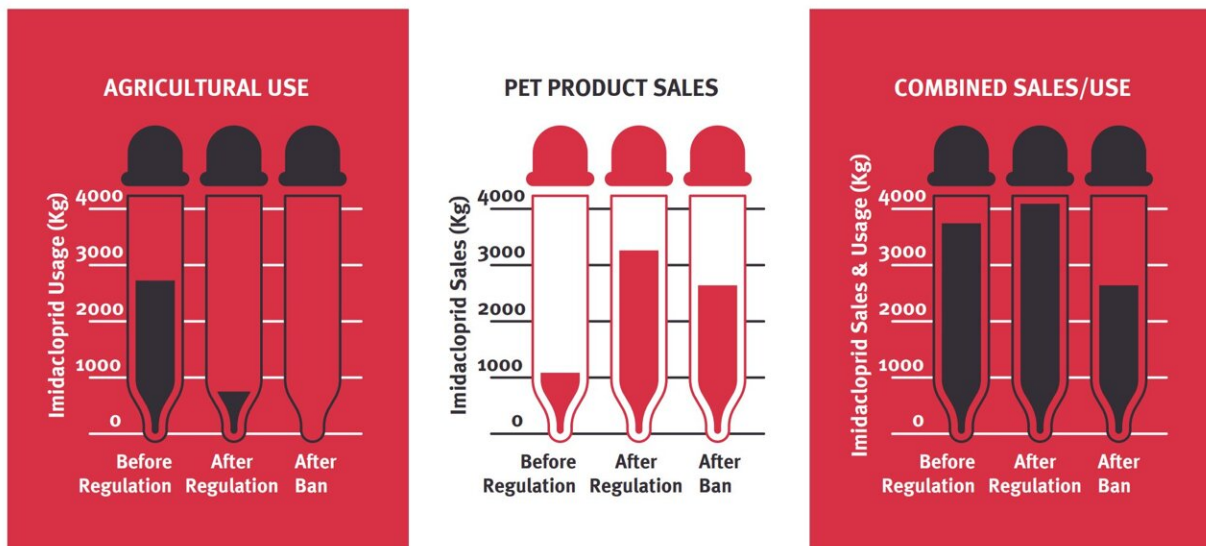


# Toxic pet flea and tick treatments are polluting UK freshwaters, says paper

March 20 2023, by Hayley Dunning



Patterns of the sales and usage of imidacloprid for agricultural and domestic pet parasiticide products in the UK. Imidacloprid was implicated in the global decline of bees and other terrestrial pollinators, and use was severely restricted in the EU in 2013, followed by a total ban on outdoor use in 2018. Here we show the usage and sales of imidacloprid before (2009) and after the initial regulations (2014), as well as after the ban (2019). Agricultural use data were obtained from the Food and Environment Research Agency (FERA). Pet parasiticide sales data were obtained from the Veterinary Medicines Directorate (VMD) under the Freedom of Information Act. Credit: *Imperial College London* (2023). DOI: 10.25561/102699

Parasiticides are commonly applied as 'spot-on' treatments on dogs and cats to prevent or kill fleas or ticks, but they contain toxic chemicals that are making it into UK rivers and ponds, particularly in urban areas. In a new briefing paper, Imperial College London researchers say the evidence points to an urgent need to review risk assessments and prescribing practices for these chemicals.

Many of these parasiticides contain a [chemical](#) in a class called neonicotinoids. These chemicals have been banned for agricultural use on crops as evidence shows they impact bees and other pollinating insects important for our food supply.

However, they are still widely sold as pet parasiticides as it was thought they were not able to reach the environment in large enough doses. New measurements of invertebrates and of [river water](#) in the UK instead show they are present in [urban environments](#), and often in concentrations that are known to harm [aquatic life](#) in lab experiments, which could cause knock-on effects on the wider ecosystem.

## **Reassessing need**

Andrew Prentis, Visiting Fellow in the Grantham Institute at Imperial College London and a member of Vet Sustain, said, "So far, our use of parasiticides for pets has focused primarily on the animal and human health benefits, but even these are not well evidenced. Chemicals that have been banned in one sector are used indiscriminately in another with seemingly little consideration of the possible risks."

