



# CANADA'S BEES ON THE BRINK



## PROTECT OUR PRECIOUS POLLINATORS – BAN BEE-KILLING PESTICIDES



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**B**ees and wild pollinators are literally the stuff of life. They are responsible for producing one out of every three bites of food we eat. Without them crops such as apples, coffee, tomatoes, strawberries, tea, peaches and flaxseed would be decimated. Our natural world and food security rely on pollinators, which is why it is so important we protect them.

The plight of bees and wild pollinators has caused significant concern for beekeepers, the public and scientists for over a decade, as bee populations have declined rapidly in many areas of the world.

In the United States between 2008 and 2013 studies found that wild bees declined across 23 per cent of their range.<sup>1</sup> In Canada the news is also serious. Over the last decade losses of honey bee hives have been far above average, hitting an astounding 58 per cent in Ontario in the winter of 2014.<sup>2</sup> The dramatic decline of native bumble bees such as the Rusty-patched, American and Western bumble bees has also set off alarm bells.

Bees and native pollinators face a slew of threats. Loss of habitat, pathogens and disease, and climate change all play a role in their decline. **But it is a deadly class of pesticides called neonicotinoids (neonics) which have been increasingly implicated in mass bee poisonings, pollinator declines and even the loss of insect-eating songbirds.**

The good news is that as scientific studies continue to stack up, showing the overwhelming toxicity of neonics to bees and other beneficial insects, we are starting to see people and jurisdictions take action to protect pollinators.

**Read this paper to find out:**

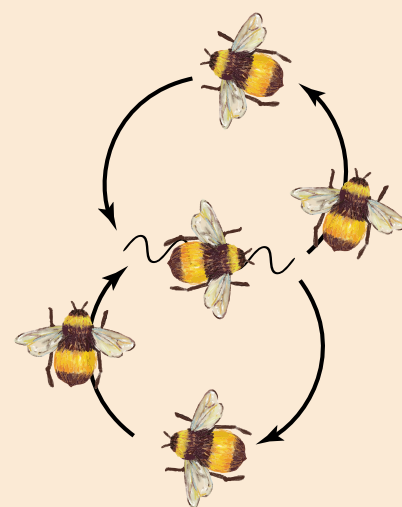
- How new science is confirming exactly why neonics should be banned.
- Which steps other jurisdictions are taking to protect bees against neonic pesticides.
- What bold action the Wilderness Committee is taking to protect Canada's bees.

Banning neonic pesticides is a goal we can achieve. By working together, sharing information and demanding action we can help safeguard bees and wild pollinators, maintain our food security and help protect the natural world. Let's do it!

### Waggle Dance:



Did you know when honey bees get back to the hive they communicate to other bees through an elaborate waggle dance? The waggle dance, which was decoded by Austrian scientist Karl von Frisch in 1973,<sup>3</sup> shows other bees where to travel to find desirable flowers and the best source of food. In 2014 scientists at Sussex University in England were able to map the area and distance bees foraged by carefully observing how bees move their bodies in the pattern of a number eight and "by measuring the angle of the dance in relationship to the sun."<sup>4</sup>



**Photos top:** Bumble bees on purple coneflower (Chris Bidleman), Monarch butterfly on milkweed pod (Robert McCaw), Rusty-patched bumble bee (Christy Stewart), Barn swallow (Robert McCaw).

**Photo background:** Garden fence at City Farmer Garden in Vancouver, BC (Earl Havlin).

# ALL WE ARE SAYING IS GIVE BEES A CHANCE

As people have mobilized around the world in defense of bees and wild pollinators, decision-makers are sitting up and taking notice. Here are some of these promising policy changes below.

**ONTARIO AND QUEBEC:** In 2015 Ontario moved to heavily restrict the use of neonics on soybean and corn crops by 80 per cent. This followed the devastating 58 per cent loss of honeybees in the winter of 2014, and the mass poisoning of honey bees in the spring of 2012 and 2013 after neonic-treated corn and soybean crops were planted. Before the restrictions, almost 100 per cent

of corn seeds planted in Ontario were pre-treated with neonics.<sup>5</sup> In December 2015 Quebec announced they were following Ontario's lead and also taking steps to reduce the use of neonics.<sup>6</sup>

