

The Eastern Swallowtail butterfly and native bees feed on the pollen of a blazing star plant at the author's home in Canton in 2022. The orange spots on the butterfly's wings are from pollen. Pollinators are endangered by the use of an insecticide known as neonicotinoids. (Courtesy of Glenn Barger)

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Neonics no-no: Poisonous insecticide threatens local waters, birds, pollinators

By Theresa Sullivan Barger Special to The Day

Can you imagine if the gummy vitamins you gave your children were weakening rather than strengthening their bodies?

That's what happens when songbirds such as eastern bluebirds, American robin and barn swallows give their baby birds caterpillars that contain a toxic insecticide called neonicotinoids — or neonics.

"We call caterpillars the gummy vitamins of the bird world," said Joyce Leiz, executive director of the Connecticut Audubon Society. "They're full of nutrients. They are what the chicks need to fledge successfully."

But thanks to the widespread use of neonics, she said, they're "at lethal levels in insect larvae and insects, which affects fish populations and bird populations."

Insect pollinators are responsible for 80% of flowering plants worldwide, including fruits and vegetables, said Louise Washer, president of the Norwalk River Watershed Association and co-founder of Pollinator Pathway. One in three bites of food we eat relies on pollinators.

Those chemicals are also ending up in humans through our water. And since New London County is the southernmost part of the state, the neonics applied on lawns, golf courses and farms north of the county flow to the groundwater and streams here.

For the past 20 years, when people apply grub-killing insecticides to residential lawns and golf courses, they're most likely using pesticides that contain neonics, a nicotine-like poison banned for outdoor use in the European Union.

Also, in an effort to protect their crops, Connecticut farmers plant neonic-coated seeds. When corn, soybean and wheat seeds are coated with neonics, the food we eat from those plants contains neonics. To a lesser extent, seeds for fruits and vegetables, including orchards and grapes, are coated with neonics, according to the Center for Food Safety. Nearly all corn farmers use neonic-coated seeds, but because the U.S. Environmental Protection Agency (EPA) doesn't require them to be classified as pesticides, there's no central way to track them, according to a study called "Neonicotinoids in Connecticut Waters" conducted by scientists at the University of Connecticut. An estimated 70% to 100% of corn seeds are coated with neonics, the report said, but it's unknown whether any Connecticut farmers use uncoated seeds. The coated seeds are brightly colored as if they're painted.

People also ingest neonics through water, by breathing it in or from skin contact.

Insecticides used for flowering shrubs and for flea and tick treatments for dogs and cats also contain neonics. A study at a university in London concluded people using flea treatment on their pets risk contaminating their hands with poisons for at least 28 days after the pesticide has been applied. When they wash their hands, the neonics flow down the drain and into wastewater.

The poison from these practices contaminates groundwater, rivers, streams and, eventually, Long Island Sound, according to the UConn study.

The study, partially funded by Pollinator Pathway, looked at two decades of U.S. Geological Survey (USGS) data collected in Fairfield County and from the Connecticut River in Enfield near the Massachusetts border. Groundwater samples were also collected in Old Lyme and Voluntown; none of the groundwater samples from those two areas tested positive for a common neonic called "imidacloprid."

If you've noticed fewer butterflies, fireflies and birds, the introduction of neonics is largely to blame, Washer said. When plants take up neonics, the pesticide is transported to all the tissues, including the leaves, flowers, roots, stems, pollen and nectar, which makes plants deadly for bees, caterpillars and some birds that eat the caterpillars. Loss of habitat and climate change also contribute to their decline.

The EPA has linked these chemicals to the decrease in bees, butterflies, birds and other wildlife, including endangered species.

Because neonics dissolve easily in water and their use is widespread, they pose a big risk to rivers, lakes and Long Island Sound, scientists said. Neonics kill insects that live in the water and serve as the base of the food chain for aquatic life, including frogs, toads, salamanders and fish.

Life depends on the food web.

"If you pull on one strand, it weakens the web," Leiz said. "If you pull on enough strands, it collapses."

Human impact of neonics

A Centers for Disease Control and Prevention study found half of Americans ages 3 and up were recently exposed to neonics.

In a 2022 study of 171 pregnant women in the U.S. and Puerto Rico, nearly 96% had neonics in their bodies. People ingest neonics through water, food grown with neonic-coated seeds and honey made by bees that fed from neonic-treated flowers. "Baby foods end up laced with neonics, and formula made from contaminated water increases the exposure," New York pediatrician Kathleen Nolan wrote in an op-ed piece in The Poughkeepsie Journal.

During a 10-year period, the EPA received more than 1,600 reports of people and pets poisoned with the neonic used to kill grubs; symptoms included muscle tremors, difficulty breathing and memory loss.

Recent studies linked neonicotinoids to human health threats, including harms to heart and brain development in fetuses, decreased sperm quality and quantity, as well as lower testosterone levels in men, the UConn study said.

While more human studies are needed, effects on mammals are cause for concern. In studies conducted with help from hunters, neonics were found in 61% of deer in 2019; two years later, 94% of deer's bodies contained the poison. The levels in 64% were high enough for it to be harmful. In rodents' testing, neonics were linked to still births, poor quality and quantity of sperm, smaller brain size, nerve damage and reduced thyroid function.

