THE WESTERN PRODUCER

Neonic threat to wild birds questioned

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The CBC Radio show Quirks & Quarks ran a 25-minute documentary on neonicotinoid seed treatments this fall that suggested the insecticides are killing wild birds in Western Canada.

The documentary reported on the research of Christy Morrissey, a University of Saskatchewan toxicologist who says neonics are poisoning aquatic insects and endangering the birds that depend on them for food.

However, a University of Manitoba environmental toxicologist said such a claim is theoretical because the science backing the hypothesis is questionable and weak.

“I don’t think the data is all that compelling at this point. Certainly, the idea that we’re seeing significant impacts on the invertebrates, especially insects … that then go on to have impacts on birds, there’s a couple of steps there. That evidence is not all that strong,” said Mark Hanson, a U of M associate professor of environment and geography and an eco-toxicologist.

“While declines in certain groups and species of birds have been occurring in Canada, these declines pre-date the introduction of neonics by decades…. Other birds that rely on wetlands, such as waterfowl, have been increasing over the same period.”

Neonicotinoid seed treatments are applied to almost all of the corn and canola seeds planted in Canada and a portion of soybean seeds. They generated global headlines in late November when the Ontario government became the first North American jurisdiction to restrict their use.

Ontario wants to reduce the acres of corn and soybeans planted with neonicotinoid treated seed by 80 percent. The government said the restrictions are needed to protect pollinators and the broader environment. Neonicotinoids have been linked to a reported decline in bee populations in Canada and the United States.

The decision angered Ontario farm groups and Canada's seed industry, which called the policy unscientific, unjustified and political.

In a statement defending its decision, the province said neonics contaminate wetlands.

"It is possible for neonicotinoids to run off from fields to nearby water bodies where they can cause harm to aquatic insects and affect the animals that feed on those insects."

Morrissey's research, heavily promoted by the CBC, likely influenced the Ontario government's position. She has sampled soil and ponds in Western Canada and concluded that neonics are moving from the soil into wetlands.

"It's staying in the soil," Morrissey said.

"And then as soon as the snow melts or it rains … it's just running off the fields and into these ponds."

Morrissey has said the concentrations of neonics in ponds are high enough to kill aquatic insects.

"So birds that are flying around, they are primarily eating midges and mosquitoes," Morrissey told the CBC.

"The ducks in the ponds, they are reliant on the midges, for example. So we know that these insects are basically the food supply for a lot of wildlife."

In a scientific review in the journal Environment International, Morrissey said neonic contaminated water is an environmental threat in Western Canada and around the globe.

“It appears that environmentally relevant concentrations of neonicotinoids in surface waters worldwide are well within the range where both short- and long-term impacts on aquatic invertebrate species are possible,” she said.

“Neonics (exceed) effect thresholds in up to 74 to 81 percent of surface waters worldwide.”

Julie Anderson, a U of S toxicology graduate and scientist with Stantec engineering in Winnipeg, has also done a literature review of neonics in Canadian water bodies. The paper will be published in Science of the Total Environment. In the paper, which Hanson edited, Anderson concluded there is a potential for neonics to impact aquatic insects. However, she said there isn’t enough data to determine the amount of neonics in wetlands and if those levels are a threat to insects.

Hanson said neonicotinoids in water bodies can kill aquatic insects at small concentrations, but the measured levels in Canadian wetlands are typically lower than Morrissey’s recommended thresholds.

“When we look at the total concentrations of neonics observed in wetland s… these are on average usually less than 100 nanograms per litre (parts per trillion), which is below proposed and highly conservative acute values of 200 nanograms per litre for the protection of aquatic life.”

Other Canadian biologists have made similar comments about Morrissey’s research. They argue that with concentrations in the parts per trillion, it’s a stretch to conclude that neonics are killing billions of insects and cutting off the food supply to birds.

Hanson said Morrissey’s data is skewed to show higher concentrations because she treats small, temporary wetlands the same as larger ponds.

Agricultural land on the Prairies often has low spots known as ephemeral wetlands. Farmers can seed a crop in those spots in dry years, but in wet summers they become temporary ponds.

“The data that’s been presented really doesn’t distinguish between the types of wetlands,” Hanson said.

“(Ephemeral wetlands) tend to see the greatest concentrations (of neonics). There shouldn’t be any surprise there … because in previous years (farmers) have been seeding that spot or very close to that spot.”

Hanson said permanent wetlands on the Prairies contain no neonics because a vegetation buffer of cattails and larger volumes of water prevent contamination.

“Those larger wetlands have imperceptible amounts (of neonics),” he said.

“For wetlands from the Canadian Prairies, concentrations are usually in the nanogram per litre range, which is considered low, or below average, globally.”

Morrissey said in an email that Hanson’s comments are incorrect. She said she sampled wetlands of all sizes, from seasonal to semi-permanent to permanent.

“While shallower ponds tend to have higher concentrations on average, our highest neonic concentration, 3,100 nanogram per litre, was from a semi-permanent pond that was never dry in the past couple years.”

Hanson said another weakness in Morrissey’s findings is that neonics persist in water for days rather than years.

“These compounds have a half life, in surface waters, of a few days,” he said.

“They’re rapidly broken down … via sunlight.”

Morrissey agreed they do degrade relatively quickly when enough sunlight penetrates the water.

However, the chemicals can persist in soil for years, and insecticide-contaminated water will from soil into ponds when it rains.

“This will cause water concentrations to repeatedly spike at intervals,” he said.

“Thus, if you are an invertebrate in the water, you will be exposed continuously over a long period of time.”

As for Ontario’s decision to restrict the use of neonics in agriculture, Hanson said the public and politicians like black and white stories where pesticides are bad and nature is good.

“We tend to like simple narratives and solutions to what are inherently complex problems,” he said.

“Whenever I hear a politician make a claim that (a pesticide ban) is going to fix the environment, I am exceptionally dubious.”

Christy's Morrissey's literature review of neonics and water bodies can be found at www.sciencedirect.com/science/article/pii/S0160412014003183.

Cats eat a lot of birds

Cat owners should put their pets on a leash If Canadians really want to protect wild birds, says Mark Hanson, a University of Manitoba environmental toxicologist.

"For every bird that is killed by a pesticide, by Environment Canada's own estimates … 100 are killed by a cat."

Two papers by Environment Canada scientists Anna Calvert and Peter Blanche that were published in Avian Conservation and Ecology concluded that cats are the No. 1 killer of wild birds in Canada.

According to the scientists' estimates:

- There are approximately 5.2 billion wild birds in southern Canada.
- Each year, house cats and feral cats kill two to seven percent of those birds.
- In total, 268 million birds are killed by human activity and cats each year in Canada.
- Cats kill nearly 200 million of those birds.
- House cats kill 27 to 186 million birds, with a median estimate of 80 million.
- Feral cats kill 49 to 232 million birds, with a median of 116 million.
- Power transmission lines kill 10 to 41 million, with a median estimate of 25 million.
- Fifteen to 30 million birds die each year when they crash into houses.
- Agricultural pesticides kill 960,000 to 4.4 million birds, with a median estimate of 2.7 million.

Source: Avian Conservation and Biology