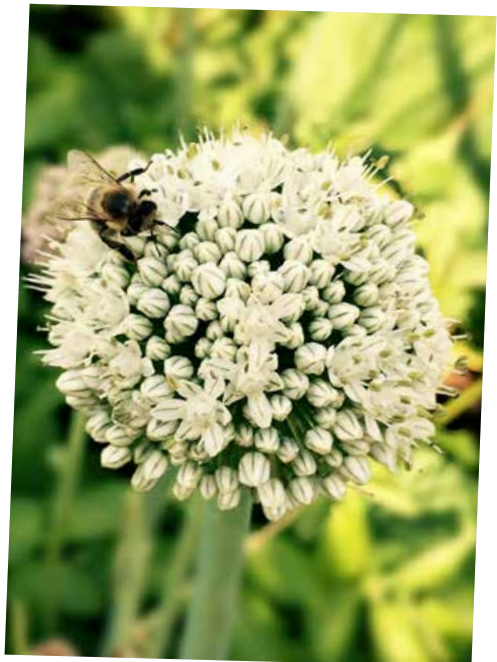
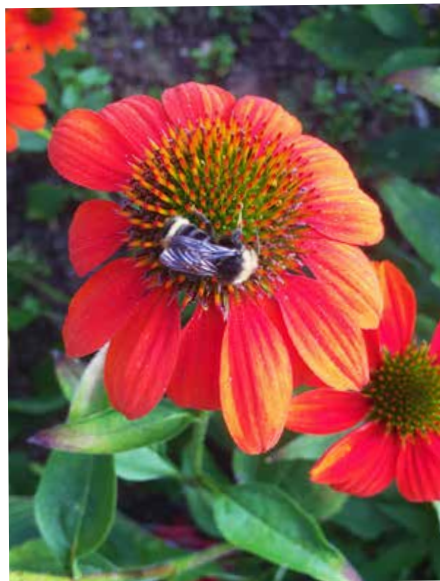
**VANCOUVER:** In the summer of 2016 Vancouver joined Montreal as one of the two largest Canadian cities to ban the use of neonics within city limits. The Vancouver ban was part of the Greenest City Plan which prioritized the "reduction of toxins in the public and private sphere." This initiative followed a move by the Vancouver Parks Board to stop the use of neonics in 2014 and to stop buying neonic-treated plants.<sup>7</sup>

**UNITED STATES:** In a largely unheralded memo in the summer of 2014, the US Fish and Wildlife Service (FWS) – citing concerns about biodiversity – quietly announced they were banning the use of genetically modified organisms and phasing out the use of neonics from all wildlife preserves as of January 2016.<sup>8</sup>

**FRANCE:** In July 2016 in reaction to declining bee populations, the French National Assembly moved to ban the use of neonicotinoids. Although the move to ban neonics faces one final obstacle of approval by the French Senate, it is anticipated the ban will go through and come into effect

on Sept. 1, 2018.<sup>9</sup> This initiative by France is good news as it goes well beyond the restrictions on three types of neonics implemented by the European Union in 2013.<sup>10</sup>

**EUROPEAN UNION:** In 2013 the EU heavily restricted the use of three neonics on flowering crops, for a period of two years. Currently, the European Food Safety Authority is conducting large-scale field trials to assess whether these restrictions will continue. While the field trials – which are anticipated to be complete in January 2017 – are underway, the current restrictions remain in place.



Photos: Monarch butterflies on golden rod (Robert McCaw), Yellow-faced bumble bee on hollyhock flower (Gwen Barlee), Rusty-patched bumble bee on purple prairie clover (Christy Stewart), Honey bee on an allium flower (Gwen Barlee).

## WHY ARE WE ARE GOING TO BAT FOR THE BEES?



In July 2016 the Wilderness Committee went to court to protect our bees and wild pollinators from deadly neonic pesticides. **Going to court is not something we do lightly, but the plight of our bees and wild pollinators is so serious, we knew we had to take action.**

Across Canada bee populations are suffering. From the alarming overwintering mortality of honey bees to the dramatic decline in bumble bee populations – such as the Rusty-patched bumble bee in Ontario and Quebec, to the Western bumble bee in British Columbia – bees and wild pollinators are struggling against

habitat loss, pathogens and pesticides. Science is pointing to the lethal and sub-lethal impact of neonic pesticides – a class of extremely toxic pesticides used widely across Canada and the world – as having a devastating impact on bees.

That is why we, along with our allies from the David Suzuki Foundation, Friends of the Earth Canada and Ontario Nature, are challenging the Pest Management Regulatory Agency (PMRA) of Canada for their unlawful registration of pesticides containing clothianidin and thiamethoxam – two very deadly bee-killing neonics. The PMRA is required to have "reasonable certainty"<sup>11</sup> that no environmental harm will result when they register pesticides for use in Canada, but this standard certainly hasn't been met with the registration of clothianidin and thiamethoxam.

**This court case could set an important precedent for the protection of our pollinators,** by potentially deregistering two very toxic neonics and requiring the federal PMRA to undertake more thorough reviews of dangerous pesticides before they are allowed to be used in Canada.



