

Farm Environment Plans – working or not?



KELLOGG RESEARCH PROJECT CHALLENGES UPDATE ON WAIMEA INDUSTRY FIGURE RETIRES

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Departures and new beginnings

What an inspiring story on Stuff.co.nz in October. Irrigating farmers, the Kingan family of Wairareka Creek in North Otago, made some clever irrigation strategy changes to look after a tributary running through their property. This led to their nomination as finalists in the annual Morgan Foundation National River Awards. Investing in variable rate irrigation and GPS technology has helped with drainage and nutrient management. More importantly their approach has improved the quality of surface water leaving their property. The cost of this technology (approximately \$60k) will be recovered in three to five years - an extremely short timeframe for clear, beneficial results. So why aren't we seeing this story on the front page of the paper and splattered across TV?

The annual National River Story award recognises inspirational river stories – examples of a community or an individual working hard to restore the health of their local river. The awards promote just what the community is clamouring for. But instead of thoughtful and balanced features on the likes of the Kingans, we more often than not receive a media diet skewed to the negatives, out of context statistics and flimsy evidence of dying rivers. Is something out of balance here?

I'm pondering these issues as I finalise my last magazine. Nikki Hawkey has joined IrrigationNZ as its new communications manager. I'll be helping behind the scenes from time to time. It's been a pleasure working for IrrigationNZ for the last four and a half years, and for more than a decade with irrigation schemes in many parts of Canterbury. Given my interest and passion for the sector, I'll certainly be keeping an eye on developments. Keep up the good work promoting the predominately positive efforts by irrigating farmers and communities to achieve environmental, social, recreational and economic balance!

There's lots of good reading in this, our final issue for the year. Our theme is Farm Environment Plans, and to do justice to what's happening, we've secured comment from schemes, consultants, regional councils and industry bodies to explore how they are working. Are Farm Environment Plans and Nutrient Budgeting really delivering results? See what these commentators think on pages 20 to 22.

In this issue, we farewell irrigation pioneer Sid Hurst and acknowledge the work of Kevin Steel, a well-respected policy maker. Our recent AGM saw the departure of Mark Slee, IrrigationNZ's deputy chairperson after 12 years on the board, we sincerely thank him for his efforts, especially joining deputations to Wellington to speak with policy-makers and politicians. Mark has always been a fantastic role model for the rest of the sector, particularly given his success as supreme winner of the 2014 Canterbury Ballance Farm Environment Award. Without individuals such as Mark, we wouldn't have such a compelling irrigation story to tell.

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Janine Holland Editor IrrigationNZ News





Good people doing great things

November's earthquake was an unwelcome reminder of New Zealand's seismic vulnerability. The images of twisted and broken roads, landslides and cows left very high and dry tell only part of the story – if this is what the quake has done above ground, we can only imagine the destruction it has wreaked beneath it.

Like our members, IrrigationNZ people are a practical bunch and at our AGM, we talked about what we could do to support quakeaffected communities, particularly in North Canterbury. We're working with Federated Farmers to get an understanding of what's needed and several of our service industry members have offered to donate pipes and infrastructure to help farmers restore water supplies to homes and stock.

We know the impact on infrastructure, industry and incomes will be felt for many months to come and we'll be keeping a keen eye on what's happening to ensure we can help our members wherever we can.

Quakes aside, there's a lot of good people doing great stuff in the irrigation sector. We're also seeing a huge increase in farm owners, scheme members and businesses participating in IrrigationNZ's training and professional development programmes and our knowledge resources are being sought after internationally.

Yet despite our collective efforts to improve environmental outcomes from irrigation, we're now being targeted in Greenpeace's latest anti-farming campaign. To be fair, they're really having a go at dairying, but they refer to irrigation as being one of the main contributors to New Zealand's declining river water quality.

I've got no problem with people pointing the finger at me – or the industry I represent – and asking hard questions. But what I don't like is when they manipulate statistics or images to skew the story away from the true reality. And I think that's exactly what Greenpeace has done in its latest campaign – showing rivers that look dirty and polluted but which are in fact naturally tannin-stained or flowing out of highly erodible catchments post a storm event.

Whilst there's no doubt irrigators have challenges to work through, Greenpeace's approach shows complete ignorance of inter-



national best practice resource management and makes no acknowledgement of the enormous investment farmers and rural communities put into environmental stewardship.

When you stand back, Greenpeace and farmers want the same things – improved environmental outcomes and sustainability for all our natural resources. We just need to get a whole lot better at telling our stories so that Greenpeace doesn't capture the market by telling only their side.

It's something to ponder over the holiday break - how do we as an industry get better at demonstrating tangible change and progress? IrrigationNZ can help by profiling members and telling the world about the great things going on - but we're only one voice in what is becoming an increasingly noisy and crowded market. I think we can get some cut-through by joining forces in the social media space. A great example of how effective this channel can be is the North Otago Irrigation Company's Facebook page - they're out there publishing good news stories and their members are sharing them far and wide. Imagine the success we'd have if every scheme, user group and service industry dedicated a small amount of time to profile

and share members, client's and shareholder's stories – this is where the real power of social media lies.

IrrigationNZ is going to get the social media ball rolling in the New Year with a couple of social media training events for members. In the meantime, get your kids and grandkids to 'like' you even more by getting them to help you get active on Facebook, Twitter or Instagram (unless that's soooo 2015! lol)

Finally, I'd like to thank Janine for the great contribution she's made to IrrigationNZ over the past four years, first as a consultant and then as a valued staff member. The magazine has gone from strength to strength under her leadership and her communication expertise will be missed. Having said this, I have a feeling she'll continue to help behind the scenes with IrrigationNZ's communication activities for a while longer!

Andrew Curtis Chief Executive IrrigationNZ

FROM THE CHAIRWOMAN



IrrigationNZ Chair's report 2016

2016 was a great year for irrigation. With the continuation of dry conditions across most of the South Island irrigation became pivotal for profitable production. Low product returns meant good practice irrigation was key to maximise production and minimise operating costs – the most affordable source of feed for New Zealand farming systems is always home grown.

IrrigationNZ made significant progress in establishing and delivering our suite of qualifications alongside the ongoing success of our training programmes and resources. At IrrigationNZ, we are really proud of these resources which provide credible independent information for both new and existing farmers on how we can continue to improve our systems and management to ensure we are irrigating efficiently and effectively. These resources are available to all IrrigationNZ Members at www.irrigationnz.co.nz/newsresources/irrigation-resources/.

Our biennial conference held in Oamaru in April 2016 was an absolute celebration of the huge progress, role and value irrigation has had in the Waitaki - one of New Zealand's first districts to develop irrigation. The pre-conference field days showcasing the collaboration of irrigators and community to utilise water storage infrastructure was second to none. A water storage pond is now home to a community trust offering sailing, canoeing and kayaking experiences for locals. The conference went on to highlight and challenge the way we communicate with the wider public, present international irrigation systems, environmental research and the "Future of Food". The latter presentation by Julian Cribb really cemented to me the envious position we have in New Zealand to produce highly nutritious food while meeting community environmental requirements. Clarifying community expectations are a work in progress as so many regions are still working through this collaborative process.

What continues to frustrate us at IrrigationNZ is despite all the positives occurring within the community, there are continuous efforts by anti-farming groups to derail the good work being done. These groups appear not to be interested in a community coming together to provide a road map for land, water and biodiversity frameworks in our districts. The initiatives now being put in place are practical ways of addressing the range of challenges we have in New Zealand as a result of decades of land development and increasing urban density. We may not always see the results immediately but we are starting to see some positive trends. Solutions are not always just focused on reducing our current environmental footprint on-farm. For example augmenting both our lowland streams and shallow aquifers which are vulnerable to Mother Nature's hot dry summer conditions. A great example of how augmentation may look in the future is the Managed Aquifer Recharge (MAR) trial in Hinds. As the water moves down the plains it augments the shallow aquifers and lowlands streams in its path. This also reduces nutrient loads in these areas. This is a great result and shows how innovative thinking combined with scientific understanding can help deliver outcomes.

"I am continually impressed with the commitment of our research and scientific community to making a difference in New Zealand – albeit under limited funding regimes."

Having just attended the Grasslands Conference in Timaru, I am continually impressed with the commitment of our research and scientific community to making a difference in New Zealand – albeit under limited funding regimes. So many of the papers presented had a focus on sustainable production. One of the challenges discussed was communicating with the wider public to provide them with greater confidence that timely progress is being made. Credible science will be a key part of the solution going forward and we must carry that message loud and clear into our communities.

Despite all the positives above there have been some low points during 2016, notably the misinformation and deliberate tactics of some to derail the Ruataniwha project despite farmer uptake being sufficient to get the project across the line. Installing irrigation has been a big decision for farmers, but they have recognised the value and opportunities water storage and irrigation can give them. As HBRIC work through the final settlement of land we applaud the commitment and patience of the team behind this project. This leadership group has a vision for Hawke's Bay which is based on creating a resilient, prosperous region that supports the community economically, socially and achieves agreed environmental outcomes – who can argue with that?

I would like to thank my fellow directors for all their time and commitment over the last 12 months, but of particular note is the huge thank you to Elizabeth Soal who resigned as a director during the year and to our one retiring director Mark Slee who currently holds the role of Vice-Chair. Elizabeth continues as the Policy Manager for Waitaki Irrigator Collectives and this year embarked on a PhD. Mark Slee has been a director on IrrigationNZ for over 12 years and has been invaluable at ensuring there is a strong practical farmer voice into the strategic directions we pursue. We wish Elizabeth and Mark all the best for the future.

Andrew Curtis and the extremely capable team at IrrigationNZ have also had a big year with our incredibly successful conference and their commitment to pursuing "Excellence in Irrigation". Thank you to all our team.

As many parts of the country are experiencing one of the best starts to spring and summer in recent years we have not seen widespread irrigation kick into gear yet. Enjoy this while it lasts. I wish all IrrigationNZ members good luck for the 2016/17 irrigation season ahead and a happy and safe Christmas and New Year.

Nicky Hyslop Chairwoman Irrigation New Zealand



Improving performance

By Chris Appleby, Fonterra.

If you were to type "Canterbury + Irrigators" into Google right now the top hit to grace the screen is "Irrigators are Canterbury's biggest rule-breakers". Not the greatest endorsement, but it does show the attention water use and efficiency is getting from the public, local communities and from regulators. For this fact, and many more, it is clear that how we manage our water is becoming more important, not only to the water users themselves, but to all those who have a connection to it.

A key component of managing and understanding anything is measurement and water use is no exception.

At Fonterra we know water is the lifeblood of what we do and in 2013, we signed the Sustainable Dairying Water Accord (SDWA) with other industry partners. This document agreement sets out a number of commitments to the New Zealand public to improve water quality. Since then Fonterra has been out on farms supporting farmers in their management of effluent, nutrients, waterways and more recently, water use.

The Fonterra water use and efficiency programme draws some direct targets from the SDWA around ensuring water meters are on farm so farmers can manage their water use through measuring.

The objectives of the programme are to support farmers throughout the country to understand what efficient water use is, be it in the farm dairy, the water going out to the stock, or through the irrigation being applied to the pasture.

In the latter, Fonterra, IrrigationNZ and DairyNZ are working together to demonstrate the value of understanding the efficiency of your irrigation system. Significant investment can be made on irrigation systems, and for some annual running costs can be hundreds of thousands of dollars, let alone the significant capital cost of the irrigators themselves. With this in mind, the purpose of this recent collaborative work has been to go to a real farm, look at the existing systems and how they are operated and see what we can achieve with simple testing and simple fixes.

The farm located just out of Ashburton was selected due to having both new and old centre pivot irrigators. The three key areas of focus were: what is the system designed to achieve; is the system being operated in accordance with the design parameters; and is it performing as it should? Steven Breneger, National Project Manager for IrrigationNZ, provided the technical expertise to investigate these questions. The testing revealed some interesting results. With design specifications in hand, a simple check of pressures and flow rates being delivered to both pivots highlighted our first issue - pressure well below specifications, and flow rates telling a similar story. As the purpose of this exercise was to test the machines 'as is, where is', application depth uniformity tests (more commonly known as bucket tests) were carried out on both the old and new centre pivots.

The results painted a clear picture. Low



Busch Pivot – Bucket Test USDA (L1) vs APP (L2)

pressure and low flow rates meant target application depths and distribution uniformity was not being achieved out in the paddock. For the new pivot this could be easily fixed by supplying it with the correct pressure and flow, which for the farmer meant simply turning on another pump station. An easy fix to the issue, which we believe will bring the new centre pivot back in line with the design specifications. The older pivot was also suffering from low pressure and low flow rate; however it was showing signs of lack of maintenance. On the first half of the 600m pivot water was being applied at a greater depth than target, while the outer half was well under applying the target depth. The cause - worn out nozzles on the pivot. With 25,000 hours of operation, nozzles on the older machine have only been replaced as needed or when damaged. Comments from the farmer prior to our testing that the old pivot grew half the grass compared to the new; and with a simple bucket test we could see why.

For the time it takes for a few checks and tests, some valuable lessons can be learned about the performance of an irrigation system. These simple tests will ensure the farm is applying the right amount of water to the pasture and maximise pasture production. It also indicates whether pumps are operating at their correct capacity, potentially saving considerable amounts of power, all reducing the operating cost of the irrigators.

Next steps for this project will be to quantify what these economic benefits are in dollars and cents which will provide a powerful story to all irrigators around why it makes good business sense to understand your irrigation system and to be efficient with water. Keep an eye out for this information in future publications.

Fonterra has its team of Sustainable Dairying Advisors throughout the country working to help farmers improve their environmental performance. Recently the South Island Sustainable Dairying Advisors received training and up-skilling from Steven Breneger from IrrigationNZ. With this knowledge our teams will be out working with our farmers to ensure they understand the benefits of efficient irrigation and support them to achieve this on their own farms.



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Supporting regional development

By the Hon. Peseta Sam Lotu-Iiga, Minister of Local Government.

Local government is a vital part of national growth, managing close to \$110 billion of fixed assets and contributing more than \$8 billion to New Zealand's GDP each year. Councils provide safe drinking water, maintain wastewater and storm-water systems and put flood protection measures in place.

Local councils have a critical role making sure our local communities are safe, wellplanned neighbourhoods where we can all live, work and play. They provide opportunities for local businesses and industry to create jobs and economic growth. When local government thrives, so does the whole country.

Ratepayers expect and deserve to get quality, value-for-money services and infrastructure. We know some councils face significant challenges in managing their assets, resources and finances. The costs of replacing infrastructure are beyond the means of some communities. Some councils are having to deal with rapid population growth, or other issues like building resilience to natural disasters like flooding and drought.

Local government ratepayers are also central government taxpayers. I believe building a relationship between the two is key.

Government funding and strong community partnerships are already working to improve freshwater quality in areas like Lake Taupo, the Manawatu River and Lake Brunner. More than \$350 million has been spent on clean-up projects since 2000 and a new \$100 million fund was set up in May to support even more work.

BETTER LOCAL SERVICES

Collaboration and shared expertise are vital to smarter, more efficient management of local services. My Better Local Services reforms will help address some of the infrastructure and growth challenges by enabling innovation and collaboration in local government.

Current local government structures limit the ability of the country's 78 councils and 66 water authorities to work together to manage critical infrastructure and deliver shared services across regions.

Councils need more options, especially

for delivering large-scale water and transport infrastructure. The reforms place more emphasis on councils joining forces to share expertise and costs across regions.

There are some councils already exploring shared water services.

Wellington and Waikato for example. Wellington Water is jointly owned by Greater Wellington Regional Council, and Porirua, Hutt, Upper Hutt and Wellington city councils. It employs 170 staff and manages \$5.3 billion in assets.

