GLOBAL RESEARCH ALLIANCE

ON AGRICULTURAL GREENHOUSE GASES

Dr William Burchill, University College Cork

Accelerating the development of BNI as a N_2O mitigation strategy for grass-based livestock systems

Situation/Issue

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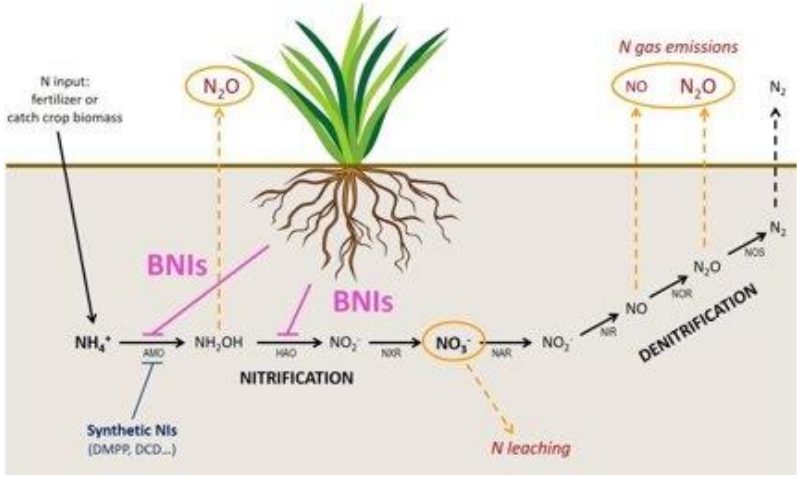
What's the problem?

- Nitrification inhibition is a known N_2O mitigation strategy
- Biological nitrification inhibition = Tropical grasses and some crops
- Nature-based solution for reducing N_2O emissions – (Targeted at urine patches)



Why is a global collaborative approach required to solve it?

- BNI research is rapidly evolving and research projects underway in many countries
- Emerging area
  - Standardised methodologies
  - Compare and collectively analyse results
- Variability in BNI results
  - Collating and expanding on existing BNI research
  - Determine key factors controlling BNI capacity in pastoral systems.

Flagship Project Goal(s)

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Accelerate progress in BNI research for N_2O mitigation

1. Connect existing BNI research projects and researchers

1. Develop common research methodologies and protocols

1. Research gaps and potential pathways to implementation

Biology and Fertility of Soils
https://doi.org/10.1007/s00374-022-01631-2

POSITION AND OPINION PAPERS

Accelerating the development of biological nitrification inhibition as a viable nitrous oxide mitigation strategy in grazed livestock systems

Cecile A. M. de Klein[1] · Saman Bowatte[2] · Priscila L. Simon[1] · Jacobo Arango[3] · Laura M. Cardenas[4] · David R. Chadwick[5] · Jeroen Pijlman[6] · Robert M. Rees[7] · Karl G. Richards[8] · Guntur V. Subbarao[9] · David Whitehead[10]

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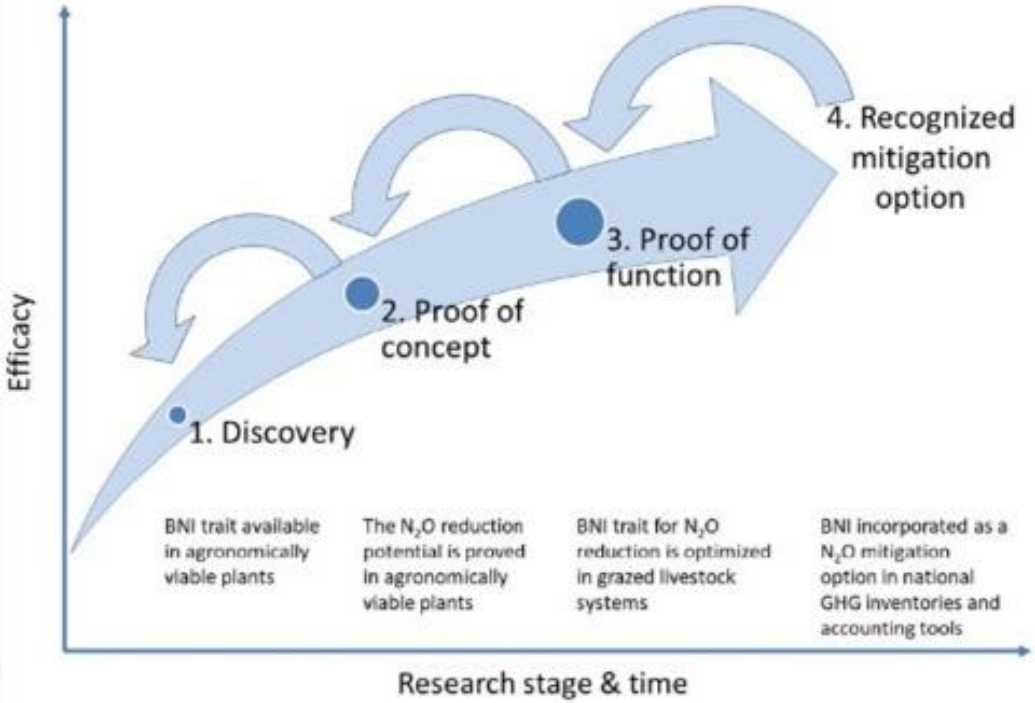

Anticipated Flagship Outcomes/Impacts

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Connection of BNI research

- Global collaborations on BNI research
- Join forces on data analyses

Agreed standardized methodologies and guidelines

Capability development:

