



# Tararua farmers lead the way



Environmental actions start locally





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## Acknowledgements

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Special thanks for content to: Te Kāuru Hapū Collective,  
Tracey Collis, Mavis Mullins, Ballance School



## Message from Mayor Tracey

**As a dairy farmer, I became involved with the Tararua Economic Impact Group and eventually entered politics because I wanted to stand up for our community in the face of poor policies and unintended consequences. It was a troubling moment when even an organic dairy farm couldn't comply with new regulations.**

During this process, we collaborated closely with DairyNZ. I vividly remember our initial meeting where we discussed the potential of plantain with the Minister for the Environment and saw his eyes light up with enthusiasm. The Plantain Project grew legs from there. While our farm wasn't selected for the trial, my husband and I supported the project right from the beginning.

We have always innovated in Tararua and been on the leading edge. It has been wonderful as Mayor to drive through the district and see more and more plantain along the way. To be recognised as a catchment project at both the Ballance Farm Environmental Awards and the Primary Industries New Zealand Awards were real highlights for me, and I am confident we will continue to see the adoption of plantain in all our farming systems. The added bonus of plantain is that if you are short of a few salad leaves, you can pop out and pluck some to add to the mix.

Congratulations to all the farmers for their involvement, and their enthusiasm for plantain. A win for the environment and our bottom line.

Tracey Collis  
Mayor



## Message from Project Chair Mavis

**Before this community project started, the regulatory situation looked dire with Tararua dairy farmers facing the prospect of going out of business if they couldn't make changes to their farming systems. This would have meant a hard economic hit for the local community.**

Instead, what we have seen is an awesome collaboration with local food producers, the Te Kāuru Eastern Manawatū Hapū Collective, schools and other community groups who got together to share information, grapple with environmental legislation, nutrients, carbon and water quality. Understanding the environment at 'your place' has given everyone a greater appreciation of the changes they need to make to achieve a successful outcome.

I take my hat off to the proactive farmers who stepped up to change their pastures over a number of seasons. It's been very exciting to be part of this project and to find that plantain is effective in reducing nitrogen leaching. It's also exciting to see it being picked up at a national level as a result of this research."

Ultimately though, this project is about much much more.

As shared by by matua Hone Morris "*Ko Papatūānuku te matua o te tangata*". *Papatūānuku is the mother of all mankind. We need to care and protect the land as we do our mothers*

Mavis Mullins  
Project Chair





# Welcome to Tararua







**The Tararua District, located in the south-east of New Zealand's North Island, has the byline Land of the Ranges due to how they connect the district. There are the majestic Tararua and Ruahine ranges to the west, and the Waewaepā and Puketoi ranges central to the district. Significantly, the district is the source of the Manawatū river, with the headwaters of the river starting in the Ruahine ranges northwest of Norsewood.**

Until local government reforms in 1989, the area was known as the Wairarapa and Southern Hawke's Bay; however the name Tararua reflects the area's rich history and cultural identity.

Known traditionally as Tamaki-nui-a-Rua (Seventy Mile Bush) the Tararua District is now recognised for its lush green pastures, with the area having been cleared for farming in the 19th century. Much of the region's economy is derived from pastoral farming, with well-established dairy, sheep, and beef farms its major contributors. Our rural towns are friendly, special places that offer a relaxed country lifestyle.

Of the Tararua District's 400,000 hectares, 33,726 hectares are in dairy farming with 88,621 dairy cows across 261 dairy farms. While dairy farming is a business and income for its owners and the local community, it's also a lifestyle. Farmers have a love and passion for their beautiful animals, the land, the waterways and the environment. Many farms have a special generational history too.

The Tararua District Council and Horizons Regional Council, farmers and the community, have been working hard for many years to ensure that this special place is cared for now and into the future.

# About the Tararua plantain project

In 2018, faced with the need to make significant environmental improvements to comply with regulatory requirements, farmers and the community teamed up in a five-year research project aimed at reducing their environmental footprint and improving water quality in the region.

The Tararua Plantain Project, led by DairyNZ, the industry organisation representing New Zealand dairy farmers, tested the benefits of adding the leafy herb plantain to local pastures. Earlier research had proven the ability of plantain to dilute urinary nitrogen, but there was little knowledge about how it would fit within a typical farm system. Tararua farmers helped identify the knowledge gaps and find solutions.

The project was about achieving real change and as is the nature of farmers, they rolled up their sleeves to take action. Success was achieved through forming and nurturing enduring relationships within the community. Many individuals and collectives joined forces to help reestablish healthy waterways in Tararua.

Not only have they been successful in improving water quality locally, but through their leadership and expertise, have also provided a blueprint for environmental improvement nationwide.