In Waikato, an independent report has recommended Hamilton city, Waikato and Waipa District councils transfer their water and wastewater assets into a jointly-owned notfor-profit organisation. All three councils have agreed in principle but no final decision has yet been made.

The current legislation puts significant obstacles

in the way of councils creating jointly owned water Council Controlled Organisations. The reforms will remove these obstacles so CCOs can own, plan and deliver core functions at a regional level.

These reforms are enabling reforms. The solutions are different for each area. There is no set formula, no one size fits all solution. The changes will enable local government to deliver better value water services for ratepayers in ways that are tailored to the needs of local communities.

IRRIGATION AND ITS BENEFITS

Local rural communities need a reliable water supply for farmers and growers. Well planned and managed irrigation schemes are good for rural economies and the environment.

Irrigation has made a real difference to rural communities like Ashburton and Oamaru. It has created jobs for locals, revitalised schools and brought more people in to the towns' retail areas. A recent report by NZIER found irrigation contributes \$2.2 billion to the national economy.

After severe droughts over the last few summers, the need for better water storage is obvious. We only capture around 2% of rainfall in New Zealand, with the rest rushing out to sea.

Irrigation can have real environmental benefits as well with more consistent river

"As a Government we are proud to be strong supporters of irrigation and water storage. The investments we make in this area are long term, not just from season to season. Over time we will be investing up to \$400 million towards irrigation and water storage." flows in summer and reduced pressure on groundwater sources. Often irrigation schemes help supply water to towns and cities.

As a Government we are proud to be strong supporters of irrigation and water storage. The investments we make in this area are long term, not just from season to season. Over time we will be investing

up to \$400 million towards irrigation and water storage.

The Government expects to make a return from investments made by Crown Irrigation Investment Ltd (CIIL). It is not a blank cheque, and projects have to be supported by local farmers and growers.

Supporting irrigation schemes is an important form of regional development and is another example of where local and central government can work together.

LOOKING FORWARD

Now more than ever, it is vital that there is a strong, collaborative relationship between central and local government. I look forward to working with our local elected representatives to tackle these challenges together. We have an important role ensuring the futures of our communities at a local level but also our country as a whole.

VIEW FROM HERE



Irrigation: the future for Canterbury

View from here contributed by David Bedford, Chairman Environment Canterbury.

Irrigation in Canterbury is essential if we are to maintain production of food in a dry and unpredictable climate as well as ensuring we have sustainable and thriving communities.

However, farming to grow our food and generate export income that benefits the whole Canterbury community comes at an environmental cost to many low-land streams, rivers and lakes. Urban people have been blaming farmers and farmers have been feeling under fire because of an issue that involves us all the use of land and water to produce food for the wider community.

Around 15 years ago people in Canterbury started working on the challenge of doing right by our environment as well as realising our development aspirations: this work grew into the Canterbury Water Management Strategy. The Strategy - which asks people to come up with local solutions for local problems - captures the desire of communities to have clean and safe water to use, good recreational opportunities, as well as meeting environmental, cultural and economic needs.

"Urban people have been

farmers have been feeling

an issue that involves us

all – the use of land and

the wider community."

blaming farmers and

under fire because of

These are diverse and seemingly competing goals which require complex and long-lived responses that will only be delivered by the whole community working together regardless of their individual interests.

In Canterbury we have no absolute shortage of water with more than enough rain-

fall to meet all our needs as well as provide for the environment. It is simply a matter of capturing, storing and then moving water to where it is needed - although the economic cost of doing so can be high.

Because of our plentiful water, irrigation is a big part of the water management solution as it provides both environmental and economic benefits. It builds resilience to droughts as well as helping farmers deal with longer term climate change.

Storage lakes in the mountains - such as Lake Coleridge and the hydro lakes in the



Mackenzie - allow us to make use of this very significant water resource.

Storage is of little use, however, without an efficient distribution network. Examples such as the Rangitatata Diversion Race allow us to build on the legacy of past investments and move water to where it is most needed.

Storage of alpine water and irrigation distribution reduces the demand for groundwater, for example, in the highly productive Selwyn Waihora area where Central Plains Water use water from Lake Coleridge that is stored during high river water to produce food for flows. This has reduced the amount of water that needs to be taken

> from groundwater aquifers in the lower part of the Canterbury Plains and will, over time, rejuvenate the low land streams.

However, the reliability of irrigation water from groundwater and from smaller spring-fed rivers is expected to decline in coming decades in many areas of Canterbury. The first cause is likely to be the desire of communities to allow for more water in the smaller rivers to maintain environmental values. This requirement is being driven by water management zone committees and given regulatory authority in Environment Canterbury's Regional Plans.

The second cause is the long-term climate trend, which suggests dry periods on the Plains may become more severe in the future. At the same time, however, the amount of water captured in the Southern Alps and flowing down the big rivers is likely to be maintained, if not increased.

EFFICIENT IRRIGATION GROWING

From mid-2010 to 2015 the amount of efficient spray irrigation grew to 479,000 hectares in Canterbury (from 371,000 hectares). The total irrigated area grew to 507,000 hectares (from 425,000 hectares).

Over the same period there was a 48 percent reduction in the amount of surface (borderdyke) irrigation from 54,000 hectares to 28,000 hectares. This efficiency drive will result in more land being irrigated with less water being used.

So it is clear that the increasingly efficient water use creates significant new options for farming in Canterbury, which provides food locally as well as driving employment and prosperity across the region. Over time water quality will also improve.

Cantabrians should also have confidence that farmers and their support industries, irrigation schemes and water user associations are taking on the challenge of improving water management and achieving the community's vision to protect and improve water across the region.

10

SALES AND SERVICE?

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VIEW FROM THERE



In Nebraska, a unique way of managing water

View from there contributed by Danielle Franck, Upper Republican Natural Resources District Communications Coordinator, United States of America.

Nebraska's unique groundwater management system has attracted the attention of states throughout the United States as they attempt to slow depletion rates while minimising harm to the agricultural economy. Their focus on Nebraska is due in part to what would appear to be a dichotomy. Nebraska has more irrigated acres than any state in the United States yet has roughly the same amount of groundwater as it did before groundwater irrigation began in the 1950s. The state's Natural Resources Districts (NRDs) system is one reason why.

Nebraska is the only state with locally governed entities such as NRDs that have broad authorities under state law to protect groundwater from contamination, overuse and user conflicts through projects and regulations. By giving groundwater management authority to locally governed NRDs rather than the state, Nebraska has experienced success preserving groundwater while also making it available for beneficial use by residents of Nebraska.

The state is divided into 23 NRDs whose boundaries follow river basins throughout Nebraska. Having districts divided by natural watershed boundaries, instead of political boundaries, allows locally elected boards of directors that govern the NRDs to make decisions that focus on natural-resource issues

relevant to their particular river basin. Boards are made up of residents of each district so there is a connection to the land and people which results in locally customised policy and management. Within the Republican Basin where I work, for example, there are three NRDs. Each one limits irrigation water usage by allocating a certain number of acre inches of water farmers can use over a five-year period, but the allocations are different within each NRD because of variations in rainfall. In the panhandle of Nebraska, for instance, some areas receive around 14 to 16 inches of rain per year, while in the southeast corner of the state rainfall averages 34 to 36 inches per year. This substantial difference in rainfall shows the reason for needing different policies and regulations on irrigation. Nebraska is very diverse in regards to geology, climatology and hydrology so each NRD has different needs which are catered to by its NRD, instead of having generic rules, regulations and programmes established by the state.

Since their formation, NRDs all over the state have helped protect Nebraska's natural resources through funding from local property taxes. In addition to managing groundwater, NRDs implement natural-resource-related projects including dams, terraces, drainage ditches, windbreaks, reservoirs and recreational trails. The NRDs in Nebraska's Republican Basin, including the Upper Republican NRD, also levy a tax on irrigated acres to generate revenue for projects that help keep the state in compliance with an interstate water compact that includes Kansas and Colorado.

According to the US Census of Agriculture, Nebraska has more irrigated acres than any other state with about 8.3 million irrigated acres, or 15 percent of the nation's total irrigated acres. California comes in second and is over two times larger than Nebraska in regards to area. The abundance of irrigation in Nebraska makes water management even more necessary.

In the Upper Republican NRD, for example, we have limited irrigation water use via an allocation system since 1979 and were one of the first known entities in the United States to regulate agricultural water use. The current allocation is a total of 65 inches of water per acre over a 5-year period, or an average limitation of 13 inches per acre annually. We track water usage using flow meters installed on wells and have been doing so for more than 40 years. Due to new technology, we are in the process of installing equipment on all meters in the district so that water usage data can be transmitted to irrigators and the Upper



A centre pivot irrigating popcorn. Nearly half of all popcorn in the U.S. comes from Nebraska, making the state the largest popcorn producer in the U.S.

Farmer Charlie Haarberg adjusting his centre pivot system this summer.

Republican NRD in real-time; this will allow farmers to irrigate more efficiently and reduce water usage. The district also helps farmers pay for the use of soil moisture probes that are estimated to reduce irrigation water usage by an average of approximately 12 percent. Technology makes monitoring water usage easier and reduces wasted water enabling farmers and the Upper Republican NRD to better preserve groundwater.

We have partnered with the federal government to permanently retire irrigation in areas where groundwater pumping significantly impacts stream flow or where there have been substantial groundwater declines. The Upper Republican NRD also partners with the federal and state government to implement water conservation practices. Partnerships with government entities have greatly aided efforts to conserve water.

Growing national and international food demands present the potential to stress water resources. It has been our NRD's and Nebraska's experience that when given the opportunity and legal authority to balance water uses with water supplies, local governments can successfully preserve water to meet future needs without sacrificing economic prosperity.

Upper Republican NRD employee Mike Nesbitt reading a flow meter on a centre pivot system in the district. Each year, the Upper Republican NRD reads flow meters on all 3,300 irrigation systems in the district to track annual water usage to ensure farmers are not exceeding their allocated water supply.

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Peach production soars with new irrigation approach

Who would have thought reducing water would lead to better peach crops? Janine Holland talks to Heinz Wattie's Senior Crop Supply Agronomist, Bruce Mackay, about research which encouraged them to dramatically reduce water application on one of their test orchards. A modified irrigation strategy has led to increased crop production and improved quality of fruit at Te Hapua.

Growing juicy, delicious and copious peaches is the aim of Te Hapua orchard in the Heretaunga Plains. As one of Heinz Wattie's long serving orchards in Hawke's Bay, the property has been used as a trial site for a new approach to irrigation since 2010.

The people behind the orchard are committed producers, but Te Hapua has always had significant challenges with the variable soils, says Bruce.

"It's a long skinny riverbed property with soils that range from 8mm water holding capacity (WHC) to 40mm WHC. They had installed a lateral and sprinkler permanent irrigation system which is well designed and maintained. We checked performance at all the extremities last season to find outputs still performing as designed."

In 2007, Heinz Wattie's Ltd initiated an 'Optimising Water Use Project'. The aim was to better understand water demands of optimal crop production in peach orchards. The company wanted to create good data sets that could justify water consent applications or renewals in an anticipated environment of changes to resource management. The goal, says Bruce, was to usher in a new era of more efficient water use by its growers.

Five properties were chosen to take part including Te Hapua.

"The aim was to try to improve the performance of their irrigation. We recognised there wasn't enough information out there on the actual water use requirements of these crops. Their irrigation strategies were based around old evapo-transpiration data. They basically applied their consented volume on a fixed rotation."

Initially a three year project involving Aqualinc (previously HydroServices), and taking a lot of advice from Dr Tony Davoren and local representative, Melanie Smith, Heinz Wattie's has elected to carry on with the research.

"We have continued with three of the properties so we can carry on generating data. Three years is not long enough to generate good data, especially when you throw a drought into it."

The 'Optimising Water Use' project started by analysing the highly variable soils at Te Hapua with an EM38 survey. The orchard was planted in 2003/04, initially without any irrigation, but with a water consent. Following the first crop in 2005/06, moisture stress in the skinnier soils severely impacted fruit size, with a percentage not achieving the 55mm required for processing. A decision to install permanent irrigation was considered the only option to irrigate the entire 19 hectare property. Te Hapua is located on leased land so investing capital in this context had to be well justified, says Bruce. They adopted an approach

Te Hapua orchard representative Joe Burbury (left) and Bruce Mackay examine peach quality.

that focussed on good design and performance, without bells and whistles, relying on old tractors and PTO pumps and manual valves. This approach has served them well with the system still performing to the letter nine years later. The system is divided into 14 irrigation blocks initially related to pump capacities and block dimensions. Permanent micro sprinklers sit between each tree minimising irrigation application on the grass planted between the rows. Water is taken from shallow wells close to the river via three pumps.

"Following the EM mapping we were able to identify the soil boundaries. We grouped the areas of like resistance and then HydroServices installed a series of tubes in each representative area to monitor soil moisture, and determine the individual soil's water holding capacity. What we found was that some of the soils were really skinny and others were quite robust," says Bruce.

The orchard was fortunate in that the already established irrigation blocks approximated the now determined soil boundaries.

Concurrent with this project, Hawke's Bay Regional Council, Pipfruit NZ, Summerfruit NZ, Zespri, Winegrowers, Mr Apple and others were involved in the CropIr calculator project being undertaken by Steve Green and Dr. Brent Clothier at Plant and Food Research, which was tasked with very similar objectives. Bruce Mackay sat with this group as well and was able to share experiences from their 'Optimising Water Use' project.

"What we recognised was that the growers were looking for weekly recommendations for irrigation scheduling. What it did was make sure our systems were working to maximise crop production. HydroServices was able to demonstrate the "Double Sigmoid Curve" that portrays the growth stages in peach crops. Aligning this information with soil boundaries, we would provide Te Hapua with recommendations for each irrigation block for the coming week."

The net result, says Bruce, was a huge lift in productivity, alongside quality enhancements.

Before they started the project, Te Hapua was producing 110–140 tonnes of peaches at a point in its life-cycle where it should have been close to peak production. The property's challenging soils however were limiting its potential, but irrigation targeting made the difference.

"Prior to this project, the grower would go out every five days and apply six hours of water over the whole property. What they didn't realise was that the soils with the 8mm WHC were actually under severe moisture stress for three and a half of the five days, and the soils with the 40mm WHC were saturated. There was only a portion in the middle that

A still from 'The NZ Watties' Peaches story' - part of a Golden Queen peaches commercial for TV.

was sort of performing, and that was only at a particular growth stage. What the soil moisture monitoring achieved for them was being able to align crop demands (which vary through the growth phases) with the soil's ability to hold and make moisture available."

"They were burning through a lot of water, diesel and physical energy. When we started sending them irrigation schedules, the amount of irrigation applied halved. Some blocks had to be irrigated every two days, others maybe every eight to ten days depending upon the weather."

For the next two seasons, production doubled and the size and quality of the fruit improved. Then the 2013 drought struck and the property's consents were cut due to minimum flows restrictions on the river a week out from harvest.

"They only produced 110 tonnes of peaches and they were wee ones. It was just heartbreaking," says Bruce.

Te Hapua has now re-negotiated their consents with the Hawke's Bay Regional Council, armed with the information gained over those four years, and allowed for by some changes in the recently notified Plan Change 6 that in times of water restriction due to minimum flows, they still retain access to some water.

"The regional council has come to the party so we don't run out of water. We still get curtailed but not put on total restriction."

This arrangement was aided by the data Heinz Wattie's could produce from the project proving their efforts to minimise water use.

"The growers have also removed trees from the skinniest soils and replanted other areas to earlier maturing varieties. We did suggest irrigating at night but this wasn't deemed necessary," says Bruce.

Despite rationing water use – or more accurately because of it – Te Hapua is now a much better performing orchard for Heinz Wattie's. The five orchards in this project all had production per hectare in the top six out of 131 properties in 2012. While this result hasn't been repeated to quite the same level since, all properties in the trial are consistently in the top 10%.

