



2015 NEW ZEALAND IRRIGATION
Industry Snapshot





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Chair Foreword



Water is a subject that many New Zealanders are very passionate about. At IrrigationNZ we are committed to helping our members and service industries use water wisely with the utmost regard for the environment. Irrigators have long considered themselves to be stewards of the land. We accept that with increasing land use intensity, water abstraction needs to leave enough water in our rivers and streams to maintain healthy aquatic ecosystems, and the impact of farming on the land needs to minimise its footprint.

So what's happening in our industry? Irrigation has seen significant changes over the last 30 years. There has been a massive investment in upgrading irrigation systems from flood to spray, and then again to modern spray (centre pivots and laterals), drip-tube and micro-sprinkler systems. This change has seen irrigation efficiency improve by 50% in just over a generation. The information age has also brought about a rapid increase in technology. Irrigators now have real-time access to water meters, soil moisture sensors and variable application systems. This allows us to know exactly what we are applying, and where, all controlled through our Smart Phones.

IrrigationNZ plays a major role in ensuring our members always have access to good information on the range of tools and management practices they can implement to do the very best they can. This commitment is on-going as we continue to learn more through good science and research.

Training and professional development is another important role for IrrigationNZ. Alongside delivering Irrigation Management workshops to more than 500 people a year, we now offer nationally-recognised qualifications in Irrigation Design, Performance Assessment and Irrigation Management. This is an exciting and significant milestone.

IrrigationNZ also has an important role working alongside policy makers to ensure that any regulations put in place are workable – they will allow irrigators to successfully manage their businesses within agreed community expectations. Our staff are specialists; they have an applied understanding of what is workable out in the paddock and what is not. This is invaluable when you are in Wellington contributing to national processes like the Land and Water Forum, OVERSEER developments or meeting with political parties to help them develop policies that are relevant and give confidence to all.

Ensuring we can provide good information to the public on what happens on an irrigated farm is another key role for IrrigationNZ. As New Zealand has grown, we have all been guilty of a lack of understanding of what life is like in our rural and urban communities. Facilitating good conversations between the two is a rewarding part of our work.

We continually talk about the fortunate position New Zealand is in with an abundance of water. This may seem like an oxymoron when you consider the prolonged drought on the East Coast. However, if the winter snow melt could be tapped through water storage, a reliable water supply could be provided with minimal impact. IrrigationNZ is committed to working with communities to investigate and then build multi-purpose water storage projects that provide benefits for all.

NICKY HYSLOP
CHAIRWOMAN, IRRIGATION NEW ZEALAND

Executive Summary



Welcome to the 2015 Irrigation Snapshot. Its purpose is to provide a transparent window on irrigation in New Zealand – where we irrigate, proposed future development, how much water we use, what it is taken for and the value this creates for our nation. Alongside this, this Irrigation Snapshot highlights the significant investment continually being made in irrigation efficiency and the benefits this creates for the environment. Investing in modern technologies means our farmers use less water, can minimise the impacts of land use, whilst increasing the value of production.

New Zealand's irrigated area is estimated at 720,000ha*. In addition there is 350,000ha of potential growth that could be sustainably achieved by 2025. The map on page 5 highlights the regional distribution of irrigation and future developments under investigation.

Currently, New Zealand only abstracts around 2% of its water resource (if hydropower is included this rises to about 5%). Irrigation accounts for approximately 60% of this. By international standards, our abstraction rate is extremely low which shows that New Zealand is a water-rich country. Irrigation typically accounts for between 50 and 70% of water use internationally. This is because plants, in comparison to human drinking water needs, stock and industrial use, require a lot more water to survive and grow.

Pastoral-based activities make up approximately three quarters of our irrigated area (dairy 50%, and sheep and beef finishing 25%). The other 25% of irrigation supports predominately vegetable and arable crops alongside fruit and wine growing.

New Zealand's irrigated area of arable and horticultural production is expanding; however its growth is limited by the need for a highly-reliable water supply. This requires investment in water storage or groundwater recharge projects, harvesting water during the winter and spring time to minimise the abstraction pressure on rivers during the summer.

In 2012 it was estimated that irrigated farms provided a \$2.7 billion contribution to New Zealand's economy, and more than double this in terms of the benefits to the wider community. Irrigated agriculture underpins many of the provincial economies on the east coast of New Zealand. Towns like Hastings, Blenheim, Ashburton, Timaru, Oamaru, Cromwell and Alexandra would be far less vibrant and resilient without irrigation.

In 2012 it was estimated that irrigated farms provided a \$2.7 billion contribution to New Zealand's economy, and more than double this in terms of the benefits to the wider community.

Water provides a unique opportunity for New Zealand. If we could sustainably harvest another 1% of our abundant water resource we would significantly grow the wider economy. Providing high reliability to existing water users whilst growing the irrigated area needs to be our focus. Stored water could also solve most of the historical water quality and future climate change challenges facing eastern New Zealand, either through augmenting river flows during the summer or recharging aquifers in the spring. Much of regional New Zealand's future success is reliant on community water infrastructure developments that create wins for both the economy and environment.



