

SINGLE-IMPACT FICHE

ORGANIC FARMING SYSTEMS

IMPACT: AIR POLLUTANTS EMISSIONS

Data extracted in October 2021

Note to the reader: This fiche summarises the impact of organic systems on AIR POLLUTANTS EMISSIONS. It is based on 1 peer-reviewed synthesis research paper¹, including 71 individual studies.

1. WEIGHT OF THE EVIDENCE

- **CONSISTENCY OF THE IMPACT:** organic systems, as compared to conventional systems, had no significant effect on AIR POLLUTANTS EMISSIONS (namely: ammonia emission), for both unit of area and unit of product. No results are available specifically for livestock/mixed farming systems.

The synthesis paper included studies conducted in Europe.

Table 1. Summary of effects of air pollutants emissions. The numbers between parentheses 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. Some synthesis papers reported effects for more than type of system.

| Impact | Metric | Impacts per unit of agricultural land | | | | Impacts per unit of product | | | |
|-----------------------------------|------------------|---------------------------------------|----------|-----------|-----------|-----------------------------|----------|-----------|-----------|
| | | Positive | Negative | No effect | Uncertain | Positive | Negative | No effect | Uncertain |
| Organic cropping systems | | | | | | | | | |
| Decrease air pollutants emissions | Ammonia emission | 0 | 0 | 1 (1) | 0 | 0 | 0 | 1 (1) | 0 |

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 papers reporting impacts on air pollutants emissions.

| Reference | Population | Geographical scale | Num. papers | Intervention | Comparator | Metric | Conclusion | Quality score |
|-----------|------------|--------------------|-------------|--------------|------------|--------|------------|---------------|
|-----------|------------|--------------------|-------------|--------------|------------|--------|------------|---------------|

¹ Research synthesis papers include a formal meta-analysis or systematic reviews with some quantitative results

| Reference | Population | Geographical scale | Num. papers | Intervention | Comparator | Metric | Conclusion | Quality score |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------|-----------------|----------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Tuomisto HL; Hodge ID; Riordana P; Macdonald DW 2012 | Field studies, modelling studies and Life Cycle Assessment studies assessing the performance of organic systems in comparison to conventional systems in Europe. | Europe | 71 | Organic systems | Conventional systems | Ammonia emission | Median ammonia emissions for organic systems were 18% lower emissions per unit of area and 11% higher per unit of product. However, differences were not statistically significant. | 69% |

3. KNOWLEDGE GAPS

The authors did not report knowledge gaps in the reviewed synthesis papers.