Photo: Honey bee on cosmos flower (Gwen Barlee).

## WESTERN BUMBLE BEE: POLLINATOR IN PERIL

The Western bumble bee (*occidentalis subspecies*) is found in southern British Columbia, Alberta and Saskatchewan. A habitat generalist, this variable coloured bee can be found in open fields, prairie grasslands, urban parks, and deciduous and mixed wood forests gathering pollen and nectar. A proficient pollinator of cranberries, cherries, apples and tomatoes, until recently this hardy bumble bee was commonly found throughout its range

However in recent years, the Western bumble bee has undergone a startling decline of over 30 per cent and has completely disappeared from large chunks of its habitat in the western United States and Canada – including places where it was once abundant.<sup>12</sup>

Monoculture agriculture practices, disease transmission from commercially raised bumble bees and habitat loss are all implicated in its dramatic decline, but as with many other bumble bee species, the role of neonics has become an increasing concern to scientists.



Photos: Western bumble bee (Hatfield/Xerces Society), Sunflowers in North Vancouver, BC (Gwen Barlee).

# THE GROWING CONCERN WITH NEONICS

Neonicotinoids (neonics), first introduced into commercial use in 1991, are a class of pesticides that are extremely toxic to bees and wild pollinators. Here's the buzz on neonics:

- Known as a "systemic pesticide" neonics are absorbed into every portion of the plant including the nectar and pollen.

- Designed to kill chewing pest insects, neonics are as toxic to honey bees and wild pollinators as they are to "nuisance" insects.

- Neonics are now the most widely used class of pesticides in the world.

- In tiny doses neonics cause acute toxicity to bees and wild pollinators,

and serious sub-lethal impacts such as failure to communicate, impaired memory and learning, less success in breeding and reduced resistance to disease.<sup>13</sup>

- By weight neonics are up to 10,000 times more toxic than DDT.<sup>14</sup>

- The vast majority of neonics end up in the soil and eventually make their way into

water bodies. In a recent 2014 study by the US Geological Survey conducted in the US and Puerto Rico, neonics were found to be present in more than half of the 38 streams tested.<sup>15</sup>

- Studies in the Netherlands showed that where there is widespread contamination of waterways by neonics, there is a corresponding decline in insect-eating birds such as skylarks, barn swallows and mistle thrush.<sup>16</sup>

- Although touted for their ability to increase crop yield, a review of 19 studies by the Centre for Food Security found that in most cases neonics did not actually increase yield.<sup>17</sup> This followed a US Environmental Protection Agency review of neonics used on soybean crops, which stated that "seed treatments with neonicotinoids provide negligible or no overall benefits to soybean production in most situations."<sup>18</sup>

**We know that these insecticides are highly toxic to bees.**

- Dr. Christian Krupke, Associate Professor of Entomology at Perdue University.<sup>19</sup>



Photos: Honeybee hive, flower garden and outside honeybee hive in North Vancouver, BC (Gwen Barlee).



Photos above: Bayer insecticides (Creative Commons), Corn with insecticide (Creative Commons), A farmer sprays his apple orchard in Lake Country, BC (Dave Blakey/All Canada Photos).

Ontario Beekeeper Dave Shuit believes he has lost tens of millions of his honey bees to neonic poisoning. **"It kills all insects,"** Schuit said. **"It doesn't discriminate between good and bad insects. It kills them all . . . This product is ripping the whole ecosystem apart . . . Where are the barn swallows? The barn swallows are an endangered species now. The writing is on the wall."**<sup>20</sup>



## FOLLOW THE SCIENCE

Science showing the lethal impacts of neonics to bees and wild pollinators continues to accumulate at a rapid pace. In 2014 a review of over 800 papers on neonicotinoids and Fipronil, another systemic pesticide, was conducted by 50 independent scientists. The results rocked the scientific world. The researchers concluded that the use of these pesticides not only harms bees and wild pollinators, and other non-target beneficial insects, but is likely to "have a wide range of negative biological and ecological impacts" and could "result in substantial impacts on biodiversity and ecosystem functioning."<sup>21</sup>

Since then additional papers have shown that:

- Conventionally grown crops are treated with neonics, which also affect the wildflowers that grow next to them. Wildflowers also get corrupted by neonics, and a combination of other pesticides, and fungicides.<sup>22</sup>

- The impact of neonics on bees and wild pollinators is so pronounced that it "may compromise the sustainability**

**of our agricultural production."**<sup>23</sup>

- Exposure to neonics reduces pollination services provided by bumble bees. The study found "bumble bee colonies exposed to neonicotinoid pesticide provided lower visitation rates to apple trees and collected pollen less often."<sup>24</sup>

