## 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

ON AGRICULTURAL GREENHOUSE GASES

- Significant N<sub>2</sub>O emissions result from direct sources through the application of nitrogenous fertilisers (EF<sub>1</sub>) 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 N<sub>2</sub>O emissions in national greenhouse gas inventories



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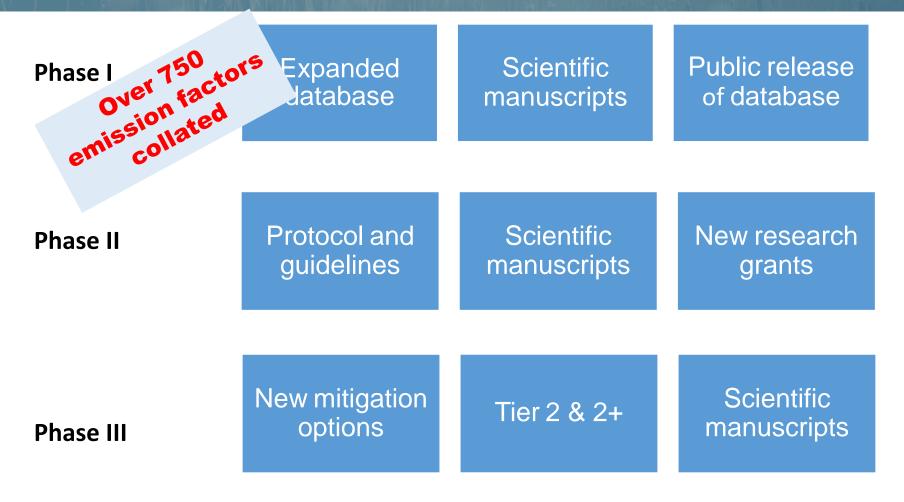
Flagship Project Goal(s)

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 N<sub>2</sub>O **mitigation accounting** 



## Anticipated Flagship Outcomes/Impacts

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## Flagship Project Partners

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Europe	Latin America
REfining Emission Factors for Inventory Reporting (REEFIR) [IRE-NZ agricultural GHG joint call].	
4-year proposal, led by Tony van der Weerden (AgResearch) and Dominika Krol (Teagasc)	4-year proposal, led by Sara Hube (INIA), with participation of Argentina, Perú, Domenican Republic, Panama and Chile
→ AIM: develop Tier 2/3 $N_2O$ emission factors for various N sources including synthetic N fertiliser	→ AIM: develop Tier 2 N <sub>2</sub> O emission factors for various N sources including synthetic N fertiliser
• €1.49M	• US\$400,000



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Activities/Results To Date

NZ/Ireland	Latin America
REfining Emission Factors for Inventory Reporting (REEFIR) [IRE-NZ agricultural GHG joint call].	Optimizando el uso de nitrógeno, mayor producción y menor impacto (N4R) (FONTAGRO).
<ul> <li>NZ &amp; Irish Tier 2 emission factor data collated</li> <li>Focus on collating Tier 2 EFs from other countries</li> <li>Process-based modelling: APSIM (NZ) output compared with NZ and Swiss test datasets; Ireland (DNDC &amp; Daycent) to do the same shortly</li> </ul>	<ul> <li>Capacity building activity January 2025</li> <li>Field activities being implemented</li> </ul>

- 2025 field experiments: urea, urea +DCD, CAN
- Annual newsletter
- Participation in conferences
- Webinar on "Nitrogen mineral fertilisers, updates on methodologies and relevant work for inventory development"

Given delays in the process of implementing pillar projects, a 9-12 months extension for the N GRA Flagship will be required



## **Opportunities to get involved**

**ON AGRICULTURAL GREENHOUSE GASES** 

- Contributing historical and future measurements of N<sub>2</sub>O 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 activities
- 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