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How neonicotinoid pesticides are poisoning Canada's agriculture

By

[Ole Hendrickson](#)

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Agriculture in Canada is heading down a dangerous path, promoted by Health Canada's willingness to continue to approve the use of neonicotinoids despite the harm done by these chemicals. On July 24, Health Canada's Pest Management Regulatory Agency (PMRA) registered a "seed protectant" with the neonicotinoid clothianidin, manufactured by Valent Canada, Inc. for commercial use on wheat.

Members of the public have the opportunity to file a notice of objection when a pesticide is registered for a major new use. However, PMRA has already received five notices of objection to previous registration decisions on clothianidin to which it has not yet responded.

A survey conducted by the Canadian Association of Professional Apiculturists found that of 100,000 Ontario honeybee colonies wintered in fall 2013, over 58,000 were dead or unproductive in spring 2014. Even taking a conservative estimate of 20,000 bees per hive, this means that over a billion bees died in Ontario this past winter. This shortage of honeybees may be affecting production of pollinator-dependent crops such as blueberries and cherries. The survey notes that pesticide exposure and colony damage incidents during the past five years are raising beekeepers' concerns about neonicotinoids.

Treating seeds with nerve poisons

Meanwhile, neonicotinoid usage is soaring. According to Health Canada's Pest Control Sales Reports, sales went from just over 100,000 kg in 2008 to nearly 300,000 kg in 2010. Two neonicotinoids, thiamethoxam and clothianidin, vaulted into the top 10 list of insecticides -- even though only small amounts of these compounds are applied per hectare because of their high toxicity.

Pesticide-coated seeds accounted for most of the increased sales. Neonicotinoid use has grown to the extent that it is difficult for Canadian farmers to buy seeds for major crops such as corn and soybeans (and soon, wheat) that aren't treated with these nerve poisons.

This means ever-increasing levels in our food. In a [study published in 2014](#), researchers at the Harvard School of Public Health analyzed fresh fruits and vegetables purchased from neighbourhood grocery stores in Boston. They found that "all fruit and vegetable samples (except nectarine and tomato) and 90 per cent of honey samples were detected positive for at least one neonicotinoid; 72 per cent of fruits, 45 per cent of vegetables, and 50 per cent of honey samples contained at least two different neonicotinoids."

When neonicotinoid-coated seeds germinate and mature into crops, the pesticide dissolves in water and permeates every plant cell. Washing food cannot remove neonicotinoid residues. The Harvard researchers noted that although neonicotinoid residues in their study were below levels allowed by the U.S. Environmental Protection Agency, the way these levels are determined "does not take into sufficient account the protection of human health from long-term low-dose exposure." This is worrisome, given the mounting evidence that exposure to nerve poison pesticides is a leading cause of neurodegenerative disorders such as autism, Alzheimer's disease, and Parkinson's disease.

A return to integrated pest management

While Health Canada appears to be ignoring scientific concerns about neonicotinoids, Ontario's Agriculture Minister Jeff Leal recently announced that the province will restrict use of neonicotinoid insecticides, noting their "widespread, indiscriminate use." Minister Leal is proposing "a system that targets the use of neonicotinoid-treated seed only to areas or circumstances where there is demonstrated need" -- a sign that integrated pest management (IPM) may be making a comeback.

The UN Food and Agriculture Organization calls IPM "an ecosystem approach to crop production and protection that combines different management strategies and practices to grow healthy crops and minimize the use of pesticides." Neonicotinoid seed coatings are contrary to IPM, because insecticides are automatically applied whether or not pests are present.

Neonicotinoids are not just killing bees. As much as 95 per cent of the pesticide coating on seeds is [washed off into soil](#) and can easily enter water bodies. Two [recent studies](#) found that neonicotinoids in water bodies frequently exceed toxicity levels for aquatic insects. Another [new study](#) shows a strong relationship between neonicotinoid pollution and disappearance of farmland birds.

We allow this war on insects, with its severe collateral damage, to ramp up and continue at our peril. Biodiversity expert [E.O. Wilson warns](#), "If we were to wipe out insects alone -- just that group alone -- from this planet, which we are trying hard to do -- the rest of life and humanity with it would mostly disappear from the land, and within a few months."

Neonicotinoid-coated seeds are only one example of indiscriminate and broad-scale agricultural pesticide use. Two other examples are related to genetically modified (GM) crops.

In the mid-1990s, Monsanto introduced "Roundup-Ready" seeds, genetically modified to tolerate exposure to the herbicide glyphosate. Glyphosate is now the Number 1 pesticide in Canada, with roughly 35 million kilograms sold in 2010. Glyphosate-tolerant GM crops provide farmers a simple, flexible and forgiving weed-management system: don't worry, just spray.

Unsurprisingly, given that the North American agricultural landscape is annually saturated with glyphosate, weeds have evolved that can tolerate this herbicide. As a result, farmers are switching to other herbicides and spraying them in greater amounts. In a [2012 article](#), Charles Benbrook writes:

"Contrary to often-repeated claims that today's genetically-engineered crops... are reducing pesticide use, the spread of glyphosate-resistant weeds in herbicide-resistant weed management systems has brought about substantial increases in the number and volume of herbicides applied."

The other main category of GM crops is those that are engineered to withstand insect attacks by producing the bacterial toxin Bt -- a "natural" pesticide, used by organic farmers. To date, few insect pests have evolved resistance to Bt. This means that GM crops with Bt have reduced the use of more toxic insecticides -- a good thing. But can this last? Pests are much more likely to evolve resistance to Bt if exposed continuously in a field of GM crop plants, as opposed to an occasional spray. Also, like neonicotinoids, Bt is present in every cell of a GM plant and cannot be washed off food before it is eaten, raising concerns that this bacterial toxin may be triggering immune reactions in our guts.