ANDREW CURTIS
CHIEF EXECUTIVE, IRRIGATION NEW ZEALAND

Current and Future Irrigation

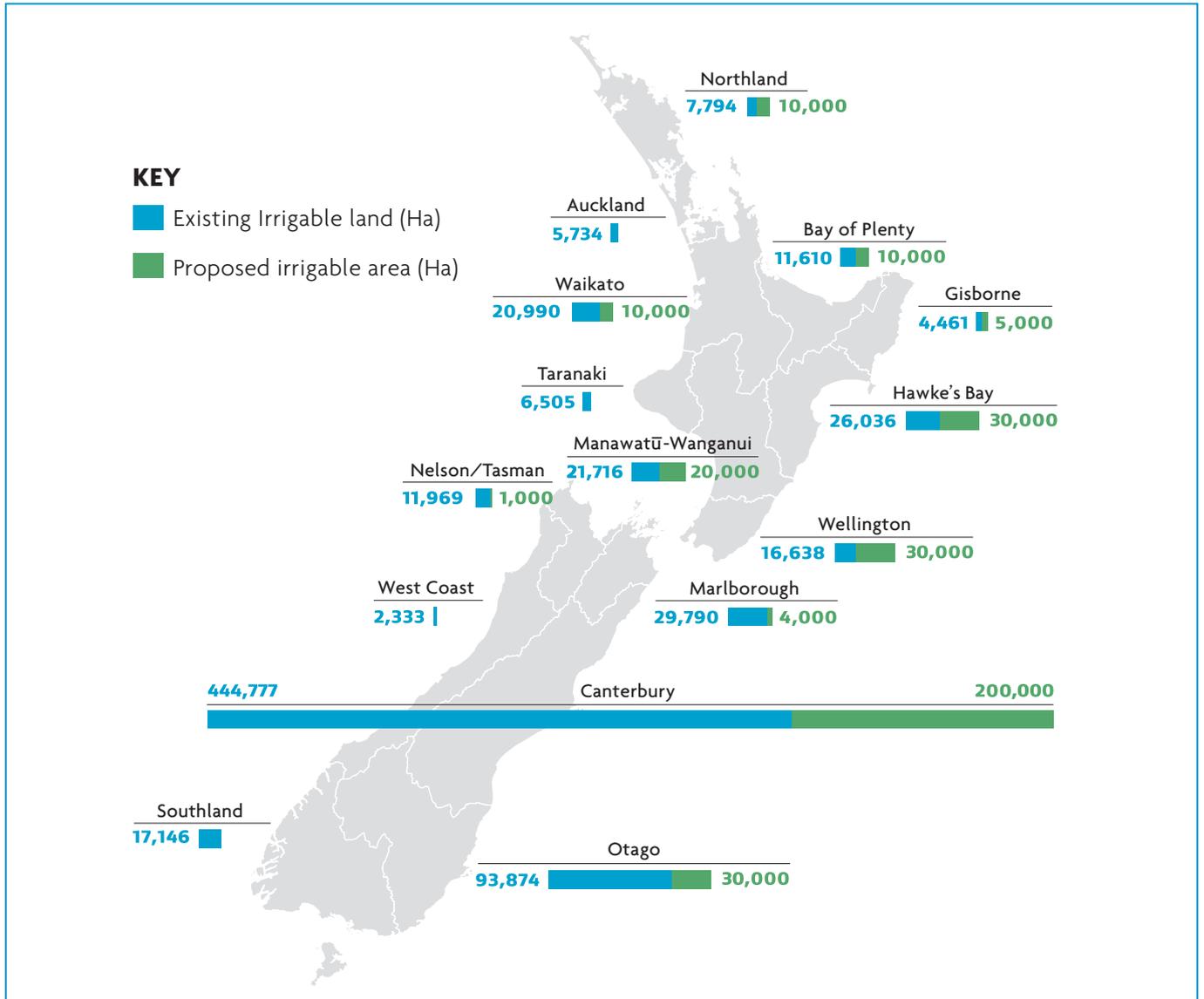
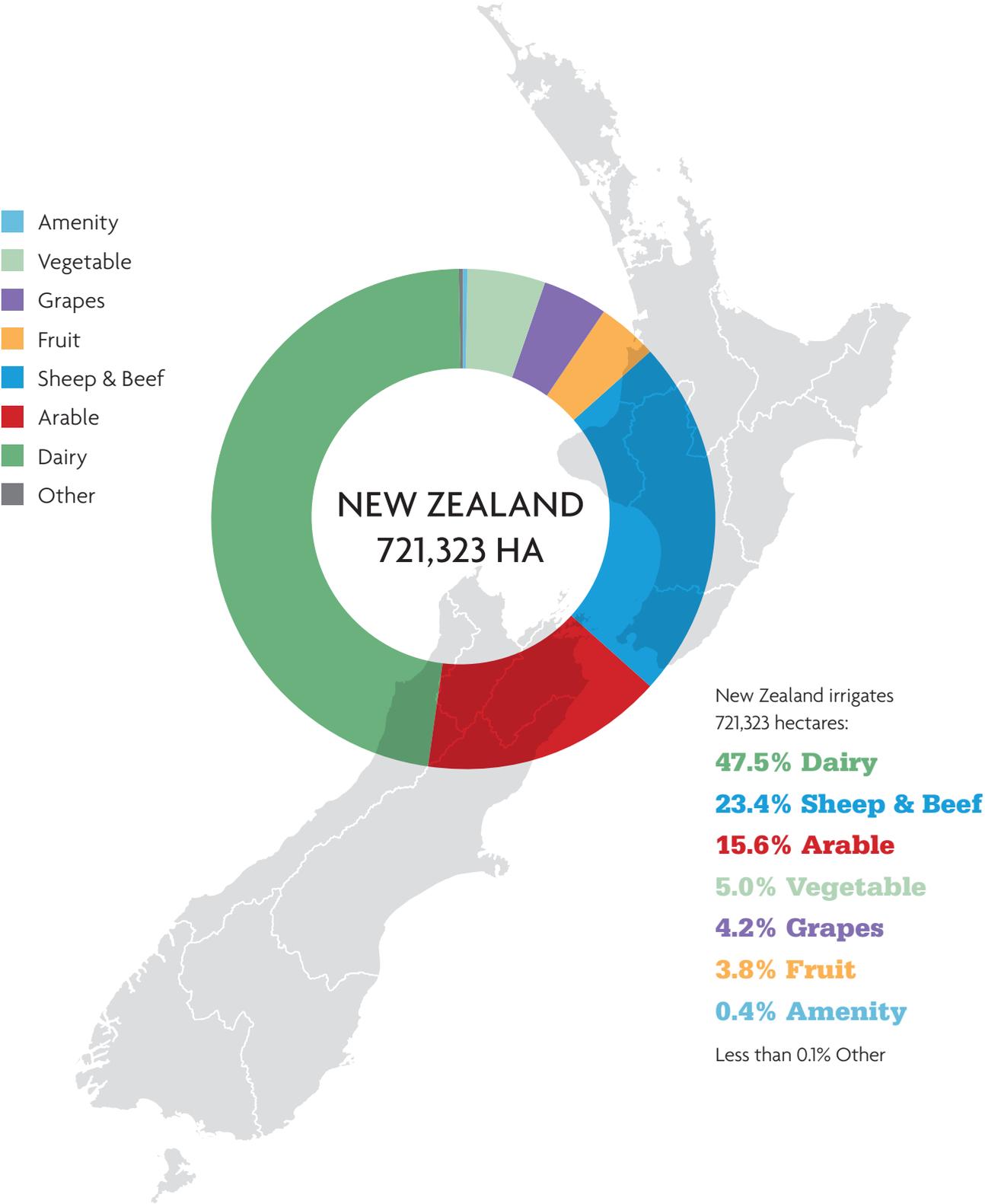