Putting their irrigation strategy under the spotlight has paid off for Te Hapua and for Heinz Wattie's.

"Heinz Wattie's are as an industry aiming to be ambassadors. If we see innovations we consider worthwhile, we will implement them to show people in our industry how they can work. That is one of our intentions with this project."

With 60 peach growers supplying them in the Hawke's Bay, Bruce says the project has been considered a success. Not only are these properties improving, others are emulating what they are doing and average yields, fruit size and fruit quality is improving.

"So it's a win-win as we are clearly using less water. If we have good soil moisture monitoring with well sited probes a soil map is forever. For us, it's all about using the water resource as well as we can."

Avoiding irrigation accidents

By Paul Ralph, FMG Risk Services Manager.

In your average paddock, there's plenty of room for both your irrigator and your tractor right? Well not always – given how often the two seem to meet each other with costly consequences!

In the last five years FMG has received close to 400 claims, costing more than \$5.2 million for impacts and accidents involving irrigators. And this amount doesn't include related damage and liability claims for farm bikes, fencing or third-party property.

The vast majority of these losses could have been prevented or minimised, saving the businesses concerned a whole lot of money, time, hassle and the loss of production. Irrigator damage isn't cheap to fix; the cost of repairs can seriously affect cash flow. Just a few examples we've come across include:

- tractors being driven into irrigators causing damage upwards of \$35,000
- travelling irrigators colliding with roto-rainer, resulting in claims for damage costing up to \$65,000
- irrigators hitting a strainer post causing spans to crumple, resulting in repairs of more than \$18,000.

A few other common causes of loss include:

- irrigators hitting fences, over grown shelter belts, pump sheds and water troughs
- vehicles being left unattended in paddocks in the irrigators path resulting in collision
- irrigators hitting other debris left in the paddock.

The extra time taken to walk the irrigator track before flicking the 'on' switch could mean saving thousands of dollars.

It makes sense to check the paddock for foreign objects and any changes to the ground or surrounding trees, shelter belts and hedges. This is particularly important before making the first run of a new season, as there will undoubtedly have been some growth since the last time the irrigator was used. And don't forget about any new fences. Keep your workers safe. Make sure all your staff are confident around using the irrigator properly.

HOW YOU CAN AVOID WIND DAMAGE

Over \$1.2 million of our irrigator claims for the past year were storm-related, so if you cannot move your machinery out of the wind, irrigators should be pointed into the prevailing wind before possible power outages mean the machines cannot be moved, parked and anchored down.

IrrigationNZ also recommends installing anchor points to chain irrigators to the ground when they're not in use.

MAINTENANCE, TRAINING AND INSTALLATION

Read the operating instructions thoroughly and walk the track with any employees before they operate the machine for the first time. This will also ensure all users avoid any obstacles including trees, hedges, fences and buildings.

If you are thinking about installing irrigation, you should first assess your farm's requirements and suitability. Obtain site assessment services to ensure you're getting a system that meets your requirements.

It's particularly important to think about topography and soil composition. Also think about what small buildings or fences you might have to move in order to allow your new irrigator to operate safely and effectively.

Ensure all materials and repairs are installed/completed according to manufacturer's instructions and properly tested. Ask manufacturers to install and commission your equipment and to provide you with full documentation including the system specifications, results of testing and commissioning and how to operate and maintain the system safely and effectively.

For more information on best practice and tips for the season visit www.irrigationnz.co.nz

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Good Governance – more than hope!

By Brent Love, Director of Farm Enterprise KPMG.

Hope is a good thing. It helps keep people positive in the hard times, however hope is not a business strategy. Often when a commodity price downturn hits we react by going into a strategy of "going through the season waiting and hoping for a price recovery".

Good governance behaviour can help farmers be prepared for the volatility in the agricultural industry by having a strategic plan in place for various scenarios.

Most farmers didn't prepare for a scenario where the payout would drop to \$3.90kg milk solid or feed wheat price below \$300/tonne. These are two recent examples where farmers were forced to make reactionary business decisions while they were under pressure.

When the prices for our production goes down and we're in times of stress, it's the worst time in the world to be making a decision about how to handle it. The physiology of your brain isn't functioning properly and all of a sudden you're trying to make decisions which could be the make or break of your business.

A large part of good governance behaviour is around scenario analysis or planning against risk. To have a plan in place for those situations and to understand what the trigger points are for making certain decisions.

Farmers should be asking themselves if they have an exit strategy for situations. For example what's the 'A' plan but if that doesn't come off then what do 'B' & 'C' plans look like? What does that mean for them and the business? The real test is what they are willing to sacrifice to stay in business and what aren't they. Good questions to keep asking are: what are your triggers to make difficult decisions? We may never need to use them, but at what point do you instigate a 'B' plan?

Doing scenario analysis and planning for future decisions also exposes what people really want out of their business and whether they are on the same page. Good governance is about having a holistic view of the business and planning the future by regularly asking the really hard questions of yourself and your business so the business is prepared.

It is important to remember where a business has come from. When a business is going well or a good season prevails, it is equally important to remain disciplined around the strategies set for the business around costs, capital and debt. This is an important discipline for successful businesses.

Governance isn't about not taking risks. Risk creates opportunity and return, and the level of return is often dependent on the level of risk undertaken. However it's the planning around the outcomes of risk positions that needs managing.

When it comes to forming a governance structure, a lot of farmers think their business is not big enough to warrant a governance board, but they should still be practising governance behaviour.

A board of six people that has the perfect structure but has all the wrong behaviour would have limited effectiveness. Likewise if farmers met once a month to talk about the strategy of their business and the long term perspective but they didn't write it down and didn't add structure then that also has limited effectiveness. Business governance and strategy needs input from a process and that process needs a team – business people often with the opportunity to gain independent thought around their business. Testing your plan against a process gives the strategy robustness and often tests its strength and unseen opportunities, but also further risk-proofs the thinking.

One of the most important parts of business strategy planning is about commitment and keeping to task. Often people start these processes but don't continue with them; this is because the team may not have been chosen correctly. The business owner is the team selector so make changes to the people – don't give up on the process.

Planned governance strategy gives business owners control and understanding of their business at a higher level than before.

So be brave and improve this part of the business before someone or something drags you into it because of a situation that could have been avoided.

Farm Environment Plans – working or not?

As Farm Environment Plans and nutrient budgeting become the new norm, IrrigationNZ thought it would be useful to explore their implementation.

The Farm Environment Plan (FEP) is often lauded as the way forward, however some have begun to question their effectiveness and cost.

If the FEP process is used as a compliance tick box exercise, then yes there are far cheaper ways of achieving this and the concerns raised have grounds.

However, if FEPs are used as intended – a farm risk identification, management and accountability tool – they have the potential to provide a robust platform for cost-effective continuous improvement and ultimately moving beyond community expectations.

An area that is often overlooked is linking FEPs to measures of practice and environmental change – how do we know we've made a difference?

The data from the numerous FEP templates cannot easily be collated, if at all, which means telling the story to the community is difficult. This needs careful future consideration.

Irrigators have come a long way in a relatively short time period of time and due credit has not been given for this, but frequently this is because the full story is not able to be told in a credible way.

IrrigationNZ posed four questions to a group of industry leaders who have experience working with FEPs. Their thoughts make for some interesting reading.

THE QUESTIONS

- **1** Is this brave new world of nutrient management and Farm Environment Plans (FEPs) actually making a difference or is it simply a highly expensive compliance exercise?
- 2 How can we continue to grow public credibility while ensuring these tools actually enable behaviour change?
- 3 Whose responsibility is it to keep these processes in check and ensure their implementation is robust, yet useful for farmers, regulators, iwi and the wider community?
- 4 When and how will we know these systems are working?

ALASTAIR TAYLOR Farm Sustainability Services Manager, Ballance Agri-Nutrients

1 It's early days but we are beginning to see a change in how farmers and the industry view nutrient budgets and FEPs. Compliance is driving the need for them, more innovative farmers and advisors are realising they can be an excellent measure for on farm performance, driving economic and environmental sustainability.

2 Two areas can help with this. Firstly, we need to have a system which is simple enough for a layperson to understand. Secondly, we have to be able to demonstrate practical changes on farm. The effects which the updates to the irrigation model within OVERSEER have had are a great example of the latter. Farmers and advisors are now better able to understand the cost in lost nutrients (and electricity usage) of non-optimal irrigation scheduling.

I think we are seeing a "coalition of the willing" coming together to achieve this. No single party can deliver this – not even the regulators, as they have to achieve not only environmental improvements, but also economic and social sustainability. Farmers need their service providers to work collaboratively. At Ballance we believe that the processes must be science-based, with reduced complexity and frequency of reporting and with achievable implementation timeframes. We work with others across the Primary Sector to try to achieve this.

Given catchment complexity, improvements in water quality may be slow in coming and difficult to attribute. In the meantime, the industry needs to be able to share good news stories with our rural and urban neighbours. Increased efficiencies, decreased aquifer N levels due to MARS, reduced electricity usage, FEP actions put in place. All these stories need to be shared. This is where tools like MitAgator, which has been developed by Ballance with AgResearch, can add value to the FEP process, providing spatial and quantifiable measurement and benefits.

EVA HARRIS Environmental Manager, Barrhill Chertsey Irrigation Ltd (BCI)

What you get out of a Farm Environment Plan and Nutrient Budget depends on what you put into it in the first place. It will be easy to spend as little time as possible on them to "tick the box" and let the plan collect dust. However, the process can be a really useful tool to re-evaluate how you use resources and identify where savings can be made. Many of our shareholders have been able to save significant dollars from refining the amount of water and fertiliser they use on their property.

2 All FEPs are audited to support the farmers with identifying how they are meeting Good Management Practices (GMPs) and look at ways they can make improvements. The one-on-one time with the auditor on site is invaluable – providing the farmer with the information they need to make real change. Within BCI, we also work closely with our auditors to identify farmers who need more help and to target our education programmes in the areas where they are of most use.

BCI is responsible for ensuring our shareholders are on track with meeting GMPs and we can tailor our programmes to meet their needs. Our auditors and internal processes are subject to external checks to ensure we are meeting community expectations. We report a summary of our programme to ECan annually, including how we are trending with audit grades and how we followed up on them.

4 We know implementing good practice will improve water quality, but we will need to be patient to see these results. It may take many years before we can see the benefits of these on-farm improvements on water quality. In the meantime, we can track how we are progressing with achieving GMPs and continually support our shareholders with making improvements.

ROBYN WELLS Chief Executive, North Otago Irrigation Company Ltd (NOIC)

1 NOIC firmly believes in the value of Farm Environment Plans having used them for a decade now. The key is to employ 'active management' of the farm plan system. We constantly think about improving environmental outcomes through better infrastructure, training or management and build that into our system.

Bringing in water quality limits (desired outputs) and linking them to the farm plan inputs (management practices) is a stepchange for farmers. There is a lot to be learnt about how to ensure good water quality can be consistently achieved. With most of the big tick items, like fencing creeks and appropriate effluent systems having already been achieved in our area, we are now preparing to tackle the less obvious issues that will require scientific input alongside on-farm trial and error.

2 NOIC believes the biggest gains can be made through irrigation efficiency to limit water/nutrient losses to the environment. Reducing and eliminating run-off and wastage will be a visible outcome and this will also improve the bottom line and allow for a more sustainable use of our water resource. Excellent behaviour should be recognised and celebrated, while poor behaviour should not be tolerated. Standing behind these values will garner credibility in the public eye. Further credibility will be gained when we can report on improvements in key water quality parameters.

3 Regional Councils by engaging in participative consultation and providing timely and useful guidance to industry, consultants and irrigation schemes. The job of improving environmental performance belongs to us all with the biggest responsibility falling on those with the biggest impacts on our rural waterways: farmers. We must all provide as much support, guidance and training to them as we "The job of improving environmental performance belongs to us all with the biggest responsibility falling on those with the biggest impacts on our rural waterways: farmers." – Robyn Wells

possibly can through the coming challenges. NOIC will stand side-by-side with its shareholders to advocate on their behalf, to employ an effective and reasonable farm environment plan system, and to provide access to relevant and useful guidance and training.

4 When environmental outcomes, as measured, improve or cease to decline.

IAN BROWN Principal Strategic Advisor, Environment Canterbury

When answering this question there are two important matters to consider. Firstly, it is important that

we view Farm Environment Plans as part of a 'package' which includes, industry agreed good management practices, some rules, a whole raft of industry support initiatives and of course, audits. FEPs are a tool, a means to an end and not the end in itself. On their own FEPs are of limited value, but when embraced along with other package activities, and integrated with other farm business planning initiatives, they become a powerful tool.

Secondly, it is important that we focus on the outcomes and don't get distracted by a message that this is all just about compliance. Strong resilient farming businesses along with improving environmental quality have to be a big part of what we are aiming for.

I am confident that if we embrace the 'package' and keep our eyes on the outcomes, then all this will make a difference.

2 The best way to grow public credibility in the whole FEP package is to ensure that there is a good audit process in place. An audit provides an opportunity to check progress against the actions as set out in the FEP and identify those areas where more attention is required and where things are working really well.

While the thought of audit is daunting to some farmers, it doesn't need to be. Environment Canterbury has developed a pragmatic farmer-focused approach to audit. The audit process recognises that every farming operation is different and what works on one farm won't necessarily work on another farm. FEP auditors must have a good knowledge of farming and farming systems and must be good listeners. Environment Canterbury has developed a certification programme for FEP auditors to ensure that standards are maintained.

3 In my view, farmers themselves with the support of their industry organisations, have a big part to play in ensuring that these processes are robust and useful for all parties. While many farmers are reluctant to get involved with the regulator, from my experience some of the best programmes have come through collaborative initiatives.

4 In the short to medium term we will know these systems are working when we see farmers embracing them as normal business practice.

In the longer term we will know these systems are working when we hear stories of stronger farming businesses and improving environmental quality.

SUE CUMBERWORTH Director. **The AgriBusiness** Group

1 The Farm Environment Plan process (writing, implementing and checking through auditing) is a risk management

approach for farmers to recognise the environmental risks of their farming systems and to manage them. Well used, this process can make a significant difference.

The AgriBusiness Group has worked with the Morven Glenavy Ikawai Irrigation Scheme over the last six years, and yes, we have seen improvements in on-farm practice. Significant changes on some properties and small tweaks on others. For all, it has reinforced the importance of good day-to-day farm practice and robust forward planning. The upside of achieving good practice and efficient, environmentally responsible use of farm resources, is they have potential benefits for both the environment and the farm business. So yes,

"... it comes at a cost but our experience is that farmers also recognise that there is significant value in it as well." – Sue Cumberworth

it comes at a cost but our experience is that farmers also recognise that there is significant value in it as well.

Nutrient budgeting is a planning tool for predicting nutrient losses and assessing options to reduce these losses.

When the FEP process and nutrient budgeting are embraced as tools to assist learning and improvement in on-farm practices they make a difference to the way farmers manage their resources.

2 In The AgriBusiness Group's experience public credibility comes with hearing good practice farming stories and seeing results. Seeing is believing. Really good examples of this are farm open-days and kids getting involved through schools. All sectors of the community can benefit from understanding the perspective of others. We must be prepared to listen to each other and engage in dialogue. Individual values around environmental outcomes are generally common ground.

3 All parties have a responsibility to support farmers by working together for a process that is workable and realistic, especially with regard to timeframe expectations. The key responsibility for on-farm implementation is with the farmer. Good support with information and tools makes this easier and more effective - industry bodies are playing a key role here. Irrigation schemes are implementing the FEP process and doing it very well. At The AgriBusiness Group we believe there is a tremendous role for farmer groups to cooperate and manage the process and implementation.

