our pastoral products.

We are now also facing up to the serious pollution caused by, amongst others, farming activities and are trying to reduce greenhouse gas emissions and superfluous nutrient discharges. We have yet to come to terms with the fact that humans are rapidly progressing the sixth great mass extinction, much of it due to global habitat destruction for the purpose of farming. Arguably, the pastoral sector has never relied more on science and technology than it does now.

Need to change

With the disintegration of our old system of pastoral sector research, development and technology transfer, what are we left with now? Something which is not as good as what we had. Clearly what we had needed to change as our value chains refocused their other attributes and activities on a much wider range of markets. But the changes that occurred were not designed with that in mind, and some changes were not really designed at all.

Most major components have gone including the DSIR, MAFTechnology, the Dairy and Wool producer boards, MIRINZ and WRONZ, most field stations and much applied research and development and most training academies. The majority of formal technology transfer activity has stopped in meat and wool, but has been retained in dairy by the deliberate creation of DairyNZ borne out of the Dairying Research Corporation and Dexcel. We now have AgResearch, Landcare and NIWA, each with a significant advantage of integrating whole areas of research and development that were often separated in the past.

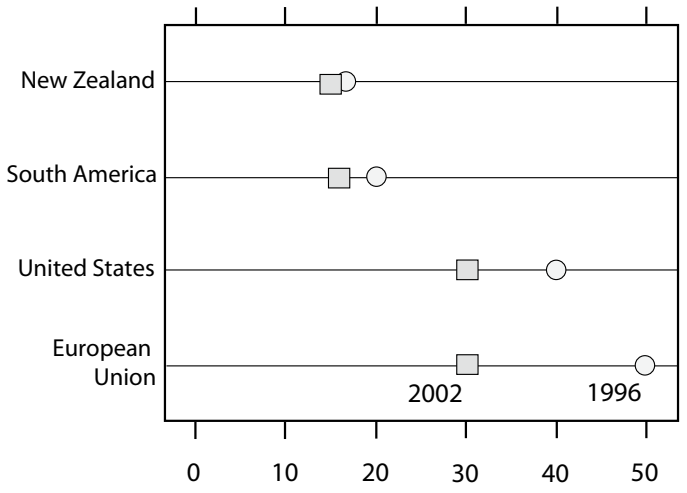
For example, AgResearch combined the DSIR's forage and rumen sciences with MAF's livestock and farm systems sciences. In the process, however, MAF's technology transfer function was commercialised as a state owned enterprise in 1992, which subsequently failed. Fortunately it turns out that the recent, innovative Fast Forward Fund and Primary Growth Partnership initiative is mainly focused on technology adoption at the resolve of firms and industries. However underlying scientific investment remains lamentably low at 1.2 per cent of GDP compared with the average of other nations average of around 2.5 per cent of GDP.

Lincoln is now a university and one that, due to the government's chosen funding model, loses money when it enrols students in many of its primary industry courses. Massey University has greatly diversified its focus away from support of the primary industries. Industry support for research and development relies on a Commodity Levy Act which could be better designed.

Importantly, trust in scientists has been eroded due to an increasing degree of control over government's funding for research and development with industry. We have seen a massive swing in land use towards dairying and away from lamb and wool. This has led to the almost complete collapse of the once dominant wool industry and with the lamb industry under growing threat from carbon farming using the Emission Trading Scheme.

How well are we doing?

Perhaps we do better than we think. For example, our rate of productivity growth in the sheep meat industry has been rising, not falling. Much of this is led by technology adoption on farm such as fecund composite sheep allied to terminal sires, and in the processing factories such as non-invasive scanning to measure meat attributes that most final consumers want. We are not failing in technology adoption



Milk production cost per kilogram milk

in an industry where most of the formal technology transfer has been dismantled.

However, can we do better? The answer is an emphatic yes. Our productivity growth rate in the primary industries is keeping this country's head above water, but it is not that good. We are not the cheapest country to produce milk any longer and our farming systems cost ranking will further erode.

Improved technology adoption

Components of a system need improving and I suggest ten improvements.

New Zealand needs to double the amount of money spent on research and development estimated as a percentage of GDP from 1.2 per cent to 2.5 per cent. We also need extra funds from both government and the private sector. We need a healthy discovery engine. However, some of that money should be for technology adoption by way of a fund dedicated to natural resources like soils, freshwater, air, nutrients and biodiversity.

Firms within the pastoral sector value chains need to spend more on research and development internally. They need to build more mature, supportive relationships with Crown Research Institutes and universities than some of those that exist now.

For this to happen, Crown Research Institutes and universities need to devolve, significantly more responsibility to allocate government funds for research and development, and be held to account for performance against agreed targets. This is now thankfully happening, but it is too soon to yet judge whether sufficient devolution occurs. Providing research entities with power over spending of government funds will rebalance their relationships with firms and industry bodies in a positive manner.

Education funding for pastoral sector-related courses in universities and polytechnics must be raised to the point where an efficient tertiary education institution can make a reasonable profit margin on their core activities. We need to re-examine the merits of the failed AgResearch and Lincoln University merger. It would have created a narrowly-focused, genuinely world-class, research university in our most important areas of industrial specialisation – primary production, tourism and associated environment. At the same time, we need to boost the focus of Massey University further up the food and beverage value chains on the products themselves and their processing, storage and transportation

We need to refocus Landcorp so that it has a substantial new role in technology demonstration and adoption in the sheep, beef and deer industries. It is tragic to deny the country this opportunity in return for a small financial dividend flow from a state owned enterprise operating in industries that farm for free capital gain ahead of dividends. Using Landcorp in this manner, back-ended on to a merged AgResearch and Lincoln University, would create a better system than we had in the 1950s to 1970s to perform research and development and encourage technology adoption.

We need to create more than one specialist innovation park in the area of agri-technology. Waikato Innovation Park focuses on dairy and red meat technologies on and off-farm. With AgResearch and Waikato Polytechnic it provides prototyping facilities and related training at Tokanui dairy research farm, and will soon do so for dairy processing at a dedicated factory at Ruakura. We need another park in the South Island at Lincoln, with a principal focus on broad acre plant-derived foods. These parks play a major role in technology adoption overseas.

The Commodity Levy Act should be amended so that the vote for continuance of the levy is based on production volumes. This will reduce the capricious environment created by the present Act. I do not see how the capital intensive, specialised architecture of a modern industry can be sustained by the present Act, if that industry has a long lifestyle tail.

We need to make transmission of information much easier across the whole rural sector. This calls for high bandwidth broadband to over 95 per cent of farms and rural communities, with an associated technology platform such as Gen-i's Rural Zone to make information sharing efficient and secure.

Finally we need to create a centre of specialist education and research in the commerce faculties of Waikato and Otago universities on how we can return to New Zealand a bigger share of the final value created by our food and beverage goods. Value chain tactics developed here will have a significant bearing on the sorts of technologies we want to see adopted in the future.

That concludes my suggested ten improved. There are many other influencing factors, such as ownership of land and factories, access to capital and trade access. But if we implemented the ten ideas above, I suggest that we would be further ahead than we are now in pastoral sector productivity growth, whilst enjoying a smaller environmental footprint.

The views in this paper are those of the author. Andrew West is Chairman of Gen-i's RuralZone Independent Advisory Group and a Director on the Board of Innovation Waikato Ltd.

David McCall and Alex Fear

Research, development and extension in the dairy industry

New Zealand's dairy farmers have a history of collective ownership of both research and develpment and extension capability for their industry. The most recent chapter in that history is now playing out through DairyNZ which was formed in November 2008.

History

DairyNZ came about by the merger of two previous farmer owned entities. One was Dairy InSight, a levy collection and investment organisation, the other was Dexcel. Dairy InSight and Dexcel were originally formed as part of the dairy industry restructuring in 2001. Dexcel was itself formed from the merger of Dairying Research Corporation, an industry owned applied research organisation, and the extension or consulting officer service which was funded by the New Zealand Dairy Board.

