

Science for Environment Policy

Organic farmland benefits biodiversity over the long term

Biodiversity on organic farms is, on average, 34% higher than on conventional farms, according to a recent study. The researchers used data from a large number of studies to show that this figure has remained stable over the last 30 years.

There is a continuing debate over whether organic [farming](#) provides greater environmental benefits than conventional farming. Previous studies have shown that organic agriculture is better for [biodiversity](#) than conventional methods. However, estimates of the benefits vary. To gain a better overview of the benefits, this research combined and analysed the results of 94 previous studies that had compared biodiversity on organic farms with that on conventional farms.

The researchers measured biodiversity in terms of 'species richness', i.e. the number of different species found. These figures were extracted from the different studies in different forms of raw data. The researchers classified the species according to their taxonomic group (arthropods, birds, microbes and plants) and also according to the function they perform, i.e. producers (plants), herbivores, pollinators, predators, decomposers (which break down dead material), and others, such as omnivores.

They also assessed the effects of land use in the surrounding landscape to see if this had an impact on species richness. Using satellite images, they estimated the proportion of arable fields and the average size of the arable fields, and used both as measures of land use intensity. They also estimated the number of habitats, e.g. wetlands, ditches and hedgerows, which is an indicator of a landscape's complexity.

Overall, the researchers found that biodiversity was, on average, 34% higher on organic farms than conventional farms. The greatest difference between farm types was found for plants; their species richness was around 70% higher on organic farms. This is probably because herbicides are not used, the researchers suggest. The species richness of arthropods, birds and microbes were also all significantly higher on organic farms compared with conventional farms, most likely due to the restricted use of pesticides on organic farms.

As a functional group, pollinators received one of the greatest benefits from organic farming, with the number of different species 50% higher on organic farms compared with conventional farms. Herbivores and predators were also more diverse on organic farms than on conventional ones.

The beneficial effect of organic farms, relative to conventional farms, was greater in more intensively-farmed landscapes, where a larger proportion of the landscape surrounding the farms was covered with arable fields. This may be because organic farms provide an 'island' or refuge for wildlife in the conventional landscape. The benefits of organic methods varied, however, depending on the species, what function they performed and the type of crops grown.

Importantly, the researchers found that the positive effects of organic methods on biodiversity remained stable over the 30 years spanning the studies included in this research. The authors of the study note that most of the data used came from research in temperate western and northern Europe and North America. Farming has been long established in these regions, and wildlife is partly adapted to extensive farming methods, although it is threatened by more recent intensive farming. It is in these regions that the application of organic farming could most clearly contribute to mitigating the agricultural impacts on biodiversity.

However, there is a lack of data from other regions, such as Asia, Africa and Australasia, and more research could help determine whether biodiversity benefits are also found in hotter climates on organic farms which grow very different crops, such as bananas or cocoa.



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