4 We believe that the systems are working well now where they have been implemented, the environmental results will generally take longer. For some issues we can see results quickly. For example the quality of some waterways can respond quickly to approaches like good erosion management and stock exclusion. We can see a difference if the problem was sediment or pathogen entry. But many of the issues are more complex, particularly in Canterbury, and it's going to take more time. People will need to work together and be patient to achieve some of these solutions.

MATTHEW DOLAN **Business Manager NZGAP, HortNZ**

1 Nutrient management plans and Farm Environment Plans are a small part of the framework that is needed to manage land and water.

There has been a lot of discussion about what that bigger framework could look like, but there needs to be more progress on this. There are a number of sustainability programmes emerging in New Zealand and overseas and we should be looking at the successful ones to see what they are doing right. The good programmes can explain exactly what they want to achieve and can measure and explain their progress against these objectives.

Regarding the cost, farmers and growers are paying for this system, so the structure needs to enable them to derive value from it further down the track. A well-designed system has a better chance of delivering value.

2 It is not just the public that need convincing, but equally, farmers and growers also need to know that progress can be made and that there are tangible benefits for them.

We need data and metrics to describe what is happening so that evidence-based decisions can be made and some good communicators to explain what it means and tell the story in a way that resonates with public and addresses their concerns.

3 Neither Government, nor industry working alone are particularly effective at making progress on complex issues. This is why they need to find a better way to work together.

Industry organisations, NGOs and iwi are playing an increasingly important role. These groups can commit to strategically pursuing issues and can focus on them over time.

The three parties - Government, industry and the industry organisations - all need to agree on who is doing what and how they are going to work together.

4 When we are all tracking a set of really meaningful metrics and watching them heading in the right direction.

Careful management needed post-quakes

Irrigating farmers are warned to take care as they turned infrastructure back on following November's devastating earthquakes.

IrrigationNZ CEO Andrew Curtis reminded irrigators that health and safety needed to be at the forefront of their minds as power cuts and surges, twisted machinery and damaged foundations could all contribute significant hazards as irrigation resumes.

With this in mind, IrrigationNZ has rereleased guidelines for managing irrigation safely post-earthquake.

While farmers are keen to return to business as usual, professionals would be needed in some cases to determine if infrastructure is safe to operate.

"The first thing is to check the situation with your power. Despite power remaining off in many districts, irrigation pump sites and sheds should always be approached with caution."

"Electricity is dangerous so always assume there is live power. Beware of surface water around electrical hardware and fallen lines, loose wires and tilted or fractured foundations. Turn off mains where power has been cut unless it's impossible to do so safely. The most important thing is to get an electrician to check the site properly before you turn power back on."

"Then check the physical structure of the irrigator, particularly pivots and linears. Look at the truss rod supports, for twists, broken welds or any bending. The foundations should also be checked for structural cracks and to ensure any electrical connections are secure."

For those who don't need to irrigate straight away, leaving the irrigation bore pump off for another week will help groundwater resettle. "We recommend pumps stay off for another week. This will give aquifers an opportunity to settle and clear."

While initial reports suggested damage to irrigation infrastructure wasn't widespread – compared to Canterbury's 2013 windstorm – the risks of malfunction and accidents following the earthquakes remain real.

"These earthquakes appear to have impacted significantly on transport infrastructure, but a hidden cost will be the impact on farmers if irrigation is delayed for an extended period. It's important irrigators seek advice and support now so they can get their systems up and running quickly, while still ensuring their safety and that of staff operating irrigators," says Mr Curtis.

The free resource can be found on the website www.irrigationnz.co.nz/news-resources/risk-advice/managing-irrigation-post-earthquake.

Climate real culprit behind aquifer decline

IrrigationNZ has responded to critics who have attributed falling water levels in Mayfield on irrigators.

Blaming irrigating farmers for the decline in aquifer levels was an overly simplistic response to a larger climatically-induced problem, says IrrigationNZ CEO Andrew Curtis.

Aquifers right across the region are running low primarily due to three winters of little rainfall and low snow levels. While late spring and early summer have seen increases in rainfall, the months preceding this were very dry and the cumulative impact of three winters of low recharge is now showing underground.

"People look at the recent rain and think the aquifers should be bouncing back, but it doesn't work like that. Aquifer recharge is a relatively slow process. For the Mayfield area it's very much driven by winter rainfall. With three dry winters behind us, we were always going to have to be careful about water use coming into this season. In fact, local groundwater irrigators are also facing exactly the same issues. Most of the irrigation around Mayfield actually comes from irrigation schemes that supply alpine water from the Rangitata or Rakaia Rivers – the irrigators are not using groundwater. The bigger picture is that we have been close to drought for three years and many water resources are under pressure."

Mr Curtis says with increasing uptake of SMART Irrigation practice and technology, some irrigators are actually reducing the water they apply – lessening their impact on the resource, while at the same time saving them time and money.

"We advise irrigators only to apply water when necessary and employ SMART Irrigation practices and technology to ensure they manage their water allocation sensibly. We certainly don't want to see anyone wasting water and want to reassure the public that with careful and prudent use, irrigation within current allocation levels is sustainable." It was inaccurate to say irrigation was currently going "full tilt" as recent data showed a slow start to the season, with many irrigation schemes reporting lower demand from farmers for water, due to the persistent cold and wet conditions.

Ashburton District Council's response to the Mayfield crisis using technology to treat a stockwater supply for drinking water was innovative and met with Public Health approval.

"We can understand that people are upset about the decline in their local aquifer but the bigger picture is we need to plan for climate change and the likely impacts on aquifer recharge. We need to be looking at how we use science to provide us with solutions. The Hinds Managed Aquifer Recharge (MAR) project is already showing positive results and it's quite feasible that local drinking water supplies could also be supported by similar MAR projects to make them more sustainable. Alternatively a direct alpine supply could also be a solution."

What are you going to do about that?

By Jane Frances, Deputy Secretary Natural Resources Policy, Ministry for the Environment.

Let me paint you a scene. I'm in Whanganui, six weeks into my role as Deputy Secretary responsible for freshwater policy at Ministry for the Environment. I'm leading a hui with my team on proposed changes to the National Policy Statement for Freshwater Management. A keen kayaker pulls an Agee jar of water out of his backpack that he collected from the river that morning. He puts it on the table we are sitting at, in front of a room full of people. 'My question is, what are you going to do about that?' he asks. The water is very cloudy, particularly in contrast with the drinking water sitting next to it on the table. And that is the question for us - the Ministry and all of us who use water.

The water remained on the table throughout our hui and it travelled back to Wellington with us as a reminder of what we are here to do. Our kayaker's question also remains with me.

To me, this sums up the job for me and others working on water quality issues. More and more, New Zealanders are expressing their expectations about taking care of our water and that takes many forms – swimmability, ecological health issues like sediment, phosphorus and nitrogen, potential health risks associated with drinking water quality, and the purposes we take water for. We are very pleased to see this increasing interest in our waterways as it aligns with the issues we care about too. In our role as Ministry for the Environment, our aspiration is to make New Zealand Aotearoa the most liveable country in the world – one with outstanding natural and built environments, with great livelihoods and lifestyles for New Zealanders. Our role in this is developing the systems at the national level that allow communities to shape this at the regional level.

Clean freshwater is a key element of a liveable New Zealand. We work with Government, councils, iwi and stakeholders to implement a system that takes care of the quality of our water in a way that brings together environmental, social, cultural and economic considerations for communities. Some of this is about choices that communities make to put more or less weight on these considerations – to shape the natural and built environments they want. Irrigation will play a part in those considerations for many communities.

You will be hearing this in the conversations around water in the communities you are involved in around the country. It is not a question of how to lift farm profit in the short term, but how to provide long term sustainable supply of water to communities in ways that support the range of objectives they have.

The question for you, like for me, is: What are you going to do with your opportunities to contribute to improving the liveability of our country? You have the opportunity to work with farmers to make irrigation decisions that improve water quality in ways that benefit us all into the future.

You can also contribute your thoughts through our policy processes. Given the importance of both water quality and quantity to irrigators, we would be interested in hearing your views on water issues.

Over the next few months, we will be consulting on proposed amendments to the National Policy Statement for Freshwater Management that were signalled in 'Next steps for fresh water' earlier this year. At the same time we will be seeking public input into the proposals for regulating stock access to waterways. Over a longer period through to late 2017, the Ministry is working on issues around freshwater allocation and next year you will start to hear about the options government is considering.

This work will help us as a country to answer our kayaker's question – "What are we going to do about it?" and to achieve the liveability we aspire to.

Big DM gains with accurate irrigator pod placement

TracMap's solution for the easy, accurate and reliable movement of pod irrigation systems is increasingly popular.

There are undeniable gains to be had in DM production using the TracMap solution for pod placement.

David Glen, CEO TracMap, advises that "many of our customers are only too happy to report that they have experienced an increase of between 2T-4T in DM production after they switch to the use of TracMap for greater accuracy in moving pod systems. The investment in TracMap pays itself off very quickly."

Indicatively the economics for investment in TracMap for improved pod irrigation are:

HA under pod irrigation	30	60
Additional DM growth / HA	2T	1.5T
Additional DM growth, total	60T	90T
Additional MS kgs, 12.5kg conversion	4,800kgs	7,200kgs
Increased revenue @ \$5.30/kg MS	\$25,440	\$38,160
Cost of TracMap unit (installed)	\$8,000	\$8,000

Furthermore, the ease of use and guidance that is implicit with the TracMap unit provide farmers with confidence that their pod irrigators are being moved for best effect by any of the staff. No longer does the farmer need to take sole responsibility and commit many hours moving pod systems in order to have peace of mind that the job is being done correctly and the water is being applied to best effect. On many properties, several staff have been trained and are entrusted to move the pod systems accurately and reliably using the TracMap guidance solution.

In addition to use for irrigation, the TracMap unit can also be used for putting accurate breaks up for cows, and on the tractor for fertiliser spreading too.

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Industry figure retires

There isn't much that Kevin Steel hasn't seen or heard of in the irrigation sector. For 20 years, the senior bureaucrat designed workable policy to support irrigation developments in New Zealand. Recently he finished up with the Ministry for Primary Industries (MPI) but was happy to share a few reflections with Janine Holland.

There won't be many irrigation scheme boards and staff who haven't had contact with Kevin Steel. The former boss of the Ministry for Primary Industry's Irrigation Acceleration Fund (IAF) retired last month, but still plans to help the sector he feels passionate about.

Kevin's primary production career began in 1996 when he joined what was then the Ministry of Agriculture and Forestry (MAF). After stints working with the Sustainable Agriculture Programme, policy work around climate change, land use and the environment (including the Kyoto Agreement) and three years as private secretary to Minister of Agriculture Jim Anderton, Kevin began focusing on irrigation development in 2008.

"The National Government had had a policy in opposition that they were going to build storage in the first term as government. It took us two and a half years to do all of the policy work that led Cabinet to put that policy in place. The question was how to design the programme to deal with large-scale storage-based schemes. It was a new policy approach – it was a really challenging and stimulating time."

Kevin moved across the Ministry to manage the IAF when it was first set up in 2011.

"It's played out well. The fund has achieved a lot and really significant progress has been made by the sector."

He quotes statistics showing that in the mid 1990's when he first became involved in irrigation development, there was around 340,000 hectares under irrigation in New Zealand. "Today, based on the latest statistics from 2012, with new irrigation areas established with IAF funding and those areas under construction, we are up to about 820,000 hectares. Plus there's another 200,000 hectares or so in the pipeline."

It's not just growth in the number and size of irrigation schemes that's critical; changes in irrigation behaviour and practice have also been an MPI focus.

"We've also seen some pretty big improvements with water efficiency and the ways things are managed. Andrew Curtis and the IrrigationNZ team have made good headway with work they are leading looking at irrigation scheduling. But there's still a way to go around irrigation decisions and scheduling. The challenge is to ensure all of these good technologies are applied evenly across the sector. Then we will get good environmental efficiencies and economics and that's got to be our target."

While Kevin has remained politicallyneutral during his career, he has never failed to be an advocate for the industry.

"It annoys me some of the media statements we get from various commentators. We have got to turn a lot of current experiences into good evidence to tell the irrigation story."

His advice extends to the responsibilities schemes have to their communities.

"We need to be taking a more strategic view around the issues. The historic approach to irrigation development has had quite a strong linear engineering focus. But as systems have got bigger, community expectations have become higher and the sector has been too slow to respond, though it is adapting really rapidly now."

He highlights Canterbury and North Otago as two areas leading the charge. "Here we see schemes working together and bringing in other skill-sets, taking responsibility for society's expectations. We now need to take these lessons and apply them to the wider sector as a whole."

It was mid-November when Kevin shut his office door for the last time. "This time next Friday will be the first time in 42 and a half years I haven't had a job."

He has no immediate plans for work, but will prepare their home for sale, as the family intends to move away from Wellington.

"I think the plan is I will continue to contribute to the sector in the stuff where I can make a difference, but will first spend time exploring what else there is to do. I've spent a lot of my time focused on family and work and haven't really developed hobbies as well

Kevin Steel speaking at his farewell function at CPW.

as I could. It doesn't mean I won't be keeping my eye on the sector, interested in progress, keeping in touch and putting in my two cents worth from time to time."

Reflecting on achievements in the past two decades, Kevin says the creation of the IAF and the opening of CPW Stage 1 are highlights.

"Personally the things that stand out are the Cabinet decision to put the IAF into place. We worked really hard on that and it was not an easy pathway to make the case and produce the evidence that this was the way for the Government to deliver on its objectives."

"From an industry point of view, probably being involved with CPW right from the early committee stage and then being at the official opening of stage one stands out. Every construction and permission for a new scheme is gigantic, but the big one for me is CPW, more from a personal point of view."

In November, CPW hosted an industry farewell for Kevin who found the acknowledgements coming his way somewhat uncomfortable. "I don't like to be in the limelight but it was really nice to see all those people. I prefer to be in the background."

Ending his time with Government has brought many memories to the fore. "As you get to this decision, I've found myself reflecting on a whole lot of stuff and remembering things I hadn't thought about for some time. Through my career I've been really fortunate to have a whole lot of interesting things to do. As a bigger team we've got a lot to be proud of."

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Irrigation pioneer of Waitaki

By Sally Rae, Otago Daily Times.

Land development was a lifelong passion for visionary North Otago farmer and IrrigationNZ Ron Cocks Memorial Award recipient, Sid Hurst.

His lengthy farming career was characterised by a readiness to diversify and take up new challenges and his name is inseparably linked with Lower Waitaki irrigation developments which transformed the landscape.

Mr Hurst, who died in Oamaru on July 21, aged 97, was widely lauded for his contribution to farming in New Zealand.

Those plaudits included an honorary doctorate of science from Lincoln University, an OBE for services to agriculture and education, the Ron Cocks Memorial Award for leadership in irrigation, and life membership of Federated Farmers.

Yet, he was never one to seek the limelight; farming was simply his passion and he derived his greatest enjoyment from developing dry land to irrigated pasture and planting trees.

That determination to continue doing what he loved was evident until the end. Even at 96, he turned up at the farm most mornings at 7am, wanting something to do.

"He would take his motorbike and trusty old heading dog that he called his eye dog, as it could see the sheep that Sid couldn't. As a team, the two of them did a good job," youngest son Russell said.

Born in Oamaru on August 12, 1918, to Archie and Jessie Hurst, he attended Windsor and Papakaio school and Waitaki Boys' High School.

After leaving school, he worked on both the home farm near Windsor and other farms. He learnt wool classing, doing classing in many sheds in the Upper Waitaki.

On the day World War 2 was declared, he signed up to buy his father's half of the farm and lease his mother's half, which he later bought.

In 1941, Mr Hurst married Hazel Ludemann, who his teacher sat him beside on his first day at Papakaio School.

He enlisted for military training but, having left school in the fourth form, he had to sit his matriculation by correspondence so he could get into the air force and become a pilot.

