

1. Sources

Neonicotinoids are a class of neuroactive insecticides chemically related to nicotine. Since the first neonicotinoid (imidacloprid) was commercialized in the 1990s, seven main compounds (acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, thiamethoxam and thiacloprid) are now available on the global market.



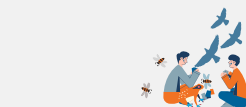
Today, neonicotinoids are used in protecting plants, livestock and pets from pest insects, as well as for malaria vector control, i.e., mosquitos, to protect humans, in more than 100 countries. Neonicotinoids are also used as biocides.

2. Why is it relevant?

Neonicotinoids target the central nervous system of insects and are highly effective with low rates of developed resistance in pest insects. Recent evidence shows that:



The widespread use of neonicotinoids may be a threat to bees and other pollinators, resulting in broad public concern, and identification by the Global Chemicals Outlook II as an issue with emerging evidence of risks to the environment.



Some neonicotinoids are highly to very highly toxic and can result in lethal and sublethal effects on adult honeybees.

Exposure may also result in high risks for bees including at the colony level and in significant impacts on other wildlife, including birds, mammals and aquatic organisms.



The European Union has classified thiacloprid as potentially carcinogenic (category 2) and toxic for reproduction category 1B, and identified it as an endocrine disruptor, indicating high human toxicity.



While neonicotinoids are unlikely to cause dietary risks of concern for consumers, the uses of these compounds may cause risks of concern during applications and other activities (e.g. children playing on imidacloprid-treated turf).

Key neonicotinoid release routes to the environment include direct releases, leaf run-off, leaching and spray or dust drift during applications to air, water and soil.



Wildlife may also be exposed by eating treated seeds, crops and their pollen and nectar, and humans through contaminated pollen, foodstuffs and drinking water.

Neonicotinoids can be transported certain distances in air before settling, and in some soil conditions, they can persist and possibly accumulate for months to years.



Different levels of occupational exposure may also occur, depending on the activities, application methods, and personnel protection equipment used.

Wildlife and humans may be exposed to neonicotinoids through contaminated environmental media.



Due to their widespread use, neonicotinoids are now detected around the world in a wide range of media. These include air, water, soil, sewage, crops and foodstuffs, house dust and human urine samples.



3. Existing instruments and actions

As neonicotinoids are insecticides, they must conform to standard regulatory requirements for pesticides that exist in many countries, particularly in the form of limit values for levels in different environmental media and maximum residual levels in agricultural products.

Regulatory instruments and actions that have been taken by some countries include total bans and restrictions on specific uses (e.g., banning formulations containing certain neonicotinoids or restricting neonicotinoid use to only greenhouses), strengthened personnel protection equipment requirements, and additional labelling requirements and scheduled re-review of the compounds.

A number of countries are in the process of taking more actions on neonicotinoids, including labelling requirements by manufacturers for directions on application, and use of personal protection equipment to protect relevant workers.

Regulatory instruments and actions are complemented by voluntary actions, e.g. voluntary cancellations of neonicotinoid registrations, or third-party standards and certification schemes which have included neonicotinoids in their frameworks.



4. Challenges and opportunities



Scientific evidence shows that the various neonicotinoid compounds have complex exchanges among environmental compartments, persist in water and soil environments, and may be transported off-field, and that bees, other wildlife and humans may be exposed to them through many different routes.

A number of countries and stakeholders have taken steps to limit uses and exposure through various instruments and actions. However, these efforts are likely not enough to address neonicotinoids as a whole.

While current measures contribute to solving issues in many developed countries, developing countries lack adequate measures to address neonicotinoid exposure.

Certain factors need to be taken into account, such as financial and human capacities in developing countries, accessibility to suitable personnel protection equipment and their alternatives, and education of farmers and other users.

These needs require international action, for example, under an international framework of sound management of highly hazardous pesticides.

Efforts to reduce exposure to neonicotinoids need to look beyond substitutions with other chemicals having similar mechanisms and effects and towards alternative techniques that minimize chemical uses.