Before 2001 dairy farmer investment in extension went back many years, and ownership of research and development personnel dated back to 1992. This was when the New Zealand government formed Crown Research Institutes and the Dairy Board formed the Dairying Research Corporation, initially as a joint venture with the government.

DairyNZ is funded by a levy on milk solids production. The levy is invested in behind the farm gate research, development, extension and biosecurity such as TB control.

Industry context

Since its formation, DairyNZ's remit and strategy has broadened considerably from those of the parent organisations. This is mainly due to the pressing challenges facing the industry around managing environmental concerns and the changing people structure of the industry. Both of these have made the task of supporting farmers more complex.

Greater pace and scale of on-farm change is required if the industry is to be able to self-manage its environmental footprint and minimise regulation. The trickle-down approach to farmer adoption, based on influencing a few early adopters, becomes seriously challenged in circumstances where rapid change is required across more than 85 per cent of farms.

Equally there is the challenge of ensuring that national and regional policies which guide the direction of change are well thought through and that they are fit for purpose in achieving desired environmental outcomes on farm. Coupled with these, the need for greater depth of people management skills in the industry and the requirement to attract and train staff has greatly increased because farms are becoming larger and employing more staff. The capability of people both on farm and to advise farmers has become a limiting factor to wide spread rapid change.

Working together

The co-operation of many organisations and stakeholders working together is needed to achieve change at the necessary pace and scale across the industry. This is important to reinforce consistent messages and to motivate and provide accurate support for farmers. One organisation cannot achieve the change on its own.

It is necessary to link and co-ordinate efforts with industry training institutions and education providers and to bring sound science and practical farming experience to the policy setting domain. It is also vital to involve dairy companies and other private sector companies which provide advice and services to farmers.

These forces have led to the creation of an industry strategy. DairyNZ is the custodian but jointly agreed with Federated Farmers and the association of the New Zealand Dairy Companies. The strategy specifies five main aims for New Zealand dairy farming. Within this context, DairyNZ is the central co-ordinator of on-farm research and development. It is the only organisation with its mission directly tied to the strategy which is to secure and enhance New Zealand dairy farming's profitability, sustainability and competitiveness.

In performing its role DairyNZ carries out two main functions. First it acts as investor of farmer levy funds in research and development, policy, vocational training, education and industry databases. Secondly, DairyNZ itself carries out research, development, extension and policy and has a subsidiary vocational training company. This capability is positioned in such a way that it complements, integrates and co-ordinates the services of external providers to farmers.

Research, development and extension

A farm systems approach is the core philosophy guiding internal operations. The DairyNZ strategy is to draw on specialist disciplines both in the public and private sectors which can solve problems for dairy farmers. DairyNZ defines its role as ensuring that solutions are adapted and optimised for farm systems in the most beneficial and practical way for farmers.

At the heart of DairyNZ's strategy is the provision of extension services to farmers. This is to ensure that there is one strong and unified message to farmers which is consistent and commercially independent. There is also a need to be able to respond to urgent needs, such as a drought, in a decisive manner.

This is not to say that the extension service is designed to operate in isolation from the many private providers of one on one advice to farmers. The formation of effective partnerships with other rural professionals is a key plank in DairyNZ's strategy to bring about on-farm change.

Rural partners

Partnering with other rural professionals is critical for two reasons. DairyNZ has only 36 extension staff in the field with another eight specialists. By our calculation there are another 1,200 rural professionals who provide one-on-one advice and services to farmers. Access to this sort of coverage is a critical element in extending our reach and support to farmers if we can gain alignment with this rural professional resource.

Secondly, DairyNZ face-to-face contact is mainly confined to working with farmers in groups to maximise coverage and not to interfere with the commercial market. However, adoption of a new technology or practice for most people requires more than being made aware of the opportunity, being given some pointers and then figuring out how to implement on their own. One-on-one advice and support is a critical element for most people and businesses, including farmers, which results in the need for effective industry and private partnerships.

In keeping with the farm systems philosophy, the core focus of DairyNZ's research capability is on applying technologies on the farm and determining how to get maximum benefit within the farming system. Specialist science is outsourced to providers within New Zealand and off-shore, often collaboratively with DairyNZ science to make sure relevance is preserved and that help is given for the transferability of applied research.

Growth and development

The main change in DairyNZ's evolution in the last three years has been the definition and growth of the development function as a distinct component the extension strategy. Historically, extension in the dairy industry relied on extension personnel working directly with science to develop their own key messages and methods to help farmers learn about scientific principles and their application on-farm.

In the latter days of the Livestock Improvement Corporation extension service, and under Rob Pringle and John Penno in the early Dexcel days, senior extension personnel were required to translate science principles into resources for use by extension officers in the field. This was termed a development function. Since then the scope and breadth of the development function has undergone major expansion.

Developers in DairyNZ now comprise about 40 per cent of the total development and extension team. From this development team we have recently spawned extension specialists. They work directly with farmers and grow capability in areas of critical industry concern where there is a dearth of qualified private capability, such as effluent system advisors, and into some traditional areas that were let slide, such as animal husbandry.

The role of developer has expanded from developing resources and tools for internal use to providing resources and tools for use by private individuals and organisations as well as direct farmer use. Examples include InCalf, DairyBase, HR toolkit and Healthy Hoof. This is done on the basis that farmers will not be charged for the product or tool, but can expect to pay for the time of the private consultant who supports them and their business using information provided by the tool. For their investment farmers can expect better advice than if these tools were not available to their advisors who do not have the capability or commercial ability to produce them. Farmers can also expect greater consistency in advice across rural professionals.

Thinking and planning

The second and more important function that the development role is now expanding into is the strategic extension function of designing routes for on-farm change, as Pauline Brightling and others in Australia describe it. That is, thinking through from the problem faced by farmers or the industry, and designing a strategy that will most effectively and rapidly lead to implementation of solutions on the farm.

These strategies, or adoption plans as we refer to them, will usually comprise a number of integrated interventions performed by different groups involved. For example, they may include gaining agreement among key industry suppliers with consistent messages and agreed facts, incentives from dairy companies, gaining agreement from commercial companies to provide new services and supporting them with staff training. Each of these approaches can be supported with the messaging and assistance provided to farmers by group extension activities run by DairyNZ.

Communication

The second area of expansion in the last three years has been communication activities and in particular their integral role in extension by creating farmer awareness and interest. Communication is now also expanding into a greater use of marketing disciplines so that we can know our farmer levy payers better so that we can promote activities of interest to

them in a more segmented fashion. Our customer relationship management database is critical for this initiative.

The third major area of change has been the addition of a policy function and its interplay with science, development and extension. The internal policy team has been created to work in closely with Federated Farmers and Fonterra policy teams. This should ensure that regional and national policy settings which affect farmers are informed by quality science and that policies created make sense on the farm and can be readily extended and adopted.

Extension methods

Against the background knowledge that extension is only part of the process of helping farmers and on-farm change, how have dairy industry extension methods evolved? Many of the extension activities and methods that we use are easily recognisable from the past. The main developments are in how we apply them and in what situation.

As a generalisation we break our extension initiatives into two categories. The first is when we are meeting the need of a reasonably large number of farmers. This may be because of –

- Climatic difficulties they are experiencing
- A common regional problem such as winter in Southland
- Challenges such as managing large farms with multiple staff
- Low milk payout
- A common imperative such as the need to adopt nutrient management planning.

The second category is where we are meeting an individual farmer need, even though a number of individuals throughout the industry will have a similar need. This may be a need for personal development to take the next step in the industry to recognise an opportunity or solve a threat to their farm business.

In each situation the nature of the interplay between communications, policy and external rural professionals, differs. However, for the system to work the factors that contribute to success are strong personal relationships between staff across functions and for there to be understanding and respect for what each brings, including their external networks. Laying this foundation has been a key element within DairyNZ. Tackling the development of external relationships is also getting strong emphasis.