**"The project was about achieving real change and as is the nature of farmers, they rolled up their sleeves to take action. Success was achieved through forming and nurturing enduring relationships within the community."**

*Adam Duker – DairyNZ project manager*





## The environmental function of plantain

Farmers adopt multiple strategies to retain nitrogen in their soils to provide optimum nutrients for pasture growth. Adding plantain to pastures is one additional step Tararua farmers have undertaken, not only to reduce leached nitrogen, but also to harness more nitrogen in the soil to grow feed for their cows – a win for the environment, and a win for productivity.



## What does the research say?

DairyNZ and our research partners have demonstrated that a pasture sward containing approximately thirty percent of Ecotain™ (plantain) can reduce the amount of nitrogen leached by up to fifty percent. DairyNZ modelling in nitrogen sensitive catchments forecasts a potential reduction of 15,000 tonnes per year of nitrogen leached on 4,200 New Zealand dairy farms by 2035.



## How does nitrogen affect waterways?

Nitrogen in its gas form (N<sub>2</sub>) makes up about eighty percent of the Earth's atmosphere. In other forms it is an important nutrient for plant growth.

Unfortunately, nitrogen in soluble form (which allows it to be taken up for plant growth) is also highly vulnerable to leaching through the soil structure, particularly after heavy rainfall. When leached nitrogen can move through groundwater and, if it makes it to a stream, river, or lake, it acts in much the same way as a nutrient for pasture but in this situation becomes a nuisance nutrient promoting the growth of aquatic algae and weeds.



## Sampling success

The low-cost production success of traditional ryegrass/white clover pasture swards is embedded in the psyches of Kiwi farmers. To achieve buy-in, the project had to demonstrate that alternative plantain-based swards provided sufficient benefits both environmentally and functionally to make the change worthwhile.

Tararua farmers, alongside AgResearch and DairyNZ scientists developed a local plantain monitoring programme to assess how plantain would affect production on-farm, and to answer farmers' questions on how to make plantain best fit their farm system.

The Tararua technicians (pictured) have been monitoring 134 paddocks across 15 dairy farms, and have collected 570+ sample results to provide us with certainty that plantain does work. The good news is:

- plantain on Tararua farms has seen a twelve percent increase in pasture yield
- plantain has the same feed quality when included in pasture
- by including plantain in pasture, Tararua farmers have been able to reduce their application of nitrogen fertiliser
- plantain has reduced the environmental footprint of Tararua farms.



# Science provides answers

## Farm stats

### Thomas & Jennifer Read

Readlands Farms, Dannevirke

Cows: 400 Friesian cross

System: 2

Farm Size: 166ha (145ha effective)

Production: 160,000 kg MS

Dannevirke farmers Thomas and Jennifer Read were part of a working group of local farmers, rural professionals and scientists who explored the complexities of incorporating plantain into different farm systems as part of an effort to improve water quality.

At first it was an information gathering exercise for everyone, seeing what would suit a particular system, says Thomas. "We have a cropping system growing turnips in the summer and when they finish, we return to pasture. We wanted a low-cost option to diversify pasture that would tolerate drought. Initially we planted 2kg/ha plantain in the 2015-16 season, and by the time the working group got going in 2017 we had scaled up to 5kg/ha. But, through experimentation, we've found that 3kg/ha works well. The cows love it too. They eat it, seeds and leaf, all the way down. It's not as fibrous as other seed heads but has the same ME (usable or metabolisable energy) and persists really well."

"Funding enabled the community research, and that's allowed us to define the reality and provide solutions. Meeting the regulatory requirements of the Horizons Regional Council has been a very unsettling process for Tararua farmers. This research has opened up possibilities for the dairy sector and redefined New

Zealand's traditional reliance on a ryegrass and clover sward. It's exciting to have another tool in the toolbox and there's a huge environmental benefit in retaining nitrogen in the system."

Apart from planting plantain to reduce nitrogen leaching and improve water quality, the Reads have taken additional steps to improve the farm's aquatic biodiversity.

Jennifer says that over the last 10 years they've fenced off and planted the margins of all the farm's streams and for the last five years have been improving the wetland areas. "It's been a big effort, and we're grateful for the support of Horizons Regional Council and students from Dannevirke High School who have helped us plant more than 10,000 native trees."

The couple say that the Tararua project has brought the local community closer together as they worked towards achieving a common goal. "When you're working in isolation, you forget how like-minded most farmers are. The project has proven that New Zealand's 'Number 8 wire' resourcefulness isn't dead, but it's been modified and redefined to enable us to do things more scientifically," says Thomas.