Figure 1. New Zealand's Existing Irrigated Area and Future Potential.

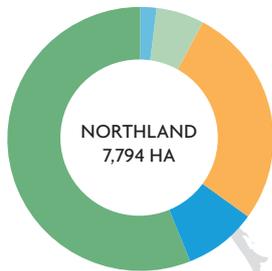
Source: Statistics New Zealand, Ministry for Primary Industries. Updated with IrrigationNZ knowledge

Irrigated Land Use in NZ

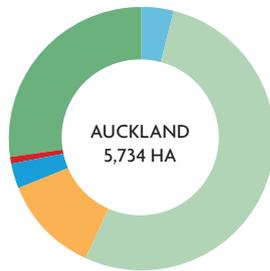


Source: Statistics New Zealand, Ministry for Primary Industries.

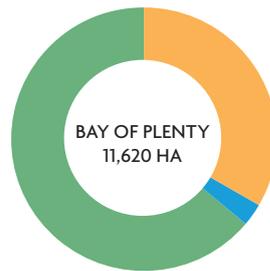
Irrigated Land Use by Regions



Northland's major irrigated areas:
57% Dairy
27% Fruit
9% Sheep & Beef



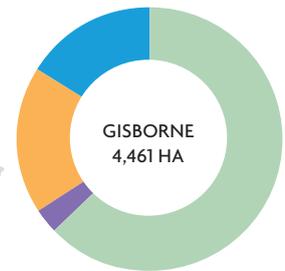
Auckland's major irrigated areas:
53% Vegetable
27% Dairy
12% Fruit



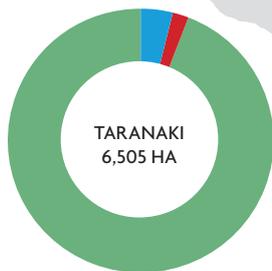
Bay of Plenty's major irrigated areas:
63% Dairy
33% Fruit
3% Sheep & Beef



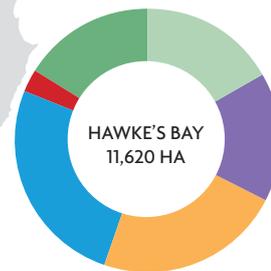
Waikato's major irrigated areas:
75% Dairy
15% Vegetable
6% Sheep & Beef



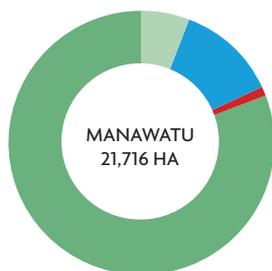
Gisborne's major irrigated areas:
63% Vegetable
18% Fruit
16% Sheep & Beef



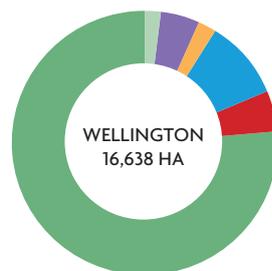
Taranaki's major irrigated areas:
94% Dairy
4% Sheep & Beef
2% Arable



