

Note to the reader: This fiche summarises the effects of Cover and catch crops on POLLINATION. It is based on 1 synthesis paper¹ containing 74 primary studies.

1. WEIGHT OF THE EVIDENCE

CONSISTENCY OF THE IMPACT

The effect of cover/catch crops, as compared to bare soil, on POLLINATION is reported in **Table 1**.

The table below shows the number of synthesis papers with statistical tests reporting i) a significant difference between the Intervention and the Comparator, that is to say, a significant statistical effect, which can be positive or negative; or ii) a non-statistically significant difference between the Intervention and the Comparator. In addition, we include, if any, the number of synthesis papers reporting relevant results but without statistical test of the effects. Details on the quality assessment of the synthesis papers can be found in the methodology section of this WIKI.

- The effect of cover/catch crops, as compared to bare soil, on POLLINATION remains uncertain. The only synthesis paper reported a non-significant effect, but based on only 2 primary studies.
- However, despite these relevant results, as the paper lacks statistical test of the effects, here they are labelled as uncertain. Details are provided below in Table 2 and in the summary reports.

The selected synthesis paper included studies conducted in Europe (see **Table 2**).

Table 1: Summary of effects. Number of synthesis papers reporting positive, negative or non-statistically significant effects on environmental and climate impacts. The number of synthesis papers reporting relevant results but without statistical test of the effects are also provided. When not all the synthesis papers reporting an effect are of high quality, the number of synthesis papers with a quality score of at least 50% is indicated in parentheses. The reference numbers of the synthesis papers reporting each of the effects are provided in **Table 3**.

Impact	Metric	Intervention	Comparator	Statistically tested			Non-statistically tested
				Significantly positive	Significantly negative	Non-significant	
Increase pollination	Pollination	Cover crops	Bare soil	0	0	0	1

QUALITY OF THE SYNTHESIS PAPERS

The quality of each synthesis paper was assessed based on 16 criteria regarding three main aspects: 1) the literature search strategy and primary studies selection; 2) the statistical analysis conducted; and 3) the evaluation of potential bias. We assessed whether authors addressed and reported these criteria. Then, a quality score was calculated as the percentage of these 16 criteria properly addressed and reported in each synthesis paper. Details on quality criteria can be found in the methodology section of this WIKI.

2. IMPACTS

The main characteristics and results of the 1 synthesis paper is reported in **Table 2** with the terminology used in those papers, while **Table 3** shows the reference numbers of the synthesis papers reporting for each of the results shown in **Table 1**. Comprehensive 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, are provided in the **summaries of the synthesis papers** available in this WIKI.

Table 2: Main characteristics of the synthesis paper reporting effects on pollination.

Reference number	Population	Scale	Num. papers	Intervention	Comparator	Metric	Conclusion	Quality score
Ref29	Vineyards. Global dataset. About 40% of all datasets originated from irrigated vineyards, 50% were rainfed vineyards and the other studies did not provide information on the use of irrigation. Most datasets came from vineyards under Mediterranean climates (n = 100), oceanic climates (n = 56), and steppe or continental climates (n = 22; three studies included vineyards from different climates). Most studies implemented randomized block designs within one experimental vineyard (n = 113), only few studies implemented block designs in several	Global. Major wine producing regions world-wide except Asian countries, New Zealand and Argentina	74	Cover crops or natural vegetation growth for soil cover in vineyards	Bare soil or removal of spontaneous vegetation in vineyards by herbicides use or tillage	Flower visitations, Seeds per plant	Limited number of experiments (2) reporting on pollination lead to non-significant effect, with a wide confidence interval. Reviewers' note: We labelled the results as uncertain due to the lack of statistical testing.	94%

¹ Synthesis research papers include either meta-analysis or systematic reviews with quantitative results. Details can be found in the methodology section of the WIKI.

Reference number	Population	Scale	Num. papers	Intervention	Comparator	Metric	Conclusion	Quality score
	vineyards (n = 12), whereas 56 datasets used individual vineyards as replicate. The majority of studies investigated the effects of bare soil management (mostly due to tillage, sometimes by use of herbicides or both) compared to cover crops or natural vegetation (n = 137 datasets). We investigated the effects of conventional vs. organic management in 27 studies and 17 datasets originated from other types of intensive vs. extensive vegetation management like the contrast of single to diverse cover crop species in inter-rows or mulching vs. mowing of vegetation.							

Table 3: Reference numbers of the synthesis papers reporting for each of the results shown in **Table 1**.

Impact	Metric	Intervention	Comparator	Statistically tested			Non-statistically tested
				Significantly positive	Significantly negative	Non-significant	
Increase pollination	Pollination	Cover crops	Bare soil				Ref29

3. FACTORS INFLUENCING THE EFFECTS ON POLLINATION

No factors were found.

4. KNOWLEDGE GAPS

Table 5: Knowledge gap(s) reported by the authors of the synthesis papers included in this review.

Ref Num	Gap
Ref29	Limited number of experiments (2) reporting on pollination.

5. SYNTHESIS PAPERS INCLUDED IN THE REVIEW

Table 6: List of synthesis papers included in this review. More details can be found in the summaries of the meta-analyses.

Ref Num	Author(s)	Year	Title	Journal	DOI
Ref29	Winter, S; Bauer, T; Strauss, P; Kratschmer, S; Paredes, D; Popescu, D; Landa, B; Guzman, G; Gomez, JA; Guernion, M; Zaller, JG; Batary, P	2018	Effects of vegetation management intensity on biodiversity and ecosystem services in vineyards: A meta-analysis	J APPL ECOL	10.1111/1365-2664.13124

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