

Pollinator Health

Pollinator Protection

Improving the health of bees and other pollinators is a necessity. Without pollinators, much of the food we eat and the natural habitats we enjoy would not exist. Taking action now to protect pollinators and reduce toxic pesticide use is a positive step for our environment and economy.

About Pollinators

With more than 700 native species in Canada, bees are the most common pollinator. Other pollinators include butterflies, moths, wasps, flies, some beetles, hummingbirds.

Pollinators transfer pollen in and between flowers while visiting a plant for food, mates, shelter and nest-building materials. This process is known as pollination.

Environmental Importance

Pollination is important because it helps create a diverse plant population.

Many crops rely on pollinators. These include:

- apples
- cherries
- peaches
- plums
- cucumbers
- asparagus
- squash
- pumpkins
- melons
- blueberries
- cranberries
- certain field crops
- and many other crops

Pollination makes plants which:

- create food and shelter for wildlife and people
- produce fuel and biomass
- moderate temperature and produce oxygen.

Economic Importance

Beekeepers produce honey, beeswax and other retail items. They also provide a service to farmers by providing honey bees to ensure there are enough bees to pollinate their crops.

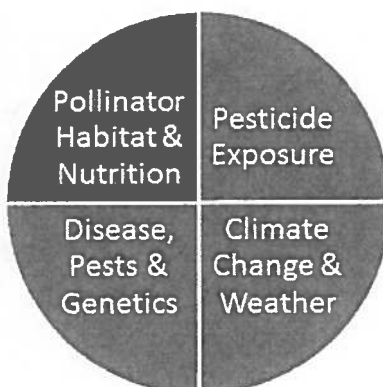
In Ontario 3,000 registered beekeepers operate 100,000 honey bee colonies. Ontario's managed honey bees and bumble bees generate about \$897 million of the roughly \$6.7 billion in sales for agricultural crops grown in the province each year. This is equivalent to about 13 % of the province's total annual crop value.

In addition to managed bees, wild pollinators also make a significant contribution to Ontario's agriculture and the environment.

Pollinator Health

The declining health and population of bees and wild pollinators is cause for global concern.

This decline in bees and overall pollinator health is likely due to a number of complex factors that fall under four areas:



The decline of these pollinators is a serious problem that requires immediate action to ensure that Ontario's food system and natural environment are protected.

Ontario's Pollinators

Ontario beekeepers have experienced unusually high honey bee hive losses over the winter.

In 2010-2011, winter mortality rate for honey bees was 43%. In 2012-2013 the rate was 38%. Last winter the mortality rate reached its highest level at 58%. Overwinter dies offs have been an average of 34% over the past 12 years. The level generally considered to be acceptable and sustainable by beekeepers is 15 %.

A large number of bees are also dying during the summer and fall months. In 2012, approximately 240 bee yards reported bee deaths. This rose to 340 yards in 2013. The federal Pest Management Regulatory Agency reported that approximately 70% of the dead bees found in 2012 and 2013 tested positive for neonicotinoid insecticides residues. The federal Pest Management Regulatory Agency stated that current agricultural practises related to neonicotinoid-treated seed are not sustainable.

Neonicotinoids

Neonicotinoids are a class of synthetic pesticides that are chemically similar to nicotine. They are neurotoxins that kill insects through attacking receptors in nerve synapses. Neonicotinoids are used for field crops, horticulture, nurseries, and urban forestry. While they are targeted at insect pests, they also harm beneficial insects like bees.

Bees and other pollinators may be exposed to these pesticides through spray, dust from treated seeds, residue and contaminated pollen, nectar and water.

3 types of neonicotinoids are considered to be highly toxic to bees and have effects at very low levels:

- Imidacloprid
- Thiamethoxam
- Clothianidin

Neonicotinoid insecticides are systemic and persistent. They spread through plants, making all parts of them harmful to the insects feeding on them. These insecticides also take a long time to break down in soil.

The potential for carry-over of residues may be of concern since these may be transported through run-off from fields to nearby water bodies.