Hawke's Bay's major irrigated areas:
26% Sheep & Beef
23% Fruit
17% Vegetable



Manawatu's major irrigated areas:
80% Dairy
12% Sheep & Beef
6% Vegetable

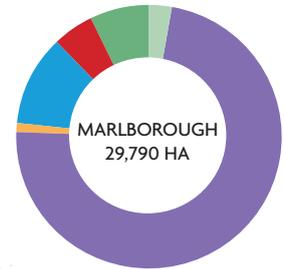
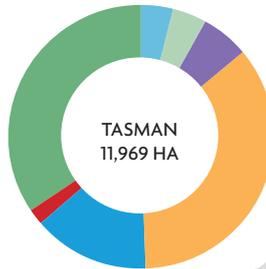


Wellington's major irrigated areas:
77% Dairy
10% Sheep & Beef
5% Grapes

Irrigated Land Use by Regions

Tasman's major irrigated areas:

- 35% Fruit**
- 35% Dairy**
- 14% Sheep & Beef**

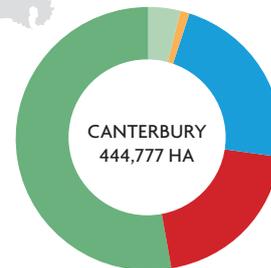


Marlborough's major irrigated areas:

- 72% Grapes**
- 11% Sheep & Beef**
- 7% Dairy**

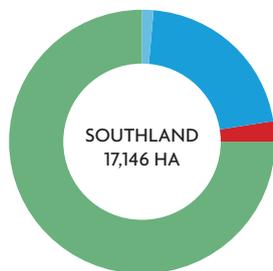
West Coast's major irrigated areas:

- 78% Dairy**
- 22% Sheep & Beef**



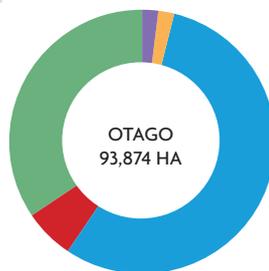
Canterbury's major irrigated areas:

- 52% Dairy**
- 22% Sheep & Beef**
- 20% Arable**



Southland's major irrigated areas:

- 75% Dairy**
- 21% Sheep & Beef**
- 3% Arable**



Otago's major irrigated areas:

- 55% Sheep & Beef**
- 34% Dairy**
- 6% Arable**

IRRIGATOR PROFILE: STUART NEILL

From Flood to Spray



Getting rid of border dyke irrigation is not an easy decision, says Stuart Neill. For many farmers, there's an emotional and lifestyle connection to an irrigation system they and previous generations have operated for decades. However the North Canterbury farmer says it's a journey worth taking. The extra reliability and production gains achievable under modern spray irrigation, he says, leave border dyke for dust.

Three years ago Stuart wasn't in a position to compare. His and wife Elizabeth's 200 hectare farm just outside Culverden was intensively border dyked. As a 50-50 sharemilker, Stuart inherited about 30 hectares of border dyke in 1996 when the former sheep farm converted to dairy. Sticking with what they knew at the time was easiest.

"We ended up with around 170ha of border dyke which seemed like the right decision at the time. Our philosophy was to be a low cost grass based system farm and as we have heavier soils border dyke was quite efficient. We did wide borders initially and it was very cost effective. At that stage environmental consequences weren't even on the radar and the first pivots were just appearing."

Fast forward a few years, having bought the farm with equity partners, Stuart began to reconsider his investment in border dyke. Involvement with the Pahau Enhancement Group to improve the Pahau stream's water quality had brought sustainability concerns to the fore.

"Border dyke in our situation had actually been quite efficient in terms of water use but there wasn't a good argument around the environmental issues."

More compelling however from Stuart's perspective was the reliability argument.

"The decision to make the change was driven around risk assessment. It was obvious that border dyke in some years was going to be off for some time. We had some very clear projections from Amuri Irrigation Company about what this could look like. We did the maths and worked out we could be off water some years for six weeks. That's what drove us to change," says Stuart.

To make the most of the investment in two pivots, grid irrigation, K line and sprinklers, Stuart says it's necessary to use monitoring technology to optimise irrigation and pasture performance. Aquaflex tapes measure soil moisture and temperature at three shallow and one deep site.

"The soil tapes are an absolute no brainer. I'm astonished people don't have them as you grow more grass with them. Soil that's too wet is a negative as well."

All water on the farm is metered. "We know exactly what we are pumping and where it is going. It gives us a gauge of irrigation efficiency. I can actually measure our performance electronically now. We've got good records around grass harvest and the pivots outperform the rest of our irrigation systems by 30-40%."

Stuart says metered data also means he's confident the farm is meeting environmental requirements.

"It would be crazy not having meters because with them, I can prove I'm only using my allocation and where it goes and when. I can show, because of our deep soil types, that water is not getting into the root zone and I can prove our water use is efficient."

Since converting to spray irrigation, Stuart has seen production lifts in areas of the farm that historically weren't watered.

"What that has shown me is that irrigation is more important than pasture species or soil type."

When the dairy payout improves, Stuart will remove the K Line and sprinklers and replace with more grid irrigation in corners of the farm the pivots can't reach. Two buffer ponds introduced to catch nutrient loss from the former border dyke system now help with storage, providing an extra 15 days leeway during the season.

