

The use and impact of neonicotinoids and other pesticides beyond agriculture

Parliamentary Briefing – January 2025



Overview

- Neonicotinoids were banned for agricultural use in the UK and the EU in 2018 due to their devastating impact on bees.
- Pesticides banned for agricultural use are routinely used in other sectors such as veterinary medicines as spot on flea treatments, forestry, and other domestic products.
- The continued presence of ecologically damaging toxins in our environment seriously hampers efforts to halt biodiversity loss and restore nature.
- Pollinators and other insects are not protected by the current pesticide approval system, which ignores long-term effects on honeybees and data on other wild pollinators.
- Co-formulants, in herbicides and other pesticides may also contribute to global insect declines.

Background

Neonicotinoids, a class of neurotoxic pesticides, have been primarily used in agriculture to control pests. However, their application has extended to other sectors such as aquaculture, commercial forestry and veterinary medicine. While neonicotinoids have proven to be effective in pest control, their use has raised significant concerns about their impact on non-target species.

Invertebrates are essential to a healthy countryside and ecosystem services, but pesticide use has caused declines in key populations of wild invertebrates, resulting in many species disappearing from large areas of the countryside. The [Bugs Matter Survey](#) points to a 78% decline in UK flying insect numbers sampled on vehicle number plates between 2004 and 2023, declines similar to those seen in [Denmark](#) and [Germany](#).

- The use of neonicotinoid pesticides has resulted in a reduction in the overwintering success of honeybee [hives](#).
- Significant [declines](#) in wild bee populations are associated with increased neonicotinoid use.
- Neonicotinoid use is also implicated in [butterfly population](#) declines.
- Invertebrate population loss is leading to [reduced pollination services and crop yields](#).

Despite the acknowledgement by the Government in 2010 that the pre-approval tests for pesticides were inadequate to protect pollinators, and the production in 2013 of a testing guidance [document](#) by the European Food Standards Authority, the UK has yet to introduce any new tests to help to ensure that pesticides are safe for non-target species. In [December 2024](#) the Government introduced plans to review and update the approach to decisions on applications for emergency authorisations of agricultural neonicotinoid use.

For most pesticides, we do not know what risk they pose to wild species in the environment as very little science has been done. [Research](#) shows widespread synergistic effects of a cocktail of chemicals on bees. Scientific evidence has documented a range of impacts from neonicotinoid exposure to [non-target invertebrates](#), aquatic and terrestrial ecosystems, as well as vertebrate species such as birds and mammals. Acetamiprid, believed to be less-toxic, is widely available to the public for home and garden use and studies have shown sub-lethal impacts of neonicotinoids on invertebrate species due to the frequent

[over-application](#) of products. The chemical properties of neonicotinoids allow them to leach into soil and water bodies, potentially affecting ecosystems far beyond their area of application. The presence of even low levels of neonicotinoids in streams has proven to be lethal for [aquatic invertebrates](#), with significant implications for the food chain.

Veterinary Medicines

At least [five pesticides](#) not permitted for agricultural use due to their impact on human health and/or the environment are being used widely in tick and flea treatments for domestic pets. [PDSA](#) estimate that 51% of the UK adult population own a pet with an estimated 10.6 million pet dogs and 10.8 million pet cats.

Neonicotinoids such as imidacloprid, dinotefuran, and nitenpyram are commonly used in veterinary medicine to control ectoparasites like fleas and ticks on pets. Imidacloprid is prophylactically applied to domestic pets to kill arthropod parasites, with 68 registered veterinary products covering domestic pets; dogs, cats, rabbits and ferrets ([Veterinary Medicines Directorate](#)). Decay products of these [insecticides](#), like thiamethoxam decaying into clothianidin, are also toxic to insect life.

Imidacloprid from flea treatments is a significant source of pollution in rivers and researchers have reported the widespread contamination of English rivers with the neurotoxic pesticides commonly used in [veterinary flea treatments](#). The concentrations found often far exceeded accepted safe limits. [Researchers](#) have estimated that as much as 9.1% of the imidacloprid administered through spot-on treatments of dogs, plus 6% of fipronil, is washed off animals and through washing of both pet bedding and owners' hands. Furthermore, pet owners risk contaminating their hands for at least 28 days after application.