A recent review of 800 peer-reviewed scientific papers by the International Union for Conservation of Nature (IUCN) Task Force on Systemic Pesticides indicated that neonicotinoid insecticides are having impacts on pollinators and other organisms such as birds, earthworms, and aquatic invertebrates.

How Neonicotinoids Affect Pollinators

Neonicotinoids are directly toxic to beneficial insects, like bees (known as acute exposure). Neonicotinoid exposure at prolonged low levels (known as chronic exposure) has been shown to:

- affect the ability of bees to gather pollen, navigate (return to their hives), and reproduce
- make bees more susceptible to diseases.

Research shows that neonicotinoids may impact colonies when residues are brought into the hive by bees after they return from collecting food.

Neonicotinoids Background

Neonicotinoids have been used in Ontario since the mid-1990s. At the time, little was known about their potential negative side effects on bees and the ecosystem. Over time, their increased use impacted the health of bees and the ecosystem they support.

Ontario grows a significant amount of corn and soybean (approximately 2.5 million acres of each crop). We also produce 70% of all Canadian soybean and 68% of corn.

In Ontario, neonicotinoid-treated seeds are often used preventatively, even if there is no evidence of a pest problem. Today, nearly 100% of corn seed and roughly 60% of soybean seed are treated with neonicotinoids. Of these crops, there is widespread over use of treated seeds.

The federal Pest Management Regulatory Agency evaluates and registers pesticides in Canada. The agency concluded that the majority of honey bee mortalities in Ontario in 2012 and 2013 were a result of exposure to neonicotinoid insecticides. This is likely from exposure to contaminated dust generated during the planting of neonicotinoid-treated corn and soybean seed.

Some neonicotinoids products have only been federally registered on a conditional basis. These conditional registrations have been renewed multiple times by the federal Pest Management Regulatory Agency even though conditions of registration have not been met. The agency is now reviewing the registration of neonicotinoid insecticides.

What the Scientific Community Says

Based on scientific findings, a precautionary approach by reducing the use of neonicotinoids is reasonable.

This is supported by:

- a recent review of 800 peer-reviewed scientific papers by the International Union for Conservation of Nature (IUCN) Task Force on Systemic Pesticides indicated that neonicotinoid insecticides impact pollinators and other beneficial organisms

- the United States Environmental Protection Agency concluded that seed treatments provide negligible overall benefits to soybean production in most situations
- the Pest Management Regulatory Agency evaluated reports of bee deaths and determined that two types of neonicotinoids contributed to the majority of the bee deaths that occurred in corn growing regions of Ontario and Quebec in Spring 2012

Action in Other Jurisdictions

Global concerns over the decreasing health and population of bees and wild pollinators have resulted in other jurisdictions taking action to protect pollinators.

The United States

In the United States:

- the Federal Strategy to Promote the Health of Honey Bees and Other Pollinators was released
- the Fish and Wildlife service banned neonicotinoid insecticides on farmed areas of national wildlife refuges
- the Environmental Protection Agency is reviewing neonicotinoid insecticide registrations, which they expect to conclude in 2018. A recent scientific report from the agency concludes that, "these seed treatments provide little or no overall benefits to soybean production in most situations. Published data indicate that in most cases there is no difference in soybean yield when soybean seed was treated with neonicotinoids versus not receiving any insect control treatment."
- a recent presidential memo directed agencies to take additional steps to protect and restore pollinator populations
- the Department of Agriculture gave funding to 5 Midwestern states to establish new habitats and support bee populations. In Minnesota, plants treated with pesticides cannot be labeled pollinator-friendly. Minnesota is reviewing neonicotinoid insecticide use, registration and pollinator impacts, which could lead to tighter regulations

European Union

The European Union placed a 2-year ban (with exemptions) on neonicotinoid insecticide use in agriculture to allow for their impact on bees and pollinators to be assessed.. This ban was put in place after a report by the European Food Safety Authority found that seeds coated with NNIs pose serious risks to bees from crops producing nectar and pollen, such as oilseed rape (canola), sunflowers and maize (corn). The ban will be reviewed in 2015.

