



Biofuel crops compete with wildflowers for bees

Pollination of intensively farmed, flowering crops could affect the pollination of wild plants in neighbouring fields, according to a study by German researchers. In their one-year study, they found fewer bees visited wild plants that are close to oilseed rape fields, although the longer-term picture is less clear. The researchers warn that increasing cultivation of biofuel crops could possibly reduce wild flower populations.

Bees pollinate both wild flowers and crop plants, providing invaluable ecosystem services to agriculture and biodiversity¹. The decline of bee populations in recent years is well publicised, and could have negative consequences for the environment and food security. However, biodiversity is also threatened by flowering crop plants, which in some cases are more attractive to bees than wild flowers. In a field of oilseed rape, a crop often planted for biofuel production, a bee can visit 2,000 flowers in an hour, simply because the flowers grow so densely, whereas in a neighbouring field of wild plants, there will be fewer plants that are more spread out in comparison.

There are conflicting theories about how crop plants affect their wild neighbours. From one perspective, bees could be drawn from the wild flowers by the more attractive crop flowers, resulting in reduced pollination of wild plants. From another perspective, however, wild plants situated very close to crops could actually benefit from large bee populations in the area, as the bees may also visit nearby wild flowers.

The researchers, partly-funded under the EU STEP², measured the effects of increasing proportions of oilseed rape on 67 agricultural land and grassland sites in Lower-Saxony, Germany. Their results revealed that when a larger proportion of an area is planted with oilseed rape, the total number of bumblebees per oilseed rape field, and number of different species of bees per field, is markedly lower.

The researchers also found that wild cowslips, which rely on bees for their pollination services, produced fewer seeds when they were in areas containing lots of crop plants. The average number of seeds produced by cowslip flowers decreased by a fifth in areas where 15 per cent of land within a kilometre radius was planted with oilseed rape, compared to land where no oilseed rape was planted.

The study indicates that careful land planning and wildflower conservation is needed to avoid the decline of wild flowers in agricultural areas planted with biofuel crops. However, the researchers highlight the results of other studies, which have shown that in the long run, flowering crops can improve pollination across a large area. They also hint that the picture is more complex than it might at first appear. Even if wild plant populations are negatively affected over the course of one year, an increase in bee populations thanks to neighbouring crop plants could benefit the wild plants the following year.

1. EUROPA. (2011). Pollination and Biodiversity. EUROPA. [Online]. Available: http://ec.europa.eu/food/animal/liveanimals/bees/pollination_biodiversity_en.htm
2. STEP (Status and Trends of European Pollinators) is supported by the European Commission under the Seventh Framework Programme. See: www.step-project.net

Source: Holzschuh, A., Dormann, C.F., Tscharntke, T., Steffan-Dewenter, I. (2011). Expansion of mass-flowering crops leads to transient pollinator dilution and reduced wild plant pollination. *Proceedings of the Royal Society B*. DOI: 10.1098/rspb.2011.0268. This study is free to view at: <http://rspb.royalsocietypublishing.org/content/early/2011/04/01/rspb.2011.0268.full>

Contact: andrea.holzschuh@uni-wuerzburg.de

Theme(s): Agriculture, Biodiversity

The contents and views included in Science for Environment Policy are based on independent, peer-reviewed research and do not necessarily reflect the position of the European Commission.

To cite this article/service: "Science for Environment Policy": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.