SINGLE-IMPACT FICHE
INTERCROPPING

IMPACT: SOIL NUTRIENTS

Data extracted in May 2021

Note to the reader: This fiche summarises the impact of intercropping on SOIL NUTRIENTS. It is based on 1 peer-reviewed synthesis research paper[1], including 180 individual studies.

1.WEIGHT OF THE EVIDENCE

- CONSISTENCY OF THE IMPACT:
  Intercropping of multiple crop species (i.e., crop mixture cropping), as compared to monoculture, has variable effects on soil nutrients, depending on the nutrient. The one reviewed synthesis paper reported an increase in total soil nitrogen, while no effect on available phosphorus concentration in response to intercropping (see **Table 1**).

  The one reviewed synthesis paper did not include data collected in Europe (see **Table 2**).

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.

		All studies				Only studies including EU			
Impact	**Intervention**	**Positive**	**Negative**	**No effect**	**Uncertain**	**Positive**	**Negative**	**No effect**	**Uncertain**
Increase Soil nutrients	Crop mixture	1 (1)	0	1 (1)	0	0	0	0	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 in the methodology section of this WIKI.*

2. IMPACTS

The main characteristics and results of the synthesis papers 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 of intercropping on soil nutrients.

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. Details can be found in the methodology section of the WIKI.

Reference	Population	Geographical scale	Num. papers	Intervention	Comparator	Metric	Conclusion	Quality score
Daryanto, S; Fu, BJ; Zhao, WW; Wang, S; Jacinthe, PA; Wang, LX 2020	Grain legumes and cereals	Africa	180	Grain legume and cereal intercropping	pure stand	Total nitrogen and available phosphorus concentration	Intercropping increased significantly the total nitrogen (by 16%) and increased (not significantly) the available P. intercropping can increase soil fertility.	62%

3. KNOWLEDGE GAPS

Authors of this synthesis	Lack of studies in Europe.
Daryanto et al., 2020	Studies that focus on indigenous African grain legumes or cereals should be encouraged because, with the exception of cowpea and teff, most past studies have focused on non-native species.