Common farmer need

The approach to tackling common issues has been to create projects with cross-functional teams. Here the interplay between research, development and extension communications and other functions is governed using the project structure. Some projects are quit long and last between three and four years. They involve scientific discovery and monitoring as part of the project, and sharing information with external agencies as well as farmers. Other projects are of shorter duration where science input is advisory.

Often the project will be development led, but not always. Sometimes there is a strong external presence on the team, other times less so. Where others are brought, in it is to involve them as part of steering groups and to present solutions. A current example is the pasture renewal project targeting Waikato and Bay of Plenty farmers ravaged by pests and drought. Here the steering group consists of industry representatives from the seed and contracting industries and scientists from external agencies and DairyNZ.

Focus farms

Another example was our 'tight management for tight times initiative' when farmers were facing a low payout in June 2008. This project was development led, including responsibility for project design, but it had science, extension and communications representation in the core project team.

It was determined to create 28 focus farms across New Zealand, one for each consulting officer at the time. Focus farmers needed to be widely respected in the district, articulate, prepared to share their spending decisions and financial information and in the top 10 per cent for managing average cost of production. Selecting farmers and gaining their agreement was the local consulting officer's responsibility, as was managing the series of events on their properties.

The communications role was to both promote the initiative to farmers and rural professionals and to help with information transfer through the press, internet and DairyNZ web site. National campaign messages were through releases to the press and industry magazines. Each farm was given a page on the web with farm description, fortnightly updates on decisions and monthly updates on financial position. This enabled farmers who attended an event to follow the progress of the farm at regular intervals.

It also proved to be very popular with private advisors and bankers allowing benchmarking for their client work. In addition, farmers could register to follow certain farms and have an email alert and link sent when information about that farm was updated. Finally, the database of farmer attendees and web followers were able to be sent a text message to notify them of an upcoming event The approach allowed us to reach 2,885 of New Zealand's dairy farms manager directly and we estimate we reached another 3,000 of the farms managers via the rural professionals.

Individual farmer need

The historical approach to everyday extension work has been to run discussion groups on a farmer's property and draw out issues of local concern on farm and address them with farmer input. This still has its place where a local issue affects most farmers in the group and the group supports meeting a common need.

However, we have developed a new approach for everyday farm discussion groups which focuses on the particular host farmer's opportunities and issues and helps other farmer input to an action plan for the host. We have labelled this farm assessment.

Consulting officers arrange a two to three hour visit with the next host farmer in the group. This will be a one-on-one visit at which the consulting officer will conduct an assessment process on the farm business, conditioned by the amount of time available.

Issues and opportunities surfaced will be flagged for group discussion or dealt with elsewhere if not appropriate for group discussion. At that visit the discussion group day will also usually be planned. Follow-up will then occur after the discussion group ensuring action plan steps are clear and to obtain commitment to action. Often these will include engaging additional professional support in the form of an advisor and through this we aim to broker farmers to rural professional services, with the farmer knowing what they want of the rural professional.

In this extension activity the interplay between the functions of research, development and extension is informal. Consulting officers will contact a relevant expert in either research or development if in need of specific knowledge to help farmers, or to bolster their own technical credibility. Their networks and relationships are paramount in this regard. The interplay with communications and marketing is tangible, with new media such as the web and texting technology being used alongside traditional media channels to promote farmer attendance. Social media are also being investigated.

Website

The second area that we have sought to upgrade to meet individual farmer need is the DairyNZ website. A farmer user survey and focus groups helped with the process. These found that 88 per cent of dairy farmers had internet access on the farm and 72 per cent of all dairy farmers access it daily. While broadband connections accounted for 75 per cent of connections, connectivity continues to be a problem in some rural areas. The other challenge was raising awareness of our website and removing barriers to its use, both in terms of content and navigation.

The usefulness of the website seems to depend on how relevant the information is and the frequency with which the information is used. Staying connected with the industry and general information did not rate highly as motivators for internet use. Access to tools was rated moderately.

The main farmer use was for short snappy independently produced material that addressed a problem that they may have confronted that day on their farm. They were looking for a place to get a solution or at least a signpost as to how to reach a solution to the problem. For those needing more in-depth information to support a decision this was mainly after canvassing informal sources.

In response to this survey the website has been refreshed, a website promotional campaign has been started and other information channels are being used to reinforce website awareness. Seasonally adjusted use of the website has increased in the three months since the refresh, with 15 per cent more farmer visitors and both average times on site and page visits showing increases by 31 per cent and 25 per cent respectively. We see that the website will be an increasingly important tool in supporting extension and preserving industry knowledge.

Summary

The main responsibility for research, development and extension within the dairy industry rests with DairyNZ, a farmer owned organisation. However, given the pace and scale of on-farm change required to maintain industry sustainability and competitiveness, it is not possible for one organisation alone to achieve the change.

This is recognised within the dairy industry and led to the industry strategy committed to by DairyNZ and Federated Farmers. Evolution of research, development and extension in the industry has seen recent growth of development as a strategic function to design and lead strategies to get farmer adoption via various industry players. This includes extension, training organisations and private sector rural professionals and organisations.

Extension activities have evolved separately for meeting common needs among a region of farmers compared with more individual farmer needs based on their own business circumstances. This has been matched by the growth in use of communications technology and in particular websites, internet and text messaging. In future, DairyNZ will increase its interdependence with rural professionals and organisations that help farmers to increase the profitability, sustainability and competitiveness of New Zealand dairy farming.

David McCall is the General Manager of Development and Extension at DairyNZ, and Alex Fear is a DairyNZ senior communications adviser.

Scott Champion

A new way of doing business The evolution of Beef +Lamb research developments

The year 2010 saw a significant amount of change for the farmer owned industry organisation representing New Zealand's sheep and beef farmers. This article outlines the new direction for Beef+Lamb New Zealand and its efforts to find more effective and efficient ways of benefitting farmers.

At a referendum held in August 2009 sheep and beef farmers supported the continuation of sheep meat and beef levies but did not support levies on wool and goat meat. On 1 July 2010 Meat & Wool New Zealand became known as Beef + Lamb New Zealand, reflecting its new role as a meat-only organisation. It also launched a new strategic plan outlining the direction for the organisation for the period 2010 to 2014.

The strategic plan sets out a vision of a growing sheep and beef industry, providing sustainable profits for future generations. It identifies four programme areas in which Beef + Lamb New Zealand will operate, farm, market, people and information. These programmes are designed to –

- Bring innovative tools and services to support informed decision making
- Continuous improvement in market access, product positioning and farming systems for New Zealand's sheep and beef sector.

The farm programme is at the core of the evolution of the research and development and extension activities. It aims to produce research, development and technology transfer for whole farm systems.

Regional focus

Our target is to help sheep and beef farmers use the tools and information currently available to them to achieve a three per cent increase in their on-farm performance.

Beef + Lamb uses a region-based structure for the farm programme activities to encourage farmers to become involved with the organisation and to find out what is available and apply the information and resources on-farm. Specialist extension managers work closely with the organisation's farmer directors and the newly-formed Farmer Council to make sure the needs of each region are considered before farmer levies are invested.

The Farmer Council is an integral part of the success of the farm programme. In addition to a region-based industry leadership function, the Farmer Council helps guide the thinking, prioritisation and structure of research investments and uptake and extension activities using the regional plan process.

As part of this process, the Farmer Council, extension manager and farmer director in each region choose the most relevant and valuable tools and services from Beef + Lamb to meet the needs of local farmers. The toolbox includes monitor farms, beef profit partnerships, farmer initiated technology transfer programmes, along with events such as seminars, field days and workshops.

The regional plan process brings an improved understanding of farmer and industry needs. Beef + Lamb uses that knowledge to direct investments for results that will provide solutions which add value to farmers. Beef + Lamb is implementing a number of other mechanisms that are critical to the success of the farm programme. These have focused on needs analysis and high performers, whole farm research and demonstration farms.

Needs analysis and high performers

The needs analysis initiative aims to identify farmer needs and what is required to respond. The organisation started with a series of 14 workshops held around the country in September 2010. A range of topics were discussed with around 180 farmers, ranging from what Beef + Lamb can do to increase farm profitability, to how the organisation can encourage the uptake of innovative farming practices, and identifying the next new horizon in farming.

