Neonicotinoid pesticides policy

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The Bumblebee Conservation Trust position is based on available evidence and sees integrated pest management as the desired end point. Consequently the Trust is calling for the ban on neonicotinoid pesticides to be made permanent and extended to all outdoor use, and for newer neonicotinoid-like pesticides (sulfoximines and butenolides) not to be licenced for use in the UK.

Summary

- Neonicotinoid pesticides are widely-available in horticulture (as treated plants and for home use) as well as in agriculture (where treatment of flowering crops has been subject to a moratorium since 2013).
- There is a large, scientifically-robust body of evidence that neonicotinoid pesticides can and do cause harm to bumblebees at field-relevant concentrations.
- There is increasing evidence that these detrimental effects are observable beyond the treated crops (i.e. in non-crop areas or through environmental persistence in treated areas).
- These negative environmental impacts outweigh the benefits of using the insecticides.

What are neonicotinoids?

Neonicotinoid pesticides are a class of chemicals designed to target the nervous system of insect species that consume crops. In 2013, in response to concerns raised that they may be causing harm to beneficial insects, particularly bees, the European Commission (EC) exercised the precautionary principle to restrict the use of the three most widely used neonicotinoids on flowering crops and ornamental plants which are attractive to bees. A call for new evidence relating to the effects of neonicotinoid pesticides on non-target organisms was issued and this evidence is set to be reviewed by the European Food Safety Authority (EFSA) by the end of January 2018. After this the EC will review the current status of the three banned neonicotinoids, imidacloprid, clothianidin and thiamethoxam.

Neonicotinoid pesticides and their immediate metabolites (which have similar properties) appear to be relatively persistent in the environment. As they are still permitted for use on non-flowering crops such as sugarbeet, this persistence allows the pesticides to be potentially taken up by flowering crops grown in the same field in future years. Additionally, the persistent pesticides can be leached out of the cropped area into margins, hedges and beyond. Low, but detectable, quantities of several neonicotinoids have been recovered from the flowers of marginal vegetation around crop fields, including wild flower strips grown specifically for pollinators.

From the 1st January 2014 it has been a requirement under the EU Sustainable Pesticide Directive, that all agricultural professionals in each of the EU member states adopts the principles of Integrated Pest Management. These principles require farmers to minimise chemical inputs, opting for the least environmentally damaging options in the first instance, with pesticides being used as a last resort. These very principles are in direct opposition to the way in which neonicotinoids have been used in the past, where they have been used as prophylactic

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seed coatings – by definition as a first-case scenario, before there could be any indication of insect damage.

Effects on bumblebees

A large body of evidence suggests neonicotinoid pesticides are having a detrimental impact on a wide range of non-target organisms, including bumblebees. This evidence includes comprehensive findings from semi-field and laboratory studies as well as correlative studies on wild populations. Whilst each particular experiment, looked at in isolation, can be debated with regards to its merits and flaws, it is clear when looking at the evidence base as a whole, that neonicotinoids pose an additional threat to our wildlife. Field-relevant doses of neonicotinoids received by bumblebees are usually too small to kill the bees, but do have sub-lethal effects, particularly on learning, direction-finding and foraging efficiency. Bumblebees suffering from exposure to sub-lethal levels of neonicotinoids are less able to combat diseases or forage for food, and therefore the colony is likely to be less successful.

Bumblebee populations are threatened by multiple, interacting factors, including neonicotinoids but also exposure to other pesticides, as well as habitat loss, fragmentation and degradation, the importation and spread of parasites and diseases, and climate change. These threats, including neonicotinoid exposure, interact with and exacerbate each other (synergistic), and the effects are often chronic rather than acute.

What can I do?

It is important to recognise that usage of neonicotinoids goes well beyond farming. In particular, their use is widespread in the horticultural and ornamental plant industries. Most garden plants in garden centres will contain the pesticides, and the pesticides themselves can be purchased for home use. This frequently includes plants of species listed as good for pollinators by wildlife or gardening groups, as these typically assess the value of the species in general as pollen and nectar sources and are not assurance schemes in relation to pesticide applications. The safest way of ensuring that garden plants do not contain neonicotinoid residues is to buy seeds or plants of known provenance (such as saving seed yourself). It is also possible to buy from organic nurseries, and several large home and garden supply retailers have recently decided to stop selling plants which have been treated with the pesticides, a move which we applaud.

Some studies appear to show a correlation between increased diet diversity in bees and decreased effect of exposure to neonicotinoids: bees which fed from a greater range of flower species were less affected by equivalent pesticide exposure. Therefore we support the provision of pollen and nectar strips – and wildflower areas generally - which are as diverse as possible throughout the season. However to minimise cross-contamination from neonicotinoids, these should preferentially be sited in areas which are not directly adjacent to neonicotinoid-treated crops. Areas which have been treated with neonicotinoids should be avoided for as long as possible when choosing sites to grow flowers.

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We understand that there has to be a balance. There must be ways to manage crop damage and allow food to be grown, but this must be done in a sustainable way. Many of the alternatives to neonicotinoids are potentially worse for bumblebees, such as applications of broad-spectrum insecticides while crop flowers are open, and much research remains to be done on this and similar questions. However, we support the adoption of Integrated Pest Management as part of a movement away from automatically opting for the chemical approach. We are calling for manufacturers to develop alternative pest control technologies which have less impact on non-target organisms and are both easy and cost-effective for farmers to use.

Of all the interacting drivers of bee declines, neonicotinoid pesticide exposure is potentially one of the easiest for us to reverse.

Links to further information

The Task Force on Systemic Pesticides website http://www.tfsp.info/

Godfray *et al*. (2014). A restatement of the natural science evidence base concerning neonicotinoid insecticides and insect pollinators. Proc. R. Soc. B 281: 20140558. DOI: 10.1098/rspb.2014.0558

Godfray *et al*. (2015). A restatement of recent advances in the natural science evidence base concerning neonicotinoid insecticides and insect pollinators. Proc. R. Soc. B 282: 2015.1818. DOI: 10.1098/rspb.2015.1821

UK Expert Committee on Pesticides Advice to Departments on risks arising from the use of neonicotinoid pesticides, October 2017. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/658146/ecp-ministers-advice-1710.pdf

The European Academies Science Advisory Council Policy report 26: Ecosystem services, agriculture and neonicotinoids (2015). http://www.easac.eu/fileadmin/Reports/Easac_15_ES_web_complete_01.pdf