Neonics are significantly more toxic than DDT, which was banned in 1972 because of its devastating effects on bald eagles, osprey and peregrine falcons, Leiz said.

Neonics pervasive

In Connecticut, the most common neonic detected in water samples was "imidacloprid." Nearly half of the surface water samples tested since 2001 contained neonics. Fewer tests have been done on groundwater — the water under the soil that ends up in well water — than surface water.

Imidacloprid has been found in some groundwater samples, "which is concerning because many people in Connecticut rely on wells for drinking water. Unlike surface water, groundwater can hold onto pesticides for a long time, especially if they are not exposed to sunlight, meaning the risk could last for months or years," the report said.

Neonics found in Connecticut's water are at levels high enough to harm aquatic life and possibly affect human health, UConn scientists concluded. Testing shows that imidacloprid levels are highest in southern Connecticut and in places with large lawns, golf courses or farmland.

When neonics coat corn and soybean seeds, a chemical industry study reported, about 3%-5% is absorbed by the plant, 1% goes into the air and the rest ends up in the groundwater or nearby streams, said Tom Andersen, communications director for Connecticut Audubon.

Neonics kill bugs and zooplankton, which is a mostly microscopic organism at the base of the food chain.

"They are the next step up from plankton. The green you see in the water are plankton," said Bill Lucey, Long Island Soundkeeper with Save the Sound. "They are crucial to larval and juvenile fish that become food for tuna, striped bass, seabirds and whales."

A study found that after neonics were introduced in Japan in 1993, the zooplankton population plunged by 80%, and there was a corresponding drop in the population of eels and smelt that eat them, he said.

Even if neonics don't kill bees immediately, they interfere with wildlife's nervous system so it disrupts their navigation, Leiz said. Neonics are nicotine-based, and similar to a cigarette, she said, bees get addicted and return to the flower poisoned with neonics.

It disorients birds so they fly in a circular pattern rather than directly, extending their migratory distance, she said. This requires more food, which there's less of because neonics kill caterpillars that later turn into butterflies and moths. A single neonic-coated seed is enough to kill a songbird.

While birds need insects most from birth through the time when first fledging the nest, 96% of bird species require insects at some point in their life cycle, Leiz said. A scientist filmed pairs of breeding birds and determined a pair of birds needs 6,000 to 9,000 insects to feed their chicks from birth to fledging the nest.

Studies: Ineffective on target insects

Whether they're applied to prevent white grubs to lawns and golf courses or as coatings for corn seed, multiple studies suggest this preventative measure is ineffective. It's like a doctor giving antibiotics to every patient feeling sick, even if the infection is viral and not helped by antibiotics. The bacteria develop immunity to antibiotics so higher doses or longer treatment periods are needed to knock out bacterial infections. It's the same for the grubs, Washer said, because they've built up a resistance.

In a 2014 study, four scientists, including Richard Cowles of the Connecticut Agricultural Experiment Station, applied neonics to golf course grass in 2012, 2013 and 2014 in Sprague, Westerly and California. They found the majority of the grubs survived the treatment, but the poison remained in the environment.

Coated seeds are also not helping farmers. A study involving 84 fields in Quebec compared crop damage and yield for corn fields and soybean fields. Half were planted with plain seeds and half were planted with neonic-coated seeds. The scientists found no significant differences in how much crop was produced between the treated and untreated corn and soybeans.

What they're doing about it

Several nonprofit groups proposed a bill pending before the state legislature's Joint Environment Committee called House Bill 6916 — An Act Concerning the Use of Neonicotinoids.

"Our bill basically says don't use coated seeds. But if you need it, you can put a request in," said Leiz, of Connecticut Audubon. "If 95% of neonics are washing off coated seed and into ground and soil, what is benefit of it?" State Department of Energy and Environmental Protection (DEEP) Commissioner Katie S. Dykes' written testimony on the bill said that although "DEEP believes that the goals of the bill and its substantive provisions are a strong step forward and that a reduction in neonicotinoids will support healthier wildlife populations, we have concerns regarding this bill because of the resources needed to implement elements of its requirements in an efficient and timely manner. DEEP supports efforts to protect bees and other native pollinators and believes that reducing neonicotinoid use will protect native plant and animal species here in Connecticut, including pollinators and invertebrates and the fish, birds and mammals that depend on them as a food source."

It took nearly 50 years for bald eagles to recover after DDT was banned, Leiz said. Neonicotinoids are to the first quarter of the 21st century what DDT was to the middle of the 20th — a silent scourge that's devastating birds and other wildlife, and putting human health at risk, she said.

Washer, of the Norwalk River Watershed Association, added, "We're hollowing out the whole ecosystem of the river so we don't have a few brown patches on lawns. There's really no argument for neonics."

Editor's note: For a list of safer options to deal with grubs, go to <u>https://www.ctpesticidereform.org/pesticide-policy/neonics-the-new-ddt/non-chemical-alternatives</u>.