SINGLE-IMPACT FICHE
SOIL AMENDMENT WITH LIME OR GYPSUM

IMPACT: GHG EMISSIONS

Data extracted in April 2021

Note to the reader: This fiche summarises the impact of soil amendment with lime or gypsum on GREENHOUSE GASES (GHG) EMISSIONS. It is based on 1 peer-reviewed synthesis research paper[1] including 19 individual studies.

1.WEIGHT OF THE EVIDENCE

- CONSISTENCY OF THE IMPACT:

Liming, compared to no-liming, showed an uncertain effect on greenhouse gas emissions (see **Table 1**). According to the reviewed synthesis paper, liming does not alter GHG emissions per ton of maize. Following our review procedure, we consider the results uncertain because they were not obtained from direct measurements of greenhouse gas emissions, but from models. No results were available for soil amendment with gypsum.

The reviewed synthesis paper did not include data collected in Europe (it was focused on Kenya).

Table 1. Summary of effects. The numbers between parenthesis indicate the number of synthesis papers with a quality score of at least 50%. Details on quality criteria can be found in the next section.

Impact	Intervention	Control	Positive	Negative	No effect	Uncertain
Decrease GHG emissions	Lime	No lime	0 (0)	0 (0)	0 (0)	1 (1)

- QUALITY OF THE SYNTHESIS PAPERS: *The quality score summarises 16 criteria assessing the quality of three main aspects of the synthesis papers: 1) the literature search strategy and studies selection; 2) the statistical analysis; 3) the potential bias. Details on quality criteria can be found in the methodology section of this WIKI.*

2. IMPACTS

The main characteristics and results of the synthesis paper are summarized in **Table 2**. Summaries of the meta-analyses provide fuller information about the results reported in each synthesis paper, in particular about the modulation of effects by factors related to soil, climate and management practices.

Table 2. Main characteristics of the synthesis paper reporting impacts of soil amendment with lime or gypsum on GHG emissions.

Reference	Population	Scale	Num. papers	Intervention	Comparator	Metric	Conclusion	Quality score
Hijbeek R, van Loon MP, Ouaret W, Boekelo B, van Ittersum MK 2021	Maize	Kenya	19	Lime	No lime	GHG emissions per yield unit	Liming does not alter GHG emissions per ton of maize. However, following our review procedure the result is uncertain, because GHG were estimated from emission factors, not from measurements.	56%

[1] Research synthesis papers include a formal meta-analysis or systematic reviews with some quantitative results. Details can be found in the methodology section of the WIKI.

3. KNOWLEDGE GAPS

R.Hijbeek et al. GHG emission was computed from emission factors and not estimated from measurements. Further research could investigate liming effects for crops other than maize and analyse GHG emission from transport of fertiliser and lime.