The general consensus was that Beef + Lamb has an important role to play in building and maintaining sector positivity. While detailed findings are still being analysed, initial feedback indicated a number of specific areas where Beef + Lamb can invest and add value to farmers, including demonstration sites, validated information for farmers, genetics and people.

The high performers strand of this initiative was identifying and working with existing farmer discussion and rural groups that maintain an innovative culture and have an interest in sharing their needs for the benefit of the sheep and beef sector. In addition to farmer groups, industry groups were also surveyed to gauge their needs.

Whole farm research

An important part of the organisational strategy was reviewing the existing applied research portfolio. The purpose of the review was to identify gaps in the whole farm research model and pinpoint opportunities for growth or expansion of the portfolio.

The research team held seven workshops with existing research advisory groups, the Farmer Council and science providers. They also ran an online survey and asked for feedback from individual research project personnel.

Participants were questioned on a number of key issues. These included the most important on-farm opportunities or restrictions facing sheep and beef farmers, opportunities for reducing costs, time and effort, along with restrictions to increasing farm productivity and revenue on the farm. Participants were also asked how they would allocate a limited research budget.

Both the workshop and survey participants identified similar investment ratios and areas of focus for six main research areas –

- Sustainable land and environment management by reducing the use of phosphate and fertiliser run-off and improving soil health and carbon retention
- Improved forage and feed efficiency with forage production on hilly, dry and low fertility soils and meeting animal needs in terms of timing, quality and quantity of forage
- More productive and efficient sheep by studying **r**eproductive wastage and lamb survival and lamb growth rates
- More productive and efficient cattle by studying increasing cattle growth rates by feed efficiency, overwintering and genetics, and increasing calving percentage
- Reducing the effect of internal parasites by breeding stock with parasite resistance, effective parasite management on farm and developing a cheap and easy diagnostic on-farm test
- Dairy beef integration by integrating dairy for maximum profit, separation of male semen and getting more beef genetics into dairy herd

New advisory groups, with the Farmer Council as the main members, will now use this information to build the whole farm research model.

Demonstration farm workshops

In September 2010 Massey and Lincoln Universities agreed to host workshops to help develop the demonstration farm concept, which aims to encourage the uptake of new research and information. A total of 40 farmers discussed their ideas with Beef + Lamb staff in a mix of on-farm, laboratory and lecture theatres. The workshops were designed to be interactive, with a focus on determining an overall framework for demonstration farms, so each region can develop their own programme to meet local needs.

The essence of the approach to demonstration farms is to identify a group of high performing farmers who will work closely with researchers and developers to identify new ideas, technologies and tools. The group will then take them back to their farms to test, and hold field days on their properties to demonstrate them to the wider farming community.

The future

The new region-based approach, the enhanced role of the Farmer Council, demonstration farms, and a focus on needs analysis, high performers and whole farm research have been key initiatives for Beef + Lamb. It will help develop the best tools and services for farmers, and increases its extension efforts to achieve greater uptake and greater productivity by sheep and beef farmers.

Plans for the future include the development of a wholesale concept, which would involve working with the agribusinesses that farmers deal with every day in transferring results from levy investment. Also on the horizon are enhancements to the monitor farm programme, targeted programmes that help farmers develop innovative ways of optimising whole farm systems.

Dr Scott Champion is the Beef + Lamb New Zealand chief executive.

Stuart Prior

New Zealand and Russian dairying – butter in our veins

New Zealand has a unique and extraordinary historical opportunity to contribute to Russia's agricultural revival by a long-term dairy partnership. Today over half Russia's dairy needs come from imports. Consumption of dairy products by the Russian population at large is not meeting the government's desired physiological norms. The shortage of domestically produced milk means that the price of milk for those few Russian dairy farmers still in business has reached an historical high of 15 to 19 roubles per litre, equivalent to between 50 and 63 US cents. The accepted minimum specifications for this milk are a fat content of 3.2 per cent and a protein content of three per cent.

Graphic testimony to the failure of the planned top-down, centrally controlled Soviet agricultural system is the state of the Russian agricultural economy today. The removal of individual ownership from land, animals and production by the Communists in 1917 took Russian agriculture down a blind alley for over 70 years.

Russia cannot feed itself. A country which contains some of the world's most fertile soils and has agricultural land in abundance, compared to New Zealand, a country with a small population of 140 million relative to its size, today imports half of its food. A century ago Russia was a major dairy, grain and meat exporter to Europe. Today it is the world's biggest importer of meat and its consumers depend on foreign dairy products and foreign multinationals to supply them with the basics.

Opportunities for New Zealand

In this article I look at the opportunities for New Zealand to become involved in the Russian dairy sector. I am drawing on experience of Vologda, the premier Russian dairy province, in north western Russia, 350 km to the north east of Moscow.

Since my first assignment at the New Zealand Embassy in Moscow between 1978 and 1980, I have taken a close interest in Russian agriculture, particularly dairying. It is because, unknown to me until relatively recently, I have at least some butter in my veins and an ancestral association with our premier dairying province, Taranaki.

An ancestor, John Batey from Cumbria, the brother of my great grandfather, arrived in Canterbury in 1888. Brought up in the butter trade and dairying and with experience in butter factories, he was one of the first dairy experts in New Zealand when our industry was in its infancy. He took charge of the Taitapu dairy factory which he managed for eight years. He then moved to Stratford to become manager of the central factory of the Stratford Farmers' Co-operative Association. He drew the ground plans and 'had the building and plant erected. In fact all the machinery has been fitted up by himself, and the factory is admitted by all experts to be the finest and most up-to-date in New Zealand.'

Lessons from history

At first sight there does not seem to be much connection between New Zealand and Russian dairy farming. But there is. In the late 19th century Russian dairymen developed a thriving export trade and were competitors to our infant exporting industry. This report in the *Taranaki Herald* of 13 January 1902 quoting an interview with New Zealand Dairy Commissioner Kinsella:

> 'Mr Kinsella had also noticed in a British paper a prediction to the effect that the time was not far distant when Siberian butter will be able to compete successfully with Danish, French, Australian and New Zealand products. Not only does the Russian Government,' said Mr Kinsella, 'run special steamers fitted up with up-to-date refrigerating apparatus between Russia and British ports, but special trains, with properly fitted-up cool cars, are run every Thursday from Ob (in Siberia) to Moscow, stopping to receive butter at all the principal points on the Siberian line. … distance of 3,000 miles… Those particulars should prove of great interest to dairymen on this colony, as showing the progressive measures being taken in one of the most conservative countries of the world to foster the industry of the small settler. New Zealand is supposed to be the favoured home of the dairyman but in many things, it will be seen, the Russian is ahead of the Antipodean.'

But the threat, as other Russian threats to New Zealand seem to have done over the decades, did not eventuate. In 1917 and 1918 Russia disappeared off the face of the global farming map as the revolution took control, destroyed the independent farming class and forced farming into the service of the industrialisation of the USSR.

A godsend for agriculture

By the 1970s, flush with windfall oil revenues, the USSR was turning to New Zealand to buy food which its failing agricultural system could not produce. That was a godsend for us, as Britain was being attracted into the embraces of its European Community suitor. British farmers were about to become subsidy junkies, setting aside New Zealand and the free market in favour of petitioning the Eurocrats in Brussels for special favours.

But we were rather afraid that, having the Russians buy a lot of meat and dairy produce from us as we coped with Britain's entry into the European Union, would bring political dangers. It did not, and we survived as an independent power while grateful Russian consumers ate all the sheep meat and butter we sent.

Russia disappeared from our radar in the 1990s as the chaos of change led to unpaid bills for dairy, meat and wool. Some of our traders tried to roll with the punches, resulting in Lada cars for butter exchange. But quickly the R of Russia became risk with a capital R and we avoided the place like the plague. As it is said, capital has the memory of an elephant, the speed of a cheetah and the courage of a rabbit. Failure to pay bills even when your entire economy and the only political system you have known has collapsed, is the equivalent of calicivirus.

