

Scottish Wildlife Trust / Buglife Briefing



Neonicotinoids Campaign

The Scottish Wildlife Trust and Buglife Scotland are leading a campaign calling for a permanent ban on neonicotinoid insecticides in Scotland.

Headlines

- There is a huge body of evidence which shows certain neonicotinoids are harmful to pollinators and other wildlife
- We want the Scottish Government to permanently ban the use of neonicotinoids that are known to be particularly harmful to pollinators on outdoor crops in Scotland
- The Government must recommend safe alternatives, both chemical and non-chemical, especially when used on crops attractive to pollinators
- The Government must help farmers cut their use of all pesticides, by funding research into integrated pest management systems that work for Scottish farmers
- We need proper testing systems to ensure that approved pesticides don't harm non-target wildlife and ecosystems

Background

On 1st December 2015, we wrote to the Cabinet Secretary for Rural Affairs, Food and Environment to ask that the Government permanently ban the use of three neonicotinoid insecticides on outdoor crops in Scotland.

We have chosen this date as it marks the anniversary of the EU ban which came into effect in December 2013 restricting the use of three types of neonicotinoid insecticides due to the "high acute risks" to bees.¹ A review of this ban is due to be undertaken shortly – we want to ensure that pollinators and other wildlife in Scotland are permanently protected from these damaging insecticides.

Neonicotinoids which have restrictions on their use are: clothianidin, imidacloprid and thiamethoxam which have mainly been used in Scotland as seed treatments for oilseed rape and cereal crops. They are also applied as foliar sprays and have been used in soft fruit, legumes and potato production.² Bees are exposed to risks from neonicotinoids through³: contaminated pollen and nectar; foliar sprays; dust from drilling neonicotinoid coated seeds, neonicotinoid granules applied to the soil and guttation⁴.

Since the EU imposed ban came into effect in 2013, there has been considerable research activity which has justified the EU's decision to ban these chemicals.

Evidence

We know that neonicotinoids harm bees by: damaging bee brains⁵; reducing bumblebee queen production⁶; reducing wild bee density⁷; decreasing solitary bee nesting⁸ and bumblebee colony growth and reproduction.⁹ Being tasteless to bees in pollen and nectar - bees can't avoid contaminated pollen or nectar.¹⁰ Neonicotinoids may also negatively affect wild bees even more than honeybees¹¹ (because honeybees are better at detoxifying after neonicotinoid exposure and have a greater buffering capacity because of colony size compared to bumblebees)¹².

Neonicotinoids persist in the agricultural landscape¹³, reduce bumblebee capacity to provide a pollination service¹⁴, contaminate and remain in soils¹⁵, potentially impact upon soil invertebrates^{16,17}, contaminate wildflowers at arable margins¹⁸; leach into the aquatic environment¹⁹, and may lead to a decline in insectivorous birds and butterflies in farmed systems^{20,21} and impact on terrestrial and aquatic ecosystems^{22,23}.

A permanent ban

Given the importance of bees and other pollinators in the ecosystem and the food chain and given the multiple services they provide to humans, their protection is essential²⁴ – this is why the ban must be made permanent and extended to all types of seed treatments and foliar sprays that are composed of these three chemicals.

Bumblebees, solitary bees, commercial honeybees, moths, butterflies, hoverflies and many other insects provide the free service of crop pollination, worth at least £43 million to Scotland's economy every year. Insect pollination is essential for the production of commercial soft fruit, oilseed rape, beans and peas and some biofuels. Continued use of these chemicals does not make economic sense. Research clearly shows their impact on a bee's ability to pollinate – which has dire consequences for crop productivity.

In Scotland, the current EU ban mainly affects oilseed rape, but winter cereals are still allowed to be planted with neonicotinoid seed coatings (mainly barley and wheat²⁵). Allowing such applications harms the agricultural environment because these applications contaminate soils, field margins and wildflowers and get washed out into water courses.

The way forward

With a ban in place, the Government will need to advise safe alternatives to these three neonicotinoids, both chemical and non-chemical, especially when used on crops attractive to pollinators. To be able to do this and to help farmers cut their use of all pesticides, the Government must support research into integrated pest management (IPM)²⁶ systems that work for Scottish farmers.

IPM is about achieving low pesticide-input systems to grow healthy crops. Reduction in pesticide use can be achieved through a combination of measures such as biological control and biomimicry and understanding agricultural ecosystems and food webs to ensure that crops are still protected. Pesticides are applied as a last resort and never as an insurance policy. Applying IPM reduces the chance of pest resistance and if practiced at the catchment scale, can benefit aquatic ecosystems, farmland wildlife including wild pollinators and agricultural ecosystems.

To ensure that all pesticides are safe to use, the testing system for approving pesticides must examine the impacts on non-target species and ecosystem health of the proposed chemical when used alone and when used in combination with other types of pesticide. The testing process should be transparent and all evidence gathered during the process should be made available publicly.

