

Bees survival: Ban more pesticides?

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Credit: Gwendolyn Stansbury

Neonicotinoids are under intense scrutiny. But a ban of a broad variety of pesticides may be required to protect bees, humans and the environment.

The European Commission, on 29th April 2013, slapped a two-year ban on insecticides suspected of killing off [bee colonies](#). This follows the European Food Safety Authority [finding](#) that they pose a high acute risk to honey bees. [Studies](#) suggest that the nicotine-like compounds fry bees' [navigation systems](#) and leave them unable to learn, while weakening their immune system.

But scientists now warn that other [nerve agents](#) targeting [insect pests](#)

may also be harming bees and other pollinators. "These [neonicotinoids](#) are just one of hundreds of compounds being used and I would be surprised if it was all down to just these chemicals," says Christopher Connolly, a neuroscientist at the University of Dundee, UK. He argues that we should not allow farmers spray a toxic soup of chemicals onto their crops.

Pesticides not adequately tested

Connolly exposed bee brains to these pesticides and organo-based pesticides and [reported](#) that the nerves spun into hyperactivity and then stopped working. A combination of these two pesticides types had a stronger impact, suggesting the combined soup of pesticides could be causing more serious harm. "I don't understand how this was missed. As a neuroscientist it just seemed blindingly obvious. The biggest effect was hyperactivation of the major learning centre, which was completely predictable," Connolly tells youris.com.

The nerve agents effects were missed because safety screens looked to see how many honey bees die after four days exposure. But harm is only evident over a period of two weeks in [bumblebees](#) and is seen when you look at entire colonies. "So the safety test is all wrong. The thing that concerns me is that this throws a question mark over several hundred pesticides, all tested by inadequate safety screens," says Connolly. He suggests that we should be tracking pesticides use in the environment, just like we monitor drug use in patients.

Not collecting such data might even pose health issues for people. "Bear in mind we have lots of idiopathic diseases in humans which we don't know the cause of and given that we don't know what pesticides are used in what combinations and when, we don't know if these pesticides may be contributing to some or even all these unknown diseases," Connolly warns.

More research needed

Connolly argues that we need to carry out research to find out which pesticides are the least harmful. If neonicotinoids are the least toxic, then we should go with them. He says governments have underfunded this research area partly because it is inconvenient to find pesticides are dangerous. Dave Goulson, professor of biological science at the University of Sterling, UK agrees: "there haven't been nearly enough studies of all pesticides or interactions between them." He recently published a [study](#) showing neonicotinoids hit bumblebee colony growth and queen production. He also tells youris.com: "beneficial insects such as ladybirds and bees are exposed to lots of different chemicals and we have a really poor understanding of what it does to them." He also points out that we need to be concerned with what we replace these nerve agents with.

More research may be helpful, but industry criticises extrapolation of lab studies to field conditions. Julian Little, spokesperson for Bayer Cropscience, based in Norwich, UK, says the evidence against these pesticides has all been lab based, essentially taking a social insect and force-feeding it insecticide. It says the results cannot be replicated in the environment.

But he also agrees more monitoring of pollinators is needed. "Where you do get large-scale bee deaths not enough has been done to know exactly what has happened," Little tells youris.com. He says pests and loss of feeding sites and nesting sites are most likely behind bee declines. "France has had restrictions [of neonicotinoids] over the last ten years, yet the bees there remain as bad if not worse than they are in the UK."

Avoidance of pesticide use

A possible solution to preserve bee populations further would be to restore the principle of avoidance of pesticide use. "The whole ethos of pest management has gone in the wrong direction," Goulson argues. Whereas integrated pest management sought to use as few pesticides as possible, the neonicotinoids are a preventive strike. "A simple analogy is that it's like taking antibiotics in case you get ill rather than when you get ill. Everyone knows that is a silly idea, as it results in bacteria rapidly developing resistance. It is the same with these pesticides."

However, opponents believe that the neonicotinoids ban is unlikely to decrease pesticide use. Quite the opposite. Little warns that farmers may now have to resort to spraying [insecticides](#) up to four times a year, now that they cannot coat seeds in neonicotinoids.

But other experts do not agree. There are several alternatives to using neonicotinoids, and other [pesticides](#), according to Simon Potts, professor of biodiversity and ecosystem services at Reading University, UK. This is a great opportunity for farmers to adopt these practices to protect bees and other pollinators. Indeed, he believes farmers will benefit from healthy pollinator populations as they provide substantial economic benefits to crop pollination.

"Few people would disagree that we need to protect our food production, but it shouldn't be at the cost of damaging the environment," Potts tells youris.com, adding: "A short-term decision to keep using harmful products may be convenient, but will almost certainly have much greater long-term costs for food production and the environment."

Provided by Youris.com

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