GENERAL FICHE
FALLOWING

Data extracted in April 2021

Note to the reader: This *general fiche* summarises the environmental and climate impacts of FALLOWING found in a systematic review of 4 synthesis research papers[1]. These papers were selected, according to our inclusion criteria, from an initial number of 236 obtained through a systematic literature search strategy[2].

The general fiche provides the highest level of synthesis – symbolised by the top of the pyramid  . As each synthesis research paper involves a number of individual papers ranging from 35 to 127, the assessment of impacts relies on a large number of results obtained mainly in field experiments (carried out in situations close to real farming environment), and sometimes in lab experiments or from model simulations.

In addition to this general fiche, *single-impact fiches* provide a deeper insight in each individual impact of FALLOWING (on biodiversity, soil organic carbon and crop yields), with more detailed information – medium part of the pyramid  .

Finally, *individual reports* 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 – base of the pyramid  .

This general fiche on FALLOWING is part of a set of similar fiches providing a comprehensive picture of the impacts of farming practices on climate and the environment.

1. DESCRIPTION OF THE FARMING PRACTICE

Description	• Fallowing refers to the farming practice in which arable land included in the crop rotation system is left to recover, at least **for the whole of a crop year**, whether worked (e.g. ploughed) or not and with no intention to produce a harvest[3], including set-aside lands.
Key descriptors	• This review **includes:** - Natural fallow comprises: o bare land bearing no crops at all; o land with spontaneous natural growth that may be used as feed or ploughed; o recently abandoned and set-aside lands (<5 years). - Green fallow: land sown exclusively for the production of green manure • This review **does not include short and seasonal fallowing periods of annual crops**; i.e., summer or winter fallows, whether soils are left bare or are shown with cover crops or green manures. These two practices are assessed in separate sets of fiches.

[1] Synthesis research papers include either meta-analysis or systematic reviews with quantitative results.
[2] For further details on the search strategy and inclusion criteria, see section 4 in single-impact fiches.
[3] Statistics explained (https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Fallow_land)

	• This review includes spatial and temporal comparisons between fallow lands and cultivated arable lands. Spatial comparisons were simultaneously conducted between nearby fallows and cultivated lands. Temporal comparisons were conducted in the same land before and during fallowing.

2. DESCRIPTION OF THE IMPACTS OF THE FARMING PRACTICE ON CLIMATE AND THE ENVIRONMENT

We reviewed the impacts of fallowing (either natural or green fallows) compared to cultivated arable lands.

The table below shows the number of synthesis papers reporting positive, negative, no effect, or uncertain effects. For each impact, the effect with the higher score is marked in bold and the cell coloured. 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 this document →.

Out of the 4 synthesis papers selected, 2 reported studies conducted in Europe and the 4 have a quality score higher than 50%. Some synthesis papers reported more than one impact.

Impact	Intervention	Comparator	Positive	Negative	No effect	Uncertain
Increase biodiversity	Natural fallow	Cultivated arable land	**1 (1)**	0	**1 (1)**	0
Increase soil organic carbon	Natural fallow		0	0	**1 (1)**	0
Increase crop yield	Natural fallow		**1 (1)**	0	**1 (1)**	0
	Green fallow		**1 (1)**	0	0	0

3. DESCRIPTION OF THE KEY FACTORS INFLUENCING THE SIZE OF THE EFFECT

Only the factors explicitly studied in the reviewed synthesis papers with a significant effect are reported below. Details regarding the factors can be found in the *individual reports* following the hyperlinks (→).

Impact	Factors
Increase biodiversity	Fallow area (Ref.5), fallow length (Ref.5)
Increase crop yield	Fallow length (Ref.4), fertiliser recommended dose in post-fallow cropping season (%) (Ref.4), interaction between fertiliser recommended dose and post-fallow cropping season (Ref.4), post-fallow cropping season (Ref.4), site productivity (Ref.4)

4. IMPLEMENTATION IN THE PERIOD 2014-2020

GAEC Cross compliance	
Greening	

Rural development measure – submeasure	

5. PICTURES

Pictures are not relevant in this case.

6. LINKS TO OTHER RELEVANT COMPLEMENTARY INFORMATION

We include in this section the links to other complementary sources of information (not peer-reviewed meta-analyses or systematic reviews), provided by AGRI or other stakeholders

7. LIST OF SYNTHESIS PAPERS INCLUDED IN THE REVIEW OF THE FARMING PRACTICE IMPACTS

Ref. Num	Authors	Year	Title	Reference	DOI
1	Koshida, C; Katayama, N	2018	Meta-analysis of the effects of rice-field abandonment on biodiversity in Japan	CONSERVATION BIOLOGY, 32(6), 1392-1402.	10.1111/cobi.13156
2	Kaempf, I; Hoelzel, N; Stoerrle, M; Broll, G; Kiehl, K	2016	Potential of temperate agricultural soils for carbon sequestration: A meta-analysis of land-use effects	SCIENCE OF THE TOTAL ENVIRONMENT, 566, 428-435.	10.1016/j.scitotenv.2016.05.067
3	Sileshi, G; Akinnifesi, FK; Ajayi, OC; Place, F	2008	Meta-analysis of maize yield response to woody and herbaceous legumes in sub-Saharan Africa	PLANT AND SOIL, 307, 1-19.	10.1007/s11104-008-9547-y
4	Van Buskirk, J; Willi, Y	2004	Enhancement of farmland biodiversity within set-aside land	CONSERVATION BIOLOGY, 18(4), 987-994.	10.1111/j.1523-1739.2004.00359.x