

# TOOLS FOR FARMERS TO MEASURE, REDUCE GREENHOUSE GASES

IT IS GETTING EASIER FOR NEW ZEALAND FARMERS TO MEASURE, MANAGE, AND REDUCE AGRICULTURAL GREENHOUSE GASES.

He Waka Eke Noa (The Primary Sector Climate Action Partnership) has developed two information sources to help the agricultural industry understand and assess the greenhouse gas emissions from their farms.

Knowing a farm's nitrous oxide and methane numbers is the first step towards managing and reducing on-farm emissions.

He Waka Eke Noa programme director Kelly Forster says the message is to know your numbers and have a plan.

By the end of 2022, all farms in Aotearoa New Zealand need to know their greenhouse gas numbers.

"There are now a range of tools that are suitable for calculating a farm's biological greenhouse gases, and more are in development," Kelly says.

"Measurement is key. When our farmers understand their numbers, they are in a position to make changes to their farming practices to mitigate or reduce emissions.

"Every farm is different, and not every farmer is expected to reduce their operation's emissions. However, the choices each farmer makes to optimise their operation will have a collective impact on Aotearoa's climate change efforts.

"Our farmers and growers are known as world leaders, innovators, and producers of premium products. They can also lead the

way in managing agricultural greenhouse gas emissions."

Farms need to know their numbers by the end of 2022 if their size is 80 ha or larger, or have a dairy supply number or are a cattle feedlot as defined in freshwater policy.

Since December 2020 when the first Greenhouse Gases Farm Planning Guidance was released, industry bodies have been incorporating information relevant to their levy payers into their Farm Environment Plans.

There are now basic principles to guide farmers and their advisors, with practical information on how to reduce greenhouse gas emissions and capture carbon.

Sequestration is one of the most important pillars that the He Waka Eke Noa partners are working through this year. The Partnership is developing recommendations for an appropriate farm level emissions pricing system.

This will include recognition and measurement of on-farm sequestration. The pricing system needs to be recommended to Ministers next year, and will be functioning in 2025.

Seven different greenhouse gas calculation methods have been assessed and classified so far: HortNZ, MfE, Alltech, E2M, Fonterra/ AIM, Farmax and Overseer. Other tools are in development and will be assessed and added to the list.

"All farmers knowing their numbers by December 2022 is an ambitious target, but He Waka Eke Noa's partners are committed to supporting their farmers," Kelly says.

"This includes developing new calculators so farmers in different sectors can calculate their GHG footprint and learn how to reduce it before our pricing system is ready to kick in."

Farmers who want advice are encouraged to talk to their industry representative, supply company or other trusted advisors about incorporating GHG into Farm Environment Plans.



HE WAKA EKE NOA DIRECTOR KELLY FORSTER.

## HOW TO REDUCE FARM GHG

**Opportunity 1:** Improve the efficiency of pasture and crop production. For livestock farmers, this can reduce greenhouse gas emissions if the total feed eaten on-farm is decreased. For cropping farmers, improving the efficiency of production is the main opportunity to reduce emissions

**Opportunity 2:** Reduce total feed eaten on farm. The total amount of feed eaten on-farm drives greenhouse gas emissions. Consider stocking rate at different times of the year, the performance of individual animals and the need for supplementary feed.

**Opportunity 3:** Match feed demand with pasture growth and consumption. This is a means to optimise stocking rates to achieve the same or higher profit with lower inputs. Improved grazing management and adjust- ▶

REDUCING THE TOTAL FEED EATEN ON-FARM IS A BIG WAY THAT LIVESTOCK FARMERS CAN CUT GREENHOUSE GAS EMISSIONS.



◀ ing stocking rates throughout the year can reduce wasted pasture wastage and lower supplementary feed inputs, which reduces emissions.

**Opportunity 4:** Improve the management of livestock effluent. Livestock effluent can be a significant source of on-farm greenhouse gas emissions when using stand-off pads or animal housing. Better use of effluent has benefits for GHG emissions and nutrient loss to water.

**Opportunity 5:** Capture and store carbon in vegetation. Planting or restoring woody vegetation on-farm can improve erosion control, the health of waterways and biodiversity. It may also capture and store carbon (sequestration).

Only land that meets certain criteria can currently be entered in the New Zealand Emissions Trading scheme. Consider the minimum standards to qualify for sequestration rewards against the risks and benefits of entering the scheme. Engage a forestry expert to help make this decision.

**Opportunity 6:** Capture and store carbon in soils. New Zealand currently has high soil carbon levels compared to other countries. Any disturbance of soil leads to soil carbon loss. Except for changes in land use (e.g. cropping to pasture), no management practices have been widely proven to increase soil carbon under New Zealand conditions, but some practices minimise soil carbon losses.

Quantifying changes in soil carbon is possible but labour-intensive and expensive. It

## HE WAKA EKE NOA

He Waka Eke Noa (Primary Sector Climate Action Partnership) brings together the primary sector, Maori and government to address climate change and agricultural greenhouse gas emissions.

Some of the farming groups involved are Beef + Lamb NZ, Dairy NZ, Federated Farmers, Horticulture NZ, Foundation for Arable Research, and Irrigation NZ.

Maori and government bodies include Federation of Maori Authorities (FOMA), Ministry for the Environment (MfE), and Ministry of Primary Industries (MPI).

Their aim is to work with farmers and growers to develop practical strategies to reduce emissions and increase sequestration while ensuring the sector's future success. **RC**

requires repeated measurements over long time intervals (3-10 years). Through He Waka Eke Noa the primary sector is working with government to explore including soil carbon into on-farm emissions reporting.

**Future opportunities.** Technologies under development are focused on reducing livestock methane production per unit of feed consumed or nitrous oxide production. These include alternate forages, additives, inhibitors, vaccines, genetic selection and genetic modification.

New nitrification inhibitors are also still



PHOTO BY MIKE DICKSON

### PLANTING OR RESTORING WOODY VEGETATION MAY BE A GOOD WAY FOR FARMERS TO CAPTURE AND STORE CARBON.

under development. None of these is currently available for use in New Zealand, but some may become viable within the next 5-10 years.

GHG calculators and farm planning guides are on the hewakaekenoa.nz website. For the latest science, see the websites nzagrc.org.nz and pggrc.co.nz. **RC**

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