Nutritek

Then, in 2008, the Russian threat returned unexpectedly. Cries of 'the Russians are coming' and loudly expressed political fears took us back to the dancing Cossacks of the Muldoon era. We digested the news that Nutritek, a leading Russian manufacturer of children's nutritional products, was buying into a milk supply in New Zealand via its purchase of the New Zealand Dairies Limited plant in south Canterbury.

There is a circularity of history. In helping the Russian investors with plans for their investment in New Zealand and a strategy for value-added products for export to the Asia and Pacific region, I found myself dealing with Russians who had butter in their veins for about the same time as me. The founder of Nutritek, and the company's enthusiast for New Zealand and the link with our world beating dairy industry, Dr George Sazhinov comes from the principal Russian dairy province, Vologda. His grandfather and his father were respected teachers at the Russian National Dairy Academy in Vologda – Vologda butter is in Dr Sazhinov's veins.

So, what had been happening in Vologda, and why did the Russians look to New Zealand? There were two reasons. First, they needed new ideas, knowledge and science to help rebuild their animal husbandry on a profitable market basis. Secondly, they needed to escape from the overbearing, some would say anti-competitive and monopolistic, pressure of foreign multinationals working in Russia.

There was also the import lobby to contend with. Economic incentives in Russia were skewed towards the importer. Their fellow countrymen were enjoying easy money from huge quota rents associated with import quotas and tariffs introduced from 2003.

Vologda butter

Vologda province in the north west of Russia covers 140,000 square kilometres, and is approximately 1000 km wide and 450 km long. The province is Russian farming heartland, the traditional centre of the Russian dairy industry, and has centuries of experience in farming. Vologda city, with a population of 300,000 and the capital of the province, was founded in 1147, the same time as Moscow. In the as yet unnamed New Zealand at this time, Messrs Moa and Co and their feathered cohorts were merely in charge of an avian-based subsistence economy.

Industrial production of butter began in Vologda in 1835. In the early 20th century it was one of the world's major dairy exporters, its products going to European markets. The province was one of three in the north west of Russia which had a strong and independent farming peasantry which was never subjected to the feudal system which developed elsewhere in Russia.

As local people point out, the province had never been captured by an enemy. Despite the harsh winters, when temperatures could go as low as minus 35°C to minus 40°C, the inhabitants of the region had been able to provide for themselves all year round from livestock farming activities. They had needed to buy only sugar and salt.

No markets, no people, no money

The collapse of the Soviet system and its replacement by the smash-and-grab version of capitalism after 1991 meant that collective and state-owned farms were broken up with land, property and equipment being dispersed. They went to new owners, who had no idea about how to work in a market economy, or to 'wide boys' simply interested in asset stripping or land speculation. This process called into question the value and future of farming in Vologda and reinforced depopulation of the countryside as the active workforce and young people gravitated towards urban areas where there were greater opportunities.

With no markets, no people, no money and no incentive to look after them, animals disappeared. Today, the province's farms are said to have 220,000 cattle, including 100,000 cows, four million poultry and 250,000 pigs.

In 1992, however, cattle numbers were reported to be 587,000. Five years later, in 1997, cattle numbers had declined to 390,000. Again, Vologda appears to have done better than most. The neighbouring Leningrad region had about 3.5 million cows in 1992 – today it has less than a quarter of that number. Even so, reductions in Vologda animal

numbers of over 60 per cent along with productivity have been dramatic.

To put this into context, Russia today may have as few as four million cows in milk on dairy farms, about 15 per cent of numbers in Soviet times. Official figures suggest, somewhat optimistically Russian dairy industry insiders say, that there are about nine million cows.

Barns for all the year

With respect to dairying, average milk yield in Vologda is said to be 5,000 litres per animal each year, well above the 3,500 litres which is the national average. A number of the better farms are achieving 6,500 litres a year, with top performers recording 8,000 to 8,500 litres. The dairy breeds in use are Holsteins and the local black-and-white cattle.

Feeding is by grass and forage – silage with additives – and local officials say that feed is cheap and available. While Vologda has a short growing season because of its high latitude location, it produces amazing herbs and grasses which in annual volume are said to be equal to or greater than the volume produced by the best Waikato land. A system based on pasture animals for four to five months of the year and housing them through the inclement periods is entirely possible. Such a system is not practised – keeping animals in barns the year round and feeding them out is the norm.

Despite the heavy presence of foreign dairy suppliers to the Russian market, Russian consumers prefer home grown. Vologda dairy products are regarded by Russian consumers as the best in Russia for quality and taste. The province produces 1,200 tonnes of milk a day. Of this, 250 tonnes a day are consumed in the region, 350 to 400 tonnes a day are dispatched to markets in Moscow, and the remainder of production is exported to St Petersburg, northern cities such as Arkhangelsk and Murmansk, and other parts of the Russian Federation – 48 regions in total.

The Vologda economy is not solely about dairy. Within the last decade efforts have been made to introduce beef farming into the province. Angus cattle have been imported to Vologda. These animals are said to have adapted very well to local conditions. They have done well on silage with crushed oatmeal mixed in. Barns were provided for these animals to shelter in, but most of the time the Angus cattle preferred to be outside. Adapting to the harsher winters, the animals had grown very thick coats.

Vologda State Dairy Farming Academy

The Vologda State Dairy Farming Academy is named after NV Vereshchagin, a dairy industry pioneer in the region in the late 19th and early 20th centuries. Established in 1911, the academy is an especially important institution in Vologda, catering today for 5,000 students. The number of students is increasing, as students show greater interest in agriculture, compared to recently popular professions such as finance and economics.

The academy has had its own teaching farm for more than 40 years. The farm is located in the aptly, if not imaginatively, named rural town Molochnoe or Dairyville. Its cows like to spend their time outside in the fresh air, even in winter. They are said to be very healthy cows. Only the young ones are kept indoors during winter. The average milk yield is about 7,000 litres.

Long history of butter productions

Industrial butter production in Molochnoe has a very long history, going back into the 1880s. In 1881 a specialised butter factory was built by a private entrepreneur. My ancestor would have been impressed. Equipped with the first separator for the province and the country, the factory was Russia's first dairy factory.

The entrepreneur also established a training school for butter makers. In 1911 the factory was acquired by the state as the production teaching section of the country's new national dairy teaching institution, the Vologda Dairy Institute. In 1916 the original factory was closed down when the institute's purpose-built dairy factory opened. This factory continued under various forms of organisation during the Soviet period.

In 1959 it was returned to the management of the Vologda Dairy Institute with the designation of experimental training plant. A new dairy factory was built on the site in 1979, with a production capacity of 160 tonnes of milk a day.

The plant serves as a teaching institution and students from the Dairy Academy gain practical experience in production there by undertaking obligatory hands-on training. With respect to purchases of raw milk, the plant pays suppliers on the basis of five grades of product, based on parameters such as fat and protein content. On average the plant produces 150 to 170 tonnes of dairy products a day.

Dry milk is a main product. Russian consumers know what they like, and like what they know. Demand for dairy

Vologda butter in the pot

products is very conservative. Consumers prefer traditional products such as sour cream (smetana), tvorog (cottage cheese), kefir (sour milk), yoghurt and milk.

Only three dairy plants are able to call their butter Vologda. The Molochnoe plant is the number one producer among these three. The plant continues to enjoy strong demand for its products with output growing at 30 per cent a year. It produces a wide range of products because the geographical area which it services, including the Moscow-St Petersburg consumer corridor of about 24 million people, is very extensive and there are no other nearby plants. Incidentally, as part of its social responsibility programme, and with shades of New Zealand past, the plant provides a packet of drinking milk free for all school children aged from seven to17 in its region under a special brand name.

