



POISONING OUR BEES



Several years ago, scientists hosted a bee exhibit in Switzerland. They asked visitors, friends, and colleagues to send them honey samples. They soon had more than 200 samples from around the world.

Scientists tested the samples for five kinds of neonicotinoid pesticides (neonics). They found neonics in three out of four samples. The level was too low to hurt humans. But almost half of the samples had enough to harm honeybees. North American honey was the worst – 86 percent of samples were contaminated.

“We were shocked,” said the lead researcher, Dr. Edward Mitchell. “It just shows us that [these pesticides] are everywhere.”

NEONICS

Neonics are nicotine-based pesticides. Farmers use them to keep pests out of their fields and orchards. They were introduced in the 1990s. Now they’re the

most common insecticides in the world.

“These neonicotinoids are extremely, extremely toxic,” says Dr. Mitchell. They are absorbed into every part of the plant – roots, stems, leaves, flowers, pollen, and nectar. Then the insects that eat the plant, or parts of it, are harmed.

In bees, the toxins affect the brain. They make it hard for the bees to learn and remember. That means they can’t find their way back to their hive. That’s a death sentence for a bee. Neonics also make bees more vulnerable to parasites and disease.

“Honeybees are social. Honey is the communal fridge,” says biology professor Amro Zayed. If this shared fridge is poisoned, several generations of bees will eat contaminated honey.

THE EVIDENCE IS CLEAR

In 2015, an international task force reviewed the effects of

BEEKEEPING IN CANADA

- There are over 8700 beekeepers in Canada, with about 694,000 honeybee colonies.
- Canada produces 81 million kilograms of honey a year.
- Alberta, Saskatchewan, and Manitoba produce 84 percent of Canada’s honey.
- The value of bee pollination in Canada is about \$2 billion a year. That’s about 10 times the value of honey produced.
- The Swiss study examined four honey samples from Quebec and three from southern B.C. They found two to five neonics in the Quebec samples. The B.C. samples contained four or five.

neonics. It looked at 1100 studies. The evidence was clear. Neonics are harming honeybees. And the damage isn’t limited to bees. Birds, frogs, fish, and other insects are affected, too.

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In September, the task force added another 500 new studies to its review. The new studies backed up the original results.

“Neonics represent a major worldwide threat to **biodiversity** and ecosystems and the benefits we receive from nature,” reported the task force.

Crops need a variety of pollinators to survive. Our ecosystems need a variety of bugs to be strong and **resilient**, says neurobiologist Christopher Connolly. If we keep using pesticides **indiscriminately**, “we don’t know when we can expect a tipping point.”

CALL FOR A BAN

The task force has asked countries around the world to stop using neonics. Europe has already banned the three most common neonics. By next September, France will be neonic-free.

Lisa Gue of the David Suzuki Foundation says Canada needs to catch up.

During the winter of 2013-2014, Ontario’s bee industry lost 58 percent of its honeybees. In response, the province started limiting the use of neonics

THE BUSY HONEYBEE

On a warm, summer day, a bee colony is buzzing with 60,000 worker bees coming and going.

In total, a colony of bees can produce 45 kilograms of honey, or more, in a season. Beekeepers extract some of it. The rest becomes the colony’s main source of food through the winter.

While collecting nectar to turn into honey, the bees’ bodies become coated with a sticky pollen. They brush off the pollen on the next flower’s pistil. That pollinates the flower so it can produce seeds or fruit.

About one-third of the food we eat comes from pollinated plants. Without bees, billions of dollars of farm crops would go unpollinated – and the variety of food on our plates would dramatically decrease.

Bee populations have been declining worldwide in recent years. Besides neonics, parasites such as mites, climate change, genetically modified crops, stress from hive transportation, and even cellphone radiation may all be contributing to this decline.

on corn and soybean crops. Quebec has proposed similar regulations. Meanwhile, Vancouver and Montreal have banned pesticide use within city limits.

Health Canada has been studying neonics since 2012. So far, it has only proposed banning one of them – by 2021. The rest are still under review.

Environmental groups want Health Canada to speed up. Ms. Gue hopes the new report will be “a wake-up call.”

NOT SO FAST

It’s not that easy, says Ron Bonnett, president of the Canadian Federation of Agriculture. Farmers can’t afford to give up neonics. They need them to fight off pests. We need either to find safer alternatives, or safer ways to apply neonics.

Dr. Mitchell disagrees. We just need to change the way we raise our crops, he says. It’s been four years since Europe’s farmers gave up neonics, and their harvests haven’t suffered. ★

DEFINITIONS

BIODIVERSITY: diversity among and within species in an environment

INDISCRIMINATELY: not showing careful thought or good judgement

RESILIENT: recovering readily from adversity



ON THE LINES

Answer the following in complete sentences:

1. How much honey is produced in Canada?

2. Which provinces produce the most honey?

3. What happens while a bee is collecting nectar?

4. Describe why bee pollination is important.

5. What are **neonics**?

6. Explain how these pesticides work.

7. How do neonics affect bees? Explain.

8. What happened to Ontario honeybees during the winter of 2013-2014?

9. What did Ontario do to reduce the use of neonics?



BETWEEN THE LINES

An *inference* is a conclusion drawn from evidence. A *plausible inference* is supported by evidence in the article and is consistent with known facts outside of the article.

What inference(s) can you draw from the fact that the four honey samples from Quebec were contaminated with between two and five neonics, and the three samples from B.C. contained four or five?

BEYOND THE LINES

Find out what you can do to help protect honeybees. Start your research at <https://foe.org/projects/food-and-technology/beeaction/> Then, consider: Which actions on your list would you be willing and able to follow through on? Explain.

JUST TALK ABOUT IT

1. *What if*... bee populations continue to shrink?
2. Albert Einstein once said that if the bees disappeared, “man would have only four years of life left.”
 - a) What reasons can you suggest to explain Einstein’s comment?
 - b) For what reasons do you agree with Einstein’s statement? For what reasons do you disagree? Explain.

ONLINE

Note: The links below are listed at www.lesplan.com/en/links for easy access.

1. Watch “What’s happening to honeybees?” from The SciShow at <https://www.youtube.com/watch?v=Zgc5w-xyQao>
2. Listen to TEDx “Save the bees! But how?” at <https://www.youtube.com/watch?v=Lhb-KQdok7s>
3. “What is killing our bees?” Find out by watching this BBC documentary at <https://www.youtube.com/watch?v=Y4C8Em3n5YM> ★