In addition to following this ban, the United Kingdom has also released a National Pollinator Strategy.

Australia

In Australia, the government provides information, warnings and use instructions on labels (with a focus on neonicotinoids). They are also reconsidering current testing methods.

South Korea

In 2014, South Korea's Rural Development Administration announced it would impose a time-limited ban on neonicotinoids, similar to the European Union ban.

Neonicotinoids and Human Health

In general, neonicotinoids kill insects through attacking receptors in nerve synapses. Neonicotinoids bind more effectively to a specific nerve receptor in insects than they do in mammals.

Recently, the European Food Safety Authority's Panel on Plant Protection Products reviewed existing data on the potential damage to humans of commonly used neonicotinoids. These include imidacloprid and acetamiprid. The review focused on the potential damage they can do to the developing human nervous system, particularly the brain. The panel is advising that all neonicotinoids be evaluated for developmental neurotoxicity.

Provincial Monitoring

The Ontario government and the federal Pest Management Regulatory Agency are monitoring the local environment to better understand the factors affecting honey bee deaths and broader environmental impacts.

We are monitoring in areas known to have high incidences of acute bee deaths. We are also monitoring areas that have had few incidences. These areas are being evaluated prior to and after planting, and samples of dead bees as well as nearby water and some vegetation are collected and analyzed for pesticides.

The Ontario government will also be sampling where neonicotinoids have been detected in water to determine whether they are migrating through soils.

Pollinator Health Discussion Paper

The government of Ontario is seeking your views on the development of a Pollinator Health Action Plan. The Plan would improve the state of pollinator health in Ontario and strengthen their populations. The plan we are proposing to develop will also promote a sustainable food supply, healthy ecosystems and a strong economy.

The discussion paper divides our proposal into two sections. The first section outlines the key elements for consideration in developing in detail our proposed Pollinator Health Action Plan. The second section covers our proposed regulatory approach to reducing pollinators' exposure to pesticides and improving pollinator health through regulating the use of treated seeds for corn and soybean crops.

Comments on Pollinator Health document [A Proposal for Enhancing Pollinator Health and Reducing the Use of Neonicotinoid Pesticides in Ontario]

The Advisory Committee on the Environment for the City of London (ACE) lauds the provincial government for putting pollinator health so high on its agenda. Our members have been encouraged to submit detailed comments regarding the plan. Here we make a few big picture comments regarding pollinator health and how the province can help, especially with respect to cities.

Recommendation 1: In thinking about improving habitat for pollinators, the province should work out a strategy for increasing the size and connectivity of natural areas at different geographic scales from regional (e.g. Big Picture Carolinian Corridors; Green Belts) to neighbourhood Pollinator Pathways running through urban neighbourhoods. The province could organize this work through conservation authorities who could work together with local stakeholders such as municipalities and farmers to determine where renaturalization areas and the corridors that connect them should go.

Recommendation 2: The province should work out funding strategies to make this work happen and should work closely with Alternative Land Use System which is already working with farmers in Ontario to get them to also focus on preserving and enhancing ecosystem services. This work needs to be scaled up and be also brought into cities.

Recommendation 3: The province needs to set targets for different land covers that support the health of pollinators including meadows/prairies as well as wetlands and woodlands. These targets will change depending on the land use and also physiography but at the watershed scale (e.g. Upper Thames River watershed), they should add up to a substantial amount of land that can provide habitat and movement for pollinators.

Recommendation 4: The long range plan of the province must be the establishment of ecologically sound agricultural systems that minimizes outside inputs of pesticides, synthetic fertilizer and the use of monocultures. Nature does not do monocultures and in nature there are no weeds. Our agricultural system needs to change from a *monoculture of annuals* to a *polyculture of perennials*. In the future we need to do away with the idea of a noxious weed list. The province should do everything in its power to encourage the emergence of agro-ecological systems that work with the cycles of nature and not against it.

Recommendation 5: The province is encouraged to develop a comprehensive ecosystem services implementation plan (which of course would include a large section on pollination) and require all of its municipalities to develop such a plan.