**"It's exciting to have another tool in the toolbox and there's a huge environmental benefit in retaining nitrogen in the system."**

*Thomas Read – Tararua project farmer*





**“At the heart  
of any  
successful  
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passionate  
people”**

Janine Swansson -  
DairyNZ Project Co-ordinator









# DairyNZ's grassroots support

Water is an important resource to our farmers and communities, and the environment is at the forefront of farmers' minds. This project has been an orchestra of passionate local farmers and rural industry partners coming together to improve water quality - all the while ensuring economic resilience for the local Tararua community. "At the heart of any successful project are passionate people" says Janine Swansson – DairyNZ project co-ordinator.

Janine Swansson's heart is deeply embedded in the Tararua District having spent all her life as part of this special community. She says it's heart-warming to work for DairyNZ supporting farmers who are passionate about looking after the environment and being the conduit for knowledge sharing through her role as the project co-ordinator.

"Many sectors have been involved in this project and it's been wonderful to see the extended group of farmers, industry partners and the community, all moving ahead towards a common goal," says Janine.





**"Tararua farmers have been fortunate to have Janine and the DairyNZ team working with us at catchment level. The project has demonstrated that it is possible to reduce our environmental footprint and still run a financially viable business."**

*Mark Diamond - Tararua project farmer*



**"We want to do better for the environment and have the option of leaving a productive farm to the kids."**

*Aaron Passey – Tararua project farmer*



*The Passeys have fenced off two major streams and created wetlands for wildlife habitat.*



# Sowing seeds for sustainability

## Farm stats

### Aaron & Jo Passey

Te Angi Farm, Dannevirke

Cows: 300 Friesian cross

System 3

Farm Size: 163ha

(120ha effective)

Production: 90,000kg MS

Aaron and Jo Passey milk 300 cows at Matamau, just north of Dannevirke. Aaron says that while the topography of Te Angi Farm prevents them from getting a discretionary consent from Horizons Regional Council they, along with other dairy farmers in Tararua, are working hard to reduce the environmental impact of their farming practices.

“We are in a high-priority catchment and the plantain project is a way of working towards consent by making changes on-farm to meet the nitrogen leaching targets outlined in the Horizons Regional Council One Plan,” says Aaron.

Research has proven that plantain can significantly reduce nitrogen entering waterways by increasing cows’ urine volume, diluting the nitrogen in urine and reducing the total amount of nitrogen excreted in urine. It also retains nitrogen in the soil, preventing it from entering waterways.

The PASSES are among a group of farmers in the Tararua district who have adopted Ecotain™ as an environmental forage. They are renovating existing pasture by direct drilling plantain. Every spring they also plant 6ha of straight plantain as part of the plantain regressing programme. The plantain is in the ground for 18 months before tetraploid ryegrass and clovers are added. “The cows on the home farm love plantain; it’s their preferred snack. They really get into it and chew it out, but funnily enough, the cows on a nearby lease block aren’t quite so keen,” says Aaron.

The PASSES are making significant farm system changes to reduce nutrient losses. “We estimate that 15-20 percent plantain in the pasture mix will help us achieve our nitrogen reduction targets. We want to do better for the environment and have the option of leaving a productive farm to the kids,” says Aaron.



# Te Kāuru Hapū Collective



## **Ki te ora te kāuru, ka ora te rere, ka ora anō te pūaha**

**'If the source of the river is healthy, so should its collective flow even to its mouth opening to the sea**

The Manawatū River, 182km long, rises on the eastern slopes of the Ruahine Range. Eleven Hapū (subtribes) living along the awa, make up the Te Kāuru Eastern Manawatū Hapū Collective. Each hapū has a long and enduring connection to the river and its tributaries. The aims of the collective are to reconnect to the awa, its flow, its stories, and its mātauranga to improve the mauri and enhance the health and wellbeing of waterways while ensuring sustainable use of land and water

Hapū are involved in a number of initiatives to protect and enhance the river and sustain the community. Te Kāuru is a signatory and an active participant in The Manawatū River Leaders' Forum since 2010. During this time, they have forged a strong relationship with Horizons Regional Council. They have liaised with landowners, planted thousands of riparian species alongside community groups and schools, and constructed fish passes. They have also been involved in the Tū Te Manawa Project which built eight Whare Mātauranga (educational kiosks) where communities can connect with the river; learn about the preservation projects, and understand the cultural and historical significance of each site. All these initiatives are contributing to better outcomes for the river.