He initially flew Stirling bombers but, after having to make an emergency landing at Dover in a "shot-up" plane, he broke his leg when he jumped from the plane. After recovering, he was transferred to transport.

Returning to farm in North Otago, he set about rabbit-proofing the property — even capturing the last rabbit — and became involved in various community sporting and school groups.

In 1958, Mr Hurst was elected president of North Otago Federated Farmers and his tenure coincided with a bad period of drought.

To recognise the support received from their Southland counterparts, it was decided to make a presentation to them.

A plane and pilot was hired and Mr Hurst and his deputy duly flew South. But they encountered thick fog on the return flight and the young pilot panicked so Mr Hurst took control and landed safely in Kurow.

Frustrated with farming in dry conditions and with an appetite whetted by a small irrigation project developed by his father on the Lower Waitaki Plains, he recognised the value in irrigation and set out to follow the water.

In 1960, in conjunction with a nephew, he bought a farm on the Lower Waitaki, later selling the Windsor farm and shifting to Awamoko in 1973. He continued to purchase or have significant interest in many farms, usually with water available.

Under Mr Hurst's leadership, the Lower Waitaki Irrigation Scheme was achieved and its worth was recognised with it becoming a national model.

The scheme now irrigates about 20,000ha, the countryside has changed from brown to green and sheep or beef cattle have largely given way to dairy cattle.

In 2008, Mr Hurst was the inaugural recipient of Irrigation New Zealand's Ron Cocks Memorial Award for outstanding leadership in irrigation.

He was lauded for his innovation in the community, as a leader with passion and enthusiasm, determination and drive to succeed for wider community and national gain and his willingness to pass on his experience and knowledge.

His inspiration, innovation, enthusiasm and philosophies had been a "huge influence" on irrigation throughout New Zealand, IrrigationNZ said in its 2008 Ron Cocks Memorial Award.

He was also a member of the National Water and Soil Council Board making national decisions on irrigation and water allocation and

Sid Hurst.

later became involved with the establishment of the North Otago Downlands Irrigation Scheme.

During his farming years, there were not many things Mr Hurst had not tried. His farming involvement covered the field from sheep and beef, dairy and deer, farm forestry and timber production, to horticulture, viticulture and beekeeping.

Russell, who farmed with Mr Hurst, said his father was determined but always open to new ideas.

"Sid had the incredible ability to see the future at least ten years ahead of everyone else. He would visualise the end result."

He started with sheep but, after drought, changed to beef cattle but they, too, were beaten by drought.

He harvested clover seed from pasture in good growing years and grew fodder beet in the early 1970s.

When electric fences first came in, there were no insulators so he designed his own and got them made at Temuka Pottery.

At 64, he converted part of the farm to dairy. Though he milked 16 cows by hand before he went to school each day, he never did a milking of the large herd.

When Mr Hurst purchased the original two blocks that formed the base of the present Invernia farming operation, there were only 15 trees. Now there are more than 80km of hedgerows and many small plantations, testament to his love of trees.

He became involved with the Waitaki Lakes Committee, which was responsible for beautifying the Waitaki Valley following the hydro-electric dam development.

The group turned many areas into scenic campsites and recreational areas. Willow trees now shading popular summer campsites came from cuttings he took from trees alongside the Avon River in Christchurch.

In 1993, Mr Hurst's farming career was acknowledged by Lincoln University when he was awarded an honorary Doctor of Science degree.

It was the first award of honorary doctorates by the then-new university and he received the honour along with the Parliamentary Commissioner for the Environment, Helen Hughes.

He was a member of the Lincoln College Council from 1962 to 1985, as a farmer representative, and chairman for the last six of those years.

He was an early advocate of autonomy for the institution which was then a college of Canterbury University.

Lincoln University Chancellor, Tony Hall, said the university community had lost one of its most loyal and stalwart supporters.

"His early vision of an independent Lincoln University has given all of us much to be grateful for. He was one of our founding fathers."

As chairman — the equivalent today of chancellor — he was at the forefront of all the early preparatory discussions and debates which ultimately led to the college becoming an autonomous university in 1990.

"Mr Hurst's lifetime of involvement in farming and matters related to rural New Zealand made him an ideal 'fit' with Lincoln's heritage and its mission as a land-based teaching and research institution. The university salutes his life."

Friend and fellow irrigation proponent, Dave Finlay, said Mr Hurst was probably one of New Zealand's greatest farmers.

Not only did he achieve the highest levels of production and performance in his own farming operation, but he also shared his knowledge with others through intelligence, assistance or just encouragement. For young people working for him, it was "like being in a university".

Mr Finlay believed Mr Hurst could have been chief executive of any big company "because he'd worked out how to succeed".

He was always thinking how to do things

Sid Hurst receiving an Honorary Doctorate of Science from Lincoln University.

better and everything he did, he had a reason for doing.

As a man, his character was "incredibly strong" and his ability as a community leader was outstanding.

It was natural that he would drive the Lower Waitaki irrigation scheme and it was a project that remained very dear to him.

Yet he never wanted to attract too much attention and did not want any credit for the work that he did, Mr Finlay said.

North Otago Federated Farmers president Simon Williamson described Mr Hurst as "one of the leading lights" in farming in the country with irrigation.

"He was one of the early people that pushed for irrigation in North Otago, he could see the value in that. Look at what it's led to," Mr Williamson said. Mr Hurst had an interest in more than 20 companies over the years, including as a founding director of meat company Fortex, and was a director or served on the committee or more than 30 groups and organisations.

Sport was another interest and he was a keen rugby and tennis player. He played rugby for Old Boys between 1933 and 1940, including senior rugby between 1938 and 1940, and, at the time of his death, was the club's longest-serving surviving member.

He played rugby for North Otago in 1940 but, like so many other young men, his playing career was curtailed by war. He was also a life member of the Returned Services' Association.

Mr Hurst is survived by his children Gwen, Lex, Joyce, Russell and Robyn, and their families.

Waimea forges ahead

With a recent name-change and signalled Crown Irrigation Investment Ltd backing, Waimea Irrigation Ltd is making good progress at getting its water storage plans off the table. Janine Holland talks to new Project Manager Natasha Berkett about their plans.

It's been a long time coming but the backers of the Waimea Community Dam are getting close to asking for investment in their water storage facility.

In October, the Waimea Community Dam Ltd company was renamed Waimea Irrigation Ltd (WIL). This was a deliberate move to provide greater clarity about who the company effectively represents, says new Project Manager Natasha Berkett. The old name will now be 'parked up' for potential use by the company's planned joint venture with the Tasman District Council (TDC) down the track.

Natasha is the company's inaugural project manager. "My appointment is seen as part of WIL's commitment to getting the dam project completed" she says.

Among her responsibilities, she lists securing investor equity, maintaining and building relationships with key stakeholders and the community, managing communication with irrigators and ensuring WIL meets the criteria for CIIL funding.

The first priority is getting an initial information memorandum out to potential shareholders before Christmas. "We're looking to have expressions of interest from irrigators by February/March 2017 so this is a key thing I'm working on."

Natasha has come to WIL from the Cawthron Institute where she was a Group Manager for the Coastal and Freshwater Group. The group provides research and consultancy services in freshwater and coastal aquatic ecology. Prior to that she worked in Hawke's Bay as both a consultant planner and in-house for the local regional council. She has a Masters in Resource Planning.

"The main thing that attracted me to this role was I really liked the idea of getting involved in one project with really good people and seeing it through to the end point. The role is the perfect balance of science, policy and planning, economics, environmental considerations and community and people."

She has strong empathy with the aspirations of WIL.

"I grew up on a sheep and cropping farm in Dovedale (in Tasman District) and also worked on orchards when I was a student. Part of my interest in the role is making things better for primary production, but also for the urban communities as well."

"That's what I like most about the role. It's a really good mix of all the things that I enjoy."

Having worked in horticulture yet living in urban Richmond, Natasha says she can see both sides of the coin, and providing that balance will be central to the project's success.

"I think it's really important to explain to urban ratepayers what the dam will mean for them. The impacts of the National Policy Statement Freshwater Management and Tasman Regional Resource plan changes affect urban water supply as well as rural water users (see side bar story). We already have a problem with salination potentially threatening some of our bores on the Waimea Plains and we've been subject to water restrictions for many years and that's without any growth in population or industrial use.

We also see a win-win in our partnership with TDC. If the dam doesn't go ahead, the

IrrigationNZ board members visiting the proposed Waimea scheme area in 2014.

Natasha Berkett.

Council will still have to do something here anyway, so what will be the cost? The dam is a solution that works on so many different levels," she says.

In the meantime, progress is rapid with many work streams underway. A procurement strategy has been drafted and a heads of agreement is being prepared with TDC around how the joint venture will operate. TDC is also in discussions with landowners about land acquisition.

Representatives from both Crown Irrigation Investments Ltd and the Tasman and Nelson councils have toured the proposed command area recently to gain a further understanding of the issues at stake and to talk to some of the water users.

"We want people to have an understanding of the operative plan (for the region) and the impacts of the water cuts that will occur if the dam doesn't go ahead. I don't think people understand yet how severe the cuts will be and the impacts on society."

Natasha says as well as preserving security of supply for irrigators, the dam will improve the environmental outlook for the Waimea River.

"The minimum flow in the Waimea River will be considerably increased with the scheme which will have a really important effect on the ecology of the river; water quality will improve as well as water quantity."

She also points to the conditions proposed for the dam including a biodiversity management plan, which will see plantings in the coastal margins to offset vegetation clearance at the dam site.

"There are lots of positive things we can talk about that we will be doing."

Chairman of Waimea Irrigators Ltd, Murray King, says Natasha's appointment and the recent surge in activity bodes well for progressing the scheme.

"Our relationship with Crown Irrigation Investments Ltd is ticking along nicely and we're getting some shareholders on board as early subscribers. One of the things that most appeals to Crown is that this is a scheme that isn't predominately dairy. We are mostly supporting high value horticultural crops. And the environmental impact of this is minimal; especially pip fruit which has virtually no nitrate or phosphate loss which is a real positive. This is about water reliability at the very few times of the year when we absolutely need it."

Waimea Irrigators Ltd is the result of investigations by the Waimea Water Augmentation Committee, a community group set up in 2003 to investigate the problem of acute water shortages affecting the Waimea Basin in Tasman District. The proposed storage plan is for a Waimea Community Dam in the Lee Valley.

REPORT SHOWS COST OF NO DAM

Without the Waimea dam, successively deeper water rationing cuts could cost the Nelson and Tasman region \$700 million, a new report released last month says.

The report by Northington Partners, an independent investment and corporate advisory business, estimated the total economic impact of water restrictions on water users in the Waimea River catchment area alone, at \$231 million.

The report states that: "Based on the potential for up to 70 percent cuts in current water allocations, the productive irrigable area [in the Waimea Catchment] is estimated to reduce from 3,800 hectares to 705 hectares in a worst case scenario."

The report was commissioned by WIL to advance the funding, technical development and construction of the Waimea Dam. It looks at the potential financial and economic impacts to the region if the dam does not proceed.

"Water security and sustainability is the single most important economic development issue in our region and this report puts a number on that," WIL strategic advisor John Palmer says.

"This is a major regional issue and major regional opportunity which has been carefully researched. There are still a number of hurdles to overcome, but the research shows the Waimea Dam is a very good example of water storage with a whole lot of benefits and virtually no downsides. The analysis also shows that it is a regional investment with benefits to both Nelson City and Tasman region."

New look to IrrigationNZ board

IrrigationNZ has two new directors on its board. We welcome Robyn Wells and Rab McDowell.

ROBYN WELLS

Robyn has been the Chief Executive for North Otago Irrigation Company Limited (NOIC) since August 2010. NOIC operates with co-operative philosophies and is currently expanding its irrigation coverage from 13,000 to 25,000 hectares. Prior to NOIC, Robyn held senior management positions in the USA and Australia, primarily in the co-operative-based renewable fuels industry. She is a director on the Waitaki Irrigators Collective representing almost 80,000 hectares of irrigated land off the Waitaki River, and has previously been independent chair of a 720-cow dairy conversion in North Otago.

The contribution she wants to make to the IrrigationNZ board is based on her experiences in the irrigation industry, including the recent development and implementation of a \$60 million expansion project for NOIC. She also brings regulatory and planning experience as part of a collective and a scheme which has recently faced such challenges as Plan Change 6a (Water Quality: Otago) and Plan Change 3 (Waitaki River Allocation: ECan).

"As an IrrigationNZ director I would envisage participating in the development of a cohesive, resilient and value-creating strategy. Our members need to feel listened to, respected and professionally represented at a national level and I believe I have the strategic, communication and governance skills to contribute."

RAB MCDOWELL

Rab McDowell farms 550 hectares at Mayfield in Canterbury, an arable, dairy support and lamb finishing operation. An area not considered to need irrigation when the Mid Canterbury schemes were developed in the middle of last century, Rab led a group who tried, unsuccessfully, to get irrigation into Mayfield 20 years ago. The Barrhill Chertsey Ltd scheme finally made it possible and Rab put pivots on 265 hectares in 2011 at the start of the scheme. He completed his irrigation development last season and now farms 90 percent irrigated.

He was chair of Barrhill Chertsey Irrigation Ltd from 2012 till August 2016 and remains a board member.

Rab has been actively involved in irrigation issues in Mid Canterbury and led a farm sector group co-ordinating input into the plan change for the Hinds Plains area – a plan that will have significant impact on farmers' ability to farm within nutrient limits.

Rab is also a member of the working party overseeing the Mid Canterbury Managed Aquifer Recharge (MAR) trial, a project to recharge aquifers and dilute nutrient loads, which is now progressing to the commercial application of MAR.

"I'm looking to continue those efforts on behalf of irrigators, particularly in the acceptability and necessity of irrigation for New Zealand's future."

MARK SLEE STEPS DOWN

IrrigationNZ's deputy chairperson, Mark Slee, retired at the recent AGM. After 12 years on the board, Mark has been a key player in the progression of our industry. Mark and his wife, Devon, farm an 880 hectare dairy farm 25km south of Ashburton on the Mayfield Hinds Irrigation Scheme (MHIS). In 2004, the Slee's won the supreme award in the Canterbury Ballance Farm Environment Award. As a previous director of MHIS and the Rangitata Diversion Race Management Ltd (RDRML), we publicly thank Mark for his governance efforts which have helped guide irrigation schemes not only in Mid Canterbury, but further afield.

NEW CONSTITUTION APPROVED

Over 50 members unanimously approved the new IrrigationNZ constitution at the recent AGM. These changes now mean:

- The IrrigationNZ Board has a maximum of eight elected board members with each board member having a maximum term of nine years (three terms of three years).
- The board has the ability to co-opt additional board members as required, however any co-opted member must stand down at the next AGM.
- The redundant executive function has been deleted from the constitution.
- The objectives of the organisation have been updated to encompass the range of activities IrrigationNZ undertakes.

Nikki Hawkey arrives

"I'm excited about the opportunity to work with IrrigationNZ, its members, stakeholders and partners. I come from a rural background (the daughter of a Southland dairy farmer) and I'm really looking forward to be back working not so much on the land, but for the land. I know there will be some big issues to deal with, but the people I have met so far – both at IrrigationNZ and in the industry – give me confidence that we can put irrigation on New Zealand's agenda and start to bring communities on board as we work towards a better, more productive and sustainable future."

SMART Watering for player safety

SMART WATERING CASE STUDY: SOUTH CANTERBURY RUGBY FOOTBALL UNION

Growing plentiful, lush grass is normally the aim of irrigation but the South Canterbury Rugby Football Union has taken a different approach to watering its sports fields.

To maintain safe playing environments, the union has reduced its irrigation watering by half. Watering deeply, less often, creates more robust sports fields as this irrigation approach generates more grass root growth, which is important for player safety.

