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Effects of different agriculture practices on ecosystem services in cereal fields worldwide

A meta-analysis to investigate the effects of conventional, organic and sustainable agriculture management in driving multiple ecosystem services from nutrient cycling to carbon stocks provides by cereals crop.

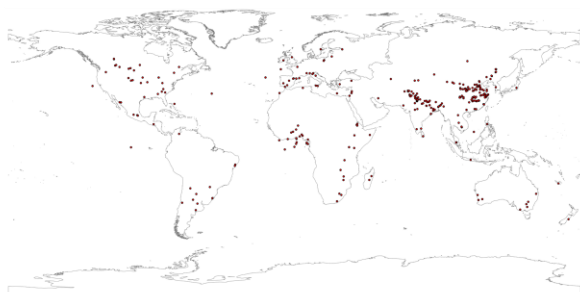


Fig. 1 Different experiments at global scale.

Revised 450 papers belong to SCI. Grouping of the different treatments assayed on the field experiments (Fig. 1). i) **Conventional**: traditional agriculture practice (tillage); ii) **Organic (O)**: organic management (no-tillage). iii) **Sustainable (S)**: optimized use of fertilizer (reduced-tillage)

Several parameter analyzed grouped in:

Crop production: yield

Soil fertility: organic+mineral+available nutrients

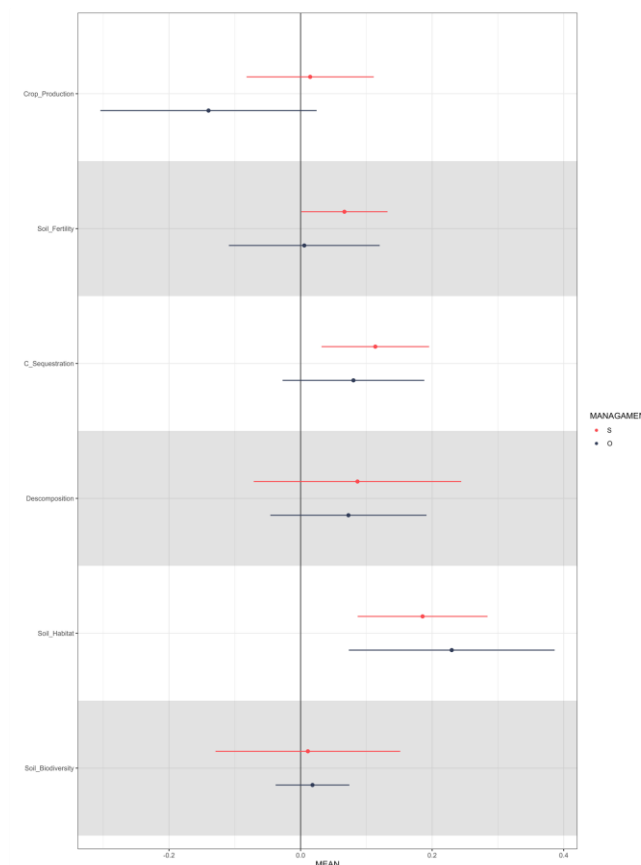
C sequestration: SOM+TOC+DOC+C seq rate.

Decomposition: mineralization+enzyme activities+ respiration + metabolic quotient+SeqRate.

Soil habitat: fungal and bacterial abundance+earthworms+microfauna+microbial biomass

Soil biodiversity: diferent biodiversity soil index

Fig. 2 Effect of different agricultural management on different ecosystem services



Sustainable agriculture has a significant positive effect on soil fertility, habitat and carbon sequestration, while organic agriculture only shows a significant positive effect on soil habitat compared to conservation agriculture (Fig. 2). In contrast, no significant effect of these practices on production is observed, indicating that both forms of cultivation maintain agricultural production while promoting key ecosystem services.