# Our caring community

**Tararua is a wonderful rural community made up of seven towns. Our small farming communities are filled with amazing people who are real innovators, love the land and care for the people around them. We are proud of our agricultural sector and our local produce.**

**Our awa, the Māori word for rivers, join the Tararua District together and are our life source.**

Norsewood in the north is the source of the Manawatū River, our largest and most significant river. A further six rivers flow into the Manawatū River. These are the Mangahao, Mangatainoka, Mākākahi, Mangaone, Mākuri and Tiraumea. They flow through the Manawatū Gorge and out to the Tasman Sea. The Ākitio, Ōwhanga, Pongaroa, Waimate and Wainui Rivers flow to the Pacific Ocean on our eastern boundary of Ākitio and Herbertville.

The Manawatū Gorge is significant because the Manawatū River is a water gap, meaning it runs directly through the Ruahine and Tararua ranges from one side to the other. This area is known as Te Āpiti meaning 'the narrow passage' a name bestowed upon the Manawatū Gorge by tangata whenua Rangitāne.

The Tararua District is a part of the Manawatū River Leaders' Accord that works together in a shared vision and goals to improve the health of the awa. Plantain is a part of how our farming community can help.

Proudly, our schools, kura, farmers, and the Te Kāuru Eastern Manawatū Hapū Collective all help to care for our waterways and play an active part in water testing. I know this as my daughter is a scientist who loves a day out of the lab working with the community to reach improved outcomes. It gives us all great hope for our future. Our work is all contributing towards vibrant communities where our land and waters are nurtured and our people flourish.

Tracey Collis, Mayor

# Ballance School Hands-on learning

**Ballance School, a country primary school near Pahiatua, is part of the nationwide Enviroschools network. Students are encouraged to think about how to care for the planet and live healthy sustainable lives.**

Principal Brenda Sutton says when local farmer (and school board chair) Catherine Mabey suggested the students get involved with helping to monitor water quality on-farm, everyone was keen.

“Projects like this show students that science can be fun and that there are lots of variables when it comes to career options. One of our key values at Ballance is responsibility, and one of those responsibilities is taking care of our environment,” says Mrs Sutton.

As part of the Tararua Project, local farmers sample water quality every month in response to the environmental initiatives underway on their farms. Ballance school students got their hands dirty helping to test the water at Mabey’s farm while also learning about the stream’s habitat and biodiversity. They saw mayflies, amphipods, and snails and caught an eel and a freshwater crayfish.

Catherine Mabey, the host dairy farmer, says it was great to see the kids working with an ecologist to catch bugs in the stream and learning about the science behind it.

“On top of all the fun, they gain an understanding of why we monitor water quality. With dairy farming being so integral to our community, it’s awesome to take the kids to a farm, and see them learning about the environment where they live,” says Mrs. Mabey.







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*Catherine Mabey - Tararua project farmer*





# Testing the waters







**A popular adage says 'you can't manage what you don't measure'. As part of the Tararua Plantain Project, local farmers have shown their stripes by establishing a programme to measure and track water quality in their local streams and rivers.**

Water quality monitoring needs to be completed over a long timeframe – years in fact – before data is robust enough to be able to report an improving trend. Since October 2020, Tararua farmers have taken and tested over 350 local water quality samples, aligning their programme to the Horizons Regional Council's own environmental monitoring to ensure integrity of the results. Adding additional clout is work completed by EOS Ecology to measure ecosystem health and stream habitat, with these results shared at an annual community event.

A new addition to the programme is environmental DNA (eDNA) monitoring. DNA cells from local streams have been harvested to identify every lifeform in contact with the stream. Some species of interest detected throughout Tararua include:

**BIRDS**

Sacred kingfisher (*Todiramphus sanctus vagans*)  
Kōtare/White-faced heron (*Egretta novaehollandiae*)  
Kererū (*Hemiphaga novaeseelandiae*)  
Silvereye or wax-eye/tauhou (*Zosterops lateralis*)

**FISH**

Upland bully (*Gobiomorphus breviceps*)  
Longfin eel (*Anguilla dieffenbachii*)  
Shortfin eel (*Anguilla australis*)  
Brown trout (*Salmo trutta*)  
Rainbow trout (*Oncorhynchus mykiss*)  
Īnanga (*Galaxias maculatus*)  
Kōkopu/Dwarf galaxias (*Galaxias divergens*)

**MAMMALS**

Red Deer (*Cervus elaphus*)  
Fallow deer (*Dama dama*)  
Black Rat (*Rattus rattus*)  
Norway Rat (*Rattus norvegicus*)  
Least weasel (*Mustela nivalis*)  
Common brushtail possum (*Trichosurus vulpecula*)  
Pig (*Sus scrofa*)

## Acknowledgement

The Tararua plantain project team, alongside Tararua dairy farmers, wish to acknowledge and thank the project partners and funders for the expertise and energy that they provided to the project.







*Dairynz* 

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