

# Systemic attack on bees devastating colonies

By Mark Pavilons

The man-made assault on Mother Nature may very well be our undoing.

Systemic stresses on bee colonies have resulted in some very concerning losses.

When Ontario's beekeepers opened their hives this spring, they found nothing but bad news for beekeepers, as well as for the vegetable and fruit growers who depend on bees for pollination.

A recent Ontario Beekeepers' Association survey of almost 900 beekeepers indicated that seven out of 10 Ontario beekeepers suffered unsustainable losses. Most worrisome, almost one in three (32%) beekeepers reported colony losses of 70% or more. After a typical winter, beekeepers recover their losses by splitting hives and adding new queens to make new colonies. When losses exceed 20%, beekeepers incur extra costs for the purchase of new queens and bees. Losses over 50% can be catastrophic. Colonies will be in recovery mode all summer and beekeepers will receive little or no income from pollination services or honey production. One in four beekeepers has said that "if these losses continue, I cannot continue in the beekeeping business."

To help commercial beekeepers stay in business, the OBA has asked the Ontario government for financial assistance to allow beekeepers to recover and rebuild their colony numbers back to last year's numbers.

"I've been getting calls from beekeepers around the province," reports OBA president, Jim Coneybeare. "The number of dead or weak colonies is astounding. These could be the worst winter losses on record."

This year's long, cold winter extending into spring was mentioned by 43% of beekeepers as the main reason for the heavy losses of colonies, already weakened by last year's poor summer weather and meagre honey crop.

Beekeepers estimate that their bees are at least four to six weeks behind where they should be at this time of year.

One in five beekeepers suspects pesticides as the cause of colony losses. Neonicotinoids, the most common pesticide used in Ontario, was recently the subject of an EU-wide ban to protect both wild and honey bees. Despite legislation adopted in Ontario to reduce their use, neonics are still being used on 75% of Ontario corn and soy crops, despite the government's goal of reducing usage by 20%.

Heavy over-winter losses and cold spring weather will also hold back Ontario a queen producers and sellers of bees relied on replace lost colonies. Most queen producers cannot fill new orders until July, which is late in the season. Beekeepers are finding that surviving colonies are not strong enough to build back their numbers.

Loss of colonies, failing queens and a slow colony build-up mean fewer colonies are available to pollinate Ontario's fruit and vegetable crops.

Honey bees are responsible for 90% of apple production. Almost \$900 million worth of Ontario's fruit and vegetable crops rely on bees for pollination. In addition to their importance for food production, pollination services are an important part of a beekeeper's income.

"It is demoralizing and devastating for beekeepers to experience such losses," Coneybeare added. "Honey bees and wild bees are just too important for everyone. We cannot allow this industry to fail."

Andre Flys, owner of Pioneer Brand Honey near Nobleton, echoed Coneybeare's sentiments.

He said colony losses go in cycles and typically beekeepers manage the losses with new technology and new methods.

The long winter is a factor this year, but beekeepers are suspicious there are more factors at play, especially pesticides.

Flys said while the government has banned certain chemicals, this doesn't mean pesticide use has declined. Farmers are simply using other chemicals.

Long-term exposure to pesticides is hindering the bees' olfactory senses, meaning they're not as efficient as detecting and learning new scents.

Last summer, biology professor Amro Zayed and his team in the Faculty of Science at York University, published a report that revealed that worker and queen honeybees exposed to field realistic levels of neonicotinoids die sooner, reducing the health of the entire colony. They were also surprised to find that the neonicotinoid contaminated pollen collected by the honeybees came not from crops grown from neonicotinoid treated seeds, but plants growing in areas adjacent to those crops.

"We needed season-long monitoring of neonics in bee colonies to determine the typical exposure scenarios that occur in the field which we were able to do in our study," said Zayed.

The UK's Expert Committee on Pesticides referenced the importance of Zayed's study in contributing new knowledge about the risk

of neonicotinoids on pollinators. The committee wrote that Zayed's study adds to a growing literature implying adverse effects on honey bee health at exposure levels compatible with those measured in the environment; persistence of neonicotinoid pesticides in non-target plants was evident in the data presented.

The YorkU team also discovered that the combination of neonicotinoids and a specific fungicide pose a highly toxic cocktail to bees.