- Training early career researchers on BNI
- Developing countries

Future research plan and international collaborative projects

Flagship Project Partners

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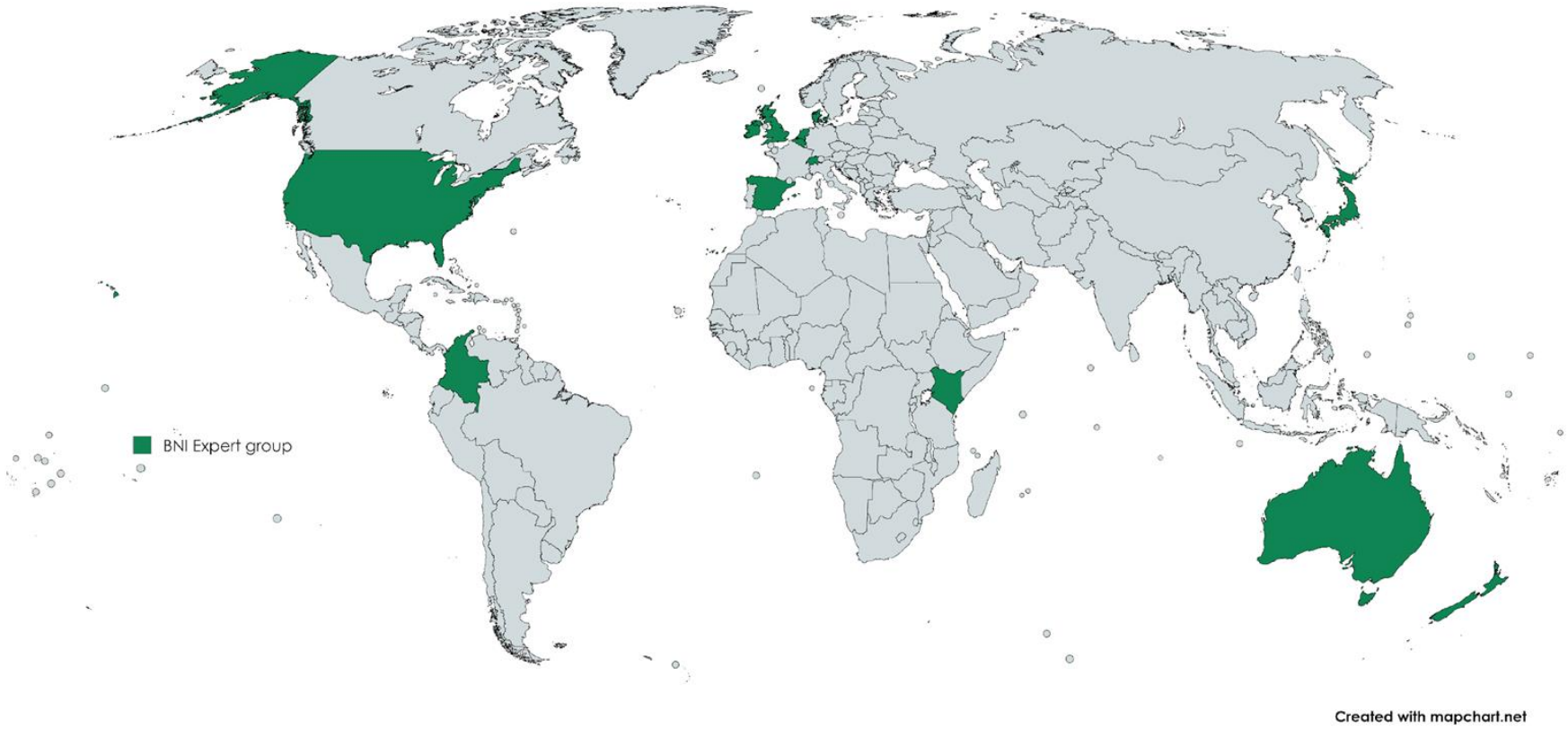
Co-leads:

- Cecile de Klein (AgResearch New Zealand)
- Jacobo Arango (CIAT, Colombia)
- Elsa Lagerquist (Université Libre de Bruxelles, Belgium)

Working group members:

- William Burchill (Ireland)
- Saman Bowatte (NZ)
- Laura Cardenas and Dave Chadwick (UK)
- Eduardo Vasquez (Spain)
- Rebecca McCulley (USA)



Activities/Results To Date

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Results to date:

- International BNI expert group has been established (Late 2023). Meets every 3-4 months for webinar
- Position paper on BNI research published
- Existing evidence of BNI in tropical grass and many crop species

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Proposed activities under the BNI Flagship:

- Connect researchers – inventory of projects, website, discussion forum
- Develop standardised methodologies – journal publication(s), training programme, screening plants
- Identifying key research gaps and proposals – collate data, meta-analyses, write joint proposals

Opportunities to get involved

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- Open access to BNI expert group webinars
- Training programme/workshops on BNI methodologies
- Connection of BNI research projects and researchers via the flagship
- Contribute to planned BNI literature review and meta-analysis
- Low-cost entry for developing countries:
    - Research exchange (e.g. people can bring their BNI source to a lab)
    - PhD/PostDoc exchanges as part of existing projects
    - PhD/PostDoc scholarship applications (e.g Cliff- Grads; NZ-Grads)
    - PhD/PostDoc summer school on BNI (e.g. Horizon Europe Erasmus+ programme for short term training opportunities)