"This not only results in increased pollution of UK waterways—which are under myriad threats from other sources of pollution—but could also lead to parasite resistance due to overuse. It's time for a reassessment of clinical need and treatment recommendations."

"Concerned cat and dog owners should talk to their vets about what is best for their pet, what is safe for the environment and whether such regular preventative treatments are needed. In the same way that we only take antibiotics when we're ill—not every month—we may need to apply the same principle to parasite treatments for our pets."

The team considered the two main pesticides included in flea and tick treatments: the neonicotinoid imidacloprid and the related chemical fipronil. There are 138 pet parasiticide products currently authorized in the UK that contain imidacloprid and 396 that contain fipronil.

There are an estimated 25 million cats and dogs in the UK, many of which are treated with parasiticides multiple times through the year, with some products recommending monthly doses. Some pet parasiticides require a veterinary prescription, whereas others are available to purchase over the counter or from online retailers.

Once applied, the products are absorbed by the body, remaining in the skin, hair, and excretions. The chemicals therefore may reach natural waterways through household wastewater and combined sewer overflows: the main routes are believed to be through owner handwashing, and people washing their pets and their pet's bedding and clothes.

## **Powerful killers**

Imidacloprid and fipronil are powerful killers of invertebrates such as insects. One monthly flea treatment for a large dog contains enough imidacloprid to kill 25 million bees. In aquatic ecosystems, insect larvae are particularly at risk, such as those of mayfly and dragonfly. These species, among others, are important food for fish, birds, and bats, potentially causing knock-on effects on the wider ecosystem.

By weight, imidacloprid is one of the best-selling veterinary parasiticides in the UK. Immediately before the ban on crop use, a combined total of over 4000 kg was used for agriculture and sold for veterinary use in a single year in the UK. After the chemical was fully banned for all outdoor use in 2018 this dropped markedly, but over 2500 kg was still being sold in the following year, all of which was destined for the domestic pet market as a parasiticide.

Professor Guy Woodward, Deputy Head of the Department of Life Sciences (Silwood Park) at Imperial, said, "There is a clear and pressing need to develop a stronger evidence base for gauging the impacts of these chemicals and their mixtures in the environment—and in particular to bridge the gap the gap between single species laboratory studies, which are still the dominant approach in ecotoxicology, to the more complex reality in the field, where we still have very limited understanding—and especially in urban aquatic ecosystems."

Recent technological improvements have allowed these parasiticides to be detected more easily in the environment. However, only a fraction of the UK's waters are routinely tested for these chemicals. Research by co-author Dr. Leon Barron showed that concentrations of these chemicals are more prevalent in [urban areas](#), supporting the idea that they are coming from domestic sources.

Dr. Leon Barron, from the School of Public Health at Imperial, said, "In our research in urban locations, these chemicals were found wherever we looked, and were in especially high concentrations near wastewater treatments plants, suggesting these are a major source."

## **Biodiversity matters**

Dr. Tilly Collins, from the Centre for Environmental Policy at Imperial, said, "It is evident from the regular detection of these pesticides that

there is a real risk to aquatic biodiversity in our ponds and rivers. Biodiversity matters to the health and function of our water bodies, detecting these chemicals so often shows we have a real problem."

Rhys Preston-Allen, from the Department of Life Sciences at Imperial, said, "Ultimately, this report brings into question whether the balance has shifted in such a way that the environmental harm caused by these chemicals now outweighs the benefits to pets and owners."

"What is clear is that this is a complex issue that requires collaborative action from regulatory bodies, scientists, vets, and consumers alike—to effectively limit the environmental impact of these chemicals. We all have a part to play in this."

"Some solutions are common-sense, such as only prescribing and using parasiticides when a pet is afflicted by fleas and ticks rather than treating healthy animals. Others are more practical, such as increasing emphasis on safe disposal of the products when they are used. With every new piece of evidence, there is also a growing willingness to reassess the regulation of these chemicals—so, I have faith that things are moving in the right direction."

**More information:** R Preston-Allen et al, Are urban areas hotspots for pollution from pet parasiticides?, *Imperial College London* (2023). [DOI: 10.25561/102699](https://doi.org/10.25561/102699)

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