

GLOBAL
RESEARCH
ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

Marta Alfaro and Tony van der Weerden (AgResearch)

Development of context-specific emission factors from the application of nitrogenous fertilisers

Situation/Issue

- Significant N₂O emissions result from direct sources through the application of nitrogenous fertilisers (EF₁) and indirect sources via ammonia volatilisation (FracGASF) and N leaching (FracLEACH)
- However, there is a dearth of information on the environmental and soil conditions and relevant variables including farm systems and management practices (timing, amount, rate and location of fertiliser application) that underpin estimates of these emissions, and there are large gaps in some regions and productive systems
- This affects the ability of countries to accurately account for and report N₂O emissions in national greenhouse gas inventories

Flagship Project Goal(s)

To compile existing data and undertake new field measurements to develop **context-specific emissions factors** relating to the application of **synthetic N fertilisers** for the purpose of inventory improvement including **N₂O mitigation accounting**

Anticipated Flagship Outcomes/Impacts

Phase I

Expanded
database

Scientific
manuscripts

Public release
of database

Phase II

Protocol and
guidelines

Scientific
manuscripts

New research
grants

Phase III

New mitigation
options

Tier 2 & 2+

Scientific
manuscripts

Flagship Project Partners

Europe	Latin America
<p>REfining Emission Factors for Inventory Reporting (REEFIR) [IRE-NZ agricultural GHG joint call].</p> <p>4-year proposal, led by Tony van der Weerden (AgResearch) and Dominika Krol (Teagasc).</p> <p>→ AIM: develop Tier 2/3 N₂O emission factors for various N sources including synthetic N fertiliser.</p> <ul style="list-style-type: none">• €1.49M	<p>Optimizando el uso de nitrógeno, mayor producción y menor impacto (N4R) (FONTAGRO).</p> <p>4-year proposal, led by Sara Hube (INIA), with participation of Argentina, Perú, Dominican Republic, Panama and Chile.</p> <p>→ AIM: develop Tier 2 N₂O emission factors for various N sources including synthetic N fertiliser.</p> <ul style="list-style-type: none">• US\$400,000

Activities/Results To Date

NZ/Ireland

REfining Emission Factors for Inventory Reporting (REEFIR) [IRE-NZ agricultural GHG joint call].

- Initial contract signed
- In person kick off meeting March 2023
- Good progress in collating Tier 2 emission factor data
- Changes to DATAMAN website architecture completed for N fertiliser database
- Contact made with researchers outside of NZ & IE, requesting data that would benefit REEFIR and the wider N Flagship team

Latin America

Optimizando el uso de nitrógeno, mayor producción y menor impacto (N4R) (FONTAGRO).

- Contracts signed
- Capacity building activity January 2025
- Field activities to start March-April 2025

Opportunities to get involved

1. Contributing historical and future measurements of N₂O emissions and ammonia emissions from diverse production systems and fertiliser treatments, with associated site information (database analysis e.g. DATAMAN initiative)
2. Participation on dissemination activity (webinar, March 25)
3. Contributing expertise in statistical analysis, modelling
4. New funding collaborative initiatives

Funded by the New Zealand Government to support the objectives of the Global Research Alliance on Agricultural Greenhouse Gases