Thanks to a major investment by the Russian federal authorities in the academy, brokered by Dr Sazhinov when he was a Deputy Minister of Agriculture, a major upgrade of the dairy plant is being completed. The basis of upgrade is a redesign of the whole dairy chain, from raw milk collection through to final products on shelves. The plant's production capacity is being increased. In addition chilling and cool store capacities are being expanded. The upgrade has gone on while the old plant has maintained production. The new part of the factory will have a baby food section.

New Zealand suppliers have already missed the trick with this plant, where a future generation of Russian dairy managers is being moulded. The French company Boccard Engineering appears to be a principal equipment supplier and TetraPak is also prominent among other brands.

The private sector opportunities

Having travelled extensive through western Russia and seen numerous dairy farms, I was interested to visit a newish dairy farm just over a year ago which appeared to me typical of what is happening in Vologda. The farm is about six years old and has about 900 Holsteins. They are housed in barns which are sided with corrugated iron. The floors are concrete, 1970s style, and awash with excrement and urine. They provide a very damp and unwholesome environment, although the temperature in the barns is said to remain above zero through the winter. Approximately 600 workers are employed by the farm, all but two of whom are women. The farm supplies milk to the multinational Danone.

The cull rate is very high, about 35 per cent a year. Calf mortality is about 25 per cent within two years. Reasons cited for the high cull and calf mortality rates include problems with feeding, gynaecological problems and health problems after calving. Replacement animals would cost about 4000 per head if obtained from Western Europe. The farm has no money for this. Artificial insemination is carried out on the basis of what the farm is able to afford in any given year. Currently artificial insemination is provided by a Moscow-based company at a cost of 150 roubles a straw, equivalent to just over six New Zealand dollars.

Silage and grain

Animals are fed on silage, all of which is harvested from the farm. This is supplemented by crushed grain, the mixes being made up according to the age and stage of the animals being fed. Silage is stored in large mounds on a concrete platform. The mounds are covered with plastic which is then covered with throwaway grass to keep the plastic in place.

Milking is carried out in a herring-bone type stall catering for 12 animals at a time. Each milking takes a full shift. Workers are not the decision makers. When I visited the farm, staff seemed to be doing their best for the animals but the economics of what they were doing were not part of their brief. For example, they were not able to give any estimate of the yield of dry matter per hectare, nor of the cost per kilogram of the dry feed provided.

The Milfos experience

I take my hat off to Hamilton-based Milfos. It was the first New Zealand agri-services company to put its money where its mouth is, and two years ago appointed a Russian agent and a farmer to scout for opportunities in Russia. Milfos is already finding considerable Russian interest in New Zealand pasture-based and grass-based systems, and in equipment such as rotary milking sheds.

The Russians realise that industrialised dairy farming with huge farms of 10,000 cows equipped with the latest technologies, such as robot milkers, costing millions, and dependent on subsidies and imported feed additives is not for them. Even if they could afford the capital investment, which they cannot, going down the EU agricultural route is unaffordable and makes no sense.

The story of the development of New Zealand's dairy system in the face of significant odds, with climatic and other challenges, into a world-beating dairy super power is one which resonates with Russians. The Kremlin has set a national goal of becoming an agricultural power again – if New Zealand can beat the agricultural odds, so can Russia. This is not a comfortable prospect for our EU friends who have been so unfailingly supportive of New Zealand agriculture in recent decades.

We can work with the Russians

Russia doing its own thing successfully in dairy scares western European suppliers of dairy systems and equipment who are realising to their horror that, on price and quality, New Zealanders can compete hands-down in Russia. In fact our systems and equipment will force a re-pricing downwards of the whole Russian market for such goods and services. No wonder people are trying to stop Milfos and other New Zealanders getting a foothold in this market.

New Zealand has a large comparative and competitive advantage. We can work with the Russians to help them to develop a profitable system of dairying based on cash flow rather than land speculation and milking of subsidies. The Russian agent for Milfos correctly asks whether we New Zealanders have the wit and ambition to rise to the challenge

and to try to level the Russian agri-services playing field in our favour.

The development of systems of dairying based on exploitation of massive subsidies to the enrichment of a few corporate farmers and the impoverishment of consumers is not where Russian dairying is heading. Milfos's work has shown with crystal clarity that there is an opportunity for New Zealand to bring different, healthier and far more sustainable and long-term profitable farming ideas to Russia.

Conclusion

We have the chance to work with a northern hemisphere partner located adjacent to critical markets for the products on which our livelihoods depend. We have the chance to participate in a two-way exchange of knowledge and transfer of science and technology.

We can work alongside Russian scientists and farmers to develop agricultural systems which are profitable and effective, are not subsidised and are based around pastures rather than factories. This partnership will materially help the Russian government to achieve its food security goals, will bring jobs to the Russian countryside, and in time, will return Russia to its rightful role as a major exporter of food.

Do not worry

The underperformance of Russian agriculture and the related problems of the country's forestry and fisheries sectors, affect not only Russia but also the global agricultural economy. For a start, Russia should be exporting dairy products, meat including sheep meat and other products to its neighbours from relatively low cost, sustainable, non-subsidised and pasture-based production.

We do not need to worry about Russian competition. First, our production is seasonally complementary. Secondly, we can help the Russians supply a large and rapidly growing domestic market with New Zealand quality produce. Thirdly, we can use Russia to help ourselves move up the value added ladder to concentrate on the move away from commodity production. This is best done in Russia alongside markets where food miles are not an issue.

Fourthly, we should be able to understand the passionate concern the Russians have to retain ownership of their farm land and not to see their birthright sold to the highest foreign bidder. They need to find ways, using fair long-term leases and a focus on profit from farming activities and business growth, to realise value from our involvement. Finally, and perhaps most important of all, the people factor – New Zealanders and Russians really do get on well together.

Start in Vologda

Where do we start in the vastness that is Russia? We could do a lot worse than looking at Vologda for dairy partnerships. In Russian scale it is a hop-step-and-a-jump from Moscow which is as exciting a capital city as you will find anywhere. There is little competition and market of over 20 million people on Vologda's metaphorical doorstep.

Back in 1902 Dairy Commissioner Mr Kinsella, the Soviets would have called him our Dairy Commissar, suggested that developments in Russian dairying would require New Zealand to lift its game. Well, he was right, albeit three generations early. He could not know of the forthcoming communist aberration in Russia which delayed things a bit.

But good things take time and there is nothing like an idea whose time has come. Russia offers our young farmers and business people the opportunities to do things which are not the easiest to do in New Zealand these days. This is to access large tracts of land, to farm to supply an insatiable domestic market, to farm for profit from cash-flow, to be smart and innovative in the use of capital and labour to help Russians build the foundations of a profitable dairy export industry selling to markets on their doorstep.

If we have the ambition and the wit, Russia can also be the stepping stone to building serious new agri-businesses overseas at a time when top quality, safe food is of pressing international importance. The seasonal and industrial complementarity of our respective dairy industries suggests the potential for a marriage made in heaven.

Stuart Prior was the New Zealand Ambassador to Russia from 2003 to 2006.

Grant Wisnewski

Milfos – Our journey into Russia

Milfos is a privately owned New Zealand company specialising in high end milking technology. The company was formed in 1987 and now employs over 100 staff throughout five operating divisions. The head office is based in Hamilton where a state-of-the-art production facility has recently been opened. Milfos currently exports to roughly 20 countries worldwide but has plans to grow this side of the business.

Recently our distribution model has changed significantly. Traditionally we have signed agreements with overseas companies to promote and sell our product abroad. With the loss of control that this brings we have now decided to remove ourselves from these contracts and employ managers who work directly for Milfos. This way we are in control of our own destiny. The in-market manager's role is to concentrate on building the dealer network within their market while also ensuring sales growth.

In 2008 Milfos employed an in-market manager for Russia and the former Soviet states such as Kazakhstan and Belarus. Whilst we have not yet ventured into Kazakhstan, Belarus or even the Ukraine, this is planned to happen soon.

Our in-market manager is a Russian from within the industry, with very good contacts both within the central government as well as the agricultural community. He has excellent relationships with these people as well as those at the New Zealand embassy in Moscow.