Chief executive of the union, Craig Calder, says the result is a win-win for the union and the Timaru District Council, which encourages residents, businesses and community groups to use water wisely to reduce pressure on the town supply.

"The council has been incredibly supportive. They listened to our needs and we've come up with a very open collaboration which benefits both parties."

The story began last year when the union researched how to improve the quality of its sports fields through grass management. Contrary to what local farmers recommended around irrigating little and often, studies from similar temperate areas in the United States suggested an alternate approach of watering every two to three weeks, deeply, would produce a better result for sports fields.

"Essentially the end goal of most irrigation and watering of lawns is to maximise grass leaf growth. But rugby fields are quite different. We want to grow strong root growth and mass as this gives cohesion to the field enabling it to withstand a very tough game. It's quite a different approach to normal grass growing objectives," says Craig.

The union applied to the council for an exemption to carry on watering through periods of water restriction on the understanding less water would be used. "We're now probably putting on about half as much water as we used to which serves the council's objective of trying to conserve water."

Timaru's climatic conditions reinforce the

suitability of this approach.

"Grass stops growing down here when the soil gets to seven degrees which happens about May and the dry spell down here runs until April. So we can't rely on autumn rains to strengthen the grass ready for winter. We have to have good growth at the end of summer/ early autumn before the cool temperatures stop growth all together. If we don't our grounds are very hard and the risk in the early season of broken bones and twisted ankles on our fields is very high."

In the past, dry grounds and patchy grass cover at the start of the season has meant postponed games to reduce the risk of player injury.

"We developed this strategy to maintain moderately active grass growth through summer. This means when we come to winter we have grass roots that are vigorous and take advantage of natural rainfall. The end result is grass that's got some cushioning effect."

The union uses a K-Line irrigation system which is moved manually every two to three weeks for a deep watering application.

Volunteers help staff to move the irrigation system and focus on watering early in the day or during the evening. Coring of the fields (drilling small holes) for aeration also ensures water is absorbed by Timaru's prevailing soil type, a hard silty clay. "It lets the air in and helps drain water through. If the ground is hard at the top, you're not going to get water

through all the layers. We've really noticed the difference it makes. Our fields are really green and lush at the moment. We've having to mow two times a week."

The union will continue to review its water management plan and consult with the council to ensure it meets the council's requirements, says Craig.

"Our major focus is on maintaining what we've done, but particularly around Health and Safety, it's paramount that we look after our players by ensuring our fields are safe."

Rugby is now a year-around sport with tournaments being hosted in the district in November and February and the potential for the grounds to harden up with this summer's predicted high temperatures being "quite major".

"If we get into the position of having total water restrictions and our grounds are too hard, we may have to cancel the tournaments and delay the start of next year's season. But in the meantime we'll continue to work with the council and apply for an exemption if needed."

Craig Calder inspects a sports field.

SMART moves to Bay of Plenty

Five Bay of Plenty councils have joined together to support a SMART Watering campaign in their backyard. IrrigationNZ and the Bay of Plenty Regional Council are partnering with Tauranga, Western Bay of Plenty, Rotorua and Taupo to launch the public awareness and education campaign in the region. Kicking off in January, it will provide water users with access to advice and support around efficient watering practice.

Uncovering the heroes of our past

Terry Heiler doesn't consider himself a history buff, but the former CEO of IrrigationNZ has been drawn into a fascinating research project uncovering the feats of two water supply and irrigation pioneers.

This winter Terry Heiler attended a meeting of the Canterbury chapter of the Engineering Heritage Project of the Institute of Professional Engineers (IPENZ), and was surprised to learn their heritage register (which recognises engineering infrastructure of heritage value and engineers who have contributed to the country in a meaningful way) was a little 'lite' in regard to engineers responsible for water infrastructure.

"Some have contributed quite a lot and I thought it would be interesting to look at them. I went away with some names and did some research. I'm not a trained genealogist but I was quite intrigued."

What Terry has come up with is a potted history of the life and times of two of the South Island's most influential water engineers.

The first is George Frederick Ritso who was born in the late 19th Century in England. Canterbury irrigators may recognise the name as the early proponents of Central Plains Water (CPW) paid homage to Ritso by naming a group after him. The Ritso Society undertook early studies into CPW's feasibility and raised funds for the scheme, yet few farmers in the area are likely to know much about the man honoured by the group.

Terry has rectified that with the information gleaned from genealogy websites, irrigation history resources and the archives of several New Zealand libraries.

George Frederick Ritso, born in England in 1842, immigrated to New Zealand in 1872. He had recently qualified as an engineer at Rochester University in New York State. Ritso's first job was assistant engineer to Arthur Dobson, the provincial engineer in Canterbury at the time. Later he worked for the Waimate Roads Board, but it was his role with the Malvern County Council in the late 1870s that brought him to Terry's attention.

As the council's assistant engineer and later engineer to the Malvern Waterworks Project, it was Ritso who oversaw the development of the area's ground-breaking rural water supply system which incorporated the first element of a limited irrigation provision. Supported by noted politician of the time, Colonel James de Renzie Brett of Kirwee, Ritso was behind plans for a water race criss-crossing the Plains that would enable the closer settlement of the plains and development of communities, which eventually led to the intensification of farming.

Both men had been exposed to the benefits of canal-based irrigation infrastructure during stints in colonial India. Colonel de Brett's backing as both a wealthy landowner and member of the provincial council and legislative assembly was pivotal to the plans getting off the ground.

"De Brett put a lot of pressure on at both levels of Government to free some money up to bring water from the Waimakariri catchment to the Plains. He was the guy who moved it along and got interest from the Government to do something," says Terry.

After successfully applying for feasibility funds, the Colonel convinced the Malvern County Council to start the job. "Up until then the majority of the Plains were dry, had light soils and the big run holders were happy with their 10,000 hectares and merino sheep. Lack of water kept the small run holders out. They had to get water from the river in buckets and bring back to their properties which was challenging and discouraged settlement."

Ritso was put in charge of the project and in a newly-promoted role as Malvern Water Works Engineer, designed and built what became New Zealand's first public development of a rural water supply system using alpine water.

"It was also the first publicly owned water infrastructure that had an irrigation component." Over five years, the water race system developed between the Kowai River source and the city. It finally allowed people to live on this part of the Plains.

Then Ritso initiated a move Terry calls "innovative". He developed a business model to extend the water races to settlers' individual paddocks. The many thousands of small feeder stock water races that define rural Canterbury were constructed by the settlers themselves under contract.

"It completely changed the game. All of a sudden you could subdivide and break down these larger properties. He was very proud of that."

Ritso's time in the spotlight unfortunately came to an early end when he was sacked from the council and replaced with a cheaper county clerk from another council in 1882. He spent the next few years flitting from one engineering project to the next in New Zealand

Terry Heiler.

and Australia, but never replicating the success he had at Malvern. He continued to be vocal about his contribution to the development of Canterbury, writing a paper called "Rural Water Supply and Irrigation in the Canterbury Plains, New Zealand" published in a prestigious English engineering journal. In the concluding paragraphs of this paper, Ritso foresaw the use of the alpine water resources to irrigate large areas of the Plains.

Terry says Ritso's story has gone unheard and despite never achieving further greatness, his efforts deserve recognition.

"It was a small contribution but big things have grown out of it. This guy has been largely unsung because he disappeared from the scene, but I think his story deserves to be on record."

Ironically while researching Ritso's story, Terry found a personal connection. Discovering the engineer had worked for the Water Conservation and Irrigation Commission in New South Wales, Terry was amazed to find he had been responsible for surveying the original irrigation scheme in the south west of the state, an area Terry himself re-surveyed in 1963. In a further twist Ritso is buried at Rockwood Cemetery in the state where several of Terry's relatives are buried.

The second individual Terry honed in on is Robert Wise who helped develop community rural water supply in the South Island from the 1950s. Unlike Ritso, much more is known about Wise, due in part to an oral history which is held by the National Library.

Robert Wise trained as an electrical engineer at Canterbury University and following graduation became an associate of GJ Gillies, who ran a large foundry in Dunedin. As part of his work, he consulted to power boards, project managing hydro scheme developments on the West Coast in Hari Hari, Haast and Whataroa.

Soon after he was approached by the town of Windsor, south of Oamaru, to utilise his engineering skills in a different direction. Charged with coming up with a water supply for the town, he devised an electricallypowered pump system from the nearby Kakanui River. A reservoir on a hill above the town provided storage. Local farmers were so impressed they asked for a similar system for stock and domestic water supply. "He came up with a hydraulic system that delivered water into individual tanks on each farmer's property. It was called the Wise Restrictor system. It trickled water at a controlled rate into the tank over a 24 hour period and it was up to the farmers to take the water to their troughs," says Terry.

The next stage was to get the farmers to agree pipe placement across their land and involve them in building the network. "Doing it all themselves was an essential part of keeping costs down." This self-help approach mirrored the way in which Ritso had the race systems developed.

The success of the Windsor system saw neighbouring community Enfield clamouring for similar. "The process then duplicated itself all the way down the eastern seaboard of North Otago. Wise was personally involved with schemes covering over 500,000 acres in North Otago alone. Wise set up all these schemes and dealt with Central Government and lobbied for subsidies."

"The deal was the individuals within the community scheme would buy a certain amount of water that would be delivered to them over a 24 hour period. It opened up enormous increases in production right up the eastern seaboard of the South Island. It was pivotal to many areas combating the droughts of the 1960s and 1970s."

Wise's real claim to fame, says Terry, is the process he developed for engaging communities, which led to the concept eventually being developed in North Otago, Southland and North Canterbury, allowing millions of acres of land to be serviced.

"Once again Wise is an unsung or forgotten innovator."

"It was a small contribution but big things have grown out of it. This guy has been largely unsung because he disappeared from the scene, but I think his story deserves to be on record,"

Wise wrote about his approach in the paper "New Zealand Rural Water Supply model and application for developing countries" in his role as counter engineer for the Waitaki County Council. His work has also been profiled in the 1973 book 'That Flocks and Men may live'. Wise received an OBE in 1966 for his efforts in developing these schemes. Terry would like to see national recognition by IPENZ for these two water engineering pioneers.

"I don't know where I'm going with this research but I think both these men need to be recognised in some way or another and brought to the attention of the engineering profession. They have been forgotten by the current generation of engineers."

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Scheme growth bodes well for future

At IrrigationNZ, we thought it was timely to reflect and celebrate the considerable gains with irrigation infrastructure development and modernisation made over the last five years. Whilst there should be recognition of the key role this government has played in co-funding feasibility studies, capital raising processes and final design, alongside the setting up Crown Irrigation Investments, recognition also needs to be given to the proponents of irrigation projects. It takes a certain kind of person to champion an irrigation scheme in New Zealand – persistent and unflappable being two key traits, not to mention a thick skin!

By IrrigationNZ's calculations, we've had another 65,000 hectares of irrigation come on-stream over the last five years with another 85,000 hectares in the wings. The only negative is many developments have ended up being sub-optimal. This was inevitable as the government's investment approach, whilst welcomed, is extremely risk averse – particularly with regard to their exit timeframe expectations.

One key aspect we've noted at IrrigationNZ is the increased level of professionalism being exhibited by proponents over the last five years. In the early days there were accusations of poor governance and management of irrigation infrastructure development projects – some of this was justified but much came down to a poor understanding of the sector. However, as projects progressed and the irrigation sector became better understood, there's been a realisation no other infrastructure sector has to deal with the same levels of complexity – commercial, engineering, community (end user uptake, wider stakeholders and public) and environment (direct footprint and farmgate impacts). A diverse range of skillsets are required by those involved in irrigation infrastructure development to manage their way through these. Despite this, in recent times the New Zealand irrigation sector has established a reputation for on-time, on-budget project delivery – we've now got others looking over their shoulders at us.

A VIEWPOINT FROM THE MINISTRY OF PRIMARY INDUSTRIES (MPI)

Five years on from the establishment of the Ministry for Primary Industries Irrigation Acceleration Fund (IAF) we can proudly look back and reflect on the progress of the schemes we have funded. It's also a good time to consider the next five years which will see us continuing to support the development of "21st century irrigation".

The IAF was established in 2011, alongside the first National Policy Statement on Freshwater. This followed a Land and Water Forum report which identified infrastructure as a critical part of the solution in the collaboratively-developed Canterbury Water Management Strategy. All of these processes led to a recognition that modern irrigation infrastructure had the potential to meet not only the future economic aspirations of the community, but also improve the environmental, social and recreational outcomes from the use and management of our water, within a strong regulatory framework.

Since then, the IAF has supported the development of more than 20 water projects across the country, with approximately \$28 million in funding paid and matched by those projects.

An example of a project that has made great

progress with the support of both the IAF and Crown Irrigation Investments Limited (CIIL) is the Central Plains Water Limited (CPWL) scheme.

CPWL General Manager Environmental, Susan Goodfellow, says the IAF has not only enabled the development of the scheme to be accelerated, it has ensured the achievement of many of the environmental outcomes within the Central Plains catchment area.

"A key challenge developing the Central Plains Water irrigation scheme was funding the development work up to the point where we had enough information to prove the Scheme (or the particular stage of the scheme) was viable and therefore enable us to seek farmer investment."

"Obtaining this development funding is not a challenge that was or is unique to Central Plains Water – it is a common challenge for most schemes. We were one of the early applicants, and without this critical funding it is very likely that the scheme would not have progressed. The IAF has not only enabled Central Plains Water to start to realise the economic benefits of irrigation, it has enabled farmers in Stage 1 of the scheme to switch off abstracting water from the precious groundwater aquifers by converting to a more sustainable run of river alternative. We have seen after a single season, 75% of what would typically be abstracted from groundwater, turned off as a result of the alternative supply being available."

As we look to the future, the government will continue to support the development of irrigation infrastructure through both MPI and CIIL.

Changes were made to the way funds were administered earlier this year. From July 2016, MPI continues to manage government grant funding for community irrigation schemes and for strategic water management studies. CIIL now manages grant funding for regional irrigation schemes through to construction ready, as well as its existing co-investment role once schemes are construction ready.

The amount of government funding available to support irrigation infrastructure remains the same, and MPI will continue to be the first point of contact for all new irrigation schemes.

Information on the Irrigation Acceleration Fund and CIIL can be found at www.mpi.govt.nz and www.crownirrigation.co.nz respectively.

A test spill of 15 cumecs.

Opuha upgrades weir

Opuha Water Ltd has recently completed a \$2m upgrade of its weir facility located 1.5km downstream of the Opuha Dam. The upgrade has increased the controlled spill capacity of the downstream weir from 110 cumecs to 250 cumecs.

There were a number of reasons for the upgrade but one of the immediate benefits is the confidence the company now has in operating the main lake at higher levels than previous.

"Prior to this upgrade, we would not have been comfortable storing water in the lake above '100%' level at this time of the year (October). This is because of the risk of a spill from the main dam causing the downstream fusible embankment to operate and therefore costing the company up to \$300k to reinstate. With the downstream weir upgrade, the likelihood of this is dramatically reduced and we are comfortable operating the main lake up to 105%, which we reached on 3 October," says Opuha Water Chief Execurive Tony McCormick.

The upgrade project has involved lowering the spillway crest on the downstream weir and

installing 1.8m high flap gates on the spillway. Normally these gates are standing up and hold the water level in the pond behind the weir. By lowering the gates, the extra spillway capacity enables floods of up to 250 cumecs to pass through the structure without the fusible embankment operating. The new gates were tested as part of the commissioning phase on 14th September with a small amount of water being spilled from the structure when the gates were lowered for the first time.

One of the other main benefits of the upgrade is the ability to release higher flushing flows, when required, to help limit the growth of nuisance algae such as Didymo and Phormidium in the upper reaches of the Opuha River.

"In conjunction with NIWA, the company has conducted flushing flow trials over several years and we are confident that the increased capacity now available will significantly improve the effectiveness of the flushing flows we can release. We will continue to work with NIWA in determining how to make the best use of this increased capacity in improving the conditions in the river," says Mr McCormick.