"The biggest risk is with water reliability. That's what drove us to change and we had an opportunity with the high payout at the time to do it. The other part is having a sustainable system long term for the environment. And I feel good about what we are doing."



IRRIGATOR PROFILE: HEW DALRYMPLE

Precision Irrigation

Hew Dalrymple boasts possibly New Zealand's largest private irrigation operation. But the Rangitikei farmer knows size isn't everything. He's equally proud that his water is being put to efficient use and is going where it should for maximum growth. Variable Rate Irrigation, soil moisture monitoring and centre pivots provide Hew with the confidence that he's making the most of his water supply.

For five generations, the Dalrymples have farmed the coastal plains near Bulls. Grain, green feed, vegetable crops, finishing stock and grazing for contract make up the business. It's a profitable operation evidenced by the fact brothers Hew and Roger have expanded from the original family farm to amass another three farms within a 20km radius, one under 33 percent ownership with local iwi. The pair are now responsible for more than 3000 hectares of farmland in the district.



“I wouldn't be without VRI now. It really makes a difference. We can consistently get at least 20 percent water savings through VRI. And by default at least 20 percent savings in electricity

The scale of the operation becomes evident when you consider their irrigation systems. Twenty three centre pivots and one universal lateral irrigator service the four farms. Ambitious plans are underway to add another 11 centre pivots over the next three years. At a cost of about 350k each, that's a significant investment, but also reflects the value of water to the Dalrymple farming operation.

The first centre pivots were introduced in 2003 and within a few years Variable Rate Irrigation (VRI) was introduced. VRI allows modification of individual sprinklers on centre pivot and lateral sprinkler systems so water can be varied and optimised along the length of the irrigator.

“I wouldn't be without VRI now. It really makes a difference. We can consistently get at least 20 percent water savings through VRI. And by default at least 20 percent savings in electricity. For two irrigators the requirement was 100 litres per second. When VRI was used we managed to get that down to a range of 76–84 litres of water per second which shows a big saving.”

Running a reasonable-sized cropping operation (growing maize, wheat, barley, peas, squash, potatoes and trials with lettuces), plus a large stock operation, means their irrigation feeds animals and produces diverse crops on-time through the year.

“Irrigation maximises what we can produce.”

While the outlay for the centre pivots is considerable, the cost of operating them is just as important. “As well as the initial investment there is also the actual running costs, the electricity and diesel charges to consider.” Hew says this provides a strong motivation to work towards best practice when irrigating.

As well as Variable Rate Irrigation, monitoring of soil moisture levels is critical. They use a neutron probe system providing weekly readings. “It's not a daily recording but you still get very good, accurate data which gives you a good guide.”

“Our regional council is very appreciative of our ability to show efficiencies of how we use our water. We show them the soil monitoring data and it's all very transparent,” says Hew. “The map of the soil shows we are responsible users of water. A council is more likely to respond positively to applications if they know you are a reliable and sustainable user, and importantly have data to prove it.

“We are always following new technology advancements in the market, For example, we are looking at a live moisture monitoring system to alter the irrigation plan more regularly, particularly for VRI.”

The prospects for Waitatapia look bright, but Hew fears many New Zealanders do not yet recognise the opportunity that carefully-managed water provides.

“We have a world to feed and it will be crops, not stock, which will feed it. That's where we are going. New Zealand has an opportunity to further expand its crop farming, particularly in the perishable market which will grow in Asia in the next 50 years. And to do this we need reliable water, water, water.”

IRRIGATOR PROFILE: MARK & DEVON SLEE

Technology Enables Efficiency



Sustainable irrigation practice and investment in technology played a major part in Mark and Devon Slee's Supreme Award win at the 2014 New Zealand Ballance Farm Environment Awards.

The couple are among New Zealand's top performing irrigators. As well as being early adopters of SMART Irrigation technology, the Slee's are committed to reducing their environmental footprint.

Mark has a long standing interest in good irrigation practice. He is a current IrrigationNZ board member and deputy chairman, a past director of the Mayfield Hinds Irrigation Scheme and of the Rangitata Diversion Race Management Ltd.

"We always saw centre pivots as the way of the future. We put two pivots on the first block and realised pretty quickly how efficient the water was and we went back and developed the whole farm."

When the family farm was converted to dairy, Mark saw an opportunity to move away from border dyke irrigation to modern centre pivots. Irrigating in a smarter way has allowed the intensification of land with no increase in water allocation. The couple have expanded over the past decade adding two neighbouring properties and a dairy support unit. Their business Melrose Dairy Ltd is now based on 1014ha with a milking platform of 660ha carrying 2600 cows on three dairy units. But less than 6ha of the more than 1000ha operation is irrigated using less-efficient border dyke or flood irrigation.

"We always saw centre pivots as the way of the future. We put two pivots on the first block and realised pretty quickly how efficient the water was and we went back and developed the whole farm," he says. The operation now features eight centre pivots alongside k-line systems.

The couple have reduced their water consumption for irrigation by more than 50% in the past decade while doubling milk production.

Using the full suite of technology to assess water need has resulted in highly efficient operation of the farm dairies and its irrigation systems.