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See also previous briefings and reports:

Scottish Wildlife Trust

- Nature in Brief: Integrated Pest Management
http://scottishwildlifetrust.org.uk/docs/002_293_intergratedpestmanagment_scottishwildlifetrust_natureinbrief_december2013_1387469755.pdf
- Pollinators Briefing
http://scottishwildlifetrust.org.uk/docs/002_057_briefingonpollinators_aug2014_1407495997.pdf
- Neonicotinoids
http://scottishwildlifetrust.org.uk/docs/002_057_publications_policies_Briefing_on_Neonicotinoids_Oct_2012_1350310904.pdf
- Neonicotinoids - supplementary briefing for MSPs
http://scottishwildlifetrust.org.uk/docs/002_057_briefingonneonicotinoids_jan2013_1359042800.pdf
- Neonicotinoids post EU vote
http://scottishwildlifetrust.org.uk/docs/002_057_briefingonneonicotinoids_march2013_1370013511.pdf

Buglife

- Campaigns: Neonicotinoid insecticides
<https://www.buglife.org.uk/campaigns-and-our-work/campaigns/neonicotinoid-insecticides>
- The impact of neonicotinoid insecticides on bumblebees, Honey bees and other non-target invertebrates
<https://www.buglife.org.uk/sites/default/files/The%20impact%20of%20neonicotinoid%20insecticides%20on%20bumblebees.%20Honey%20bees%20and%20other%20non-target%20invertebrates.pdf>
- A review of recent research relating to the impact of neonicotinoids on the environment
<https://www.buglife.org.uk/sites/default/files/Areviewofrecentresearchrelatingtotheimpactofneonicotinoidsontheenvironment.pdf>

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- ¹ Commission implementing regulation (EU) No 485/2013
- ² See: <http://www.sasa.gov.uk/pesticides/pesticide-usage/pesticide-usage-survey-reports>
- ³ <http://www.efsa.europa.eu/en/press/news/130116>
- ⁴ Guttation is the process by which some plants exude sap in droplets that resemble dew
- ⁵ Moffat et al. 2015 Chronic exposure to neonicotinoids increases neuronal vulnerability to mitochondrial dysfunction in the bumblebee (*Bombus terrestris*). *FASEB J.* doi:10.1096/fj.14-267179
- ⁶ Whitehorn et al 2012 Neonicotinoid Pesticide Reduces Bumble Bee Colony Growth and Queen Production *Science* 336 (351-352)
- ⁷ Rundlof et al 2015 Seed coating with a neonicotinoid insecticide negatively affects wild bees. *Nature* Doi:10.1038/nature14420
- ⁸ Rundlof et al 2015 Seed coating with a neonicotinoid insecticide negatively affects wild bees. *Nature* Doi:10.1038/nature14420
- ⁹ Whitehorn et al 2012 Neonicotinoid Pesticide Reduces Bumble Bee Colony Growth and Queen Production *Science* 336 (351-352)
- ¹⁰ Kessler et al. 2015 Bees prefer foods containing neonicotinoids. *Nature* 521 (74–76)
- ¹¹ Rundlof et al 2015 Seed coating with a neonicotinoid insecticide negatively affects wild bees. *Nature* Doi:10.1038/nature14420
- ¹² Henry et al 2015 Reconciling laboratory and field assessments of neonicotinoid toxicity to honeybees. *Proc. R. Soc. B* 282: 20152110.
- ¹³ Goulson 2013. An overview of the environmental risks posed by neonicotinoid insecticides. *Journal of Applied Ecology* 11/1365-2664.12111
- ¹⁴ Stanley et al 2015. Neonicotinoid pesticide exposure impairs crop pollination services provided by bumblebees *Nature* doi:10.1038/nature16167
- ¹⁵ US Environmental Protection Agency, Office of Pesticide Programs. Factsheet Clothianidin (2003) EPA Publication 7501C; www.epa.gov/opp00001/chem_search/reg_actions/registration/fs_PC-044309_30-May-03.pdf.
- ¹⁶ Goulson 2013. An overview of the environmental risks posed by neonicotinoid insecticides. *Journal of Applied Ecology* 11/1365-2664.12111
- ¹⁷ Hopwood, J., S. H. Black, M. Vaughan, and E. Lee-Mäder. 2013. Beyond the Birds and the Bees. *Effects of Neonicotinoid Insecticides on Agriculturally Important Beneficial Invertebrates: The Xerces Society for Invertebrate Conservation*
- ¹⁸ Krupke et al 2012 Multiple Routes of Pesticide Exposure for Honey Bees Living Near Agricultural Fields. *PLoS ONE* 7, e29268
- ¹⁹ Goulson 2013. An overview of the environmental risks posed by neonicotinoid insecticides. *Journal of Applied Ecology* 11/1365-2664.12111
- ²⁰ Hallmann et al 2014 Declines in insectivorous birds are associated with high neonicotinoid concentrations. *Nature* 511 (341-343)
- ²¹ Gilburn et al. 2015 Are neonicotinoid insecticides driving declines of widespread butterflies? *Peer J* 3:e1402 DOI 0.7717/peerj.1402
- ²² Van Dijk et al 2013 Macro-invertebrate decline in surface water polluted with imidacloprid. *PLoS ONE* 8, e62374
- ²³ Roessink et al 2013 The neonicotinoid imidacloprid shows high chronic toxicity to mayfly nymphs. *Environ. Toxicol. Chem.* 32, 1096–1100
- ²⁴ European Food Safety Authority January 2016
- ²⁵ Pesticide usage in Scotland 2014
- ²⁶ See Scottish Wildlife Trust policy on Pesticides