Agricultural policy change drives increased pollination demand

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Research involving botanists from Trinity College Dublin has shown that the demand for financially critical pollination services has risen five times as fast as the number of honeybee colonies across Europe. The mismatch is linked to agricultural policy changes and raises concerns about how countries will cope with losses of other wild pollinators, which could be critical in meeting the deficit when honeybees alone cannot pollinate all crops.

Recent increases in the land area devoted to insect-pollinated crop plants, such as oilseed rape and soya bean, which are used as biofuels, have placed a greater load on the shoulders of our pollinators. In Ireland, there has been a 300% increase in oilseed rape cultivation in the last five years. Further increases are likely as farmers respond to demands driven by the proposed target that EU member states obtain 10% of their fuel from biofuel stocks by 2020.

The research, just published in the world's largest open-access journal *Public Library of Science One*, has implications for conservation practices throughout Europe. Many wild pollinator species are in decline in Europe due to agricultural intensification, habitat degradation, disease and parasite spread, and climate change.

In the large-scale study, a total of 17 scientists compared the number of honeybee colonies with the demand for pollination services in 41 European countries between 2005 and 2010. Honeybee colony numbers decreased in 15 countries over that period. While they increased in other

countries, the demands for pollination services increased much faster.

In just over half the countries, including the UK, France, Germany and Italy, honeybee stocks were found to be insufficient to supply pollination services alone. If taken as a continuous region where colonies could move freely, Europe as a whole only has two thirds of the honeybee colonies it needs, with a deficit of over 13.6 million colonies. This indicates an increasing reliance on pollination services provided by wild insects.

Associate Professor in Botany and Director of the Trinity Centre for Biodiversity Research at Trinity, Jane Stout, who is co-author of the journal article, said: "Ireland has experienced a threefold increase in land area of cultivation of oilseed rape over the past 5 years. Since this crop has a higher yield when it is insect pollinated, this means that farmers in Ireland are more reliant on insect pollinators than in the past. This work emphasises the importance of wild pollinator conservation at the European scale, and shows that we must not be too reliant on managed honeybees to provide crop pollination."

Dr Tom Breeze, of the University of Reading (UK), led the research. He said: "This study has shown that the EU biofuel policy has had an unforeseen consequence in making us more reliant upon wild pollinators like bumblebees and hoverflies to meet demands for this basic ecosystem service."

More information: Breeze TD, Vaissière BE, Bommarco R, Petanidou T, Seraphides N, et al. (2014) "Agricultural Policies Exacerbate Honeybee Pollination Service Supply-Demand Mismatches Across Europe." *PLoS ONE* 9(1): e82996. DOI: 10.1371/journal.pone.0082996