Commissioning trials.

New gates before pond water level is raised.

Lake Opuha is full.

Check It close to release

After rigorous user testing, the Check It -Bucket Test app is close to being released into the marketplace to help farmers assess the accuracy of their irrigation application.

Designed by IrrigationNZ, in conjunction with specialist agricultural technology provider Regen (with the support of AGMARDT), the app tests how much and how evenly irrigation systems are applying water.

The Android version of the app is available for download free of charge at Google Play. The iOS version is still being finalised and should be ready early in the new year. The easiest way to find it is a simple search, 'Bucket Test'. Currently up and running for arable and pastoral systems, a drip micro irrigation option

designed for use in orchards and vineyards will be released next year as a free update.

IrrigationNZ's National Project Manager Steven Breneger says the app will help farmers move towards one proven way of checking their irrigation application.

"With more bucket tests being undertaken with Farm Environment Plans, this app will provide one consistent method to measure how well your irrigator is performing," he says.

"Our goal is to create the most robust, yet simple way of doing a bucket test. We've aimed it at farmers and it's designed to look at the irrigator itself, not anything beyond it. It assesses the accuracy of the wetted footprint and gives farmers a quick and easy indication if there are any problems with their application."

The app is already being used in the field by summer students working for Environment Canterbury. Earlier in the process, user tests with farm managers and consultants covering various irrigator types were undertaken with positive feedback, says Mr Breneger.

"We've had a lot of support and interest. While the app has been developed around

WHAT IS A BUCKET TEST?

A bucket tests gauges how much and how evenly water is being applied. For some irrigation systems it also calculates the instantaneous application rate. A series of buckets are set out in a line under the irrigator in front of the wetted length so samples can be taken. The wetted length is the area over which an individual sprinkler applies water at any given time. For drip micro irrigation, individual sprinklers or emitters are tested. The bucket test is a very simple way of understanding if you have a problem without any prior knowledge of complex hydraulics and pressure.

the centre pivot methodology first as these irrigate the largest area in New Zealand, we do recognise the need for a drip micro version and this is being worked on currently."

Regen CEO Bridget Hawkins says they became involved because of their experience in the agricultural technology market. "We are delighted to have developed the Check It -Bucket Test app with IrrigationNZ using our expertise in robust and simple to use software for farmers."

Technology for efficient irrigation management

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Free scheduling and soil moisture monitoring advice

IrrigationNZ welcomes visitors to our exhibition site at the FAR fielday on 7 December at Chertsey, near Ashburton. Come and discuss your irrigation scheduling, irrigation system and soil moisture monitoring queries.

Understanding your soil is critical to irrigation scheduling. IrrigationNZ can provide you with resources that will help you understand your soil type and how much water it holds.

Soil water budgets are a simple low cost method to schedule your irrigation. Inputs (rainfall and irrigation) and outputs (plant water use and any drainage from over irrigation) are recorded as a daily water budget in mm. The soil's water holding characteristics define the maximum amount of water that can be stored, again in mm.

Soil water budgets work well for pasture irrigation where the daily Potential Evapotranspiration (PET) can be used as the measure of plant water use. For other crops PET needs to be adjusted by a crop factor, this reflects the crop type and/or growth stage.

IrrigationNZ's Irrigation Essentials and Irrigation Management resource books provide detailed information on understanding soil water, climate measurements for irrigation, plant water use, and how to use these to schedule your irrigation. These are available for a small price. We can also put you in touch with commercial water budgeting tools and services.

Soil water budgets are usually used in conjunction with soil moisture monitoring. On site will be copies of our new Soil Moisture Monitoring Resource Book. Launched earlier this year, the guide book covers the technology options available for monitoring and considerations for installing and maintaining sensors. It also provides a list of simple questions irrigators can work through to successfully choose the right soil

moisture monitoring option for them. This is available on the IrrigationNZ website www.irrigationnz.co.nz/news-resources

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Irrigation planning for a dry season

Irrigation considerations for cropping with low or restricted water by Elin Arnaudin from FAR.

For a number of growers, the lack of groundwater refill over winter is causing worry about the potential for wells to run dry or water restrictions to be enforced before the critical timings for crop water requirements. This may mean seriously considering some dryland crop management approaches or making decisions about prioritising irrigation. Also, early spring sowing to increase root growth and selecting crops that will still give returns under drought stress are options to cope with less water. However, from the start it is important to make the most out of the water that you do have by ensuring your system is putting water on efficiently and that the correct amounts are going on.

IRRIGATION EFFICIENCY

Making sure that irrigation equipment is functioning properly and scheduling application to meet crop demand will provide savings through:

- Reducing water wastage from overapplication, leaks, and unevenness
- Reducing energy and labour costs
- Helping maximise crop yield and nutrient uptake
- · Reducing nutrient losses.

A few basic actions can help improve the irrigation efficiency on your farm:

- Regular maintenance and repairs of equipment
- Understanding your soils and their ability to hold water
- · Monitoring soil moisture levels
- Knowing how much water you're putting on and keep records
- "Bucket testing" irrigators to make sure water goes on evenly
- Understanding the crop's root depth, water demand, and trigger point
- Training staff to operate irrigation equipment properly.

TARGET INPUTS TO EXPECTED YIELD

There are many differences between farming dryland and irrigated crops, but nitrogen (N)

management is probably the most important one to consider. If reduced irrigation capacity means a lower crop yield potential, N application should be targeted to the lower yield. Timing of N application also becomes a bit trickier.

TIMING OF N APPLICATION

Optimum N timing in dryland crops is slightly more difficult to achieve compared to a crop where water is readily available to ensure uptake in periods of very dry weather. Timing N application to just before, or even during rainfall will help reduce N loss through volatilisation to the atmosphere. If there is uncertainty with the weather forecast, consider the use of a nitrogen fertiliser coated with urease inhibitors based on Agrotain® (e.g. SustaiN). These have given yield increases in some trials compared with urea, when the fertiliser hasn't been washed in within 24 hours of application. Remember that the larger the soil mineral N reserve, the greater flexibility you have in timing windows for nitrogen application i.e. N timings can be delayed.

OVERALL RATE OF N

When converting a crop from irrigated to dryland, it is important to review the agronomy of the whole crop, including the overall rate of N. It is much easier to work out how much N you need to apply with the certainty of irrigation. A summary of results from ten FAR autumn sown feed wheat N trials with irrigation suggests a total of 300 kg N/ha (soil mineral plus applied N) will be close to the mark. Dryland yields are much more variable due to the reliance on rainfall, therefore calculating the optimum quantity of N is more difficult. As the dryland yield potential increases, the optimum N rate will increase toward the optimum under irrigation. The FAR Cropping Strategy - Nitrogen Application in Wheat offers a guide to targeting N rates for dryland and irrigated wheat. Any changes to N rate will need to be reviewed right up to ear emergence, based on spring rainfall events.

PRIORITISING IRRIGATION

As the soil dries from the trigger point toward wilting point, potential yield decreases in a straight line with the effects varying by crop species (Table 1). The bigger the potential yields, the greater the relative reductions in yield. The form of yield loss can change. For instance, early drought stress in barley reduces grain number mostly through the loss of tillers, whereas late drought stress results in small, pinched grain with high screening losses.

Table 1.

Crop species	% decrease in potential yield for each mm below the trigger point	
Maize [*] , oats, potatoes, sweetcorn	0.10%	
Ryegrass seed	0.14%	
Barley, peas, wheat	0.25%	

*Maize sensitivity to drought decreases with time because the trigger point increases as the root system develops.

The goal is to avoid a situation where the trigger point is exceeded. As an example, a 50mm irrigation on a healthy wheat crop (yield potential 13 t/ha) applied just before trigger point is reached is 13 t/ha x 50mm x 0.25% = 1.63 t/ha. Assuming the cost of irrigation is \$100/ha (\$2/mm) and the wheat is worth \$300/t, the return would be \$480/ha, a net gain of \$380/ha.

For the same irrigation on a 2.2t/ha ryegrass seed crop, the yield response would be 2.2 t/ha x 50mm x 0.14% = 0.14 t/ha. At 2,200/t the return would be 338/ha and the net return to irrigation 238/ha. In this example, if there was insufficient water, it would pay to irrigate the wheat ahead of the ryegrass.

IRRIGATION COST CALCULATOR

Have a look at the irrigation cost calculator on the FAR website. This tool allows you to do the above calculation on a range of crops.

Trans-Tasman Memorandum of Understanding signed

In a significant move that will strengthen the relationship between the irrigation industries in New Zealand and Australia, industry bodies IrrigationNZ and Irrigation Australia recently signed a memorandum of understanding (MoU).

The MoU formalises the relationship between the two industry bodies and will have significant long-term benefits for their membership and the irrigation sectors in general, according to Nicky Hyslop, IrrigationNZ Chairperson, and Andrew Ogden, Irrigation Australia Chairperson.

"It will ensure we have an agreed process for developing our partnership into the future," Mr Ogden says.

The MoU sets out a number of key benefits for the organisations and identifies opportunities for cooperation.

"One of the areas that Irrigation Australia has traditionally been particularly strong in is our advocacy for and development of professional development and industry certification.

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The MoU ensures the expansion of this focus with an agreement for both bodies to work together to develop training qualifications that are mutually recognised," he added.

Information has also been identified as an area where both parties will benefit from a cooperative approach.

"Over the years both organisations have built up significant irrigation information resources," says Mrs Hyslop.

"As part of the MoU we have agreed to share these resources, which means that our members and the wider irrigation sector will have access to a unique information bank that has been developed by the industry for the industry. And, importantly, sharing resources will avoid duplication and drive efficiencies – a real win for our members," she added.

Under the MoU, the industry bodies have agreed to co-operate in developing and reviewing any standards that have an impact on their irrigation industries.

"Standards underpin the quality of

installations and level of professionalism in the industry, and both bodies have worked on developing them and promoting industry awareness of their importance," said Mr Ogden.

"This agreement to co-operate in developing and reviewing standards is an important step that will further contribute to the community recognising the expertise of industry members in both countries," he explained.

Another opportunity identified in the MoU is helping with, and attending, each other's major events such as conferences and exhibitions.

"We have also identified that there is an opportunity to put together joint study tours and similar activities designed to improve access to up-to-date information and technology," said Mrs Hyslop.

Mrs Hyslop and Mr Ogden said that their organisations were looking forward to working together in the future and that the MoU will be an efficient and effective way for them to maximise the benefits for their membership and the irrigation industry generally.

Irricon has an experienced and fully qualified team to help you with your farm resource management requirements:

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- Irrigation efficiency assessments
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Kellogg research project challenges irrigation scheme board's thinking

IrrigationNZ's Business Manager Chris Coughlan has spent the past few months researching and writing her Kellogg Rural Leadership Programme project. She provides Janine Holland with a taster of her findings.

What motivated you to apply for the Kellogg scholarship?

Over the past eight years I have worked in irrigation and water, I have had the pleasure of working with industry and many boards, through IrrigationNZ programmes to help build skills and capability. As a consequence of this, I have been exposed to many of the challenges these groups face and found myself increasingly interested, particularly as I have moved around the country, listening to different community leaders who are often experiencing the same things. There are many opportunities sitting within grasp of the primary sector to take control of aspects of the change they are facing and I wanted to make some effort to engage the irrigation schemes on what these opportunities might be.

Why did you choose this area of study?

For New Zealanders water is a passion, an integral part of our lives and our environment. It is also an important resource for agriculture and economic development. Our need to balance expectations to achieve optimal outcomes for all New Zealand is paramount.

There are many layers of water governance in New Zealand. For irrigators and irrigation schemes the many elements at play and competing voices are creating an increasingly complex environment for them to work in. The aim of this project is to clarify for irrigation schemes the breadth of elements at play in water governance in New Zealand and through conversations with stakeholders, to expose to schemes views on their structure and role and the opportunity before for them if they are prepared to be challenged. Ultimately this is to enable irrigation schemes. To be perceived as successful, legitimate and trusted users of water, our public resource.

Reception from wider irrigation sector to your research?

The Kellogg Rural Leadership Programme is well known and so I was well received by everyone I approached. It is an established and respected programme in the rural and primary industry sectors with a large alumni who have achieved success in leadership roles throughout New Zealand agriculture. A number of those I approached, I discovered, were alumni!

What were your main findings?

Irrigation schemes need to genuinely look outwards not inwards ... this is not about the local accountant or lawyer on the board (although they can be worthy additions!) but rather schemes being prepared to consider their structures and how they can use them to build trust and create a bridge to the those outside their command area. What this would look like probably needs further discussion but it could be a hybrid model of governance – part shareholder, part 'wider world view' that will challenge them. Schemes may not like it, it will be uncomfortable but the rewards could be enormous.

What surprised you the most during this process?

The nature of concern about water quality within the Kellogg Leaders group. While wellplaced, the appreciation of the complexities at play and context e.g. our water bodies relative to the rest of the world, just weren't there. This tells me the primary sector isn't well coordinated nor do they do a good job of talking about the 'good stuff' to their own sector or New Zealanders in general. On the other hand environmental groups have had huge success at coining phrases and telling stories from their point of view.

What's the process now for presenting your report?

The base report was delivered for assessment in late October and a formal presentation made on 16 November at Lincoln to the Kellogg group and guests. The final report will be available for industry in early December and shortly after on IrrigationNZ's website.

What do you plan to do now with the research?

The research will be distributed to all those

Chris Coughlan.

that have contributed to my research. I would also like to have the opportunity to present it to the irrigation schemes throughout NZ. It will, I have no doubt, challenge their thinking but I do hope it will open a door to conversations about 'what is possible' if schemes were to have a 'wider world view', mitigate perception of 'conscious or unconscious bias' and they take the opportunity to bring a new level of confidence and trust in their activities to the wider community.

This project has exposed deep challenges around trust and confidence at all levels of water governance in New Zealand. There is no silver bullet to deliver immediate change to fix this. The interviews have highlighted clearly the commitment of the schemes to work through implementing change and ensuring they work positively with those stakeholders directly connected.

This project however has highlighted a new opportunity to effect real change. The opportunity to change perceptions so that irrigators and schemes are acknowledged as successful, effective, legitimate and trusted users of water, our public resource, for the benefit of New Zealand.

This will mean irrigation schemes need to be willing to embrace a more diverse and outward looking board. They need to bring people in that will challenge their thinking and hold them to account. It will be confronting but it will provide a transparency and an openness to start discussion. It will also provide an opportunity to have realistic conversations and find reference points for communities to collaborate. It will negate negative commentary because the wider community, along with irrigation scheme boards, will own the outcomes.

This is a first and critical step for irrigation schemes to 'break the ice' and become trusted users of water our public resource.

INDUSTRY UPDATE

Industry and projects update

IRRIGATION DESIGNER QUALIFICATION

Registrations are still open for the next intake of the Irrigation Designer qualification. Around a dozen industry personnel are expected to join the 2017 course which commences in January. Those involved with the pilot course this year have reported strong satisfaction with the qualification, enjoying both the learnings and process, says IrrigationNZ Project Manager Steven Breneger. "We will be extending an invitation to interested industry players to present certain topics within the classroom that they are specialists in for next year's course."

EECA PROJECT

Evaluations on three Waimakariri District farms taking part in our EECA energy efficiency audit project should be completed by Christmas – as long as the weather co-operates! A prolonged bout of wet weather in the district has stalled progress completing evaluations, says IrrigationNZ Project Manager Steven Breneger. Each farm has been kitted out with SMART SCADA farm panels installed by Schneider Electric. Providing real time access to power consumption, flow rate and soil moisture information, data will be assessed to see how energy efficient each farm's irrigation system is. Aqualinc is conducting the audits focusing on application efficiency.