During this process we have also been helped by Stuart and Olga Prior from the Prior group. The Prior group is a New Zealand company specialising in helping business between New Zealand and Russia.

Different model

The Russian farm ownership model is quite different from New Zealand's. Local villages were given land they owned as a collective. The shares, which farm workers took from these collective farms, are known as pais. It is now possible for foreigners to own land in Russia but the condition is that this ownership must be shared with a Russian. Most of the farmers we are dealing with at the moment are actually businessmen based in Moscow who have acquired a number of pais and aggregated them into significant land holdings.

Most large dairy farm projects in Russia are financed through the government agricultural financing arm RosAgroleasing. At the end of 2010 Milfos was recognised as an approved supplier of milking technology for funding by RosAgroleasing. This was a major breakthrough for Milfos.

With the onset of the recession and the fall in oil prices, agricultural money dried up quickly and most large dairy constructions were put on hold. However, with the rise in oil prices, we have now noticed that money is starting to flow a little more freely again.

Within a month of being recognised as an approved supplier we were awarded our second large contract in excess of a million dollars to supply a new 2,400 cow farm with milking technology. We expect to have this system installed mid way through 2011.

Critical relations

With one large rotary system already on the ground, plenty of lessons have been learned regarding exporting to this country. Personal relations are critical. It is important to have a local person who you can trust to be involved on your behalf. There are always small issues regarding customs clearance and unless there is somebody that can go and get this sorted locally, it can be a very time consuming and frustrating task.

Patience is another virtue. Nothing happens quickly in this region and this can be very frustrating. However when projects do come to fruition it can be rewarding and gratifying.

Until you have the trust of local people, trading can be difficult. Relationships need building and this can take time. However, once you have broken through this barrier the Russian people are very warm and accommodating to deal with.

In the region where our in-market manager is based, there is a large amount of land suitable for 12 month pasture based farming. This lies at the same latitude in the northern hemisphere as Oamaru is in the south, so is therefore ideally suited to New Zealand technology.

We see this market as a potentially large opportunity for the company. This year we will be making a concerted effort to ensure that we become one of the recognised and preferred brands for new dairy constructions in this new market. While entering a new market is never easy the groundwork is now in its final stages of completion. We have the right team in place, the right technology for this region, and I am certain our plans and goals will be achieved.

Grant Wisnewski is the international business development manager for Milfos International.

Pamela Fleming

The Ahuwhenua Trophy Celebrating excellence in Maori farming

The relationship Maori have with their whenua or land is rich with spiritual, political, genealogical, historical, social and economic dimensions. It is a relationship with practical implications for the way 21st century Maori farmers are managing some of our largest and most successful agribusinesses and offers lessons to all farmers aiming for excellence.

This is demonstrated clearly in the annual Ahuwhenua Trophy – BNZ Excellence in Farming competition which acknowledges and celebrates business excellence in the pastoral sector. Between 10 and 15 per cent of sheep and beef cattle are farmed on land owned by Maori and an estimated 10 per cent of dairy production comes from Maori owned agribusiness. The two Ahuwhenua Trophy cups – one for sheep and beef farming, the other for dairying – reflect this reality.

Lodestar for Maori farmers

The competition has a prestigious history dating back to 1932 when it was introduced by Sir Apirana Ngata and the then Governor General, Lord Bledisloe, to encourage skill and proficiency in Maori farming. Lord Bledisloe donated the original Ahuwhenua Trophy, a large impressive ceremonial cup, two years after he donated the almost identical Bledisloe Cup to encourage competition between New Zealand and Australia in rugby.

Govenor General Anand Satyanand presents Dawson Haa, Chairman of the Waipapa 9 Trust, with the Ahuwhenua Trophy

The competition was a lodestar for aspirational Maori farmers during much of the 20th century. It went into abeyance in the 1990s before it was re-launched in 2003 by Meat New Zealand, now Beef + Lamb New Zealand, in response to the changing face of Maori farming.

The trophy encourages participation from both individual and collective Maori landowners. However, the nature of Maori land tenure means most of these farms are, in fact, large scale businesses where the land is held collectively by hapu or extended family members. The two common collective models are Maori land trusts and incorporations, which operate with governance boards acting on behalf of the owners.

In 2008 there were 129 Maori incorporations and 5,201 Maori trusts. Together they administered around two-thirds of Maori land, conservatively estimated at 1.5 million hectares or 12 per cent of New Zealand's agricultural land. This makes Maori the largest natural grouping of pastoral farmers in the country.

Like corporate farmers

Maori involved in the primary sector, which represents over half the Maori commercial asset base, contribute hundreds of millions of dollars each year to the New Zealand economy and continue to innovate and become more productive.

Ben Gordon, a former senior advisor for Te Puni Kokiri who now works for the Maori Trustee, says that much of the Maori land in agricultural and horticultural production can be likened to corporate farming. It brings with it the challenges of managing various stakeholder expectations,

often across multiple sectors and with a long term perspective. Good governance provides the credibility for commercial relationships and a connection to the owners. The ability to gain investment rests with the people governing, managing and operating the business. As developments progress, everyone tends to have more confidence and trust.

In December 2010 the economic research company BERL credited a rejuvenated Te Ahuwhenua Trophy encouraging competition among the Maori trusts and incorporations with continued expansion and productivity gains. The report goes on to say that their boards and management is involved in debates over sustainability, carbon credits and added-value exports which require international benchmarking for best practice in financial, legal and managerial operations.

Incorporations

Incorporations are the favoured model on the North Island's east coast. One of the more high profile examples of an excellently managed incorporation is Whangara Farms, 20 km north of Gisborne, and the current holder of the Ahuwhenua Trophy.

The Whangara Farms partnership was formed in 2006 when two neighbouring farms, Pakarae and Whangara B5, joined to form a 5,600 hectare property. They run a Romney based flock of 30,000 sheep and a herd of 5,000 Angus cross cattle. The partnership, which expects to run 60,000 stock units within the next five years, has since bought another sheep and beef farm in the nearby Ruakatuki Valley.

This property with its high rainfall is a prudent move for the partnership. Its other farms border the Pacific but are more vulnerable to drought. The partnership took possession of Ruakatuki Valley farm in April 2010 and moves stock between the farms as weather conditions demand. Whangara Farms chair, Ingrid Collins, says that incorporations have more autonomy in their decision-making than their colleagues working under the Maori trusts governance model.

Ingrid was the first woman to chair a Maori incorporation management committee and has been involved in Maori land incorporation management for 35 years. A successful business woman in her own right, she is the immediate past chair of the Tairawhiti District Health Board, and until recently, a member of the Federation of Maori Authorities Board. Under Ingrid's leadership, Pakarae and Whangara B5 have achieved high levels of governance which Ingrid says, is the main reason she was asked to join the Ahuwhenua Trophy Management Committee. The experience of developing that high performing structure is something she feels she can share with other Maori farmers whether they are operating under trusts and incorporations or running their own business.

A clear vision is essential. At Whangara Farms they have a simple one page strategic plan with a much more detailed business plan sitting behind it. They also have a series of clear, objectively measurable performance indicators specifically related to the productivity and profitability of the farming systems and for the development of staff.

Waipapa 9 Trust

Those sentiments are echoed by all Ahuwhenua Trophy winners. Quietly and prudently managing huge assets with careful debt management strategies, these enterprises provide all New Zealand agribusinesses with strong role models. The current Dairy Trophy holder, Waipapa 9 Trust, is one of these.

Situated just north of Taupo, the Waipapa 9 Trust represents seven different hapu. Over 20 years it has developed a portfolio including dairy, sheep and cattle, forestry and commercial property, and now has in its care over 6,500 hectares and $60 million of net assets.

The 2009 Ahuwhenua dairy competition winner, Cesped Lands Ltd, which owns or leases five properties in southern Hawkes Bay is a good example of an individual family structured farming enterprise. Cesped Lands Ltd is owned by husband and wife team, Dean and Kirsten Nikora. They developed their business by following a wealth creation strategy of high-risk investment accompanied by disciplined risk analysis which the Ahuwhenua judges described as nothing short of outstanding.