There are also lingering concerns about impacts of Bt crops on non-target insects such as the Monarch butterfly. This species is in extremely rapid decline, with glyphosate eliminating the

main food plant (milkweed) for its larvae, and neonicotinoids contaminating other plants on which adults feed.

Agricultural landscapes have been transformed into killing fields -- swallows, bats, frogs, swifts, dragonflies, bumblebees, honeybees, butterflies -- all are vanishing.

Alternatives to neonicotinoid use

According to the conclusions of the Task Force on Systemic Pesticides (www.tfsp.info), use of neonicotinoids may provide no net gain or even a net economic loss on some crops. In a [2011 article](#), Nicholas Birch and his colleagues note that "despite costly and increasing inputs of pesticides (insecticides, fungicides, herbicides), current figures for global crop losses still show that pests, diseases, and weeds are reducing food availability and security considerably."

IPM affords a broad range of safer alternatives, including organic farming, crop mixtures and rotations, using less sensitive crop species in infested areas, using trap crops, and biological control agents. Birch and colleagues point to a 2005 survey of 62 international IPM projects covering 26 countries and 25.5 million hectares of crops (rice, corn, wheat, sorghum, vegetables, potatoes, cotton, and beans). Over 60 per cent of the projects resulted in both reduced pesticide inputs and increased yield. On average, yields increased by 40 per cent and pesticides were reduced by 60 per cent.

A key feature of IPM is that biological pest control measures are routinely applied; chemical controls are used only when necessary. While biological control may involve introducing an individual species that attacks a crop pest, it is a much broader concept. At the landscape level, biocontrol aims to conserve wildflower borders, buffer strips, and hedgerows as refuges for predators of crop pests.

According to Birch and colleagues, suppressing insect pests by promoting natural enemy assemblages has been extensively tested and shown to be successful. They note that IPM requires investment in the natural sciences: knowledge of soil organisms, crop and non-crop plants, multiple herbivores, and natural enemies such as predators and parasitoids. An overall goal is to restore diversity and to avoid unstable, over-simplified systems that require constant chemical interventions.

How we choose to grow food will determine our health -- and the health of many other species. Fortunately Ontario's Minister of Agriculture seems to be on the right track in restricting neonicotinoids and promoting integrated pest management. Swift progress in these directions is urgently needed.

Ole Hendrickson is a forest ecologist and current president of the Ottawa River Institute, a non-profit charitable organization based in the Ottawa Valley.

NORAHG RESPONDS TO HENDRICKSON — MISLEADING THE PUBLIC WITH AMATEURISH & DISCREDITED STUDIES SUCH AS THE HARVARD STUDY

Ole Hendrickson is WRONG ! Neonicotinoid Insecticides are ABSOLUTELY NOT poisoning Canada's agriculture, and are NOT the cause of Bee Colony Collapse Disorder ! Science and statistics DO NOT support demands to RECKLESSLY PROHIBIT against Neonicotinoid Insecticides used in the Agriculture Industry. Hendrickson is a mere Anti-Pesticide Screeching-Monkey Forest-Ecologist in Ottawa, Ontario, and has absolutely NO valid training or recognized background in matters concerning pest control products and bee-keeping. Hendrickson SHOULD LEAVE SCIENCE TO THE REAL EXPERTS, and STOP RELYING UPON AMATEURISH AND DISCREDITED STUDIES such as the so-called Harvard Study. Bee experts have quickly criticized the so-called Harvard Study, which was NOT performed by Harvard University. The study could NOT even be published legitimately in North America, and could only be published in some obscure publication in Italy. Moreover, the author of the study has NO RECOGNIZED EXPERTISE in matters concerning honeybees. Experts complained that the study had exposed bees to an unrealistically high dose of insecticides. The Government of Australia noted that — (1) The Harvard Study is clearly DISCREDITED because bee colonies were fed « *astronomical* » levels of imidacloprid-laced corn syrup. (2) The Harvard Study is also DISCREDITED because the sample sizes were far too small. (3) The Harvard Study is further DISCREDITED because the symptoms the colonies subsequently suffered did NOT, in fact, mimic the symptoms of Bee Colony Collapse Disorder. Everyone agrees that Neonicotinoid Insecticides may be lethal to bees in extremely large doses. But, in the real world, bees are NOT getting drenched with these insecticides. Overwhelming scientific evidence has consistently indicated that Neonicotinoid Insecticides are SCIENTIFICALLY SAFE and CAUSE NO HARM TO BEES when used properly. The so-called Harvard Study is merely an AMATEURISH ATTEMPT TO PERFORM BEE RESEARCH, and has been DISCREDITED. <http://wp.me/p1jq40-81U> <http://wp.me/p1jq40-81U> Hendrickson should stop relying upon such AMATEURISH STUDIES that are designed to MISLEAD THE PUBLIC. PROHIBITION WILL NOT SAVE BEES. <http://tinyurl.com/pxqzh6m> For the whole truth regarding bees, go to ... <http://wp.me/p1jq40-7zT> <http://wp.me/p1jq40-6WJ> <http://wp.me/P1jq40-2BA> <http://wp.me/p1jq40-6H8> <http://wp.me/p1jq40-7ty> NORAHG is the National Organization Responding Against HUJE that seek to destroy the Green space industry. WILLIAM H GATHERCOLE AND NORAH G Get the latest details at <http://pesticidetruths.com/> <http://pesticidetruths.com/toc/> <http://wp.me/P1jq40-2rr> <https://www.facebook.com/norah.gfon>