INSTALLATION APPRENTICESHIP

A needs analysis is currently underway to determine whether IrrigationNZ's proposed irrigation installation apprenticeship will meet NZQA's requirements. IrrigationNZ staff met with Competenz (the engineering industry training organisation we are partnering with) to create the industry-first apprenticeship last month. The parties are working together on the needs analysis which will need to be submitted early in the new year. The apprenticeship will be targeted at school leavers as well as young people with a practical nature who want to transition from other careers. It is hoped that the qualification will be marketready by the close of 2017/early 2018.

FARM DAIRY EFFLUENT CAMPAIGN

IrrigationNZ is currently surveying industry to contribute their views towards a communication strategy they are developing

to promote the Farm Dairy Effluent Accreditation Programme. If you have views on promoting this programme, please contact Charlotte Butler on ph (03) 341 2225 or email cbutler@irrigationnz.co.nz.

IRRIGATION WORKSHOPS

More than 100 people attended free irrigation 'taster' workshops in Canterbury in October thanks to a partnership between IrrigationNZ and Environment Canterbury. Hosted by the regional council with content provided by IrrigationNZ, workshops were held in Kaikoura, Hurunui, Waimakariri, Selwyn and Ashburton Districts.

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MBIE maximising the value of irrigation

The MBIE Programme 'Maximising the Value of Irrigation' is undertaking research to support industry to develop irrigation control systems that improve productivity, minimise wasted water, and reduce negative environmental impacts such as ponding and nitrate leaching. The programme is led by Landcare Research with Plant & Food Research, and also includes researchers from FAR, Lincoln AgriTech, Massey University and the University of Southern Queensland.

The programme, now half-way through its six-year duration, has gathered data (soil, crop, climate, irrigation management) over two irrigation seasons from commercial farms (arable, mixed arable/pastoral, process vegetables, high-value seed crops and fresh vegetable crops) and research trial plots (Massey, Lincoln, Chertsey). This data is being used for scenario modelling with APSIM software (Agricultural Production Systems Simulation Model - www.apsim.info) to investigate (i) potential benefits of precision irrigation for different levels of soil variability, and (ii) soil management effects on irrigation water use efficiency (including mulching, cultivation, hydrophobicity). The APSIM model uses a spatial framework developed in the programme for sub-paddock scale modelling (e.g. Fig. 1), and soil data extracted from the S-map database by a web processing service also developed in the programme.

We are also developing and trialling wireless sensor network (WSN) technologies to continuously monitor the soil and crop during the irrigation season.

WIRELESS SENSOR NETWORKS

A wireless sensor network (WSN) system provides real time data via cellular or ADSL networks to end users. Figure 2 shows a pea crop at the Massey pivot where we deployed a WSN for the past two irrigation seasons. This WSN consists of replicated soil moisture sensors installed into the ground at four depths (10cm, 20cm, 30cm and 40cm) in each management zone (Fig. 3). The soil moisture sensors are connected to 'nodes' that log and transmit the soil moisture data via a base station and data cloud service to a web page or cellphone app.

The nodes transmit and receive data between themselves, and this 'mesh network-

Figure 1. Soil maps are converted into (a) management zone maps for potential upload to precision irrigation control software, and for Spatial-APSIM modelling exercises. A digital elevation map (b) is used to derive a relative wetness index (c) for each cell, and potential water run-off pathways (d).

Figure 2. Wireless sensor network systems have been developed and are being used in the 'Maximising the Value of Irrigation' programme for continuous real-time soil moisture monitoring. This photo shows the Massey University VRI pivot with soil moisture monitoring nodes (circled) installed into a pea crop.

ing' capability means that the system finds the most efficient pathway to deliver data to the base station. If one node fails the communication pathways automatically reroute to find the next most efficient route. The nodes are battery powered and recharged by solar panels. Once the base station is activated, the sensor network self-forms by allocating unique IP addresses to each node and defining the most efficient communication path to relay the data.

Figure 3 provides an example of the collected soil moisture data under the pea

crop for the period 2nd November 2015 to 6th January 2016. Zone 1 is a more sandy soil than Zone 2, and tends to dry out and require irrigation first. The graphs show the differences in soil moisture at the four depths in these two soil zones. Zone 1 soils contain approximately 10% moisture and Zone 2 soils contain about 20% moisture at the 30cm soil depth for the period of soil moisture monitoring.

In the first year of our trials, when no irrigation was applied, the pea crop yielded lower in the more drought-prone Zone 1 (3900 kg DM/ha) compared with Zone 2 Figure 3. Wireless soil moisture sensor networks (WSN) are being developed and tested in the 'Maximising the Value of Irrigation' Programme. This figure gives an example of data collected from four depths in two soil zones (1: sandy; 2: silty). The technology is being developed to provide real-time information via webpages and apps to assist irrigation scheduling decisions.

(5200 kg DM/ha). More research is planned to study the effects of varying irrigation to the two zones, guided by real-time sensor monitoring of the soil and crop, and laboratory characterisation of the soil differences. The programme is benefitting from participation of Massey University students in these trials.

We would like to acknowledge the generous financial support of MBIE and our co-funders: The Vegetable Research & Innovation Board, FAR, IrrigationNZ, Hawke's Bay Regional Council, and Environment Canterbury.

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REGIONAL REPORTS

MINISTER FOR PRIMARY INDUSTRIES RECEIVES ENVIRONMENTAL UPDATE

Primary Industries Minister Nathan Guy recently visited Clifton Falls and received a full briefing on the activities of the Kakanui Community Catchment Project. The project's main focus is to improve knowledge of the various ways to improve water quality, reduce soil erosion, and increase biodiversity (aquatic life and native plants) within the catchment, which includes the Kakanui River and tributaries such as the Waiareka and Kauru sub-catchments. Mr Guy and local MP for Waitaki, Jacqui Dean, also received information on the North Otago Irrigation Company expansion and the company's environmental farm plan system from NOIC's Chairman, Leigh Hamilton, and CEO, Robyn Wells.

HURUNUI WATER PROJECT PROGRESSING WELL

Receiving resource consent in December 2015 was a defining moment for Hurunui Water Project (HWP). This enabled substantial progress during 2016 toward getting the scheme nearer to being construction and funding ready, and Water User Agreements offered.

Progress was further aided by an Irrigation Acceleration Fund grant of \$520,000 for the pre-feasibility work-stream, carried out between March and October. A key workstream identified was a survey to better define shareholders' intentions. It showed most were not going into intensive farming once water became available. Their need was simply for a reliable water supply so they could carry out, and extend from, existing farm practices with confidence, and realistically consider targeted diversification, new opportunities and contracting to supply. Given the drought

conditions occurring in the region, protection against the high costs associated with drought was also on farmers' minds.

The estimated area of irrigation demand reduced to around 21,000 hectares within the original consent footprint of 58,500 hectares. The intended land use remains predominantly mixed and arable, with only a modest move to intensive dairying. This results in a lower density scheme. While this has some technical and economic challenges, it has the advantage of a lower nutrient discharge.

The endorsement by shareholders in July of a board proposal to raise loan funding and enter into an Early Contractor Involvement (ECI) contract provided the underpinning to proceed into full feasibility phase.

A total of 68 shareholders subscribed \$868,500 to the loan. This demonstrates wide shareholder support for establishing an irrigation scheme in the Hurunui District, which is encouraging for potential institutional investors.

The ECI contract has been signed with Rooney Group, which has begun work. Their emphasis is on designing a distribution system to suit a lower density scheme at an affordable cost.

At the time of writing, HWP had lodged an application to Crown Irrigation Investments Ltd for a dollar-for-dollar grant of up to \$3.3million from the Regional Irrigation Development Fund to support the full feasibility work.

FUNDING BOOST FOR MHIS

In September MPI announced a \$345,500 funding boost for the Mayfield Hinds Irrigation Scheme through the Irrigation Acceleration Fund (IAF).

The funding will support feasibility investigations and design of a major piped extension to increase the Scheme's current irrigated areas by 4,500 hectares. If feasible, the extensions will further increase water-use efficiency and reduce ground water use.

The MPI investment was welcomed by Mayfield Hinds Irrigation Limited (MHIL) Chairman, John Nicholls.

"The MHIL growth projects are a result of using water more efficiently and the scheme investing in enhancements such as water

storage, telemetry and automation. No new water is being sourced for these developments," says Mr Nicholls.

"We are extremely pleased with the support that this project has received from farmers in the Ruapuna area at the top of the MHIL scheme. A 1600 litres per second piped extension is currently being investigated for development in this area.

"New farmer irrigators joining the MHIL scheme will be required to operate under the Rangitata Diversion Race land use consent which provides for Farm Environment Plans, nutrient budgeting and on-farm auditing of practices. This demonstrates MHIL's commitment to efficient use of water and adherence to good farm management practices.

Ministry for Primary Industries Deputy Director-General Sector Partnerships and Programmes, Ben Dalton, believes government support of water investigations is essential for the livelihoods of regional communities, and in turn the New Zealand economy.

"MPI's Irrigation Acceleration Fund

invests in the development and construction of irrigation infrastructure and all schemes must meet criteria which considers environmental, cultural, social, recreation and economic benefits," says Mr Dalton.

"MPI has committed \$345,500, matched by MHIL, to progress an investigation that has the potential to deliver many benefits to the Mayfield Hinds community. Irrigation allows for more reliable production, which in turn allows increased employment opportunities on farms and within wrap-around industries such as rural supporting services.

"Modern water infrastructure encourages better use of water, and a better environment as those who have access to water through the scheme have a collective responsibility to monitor and limit water use, nutrient applications and run-off to meet consent obligations."

The Irrigation Acceleration Fund is one of the mechanisms we use to support sustainable primary sector growth in the regions, to help achieve our goal of doubling the value of primary industry exports by 2025.

The MHIS sign at their new storage pond.

Irrigation events and training

For more information and to register for events, please visit: www.irrigationnz.co.nz/events

TRAINING

Scheme-initiated training led to a flurry of training days being held recently. Both Amuri Irrigation Company and Mayfield Hinds Irrigation Scheme have hosted Irrigation Operator and Manager training workshops to upskill shareholders, with IrrigationNZ supplying content. The first was focused on Farm Environment Plan requirements and the second training for farm owners and staff operating irrigation on a daily basis. Barrhill Chertsey Irrigation recently partnered with IrrigationNZ on two soil moisture monitoring workshops for its shareholders, and Water Wairarapa will host IrrigationNZ for an Irrigation Development workshop with potential irrigators in the region.

IRRIGATION DESIGNER

Late registrations are still being taken for the 2017 New Zealand Certificate in Irrigation System Design.

For class training dates, registration and further information please go to our website www.irrigationnz.co.nz/events-training/ irrigation-training/design

IN BRIEF

REVAMPED INZ WEBSITE

IrrigationNZ will relaunch its website next month. The old website, while it contained many valuable resources, had become a jumble of pages and links. It was far from user friendly.

After receiving much feedback, we've analysed this and reconfigured our website accordingly – to better meet the future needs of irrigators and the irrigation service industry. One thing we're very aware of is the website is currently well used – our analytics shows we're now in excess of 10,000 hits per month.

New features on the website will include an easy access 'Good Management Practice' knowledge resource for those irrigators that simply want to get hold of the basic information they need to achieve this.

We've also created a 'practical resources' section, where all the resources IrrigationNZ has produced over the last decade can be easily accessed by members.

A member log-in has also been added to the site, as we've decided we're giving away far too much for nothing – members will be able to access everything as part of their membership, whereas non-members will only get snippets of information. This should encourage them to join up!

We'd encourage all members to explore the new website and feedback any comments to us at admin@irrigationnz.co.nz.

Hinds MAR pilot working group – update

PROJECT OVERVIEW

The Hinds/Hekeao Managed Aquifer Recharge (MAR) Pilot project tests the application of artificial recharge tools to replenish depleted aquifers and improve groundwater quality in the Hinds Plains Catchment (Figure 1).

Located near the town of Ashburton, the pilot project targets an area where declines in groundwater levels, spring-fed stream flows and groundwater quality are most acute.

Through the Canterbury Water Management Strategy process, the Ashburton Zone Committee recommended the development of a trial site to test the application of MAR in a five year test programme consisting of two phases:

- Phase 1 (2016-2017) proof of MAR concept testing; and
- Phase 2 (2017–2021) continued operational testing and infiltration site optimisation where specialised MAR tools are custom designed for conditions on the Canterbury Plains.

The community-appointed Hinds MAR Pilot Project Working Group is leading Phase 1 of the project. The Working Group membership includes a wide range of stakeholders and technical experts interested in evaluating this tool for the sustainable management of water resources.

MAR RESULTS – AFTER 130 DAYS OF OPERATIONS

Beginning on the 10th of June 2016, the trial has been operating for over 130 days and has recharged over 1.1 million cubic metres (or 1.1 billion litres) of high quality Rangitata River water (consented but unutilised stockwater). Bores monitoring regional groundwater conditions around the site have showed marked improvements in both water quantity with rising levels and in water quality with decreasing concentrations of nitrate-nitrogen (Table 1).

Table 1. Hinds MAR Pilot Water Quality Results for groundwater near site.

QUALITY: Nitrate-Nitrogen	RESULTS: May to September 2016	
Groundwater monitoring sites near MAR Pilot Site	Average – all samples (mg/L)	Average of last samples taken: September (mg/L)
Source water (Rangitata River)	< 0.1	< 0.1
Regional groundwater – MAR influenced	3.3	2.7
Regional groundwater – not yet MAR influenced	10.4	10.2

State-of-the-art nitrate monitoring equipment provides clear scientific evidence that improvements are linked to MAR site operations (Figure 2 and Figure 3). Geologic mapping of the Hinds Plains aquifer coupled with the monitoring results indicate that a portion of the MAR water is travelling down-gradient along a permeable pathway toward Tinwald (Figure 3). Positive changes in groundwater levels and nitrate-nitrogen concentrations have been observed in the direction of springs feeding the Hinds Drains. The geologic modelling has also provided a powerful tool in understanding where to position and how to best monitor future MAR sites throughout the catchment.

For more information visit the Hinds MAR website via: arcg.is/10ZkNuN Contacts: Peter Lowe, Hinds MAR Pilot Working Group – Chairman, and Bob Bower, Projec Manager/Principal Hydrologist. Email: MAR@golder.co.nz

Figure 1. MAR Pilot site.

Figure 2. MAR influenced groundwater levels and decreasing nitrate-nitrogen concentrations tracked using state-of-the-art tracking equipment (Lincoln-Agritech Ltd.), bore located 1.1 km down-gradient from the MAR site (See Figure 3).

Figure 3. Hinds MAR Project Area – Aquifer mapping, monitoring sites, nitrogen plume and spring-fed coast drains (Golder).

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FOUNDATIONS OF WORKING WITH TANGATA WHENUA – IRRIGATIONNZ WORKSHOP, 8 SEPTEMBER 2016

IrrigationNZ held its first workshop focusing on working effectively with tangata whenua in September. The small group of participants representing irrigation schemes around the country found the experience valuable and further workshops may be planned.

Back Row: Jeremy Boys; Richard Plunket; John Wright; Ryan O'Sullivan; Tony McCormick. Middle Row: Haidee McCabe; Stacey Scott; Robyn Wells; Gina Solomon. Front Row: Leigh Hamilton; Fiona Sloan; Peter Lawless.

THE LAST WORD

"WaterForce thinks a central industry voice is important, particularly for central government and local authorities. IrrigationNZ provides a go-to organisation that represents what the industry wants and sees as realistic achievements. The quarterly magazine is valuable as a good information source covering what is topical and outlining the current challenges, particularly around water quality. We're also positive about the work IrrigationNZ is undertaking to develop an irrigation installation apprenticeship. As an employer in the irrigation industry, we see this as a valuable tool allowing individuals to better themselves."

Ron McFetridge, General Manager, WaterForce

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