Waipapa 9 Trust Farm – Dairy Trophy holders


Waipapa 9 Trust Farm

Competition a challenge

Every year the competition highlights success stories. Wairarapa Moana Incorporation, which took the trophy in 2005 for its Te Pouakani sheep and beef unit, has an asset portfolio including dairy and forestry investments worth a total of $152 million. The 2006 dairy competition winner, PKW Farms Ltd, has interests in Taranaki worth an estimated $50 million.

Entering the competition is a challenge in itself but many say that the rewards are well worth the effort. Feedback and honest business advice from objective outside judges is one of the most important benefits. It is not uncommon for winners to have entered a few times before taking the prize because entrants are given access to a network of progressive and like minded individuals and exposure to the successful practices of other farmers.

The current chair of the Atihau-Whanganui Incorporation, Dana Blackburn, was a board member when the incorporation, which runs over 206,000 stock units on eight different stations, first entered in 2003, the year the competition was relaunched. Dana is also the competition's new chief judge.

Dana explained that they entered initially just to get a foot in the door and to understand what was required to be a contender. They were amazed by the variety and quality of expertise and information that was made available and impressed by the calibre of people involved. The Ahuwhenua Trophy seems to attract the support and interest of people at the top of their game no matter what role they play in the wider rural sector.

One of those people is the chair of the Ahuwhenua Executive Committee, Kingi Smiler. A chartered accountant with a wealth of international business experience, Kingi holds a number of directorships and is also currently chair of Wairarapa Moana Incorporation and the recently established Maori owned dairy processor company, Miraka. Kingi said that Maori farming is the sleeping giant of New Zealand's agricultural sector, and the Ahuwhenua Trophy competition demonstrates that Maori farmers are operating some of New Zealand's largest and most successful agribusinesses.

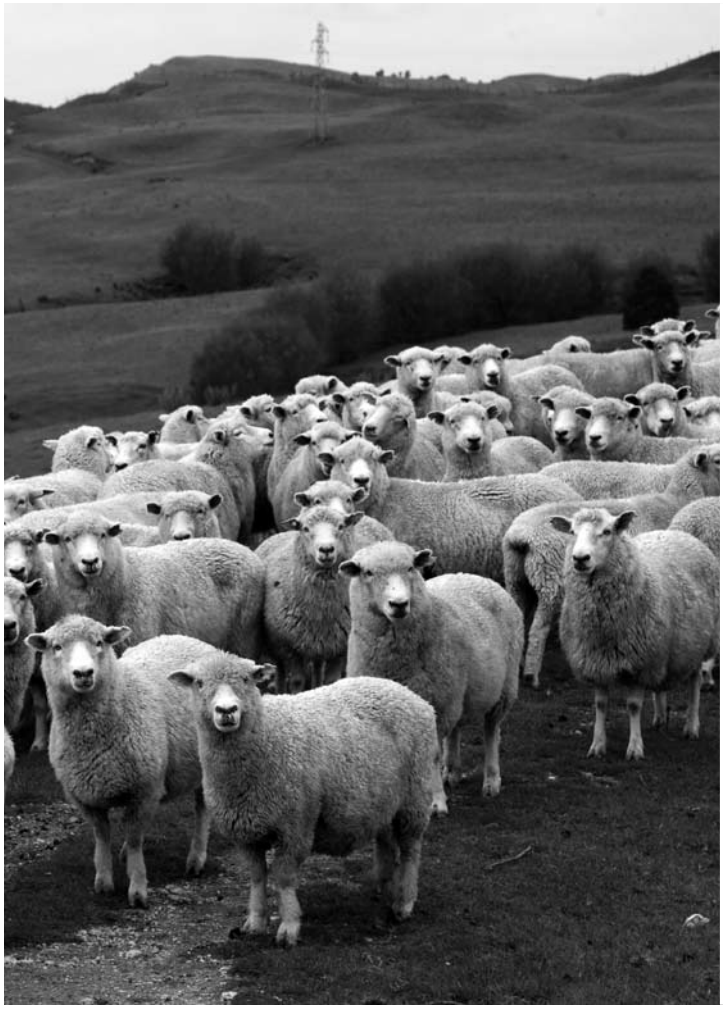
2011 competition

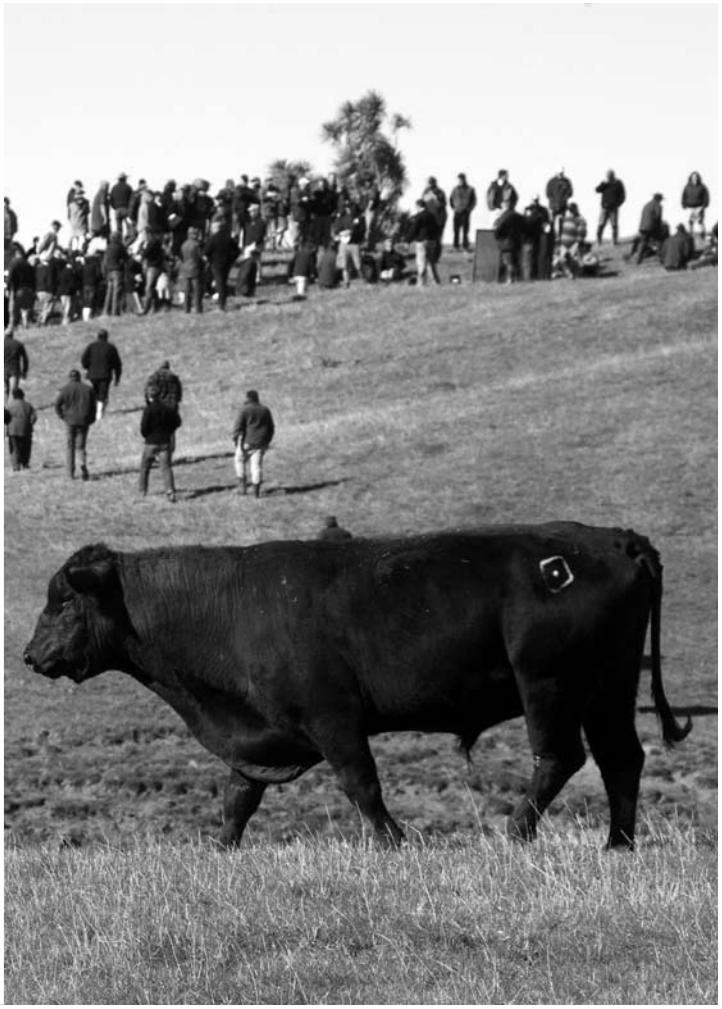
As well as being presented with the historic Ahuwhenua Cup, the winner of the 2011 competition will receive a replica of the trophy, a medal based on a 1932 design and up to $40,000 in cash and farm-related products and services. The three regional winners will each receive a medal and $15,000 in cash or farm related products and services. Entrants will be tested on a range of protocols based on the efficiency with which the property is farmed relative to its potential, effective governance and management of the farming enterprise including a strong focus on environmental management. Financial performance is an important part of the judging criteria but judges are also required to take into account conditions that affect financial performance such as drought and market returns.

Each regional winner will host a public field day. Competitors benefit from high level peer review on their farms. The opportunity to share this at the field days leads to improvements in performance for the competitors as well as the attendees. An awards dinner will be held in Rotorua on 3 June 2011.

Sponsors of the competition

The competition enjoys the support of a number of organisations working within the agricultural sector. BNZ is the Platinum sponsor for the Award. Gold sponsors are AgResearch, Te Puni Kokiri, Beef + Lamb New Zealand. Silver sponsors are PGG Wrightson and Ballance Agri-Nutrients, and Bronze sponsors are the Ministry of Agriculture and Forestry, Agriculture ITO, AFFCO, BDO, Maori Trustee. Allflex and Yamaha Motors. Sponsor support will also be supplied by Tohu Wines, Landcorp and DB Breweries.





Field days at the Pakarae Whangara B5 partnership farms near Gisborne