Investing in soil moisture monitoring analysis provides the couple with quality data on how soils are faring so they can ensure water is only added to those paddocks that need it.

Melrose Dairy Ltd is now one of the region's highest achieving dairy units. In the 2013 season it produced 1834kg Milksolids/ha, well above the region's average. It is one of four top privately-run Canterbury farms against which Lincoln University measures the performance of its dairying operations.

These results make them not only one of the top performing dairy farming operations in Canterbury, but show sustainable dairy farming is underpinned by modern irrigation practice.

And profitable productivity is not their only focus. The couple place equal emphasis on environmental management, animal welfare, compliance and the community in which they farm which contributed to their win at the 2014 New Zealand Ballance Farm Environment Award.

Herd size is kept under 1000 to place less pressure on the cows and staff. A focus on staff management and a high level of awareness and consideration to team members has resulted in low staff turnover.

And their environment is a priority. Existing shelter belts have been retained where possible, but in areas where trees had to be removed to accommodate modern irrigation, trees have been replaced by low-growing native species. "In actual fact we have planted more trees than we removed." Integrating these species into the farming systems has cost Melrose Dairy Ltd \$180,000 in plantings and maintenance.

IRRIGATOR PROFILE: CHRIS HOWELL

Growing Grapes – The SMART Way



“If more people aim for sustainable water use that will mean more people can use the resource.”

Ten kilometres west of Hastings, Prospect Vineyard specialises in producing top wine grapes, particularly Merlot. Prospect Vineyard owner Chris Howell is proud of the family business which began twenty years ago when wife Catherine and himself bought 15.8 hectares of bare land in the area. “There was nothing on the property apart from a couple of trees. We put in all the infrastructure, including the water supply and bore.”

Right from the start, Chris says it was clear their land would need water to get the best out of it.

“It’s all very light soils. It can hold quite a lot of moisture for a while but when it starts to dry out, it dries out quite quickly.”

Within a few years, the couple had invested in a surface drip irrigation system using inline emitters that they can control automatically.

“Drip irrigation is very precise and grapes are a highly efficient user of water. So overall we use far less water than orchards or cropping.”

Prospect Vineyards normally starts irrigating in November, depending on how dry it is, and goes through until mid-March “though some seasons we don’t have to irrigate much at all.”

“But I prefer it when we have to irrigate because you can control your fruit growth and size,” says Chris.

Over time, Chris has added monitoring technology to ensure they’re using no more water than needed.

“We have times we use irrigation consistently but we’re always aiming for better use of water. We’re now much more targeted than when we started irrigating and this has influenced how much we put on.”

In 2013, despite drought conditions that plagued much of the North Island, Prospect Vineyards applied 400ml of water per ha – in a summer where the Hawkes Bay received 98ml of rain in the whole growing season. Water metering showed 320ml of water per ha was received as ‘effective water’.

Effective water is the water available to the plant – after any which has evaporated or gone below the root zone.

“That showed us how efficient we had become with our water use,” says Chris.

A series of soil moisture probes on their properties provide weekly reports on soil moisture levels.

“It’s not a cheap option. If I dug holes and made visual assessments it would be cheaper. But the probes make a big difference to the quality of the crop in the end. We don’t get the rapid drying out of the root zone or over-excessive watering of the crop. The advantage is the soils on our property are quite variable and monitoring enables irrigation to be more targeted.

New environmental regulations requiring telemetered information from bores (groundwater takes) has provided further insights into their water management.

“We always second guess what the season is going to do but the bore information has actually been very useful. Combined with monitoring, we now get to see what water has gone on and its effect.”

Chris supports SMART Irrigation and says most winegrowers are keenly aware of the need to demonstrate responsible water use.

“I think the onus is on smaller growers as well as larger ones to irrigate responsibly. We are big on sustainability in the wine industry. It’s all about getting the best out of what you use. If more people aim for sustainable water use that will mean more people can use the resource.”



Construction process of the \$110m stage two piping of the ALIS scheme (story page 15).

Many jobs rely on water

45,000

employed in **Dairy Industry**



50,000

employed in **Horticulture**



110,000

employed in **Tourism**



SOURCE: Industry 2014 and Statistics NZ 2013. Adapted from Ministry for the Environment.

SCHEME PROFILE: ASHBURTON LYNDHURST

Gravity-fed System Delivers Results



Ashburton Lyndhurst Irrigation Scheme (ALIS) is one of the country's oldest irrigation networks. Developed in the 1940s as part of the Rangitata Diversion Race (RDR), for more than 70 years the scheme provided border dyke irrigation via a gravity-fed open channel system. Farms from the top of the Canterbury Plains near Methven to 30km south at Ashburton township benefited from its water network.

Originally designed to irrigate 60% of a farm (which in the 1940s was considered sufficient), in recent years ALIS has modernised its network and improved water efficiency to increase the water available for shareholders.

An \$8 million development in 2008 saw around 30km of gravity pipeline installed to irrigate 4000ha within the scheme. Ground-breaking in New Zealand at the time, the stage one project used the natural fall of the plains to generate pressurised water to the farm gate by piping water from the RDR to 37 farms in one corner of the scheme. Enough pressure was generated to allow spray irrigation without pumping.

Energy savings were immediate with reduced pumping and transmission losses and a considerable advantage being the release of water previously lost through leakage and water movements. The scheme saved about 20% of the water it was using to service that area and was able to irrigate more land with the water savings.

