

Evidences

Study #4475

Contributing Projects:

- P1952 - Exploring options to increase water and nitrogen use efficiency and to enhance carbon sequestration in rainfed wheat-based systems
- P872 - Environmental protection using traits associated with biological nitrification inhibition (BNI) - Reduction of N fertilizer use for wheat production using the BNI
- P1327 - Building foresight portfolio for WHEAT AFS, including synthesis, gap analysis and new studies, as input in conducting priority setting for WHEAT AFS
- P1927 - Environmental protection using traits associated with biological nitrification inhibition (BNI) - Reduction of N fertilizer use for wheat production using the BNI function.
- P1958 - Biostimulant: Preliminary experimental assesment of seed and fertilizer coating with humic acids (HumiFirst)

Part I: Public communications

Type: Other MELIA activity

Status: Completed

Year: 2021

Title: Lower N₂O emissions from maize and wheat by reducing excess N applications, while keeping current yield levels

Commissioning Study: CRP

Part II: CGIAR system level reporting

Links to the Strategic Results Framework:

Sub-IDs:

- Agricultural systems diversified and intensified in ways that protect soils and water
- Reduce pre- and post-harvest losses, including those caused by climate change

Is this OICR linked to some SRF 2022/2030 target?: Yes

SRF 2022/2030 targets:

- Increase in water and nutrient (inorganic, biological) use efficiency in agro-ecosystems, including through recycling and reuse

Description of activity / study: Scientists estimated the potential for N₂O emission reductions from maize and wheat fields based on reducing excess N applications while keeping current yield levels. Results show considerable N₂O emission reduction globally, particularly in those countries and regions where existing N losses and emissions are very high (see Fig. 6). Although limited in spatial coverage, previous studies showed huge (~ 44 Tg yr⁻¹) global total N losses from maize, wheat and rice fields, mostly concentrated in China and USA for maize and China & India for wheat and rice production (Liu et al., 2016). This shows a tremendous potential for improving the efficiency of N use in cereal production in many countries without compromising yield (Liu et al., 2018, Liu et al., 2016) and even increasing it (Mueller et al., 2014; Xu et al., 2015).

Geographic scope:

- Global

Comments: <Not Defined>

Links to MELIA publications:

- <https://doi.org/10.1016/j.scitotenv.2021.146696>
- <https://doi.org/10.1111/gcb.15588>