

Pesticides impair bees' ability to gather food, researchers find

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Bumblebees are important pollinators. Credit: Dave Goulson

(Phys.org) —Controversial pesticides ingested by bumble bees can seriously impact the insects' ability to collect food, even at very low levels of contamination, says new research from the University of Sussex and the University of Stirling.

The study, published in the journal *Ecotoxicology*, shows that even tiny doses of a neonicotinoid pesticide called imidacloprid reduce the amount of [pollen](#) collected by bumblebee colonies by 57 per cent, and that the effects last for at least a month after exposure.

The researchers fitted bees with electronic tags so that their movements could be tracked. Each bee was weighed as it exited and entered its nest. Many pesticide-treated bees failed to collect any pollen at all, and those that did tended to collect less than untreated bees.

Imidacloprid is one of three [neonicotinoids](#) currently the subject of a two-year EU [moratorium](#) due to honey bee health concerns.

Neonicotinoids have previously been linked to Colony Collapse Disorder in honey bees, and more generally they have been implicated in causing pollinator declines. Neonicotinoids are synthetic variants of nicotine and used to kill insect pests. Applied as a seed dressing, the pesticide gets into the pollen and nectar of crops such as oilseed rape, which the bees feed on. Debate has raged as to whether bees consume enough to do them harm, and these concerns led to the EU moratorium.

Professor Dave Goulson, the study's senior author, says: "It is unclear what will happen when the moratorium expires, as the agrochemical companies that produce them are in a legal dispute with the EU over their decision. Our new study adds to the weight of evidence for making the ban permanent."

Previous work by Professor Goulson and others suggests that bumblebees are particularly sensitive to the chemical agents in neonicotinoids; that their nests grow more slowly when they have been exposed to them, and that they produce fewer new queens. The new study suggests why these negative impacts might be occurring.

Professor Dave Goulson adds: "Pollen is the only source of protein that bees have, and it is vital for rearing their young. Collecting it is fiddly, slow work for the bees and intoxicated bees become much worse at it. Without much pollen, nests will inevitably struggle."

Hannah Feltham, from the University of Stirling, who carried out the experiments, says: "This work adds another piece to the jigsaw. Even near-infinitesimal doses of these neurotoxins seem to be enough to mess up the ability of [bees](#) to gather food. Given the vital importance of bumblebees as pollinators, this is surely a cause for concern."

More information: "Field realistic doses of pesticide imidacloprid reduce bumblebee pollen foraging efficiency." Hannah Feltham, Kirsty Park, Dave Goulson. *Ecotoxicology*. January 2014. [DOI: 10.1007/s10646-014-1189-7](#)

Provided by University of Sussex

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