An overlooked improvement was the flexibility that came with pressurised water. "We underestimated the value to our shareholders of having water 24-7; the convenience and efficiency it generates. It was an additional benefit we hadn't really counted on," says Jess Dargue, ALIS scheme manager.

Stage two of converting the rest of the nearly 30,000ha scheme to gravity-fed pipeline began in May 2014 and two lines will be operational this summer. The \$110 million stage two project was expected to take three and a half years to complete, but by this month nearly 40% should be up and running. With more than a third of the scheme converted to pressurised supply, shareholders should be feeling more confident about the upcoming season, particularly following another dry winter.

"We chose to build an additional 20% allocation into the system over and above each farmer's allocation with a view to accommodating on-farm storage and giving farmers the option of bringing additional flow to their properties during high demand periods," says Jess.

"It was quite expensive for us to do this. Most schemes only design a system to deliver the allocation and it was hard to justify the additional cost, but we thought it was worthwhile. While about one third of our shareholders have on-farm storage, it's reasonably limited (around 2 million cubic metres)."

"We took a different approach by allowing our farmers who were converting to spray to pump directly out of the race. We knew a piped network was the future and didn't want to force them into on-farm storage knowing we wanted them to invest in a gravity-fed distribution system," he says.

Once stage two is complete, the ALIS open race system will dramatically reduce from 250km of open races to 25km. The system works by using those channels to get the water from the RDR down to five service ponds that run the length of the scheme. From the ponds, pressurised pipelines generate gravity pressure using the natural contours of the plains, and then the network fans out to the service areas downstream.

"This project has really been influenced by what our farmers are doing, the dramatic move that's taken place from border dyke to spray irrigation. That led us to come up with the scheme upgrade to meet our shareholder's needs. In terms of the nutrients, it was also felt to be the best way forward to manage water efficiently and protect the resource that we are so fortunate to have," says Jess.

SCHEME PROFILE: VALETTA IRRIGATION SCHEME

Piping Move Sees Gains



A Mid Canterbury irrigation scheme that illustrates the water efficiency gains possible from converting open channels to underground pipes is Valetta Irrigation Scheme.

Smack bang in the middle of the Canterbury Plains, Valetta supplies irrigation water to forty one shareholders and nine farmers who belong to the nearby Barrhill Chertsey Irrigation Scheme. The scheme takes its water from the Rangitata Diversion Race; one of three schemes that operate under the Rangitata Diversion Race Management Ltd's wider umbrella.

Two years ago, Valetta's open race channel system was replaced by an underground pipe network. The piping project cost shareholders in the realm of \$30 million but was necessary to take the scheme to the next efficiency level, says director and shareholding farmer Graeme Wall.

"Now we are able to spread the water further. We supply 13,000 hectares (just under 11,000 to Valetta shareholders) which is mostly spray irrigated (about 99%). Previously under border dyke we only covered 7,600 hectares so that's a significant increase (almost double)."

Piping the scheme was first mooted in 2007 but initially dismissed due to cost. Then an Aqualinc study showed a more efficient piping network could produce water savings of nearly 40%. This convinced Valetta's 42 shareholders to take the plunge.

Moving to gravity-fed pressurised pipes has reduced evaporation and seepage losses, while at the same time improving water efficiency and increasing the amount of land that can be irrigated, says Graeme.

"We've been able to grow the scheme because we've picked up the leakages."

With 80% of shareholders already involved in dairying and dairy support, there have been no significant land use changes, but the project has ushered in more refined application of water.

"With telemetry our farmers can monitor their water better. They know their cubic metres of use per year and how much water they are putting on. That could lead to further savings in water and we may also be able to expand our scheme."

Water savings have come hand in hand with power savings from reduced conveyance demands and on-farm pumping requirements. The scheme saves (through gravity) enough electricity to power close to 2000 households, and farmers individual power costs have been slashed.

"The other thing people haven't got now is power costs. There's only a power cost to turn their pivots on and we've been able to lock in per hectare cost for that too."

Alongside the water gains, 55 hectares of land has been returned to productive use through ditches being filled in, which has enabled shareholders to improve their productivity.

"You would hope because we are running as efficiently as possible we would also have reduced our leaching," says Graeme.

Spray irrigation is now the norm and Valetta's two settling and storage ponds provide one day of storage for every shareholder allowing 'on-demand water'.

With minimum pressure of four bars at each outlet, centre pivots are viable across the scheme, but Valetta's run of river water take puts pressure on what they can deliver.

Valetta's current goal, says Graeme, is to work with the regional council to enable better use of groundwater consents within the scheme area to shore up their reliability.

"What we would like to try and do is grow the scheme using shoulder water but combining that with groundwater consents to improve reliability. It's a work in progress."

SCHEME PROFILE: HAKA VALLEY IRRIGATION

Size isn't a Barrier

Irrigation companies don't need to be large scale. One of the smallest in the country started operating this season with only five shareholders. Haka Valley Irrigation evolved from collaborative efforts by farmers in the valley to explore options for water. Chairman of the scheme, Andy Hayes, says without more reliable irrigation, his former sheep and beef operation had a grim future. Being able to share the costs of development and responsibility for irrigation infrastructure has made his dairy unit more viable.

