GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

GRA FLAGSHIP PROJECT PROPOSAL

Title: Development of context-specific emissions factors from the application of nitrogenous fertlisers

Leader: Chile

GRA Council Champions: *list the names of at least 5 GRA Members and Partners (including at least 3 Member countries)*

1. *New Zealand*
2. *Costa Rica*
3. *FONTAGRO*
4. *Spain*
5. *Chile*

Countries involved: New Zealand, Spain, Costa Rica, Chile

Start date and project length: March 2022 – 4 years

Brief description of project:

Targeting emissions resulting from the application of nitrogenous fertilisers relate to N_2O emissions from N fertiliser inputs (EF_1), N_2O emissions from drained/managed organic soils (EF_2), N_2O emissions from atmospheric deposition of N on soils and water surfaces (EF_4), N_2O emissions from leaching and runoff (EF_5), and ammonia volatilization is still a significant challenge for national inventories of many GRA countries. In most cases, emissions form N fertilizer use is a key category at the national GHG inventory report. Nevertheless, there is a dearth of information on the environmental and soil conditions and relevant variables that underpin estimates of these emissions, including related to farm systems and management practices (timing, amount, rate and location of fertilizer application), existing significant gaps in some regions and productive systems. This limits the accountability of national GHG inventories, and the possibility to adequately reflect the effect of mitigation actions implemented.

The project seeks to compile existing data and undertake new field measurements to develop context specific emissions factors relating to the application of N fertilisers for the purpose of inventory improvement including N_2O mitigation accounting.

Key partners and existing resources:

The GRA Special Representative has undertaken preliminary meetings, confirming interest of the following institutions and partners:

Institutions involved in discussions to date have included: INIA – Chile, INTA Argentina, INTA – Costa Rica, Landcare Research - New Zealand, Teagasc – Ireland, Rothamsted Research – UK, AAFC-Canada, USDA – USA, Colorado State University – USA, Thuenen Institute – Germany, University of Goettingen – Germany, CAAS – China, ETH Zurich – Switzerland, IITA – CGIAR, CIMMYT – CGIAR, International Fertiliser Association, University of Costa Rica, AgResearch – New Zealand, La Molina

University – Peru, Lincoln University – New Zealand, University Politechnic Madrid – Spain, Bangor University – UK, Aarhus University – Denmark, University of Oslo - Norway, Embrapa – Brazil, Queensland University of Technology – Australia, The Nature Conservancy Trust, University of Hohenheim – Germany.

As per resources available, in-principle, US$ 0.4M has been secured for new research, as well as significant in-kind contributions through existing or planned field research. Further resources will be sought to support expanded participation and allow targeted field research to be undertaken.

Benefits and outcome from Flagship project:

This flagship will build up on existing collective experiences such as the Dataman initiative, a successful example of GRA countries and partners' efforts to develop Tier 2 EFs from manure deposition, management, and storage, that have been published and incorporated into the IPCC EFDB for the consideration across productive systems around the world.

It is expected that this flagship will provide Tier 2 EF for the use of N fertilizer around the globe for significant agricultural productive systems and practices, contributing to more accurate GHG inventories and providing the required information for the reflection of the respective mitigation efforts by countries.

Further Resourcing needs: Provision of data from historical measurements of N2O and ammonia from diverse production systems and fertiliser treatments, with associated site information (database analysis e.g. DATAMAN initiative), as well as funding future field trials in diverse systems, particularly those systems and regions currently underrepresented globally.

Resourcing mechanisms:

FONTAGRO calls will be used in the context of Latin America and Caribbean. CLIFF-GRADS to support involvement of PhD students from developing countries. Specific research calls or targeted funding from participating members and partners will be sought to complement this, including from other regional funding mechanisms, donors, private sector and philanthropy.

Linkages

FONTAGRO