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Insect Pollinators Initiative

An investigation into the synergistic impact of sublethal exposure to industrial chemicals on the learning capacity and performance of bees

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We rely on a varied cocktail of pesticides to protect crops from pest damage. Pesticides are also used to protect bees from mite infestation. Exposure to such chemicals could be harming beneficial pollinators and chronic exposure may be particularly important in the context of other challenges faced by these insects.

Many insecticides work by interfering with information flow in the brains of insects - either increasing or decreasing their brain activity. This group of researchers will be asking whether chronic exposure to chemicals used to control mites, combined with levels of agricultural pesticides that are not lethal but could be damaging, are affecting foraging, navigation and communication in bees.

Honeybees and bumblebees will be monitored and the researchers will investigate their ability to learn. To do this they will assess their performance using radio tagging of individual bees and assessment of specific learning tasks. In partnership with the Scottish Beekeepers Association they will carry out a three year survey of the impact of environmental chemicals on colony performance. The team will study the brain cells of bees in the laboratory to monitor the effects of pesticides (both single pesticides and also multiple combinations). They will be seeking to understand the molecular basis of learning and memory in bees and how this is affected by pesticide exposure. The researchers will also attempt to produce the first ever honeybee cell line to facilitate future pesticide screening.

This project is in partnership with Dr Jenni Harvey, the University of Dundee, Dr Nigel Raine at Royal Holloway, University of London, Dr Geraldine Wright at Newcastle University and Professor Neil Millar at UCL.