For the past 25 years, Haka Valley farmers have investigated the options for more reliable irrigation. Different ideas were debated ranging from numerous storage dams through to pumping water from the Waitaki River. A scoping study was then commissioned to see what financial gains would result from each option. The initial capital costs put off some, says Andy, and the idea stalled until consent was granted to take 6000L/sec from the Waitaki.

"Gradually over time the amount of interested irrigators dwindled to the stage where 2000 hectares wanted to be irrigated. Haka Valley Irrigation Ltd started with six shareholders, then two exited the company, one bought in and now we have three wet shareholders and two dry shareholders. Haka Valley Irrigation Ltd then contracted Bosch Irrigation to build a scheme."

The wet shareholders decided to build a scheme with capacity to pump all of its consented allocation of 1000L/sec or 1900 hectares, even though the three farmers involved were only going to use roughly 650L/sec or 1200 hectares to start with.

"We wanted to fully utilise the consent allocation for future use," says Andy. "Haka Valley Irrigation Ltd has many major benefits with the scheme. The first being that we can pump our allocated 1000L/sec into the buffer pond during the night/low electricity rates and use the pond during the day/high rates, especially in the shoulders of the irrigated season. This keeps the annual power charges very low."

The next and most positive advantage with the scheme is that the source of Waitaki water is from the Southern Alps, making it a very reliable irrigation scheme. Where other irrigation schemes have struggled with constant restrictions being in place over the majority of last year's irrigation season, we would not have been restricted at all.

The HVIL scheme was built to a very low capital cost also. At roughly \$3,500/ha to the farm gate, this is \$4,000–\$5,000/ha less than other irrigation schemes.

As a dairy farmer in a drought prone district, I could not afford to be running this chosen farming system without reliable water. My on-farm irrigation system has been designed to apply 5mm/day, which is enough to maintain grass growth through the hot Haka summers. On-farm soil moisture probes are a part of our consent requirements so that the water pumped into the Haka is used most efficiently.

The HVIL scheme was built to a very low capital cost also. At roughly \$3,500/ha to the farm gate, this is \$4,000–\$5,000/ha less than other irrigation schemes.

"We believe we have built a very low cost, efficient and reliable irrigation scheme which will really benefit the Haka Valley. It will increase the value of existing sheep and beef farms. It will also introduce more people into the area, for example I have bought in four more staff since converting to dairy. The other shareholders of Haka Valley Irrigation are mostly dairy support based farming systems which have and will introduce more jobs and bring more financial security to their farming systems. Overall, we are confident of the scheme and can't wait to see the on-farm benefits."



SCHEME PROFILE: CENTRAL PLAINS WATER

CPW Reduces Pressure on Aquifers



After a turbulent few years, the backers, shareholders and staff of Central Plains Water Ltd (CPW) can rightly feel proud of themselves. With the official opening of the scheme in August, CPW is no longer a 'developing scheme' but a fully-fledged operational water provider.

Only 15 months after work commenced, the company's 17km long canal for Stage 1 was filled with water. In early September the first allocation was made available for CPW shareholders for this season. The 130km-long pipe network is delivering water to approximately 20,000 hectares of farmland in Central Canterbury in an area bordered by the Rakaia and Hororata Rivers. Importantly, the scheme has enabled farmers who were irrigating via groundwater to switch to CPW's surface water allocation. Not only has this reduced pressure on the aquifers, once fully developed, the scheme will bring 300 million cubic metres of alpine water into the catchment improving reliability and sustainability of supply.

CPW will help shareholders address [these] concerns through its Farm Environment Plan implementation programme. But as many of its larger shareholders are already irrigators and "sophisticated ones at that", like Purata, Grasslands and Dairy Holdings, they are already some way down the track in tackling these environmental responsibilities.

Managing to construct a scheme of this scale in just over a year is, in anyone's terms, a significant infrastructure achievement. Building the canal was one of New Zealand's biggest earthmoving projects in recent years with more than 3.3 million cubic metres of material being moved, 560,000 square metres of HDPE liner and 815,000 square metres of geotextile installed as underlay, and thirteen bridges spanning up to 28m being built.

Importantly, the project came in on time and within budget, as well as delivering 100% compliance on environmental conditions and the number of easements achieved.

While Stage One is now up and running, CPW won't be resting on its laurels, says CEO Derek Crombie. Planning for Stage Two is underway which will be progressed over the next two years. Up to another 30,000 hectares may be irrigated depending on shareholder support.

The future challenges confronting new schemes like CPW include looming nutrient management requirements and on-going financial feasibility.

"The big story for farmers is not leaching. They've now got to manage their on-farm infrastructure so nutrients stay on the ground and don't leach."

CPW will help shareholders address these concerns through its Farm Environment Plan implementation programme. But as many of its larger shareholders are already irrigators and "sophisticated ones at that", like Purata, Grasslands and Dairy Holdings, they are already some way down the track in tackling these environmental responsibilities.

But the way ahead will require further Government investment as the capital costs of developing each stage are considerable.

"We are revisiting now what's going to be affordable irrigation in these new economic parameters. As new schemes, we have been told we are too expensive which is a challenge for the industry but also for New Zealand. If irrigation is important for the economy you can't rely on the farmers to do it all. It's a national imperative."



Central Plains Water Scheme

Photo: Central Plains Water Ltd & Fulton Hogan

