

The Positive Impact of Organic Farming in Bee Health

From www.bee-life.eu



The impact that industrialised farming has on the environment and wildlife is generally accepted. Field observations and vast research on the subject indicate that modern agriculture has played a significant role since the 1970s on the decline of biodiversity [1], thus directly affecting bees and other pollinators [2]. Therefore, both researchers and field practitioners have turned their attention towards more eco-friendly alternatives. Organic farming is one of the alternatives. However, the positive or negative impacts that it may have on honeybees is still understudied and calls for further research [3]. Compared to conventional agriculture, how does organic farming impact honeybees? It is this question that inspired a group of researchers who analysed how organic farming is changing the way that agriculture influences honeybee health.

Before looking into the impact on bees, we need to understand what "organic farming" is. According to the European Commission, Organic production is an overall system of farm management and food production that combines best environmental practices, a high level of biodiversity, the preservation of natural resources and the application of high animal welfare standards, and a production method in line with the preference of certain consumers for products using natural substances and processes" [4].

Organic farmers usually apply certain practices which are considered as safer for the environment than those in conventional farming. For example, it uses ecologically based pest controls and biological fertilizers derived largely from animal wastes and nitrogen-fixing plants. It also includes mechanical solutions to manage pests and disease. Thanks to these practices, organic production usually brings along some benefits to the surrounding environment and its neighbouring honeybees.

To better understand the impact of organic production on honeybees, we met with Dimitry Wintermantel, a researcher of the French National Centre for Scientific Research and primary author of the article "Organic farming positively affects honeybee colonies in a flower-poor period in agricultural landscapes" [5]. In a nutshell, Wintermantel says, the study points out that organic farming may be a "honeybee-friendly" alternative. The study is particularly relevant now that the land used for organic farming has increased by 70% in Europe during the last ten years [6].

The study includes six years of data from 10 different apiaries per year placed in random locations throughout a research site in France. Since the demand for organic products has increased widely since 2013, there was also an increase in the exposition to organic farms. For

the study, some colonies were exposed to over 30% organic farmland within 1500m, and 70% within 300m.

There are some key aspects of organic agriculture that influence bees. Dr Wintermantel sums them up as:

- Continuously available floral resources.
- Presence of spontaneous flora.
- More grassland.
- Greater weed diversity and abundance (as a result of limited or no use of synthetic herbicides).
- Increased crop diversity.
- Fewer intoxications (due to reduced or null use of pesticides).

In the study, the resulting conditions from these factors are found to have an impact on bee health and colony strength. Even though less abundant cultivation of oilseed rape in organic farmland was thought to affect honeybees negatively, organic farming resulted in a positive influence on the overall.

Mass-flowering oilseed rape is usually thought to be a crucial source of resources for honeybees. Therefore, researchers expected to see a negative effect of organic farming since it usually makes no use of this crop. However, they observed that there was no such negative effect. They actually observed that, overall, organic farming had a positive effect on honeybees. Dr Wintermantel explains that “this may suggest that organic farmland could compensate for the reduction in floral resources during the oilseed rape bloom by less intoxication, considering that oilseed rape is usually heavily treated with pesticides”.

Besides reduced levels of intoxication, organic production also alters resource availability. Researchers observed that there are constant floral resources available throughout longer times and across the seasons. “Organic farmers cultivate so called cover crops in between cash crops to fix nitrogen in the soil. As a result, there is an increase in floral diversity and a more continuous floral resource availability”, explains Wintermantel. This constancy is beneficial to honeybees. The study points towards the fact that the increase and regularity of resources is a dominant effect of organic farming's positive impact on bees. In synergy with the decrease in pesticide use, the increase in variety and constancy of floral resources are pointing towards improved conditions for honeybees.

Such constancy in resource availability is particularly valuable for honeybees during *dearth* periods (shortage of insect-pollinated flowers, with a decline in pollen collection by honeybees in between the blooms of oilseed rape and sunflower). During these challenging periods, where bees are lacking resources to collect, organic farming proves to be particularly helpful in the survival of the colony.

The study clearly "presents evidence that organic farming increases honeybee colony performance", concluding that organic production "can buffer adverse effects of intensive agriculture on honeybee colonies". It indeed reveals several significant features of the influence

that organic production has on bees. However, not all is clear, nor all the questions answered. Dr Wintermantel insists that further research is needed. Mainly, there is a need for measuring each factor in isolation, to try to assess better how they interact with bees. Only then will we be certain of the quantifiable impact that more varied and constant flora, or pesticide reduction, has on bees. Thanks to this study, however, we have a clearer picture of the relationship between organic farming and bee health.

[1] IPBES, 2019. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Available online: https://www.ipbes.net/system/tdf/ipbes_7_10_add-1-advance_0.pdf?file=1&type=node&id=35245

[2] Potts, Simon G., et al., 2005. "Global Pollinator Declines: Trends, Impacts and Drivers." *Trends in Ecology & Evolution*, pp. 345-353. Available online:

<https://www.sciencedirect.com/science/article/abs/pii/S0169534710000364>

[3] Bengtsson J, Ahnström J, Weibull A., 2005. The Effects of Organic Agriculture on Biodiversity and Abundance: A Meta-Analysis. *Journal of Applied Ecology*. Available online: <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2664.2005.01005.x>

[4] European Commission, 2014. COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Action Plan for the future of Organic Production in the European Union. Available online: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/organic-action-plan_en.pdf

[5] Wintermantel et al., 2019. Organic farming positively affects honeybee colonies in a flower-poor period in agricultural landscapes, *Journal of Applied Ecology*, Available on line: <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13447>

[6] EU Agricultural Markets Briefs, *Organic farming in the EU*

A fast growing sector, No 13 | March 2019, 12p. Available online: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/market-brief-organic-farming-in-the-eu_mar2019_en.pdf