FARMING PRACTICE
ORGANIC FARMING SYSTEMS

IMPACT: GLOBAL WARMING POTENTIAL (LCA)

Reference 30

Mondelaers, K; Aertsens, J; Van Huylenbroeck, G. 2009 A meta-analysis of the differences in environmental impacts between organic and conventional farming BRITISH FOOD JOURNAL 111 10, 1098-1119 10.1108/00070700910992925

Background and objective

In recent years a lot of research has investigated whether the application of the organic farming principles indeed results in differences with respect to environmental pressure. This paper aims at comparing the environmental impacts of organic and conventional farming and linking these to differences in management practises. The studied environmental impacts are related to land use efficiency, organic matter content in the soil, nitrate and phosphate leaching to the water system, greenhouse gas emissions and biodiversity. Only impacts on organic matter content are reported here.

Search strategy and selection criteria

1)Peer reviewed; 2) studies dating from after 1992 (year of EEC regulation 2092/91); and 3) (semi) paired samples, this means that organic and conventional data are compared within the same study. (1) Peer reviewed. (2) Studies dating from after 1992 (year of EEC regulation 2092/91). (3) (Semi) paired samples, this means that organic and conventional data are compared within the same study.Weighting of the references is based upon the possibility of deriving the standard error (s.e.) from the references. Hereby, three cases are distinguished: 1) the s.e. is reported in the study, hence the data point can enter the meta-analysis; 2) the s.e. is not reported, but multiple data points are available in the study , enabling the calculation of a standard deviation based upon the available data which can be entered in the meta-analysis data base; and 3) no s.e. is reported, only a single observation is available. The latter data point has not been retained for the meta-analysis, but is only used in the sign-test.

Data and analysis

The significance level of the overall effect size is computed. The statistical homogeneity of the effect sizes is calculated. The studies used in the meta-analysis are grouped according to various characteristics of the single studies, and the effect sizes between these groups of studies are statistically compared and analysed.

Number of papers	Population	Intervention	Comparator	Outcome	Quality score
9	Studies assessing the performance of organic systems (crops + livestock) in comparison to conventional systems.	Organic mixed farming: with animal and plant production on the same farm.	Conventional mixed farming	Metric: GHG emissions (total, N_2O, CH_4); Effect size: Ratio of organic matter content (%) in organic systems to conventional systems.	50

Results

- Organic mixed farming (crops + livestock) scores equal (per unit product no general direction is noticeable) or better (per unit of agricultural area. For CH_4, N_2O and aggregated GHG emissions) than conventional farming.
- NULL
- NULL
- NULL
- NULL

Factors influencing effect sizes

- No factors influencing effect sizes to report

Conclusion

Organic mixed farming (crops + livestock) scores equal (per unit product no general direction is noticeable) or better (per unit of agricultural area. For CH_4, N_2O and aggregated GHG emissions) than conventional farming.