Whenua Haumanu

Nurturing the land through exploring pastoral farming

Report for Year 2 Quarter 3

(Jan 2024 - Mar 2024)

Whenua Haumanu aims

To build a robust scientific evidence base, regarding the effect of standard and diverse pastures under contemporary and regenerative management practices on soil biology, diversity and structure, pasture growth, quality and persistence, animal production, health and welfare, quality of milk, meat and wool, nutrient leaching, methane and nitrous oxide emissions and carbon production and storage.

To actively engage the pastoral sector and extend information about the suitability and relevance of standard and diverse pastures under contemporary and regenerative grazing practices across NZ environments.

Quarter highlights/outputs

Massey University

In the past quarter, the Massey University farmlet management advisory groups have met once for both the sheep farmlet and the dairy farmlet, and monthly discussions have been had with the farmlet advisors.

On the sheep farmlet, deferred grazing was utilised between November and March in the regen treatments on a quarter of the area (3 paddocks). This was successful in helping to minimise the amount of extra on-farm grazing required by additional ewes.

On the dairy farmlet, summer crops have been utilised in all three treatments, with the diverse pasture crops getting good reception from the public due to its colourful nature with sunflowers throughout. The contemporary crop struggled to get good yields due to the dry conditions experienced from November through to March this year. All treatments have had dry conditions with low pasture growth rates, production levels from the cows have been maintained through the use of conserved supplements. Winter crop areas are currently being prepared. Low production cows are being dried off in reflection of current pasture growth expectations.

Monthly root images have been collected from the minirhizotron tubes on both the dairy and sheep farmlet. Mapping of the organised images have already begun, and analysis is to follow.

Since our last reporting, the surface functional predators were sampled, and we have completed the laboratory analysis of the soil porosity samples. Soil aggregate stability, infiltration, penetrometer resistance and bulk density, as well as earthworms and mesofauna and nitrate and phosphorus leaching have been analysed statistically and these results were presented at the Farmed Landscapes Research Centre Workshop in Feb 2024.

The soil PhD students working on the nitrogen contribution from legumes and trace element uptake by diverse pastures have completed their confirmations and are going well. A new PhD student working on phosphorus solubilisation and uptake started in March. We have several new Masters students including a student examining soil bacteria and fungi under our pasture treatments and two Masters students researching nitrate leaching under sheep and dairy.

Lincoln University

Two new PhD students have started this quarter. One student will examine dry matter production, light interception and water use of conventional versus regenerative pastures. The topic for the second student is still to be decided.

Honours students also recently began their academic year. One B.Ag.Sci.(Hons) student will examine liveweight gain of hoggets grazing regenerative and conventional pastures. A second B.Ag.Sci(Hons) will evaluate the impacts of regen ag on winter crop production. A third B.Sci.(Hons) has a preliminary project title of "Microbial responses to Regenerative and Conventional farming practices in dryland pasture systems" and a fourth B.Ag.Sci.(Hons) project is titled "Spatial variability of soil enzyme activity under conventional and regenerative agriculture regimes".

Programme events approaching in the upcoming quarter

Programme Management

Meetings with the programme management and the programme governance group is continuing as scheduled. The Annual Plan for the coming year is currently being drafted along with the year three budget. We aim to have a complete draft ready for the July governance group meeting. Work has also begun work on the Annual Report covering year two.

Mātauranga Māori

Our research with Rangitāne o Manawatu is continuing. We are in the process of developing initial sampling strategies with plant ecologists to help us identify native species that may be useful to be adapted for pastures. At this stage we are working together to identify both remnant native landscapes as well as targeting Māori Lands that have not had modern day pastures species introduced. As part of this work methods of identification and sampling are being developed. This work will also be transferred to exam areas on the Turitea/Massey Farms for Rangitāne to survey. A Māori student has recently applied for a scholarship to conduct a PhD investigating native grasses as part of the programme, but the outcome of that application is not yet known.

Soils / environment

Soil porosity and surface functional predator data will be statistically analysed over this quarter. The yearly soil fertility, physics and biological sampling will occur in May/June 2024.

Our new Masters students, looking at soil microbial activity and nitrate leaching, will begin their research this quarter.

Pastures

Pasture related measurements, where applicable, will continue as described. Associated pasture data will be collated and analysed as appropriate. New pasture measurements will commence and include, but are not limited to, leaf level gas exchange, refractometry, soil plant analysis development (SPAD) chlorophyll, and some additional root work to support the minirhizotron efforts.

New postgraduate students are being mentored into the pasture portion of the project and studies undertaken. A new master's student will begin collecting weed related data.

Massey dairy farmlet

Pregnancy scanning has been completed, with good in-calf rates achieved across all treatments, although there are some numerical differences in in-calf rates these are to be analysed at the end of three seasons to obtain sufficient records to determine if differences are true results. Two new PhD students have begun to look at the dairy data at system level and into the faecal and soil microbiota through DNA analyses.

Massey sheep farmlet

The mating period commenced in late March and continued throughout April. A new PhD student has started and will look at the nitrogen leaching and nitrogen partitioning data from the sheep farmlets for the 2023, 2024 period.

Lincoln Farmlets

Collection of data measurements, including dry matter yield, botanical composition, nutritive value, soil moisture, NDVI, and sheep liveweight continues.

Engagement and extension

We are currently developing both physical and web-based resources explaining what we are measuring at the Massey farmlets, along with how and why. Visits to various regen farms and partner farms have been planned for quarter four.

Work is underway to update the programme website, as well as adding a number of new features, such as a "news" section. Planning around creating new video material as well as photography has also commenced. Work is also underway to prepare for the National Fieldays, where the programme will be featured on MPI's Science for Farmers Site.

Investment

Investment period	MPI contribution	Partner cash contributions	Partner in-kind contributions	Total investment
Year 2 quarter 3 actuals	$ 512,796	$111,524	$286,501	$910,822
Year 2 to date actuals	$ 2,093,630	$204,210	$900,415	$3,198,255
Year 2 budget	$3,378,050	$476,080	$724,832	$4,578,962