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FACT SHEET

NEONIC PESTICIDES THREATEN HUMAN HEALTH

Neonicotinoids, or "neonics," are neurotoxic pesticides and the most widely used insecticides in the United States today. While neonics are best known for driving mass losses of bees, birds, and other wildlife, roughly half of Americans are exposed to neonics on any given day, and there is mounting evidence that neonic pollution may have potentially devastating effects on human health. Designed to mimic nicotine, neonics permanently bind to insects' nerves, overstimulating and destroying them. Evidence shows neonics can similarly damage human nerves—which also respond to nicotine—and cause other harms. Here's what you should know.

NEONICS THREATEN CHILDREN'S HEALTH, INCLUDING BRAIN DEVELOPMENT

- Children are the most at risk from neonics. Studies link prenatal exposure to neonics with higher rates of birth defects of the heart and brain, autism spectrum disorder, and cognitive impairment.[1]
- Neonics pass easily from a pregnant mother to her developing fetus through their shared blood flow.[2] Neonics have even been found in newborns, with higher levels associated with low birth weight.[3]
- Neonics have also been detected in breast milk, meaning an infant may be exposed during breastfeeding.[4] Infant formula can also lead to exposure if the formula is reconstituted with tap water containing neonics.
- Studies of neonics in animals suggest there may be no safe level of neonic exposure during early life development. Industry sponsored studies of rodents exposed early in life report serious neurological effects—including thinning of key areas of the brain—even at the lowest dose tested. More recent research on prenatally exposed mice at even lower doses found adverse impacts on learning, memory, and anxiety that lasted into adulthood. In an older study of deer, prenatal neonic exposures were associated with increased rates of death.[5]

Neonics can leach from treated lawns and agricultural fields into water supplies, including tap water.

NEONICS CAN DAMAGE NERVES, IMPAIR REPRODUCTIVE HEALTH, AND CAUSE OTHER HARMS IN ADULTS

- Over the course of five years, around 850 people reported neonic poisoning in the United States, equivalent to a case nearly every other day. Their symptoms included headaches, dizziness, lethargy, face swelling, muscle weakness or tremors, vomiting, and pain and tightness in chest. In rare cases, there were severe effects, including seizures and death.[6]
- Human population studies link chronic neonic exposure to a host of harms, including neurological symptoms, such as memory loss and finger tremors; reproductive system effects, such as lower testosterone, semen quality, and sperm count; thyroid hormone disruption; and metabolic effects, including altered insulin regulation and changes to fat metabolism.[7] Exposures to neonic mixtures have also been associated with negative pregnancy outcomes in women.[8]
- Animal studies confirm similar harms. Dozens of rodent studies link neonics to reduced sperm count, reduced sperm motility, altered sperm morphology, and impaired testicular function.[9] Newer animal research also shows neonics can target the ovaries, resulting in significantly fewer egg follicles and more unhealthy ones.[10]

NEONICS POLLUTE OUR EVERYDAY LIVES

- Centers for Disease Control and Prevention (CDC) monitoring from 2015 to 2016 shows that about half of Americans have neonic residues in their body on any given day.[11] A more recent study of pregnant women found neonic residues in over 95 percent of the women tested, with the highest levels in Hispanic women. Troublingly, the amount and frequency of neonics detected increased over the four-year study (2017–2020).[12]
- Neonics contaminate many foods, especially fruits and vegetables. And because neonics are designed to be absorbed into plants, including their leaves and fruit, they cannot be peeled or washed off. Testing commonly detects one or more neonic chemical in foods such as apples, pears, grapes, leafy greens, strawberries, and tomatoes, and in kid favorites such as applesauce and even baby food.[13]
- Neonics can run off agricultural fields and contaminate soil and water supplies, including tap water.[14] Common chlorination treatment for drinking water does not remove neonics, and in fact can create chemical byproducts that may be even more toxic.[15]

THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) HAS LONG UNDERESTIMATED OR IGNORED NEONICS' HEALTH THREATS IN VIOLATION OF FEDERAL LAW

In setting official "safe" levels of neonics in food, the EPA ignored evidence of serious risks from early life exposure (such as brain thinning) in studies submitted by pesticide manufacturers. As a result, it set approved exposure levels too high and waived the legally required tenfold "child safety factor," thereby permitting at least 10 times more neonics in food than the law allows.[16] In 2020, NRDC petitioned the EPA to correct its errors and ensure food is not contaminated with dangerous levels of neonics.[17] After years of inaction, NRDC sued the EPA in 2025 for failing to respond.[18]

The largest use of neonics is as coatings on crop seeds before planting, such as these neonic-coated corn seeds.

Endnotes

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