Acetamiprid in Forestry

In the UK, neonicotinoids, particularly acetamiprid, are used in commercial forestry to control pests like the Pine Weevil (*Hylobius abietis*) and Spruce Beetles (*Hylastes* spp.), which can cause significant damage to commercial forestry products. The insecticide is highly soluble and volatile in water and very persistent in aquatic systems. It has a high potential for bioaccumulation, is [highly toxic](#) to earthworms and birds, and moderately toxic to most aquatic organisms and mammals. Despite the EU banning several neonicotinoids due to their harmful effects on bees and other pollinators, acetamiprid is still permitted and widely used in forestry.

The use of Acetamiprid is [legally permitted](#) in the UK, but in 2015 it was categorised as a '[Highly Hazardous Pesticide \(HHP\)](#)' by the Forest Stewardship Council (FSC). In 2018, the yearly use of hundreds of kilograms of acetamiprid on forests in Mull was [reported](#) and concerns have been raised by experts over the existing knowledge gaps with regards to the application of acetamiprid and the consequent negative impacts on beneficial insects and the broader ecosystem. The private forestry industry in Scotland has been unable to give the exact amount of acetamiprid sprayed and it is believed by experts that the insecticidal pesticide is being applied at higher rates than the banned neonicotinoids because it is considered less toxic.

Acetamiprid had its approval renewed in the EU in 2018. Following a re-evaluation in 2022 to review new scientific evidence regarding its impact on human health and the environment by the [EFSA PPR](#) Panel, major uncertainties were found in the developmental neurotoxicity (DNT) properties of acetamiprid.

Salmon Farming

In salmon farming, neonicotinoids like imidacloprid have been considered for use to manage sea lice infestations. Imidacloprid is one of the three neonicotinoids that were banned by the [EU in 2018 for use in agriculture](#). Sea lice are a significant problem in salmon farming, causing health issues for the fish and economic losses for the industry. The use of neonicotinoids in aquaculture has significant potential environmental impacts, including harm to non-target aquatic organisms and contamination of the marine environment.

Many vertebrates are also affected by imidacloprid, including higher DNA damage in human peripheral blood lymphocytes. Based on up to date toxicity studies, imidacloprid is a [severe water pollutant](#) that can adversely affect the aquatic ecosystem, including fish reproduction and development.

Domestic Plant Protection Products

Despite being banned for use in agriculture, imidacloprid is available as a spray for ornamental plants in greenhouses. Data on prevalence of use is not collected, but a [recent survey](#) found that 70% of potted plants on sale in 9 garden centres in the UK were contaminated with neonicotinoids. While the study found thiamethoxam, clothianidin and imidacloprid in the plants, some of the plants may have originated from outside the UK.

Fixing the system

Buglife is concerned that a focus on neonicotinoid use in agriculture is obscuring the opportunity to address these highly toxic chemicals in use in other sectors.

Pre-approval tests for pesticides only look at data on short-term effects on honeybees, this does not protect honeybees from long-term harm or sub-lethal effects and provides little or no protection for other species as honeybees are a poor test surrogate for wild pollinators such as bumblebees, solitary bees, ground beetles, and moths. The consideration of the impact of these chemicals on freshwater life is lacking, ignoring the true risk to the environment.

Invertebrates need better protection to be enshrined in law. During the process of the Environment Act in 2021, the House of Lords tried to pass an [amendment](#) to limit the harm done to pollinators by pesticides, and over 60,000 people signed a [petition](#) calling on the Government to accept the revision. However, the Government [rejected](#) the amendment, claiming that the law already makes provisions to protect pollinators from the effects of pesticides. At the time the National Action Plan (NAP) for the Sustainable Use of Pesticides was [promised](#) to be published in a matter of weeks. Three years later the NAP has still not been published with no transition in place to reduce pesticide use across all sectors.

Buglife calls on the Government to reduce the harm and use of pesticides across all sectors.

- Invertebrates including bees and other pollinators need better protections enshrined in law.
- Parliament must legislate for new 'pre-approval' tests and processes that will protect bees, pollinators, and other beneficial invertebrates from all the ingredients in proposed pesticides while enabling public participation in environmental decision-making.
- Pesticides banned for use in agriculture must be banned for use in all other sectors including veterinary flea treatments, forestry, aquaculture and domestic products.
- The National Action Plan on Sustainable Use of Pesticides must be published without delay, prioritising actions that lead to pesticide reduction.
- The UK must commit to reducing pesticide usage to meet binding targets to restore nature and those agreed through the Kunming-Montreal Global Biodiversity Framework.