- An April 2015 report by the European Academies Science

Advisory Panel expressed concerns about neonics, especially the prophylactic (preventative) use of the pesticide. "There is an increasing

body of evidence that the widespread prophylactic use of neonicotinoids has severe negative effects on non-target organisms that provide ecosystem services including pollination and natural pest control."<sup>25</sup>

- In a study on soybean crops, slugs (considered a pest insect by farmers to these crops) were not negatively impacted by the use of neonics. However, over

60 per cent of beneficial beetles (Chlaenius tricolor) that predate on the slugs were impaired or killed by the pesticide, with the result being "a loss of crop due to a decline in beneficial insect predators and an increase in pest slug population."<sup>26</sup>

- Neonics negatively impact honey bee queen populations.**

A recent study published in the journal Nature showed not only are neonics very toxic to bees, but they "severely impact" honey bee queens. Exposure to neonics at a field-realistic level impaired the reproductive anatomy of queen bees.<sup>27</sup> This news is of particular concern as the health of the queen is crucial to the overall survival of the hive.



Photos: Honey bee on cosmos flower (Gwen Barlee).

### Butterflies in Decline

US Department of Agriculture researchers are raising the alarm that the use of neonics may be negatively impacting monarch butterflies. These regal butterflies have undergone a dramatic decline in the last twenty years. Known for their striking colour and multigenerational migration, monarchs rely heavily on milkweed, a plant that is considered a nuisance by farmers because it is toxic to range animals. In studies, USDA researchers found that just one part per billion of clothianidin, a very potent neonic, could impact monarch caterpillars.<sup>28</sup>



Photos: Monarch butterfly, Caterpillar on milkweed (Robert McCaw).

# TAKING CARE OF THE BIRDS AND THE BEES

Protecting our bees and wild pollinators is something people intuitively understand. Whether it is safeguarding our food security or simply understanding the vital role pollinators play in helping the natural world flourish, Canadians from coast to coast are speaking up and taking action to protect bees – and their actions could not be timelier.

The threats to our pollinators are manifold: disease and pathogens, loss of habitat and climate change are serious and ongoing threats. But it is the profound danger posed by neonics that has raised the most concern. Wildly toxic to bees and wild pollinators in minute doses, neonics have been implicated in mass bee die offs, colony collapse disorder and the dramatic decline of numerous native bumble bee species. The well-documented dangers of bee-killing neonics are why the Wilderness Committee is standing up for our pollinators and calling for **a complete ban on neonic usage in Canada**. If we want to prevent a silent spring, we need to put the birds and the bees above corporate profits and short-term thinking.



Photo: Chinese farmer hand pollinating a fruit tree (Kevin Frayer).

A future without bees is a reality for rural Chinese farmers in Hanuyuan county who've now employed

workers to do the jobs of bees by hand pollinating fruit trees. With toxic pesticides wiping out much of the local bee population, farmers in the "the world's pear capital," have to deal with the exhaustive task of transferring pollen from male flowers to female flowers to fertilize them.<sup>29</sup> It's a sobering reminder of how crucial bees are to food production and security. **This process is a drastic step that we shouldn't have to take in the future, if we protect our pollinators from the threat of neonics and harmful pesticides.**



Photos: Eastern bluebird (Robert McCaw), A farmers market (All Canada Photos), Bee hotel at City Farmer Garden in Vancouver, BC (Earl Havlin).

## HELPING BEES IS AS EASY AS 1, 2, 3...

- 1. Write to the Prime Minister.** Ask him to protect Canada's bees and wild pollinators by enacting a complete nation-wide ban on bee-killing neonicotinoid pesticides. If you have already contacted the Prime Minister, get three of your friends to take action. **Let's give bees a chance!**
- 2. Tell your friends and family.** When more people understand the dangers of neonics, we have a better chance of protecting our bees and wild pollinators. Contact us at 1-800-661-9453 for additional copies of this paper to distribute to friends and neighbours. **Let's create some buzz!**
- 3. Plant a bee-friendly garden.** Choose flowers that bees love. Pollinators are passionate for bee balm, catnip, lavender, globe thistle, cosmos, allium and many others flowers. Make sure that the plants you buy are neonic-free. More and more stores are phasing out neonics, so it's getting easier to guarantee that the plants you purchase are not contaminated with neonics. You can find out more here: [bit.ly/2bjgui5](http://bit.ly/2bjgui5)



Photo: Plants and flowers in a local garden in North Vancouver, BC (Gwen Barlee).

### Contact Information:

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# YES! I'LL GO TO BAT FOR THE BEES

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