

Do You Make This Accidental Bee-Killing Mistake?

Proof-positive about what's decimating our bee populations, despite all the quibbling and controversy. But even if you're all about protecting them, it's very easy to make this common mistake. What to know before you act to make your yard bee-friendly.

Reviewed by Dr. Becker

STORY AT-A-GLANCE

- A 2015 study conclusively proves that neonicotinoid insecticides cause brain impairment in bumblebees, and play an important role in the poor functioning of colonies and the decline of bee populations
- Even at very low levels, neonicotinoids disturb the brain function of bees, inhibiting their ability to learn and to forage for food
- The data the team collected shows that even very low levels of insecticides resulted in an estimated 55% loss in live bees, a 71% loss of healthy brood cells, and a 57% reduction in the total bee mass of a nest
- Nearly 10% of about 2,000 species of European wild bees are now threatened with extinction, according to a study published in March by the European Commission
- Study researchers recommend planting more bee-friendly crops and banning the use of neonicotinoids on bee-friendly garden plants and land used to grow crops attractive to bees or other insect pollinators.

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A 2015 study confirms that neonicotinoid insecticides cause brain impairment in bumblebees, resulting in poor functioning of their colonies.

Neonicotinoids are nicotine-like chemicals and are the most widely used class of insecticides in the world today. It's hard to find pest control products that don't contain at least one neonicotinoid insecticide.

The role of neonicotinoids in the worldwide decline of insect pollinators is widely disputed by the agricultural industry. However, researchers in Scotland at the University of St. Andrews and the University of Dundee have provided scientific evidence that low levels of these insecticides found in the nectar and pollen of plants are enough to damage the bee brain.

Even Very Low Levels of Neonicotinoids Impair the Brains of Bumblebees

A team led by Dr. Chris Connolly of Dundee's School of Medicine performed both laboratory and field studies to evaluate the risk of neonicotinoids to bumblebees. Since neonicotinoid contamination of nectar and pollen consumed by bees is estimated at around 2.5 parts per billion, and since there is considerable disagreement as to whether this level is enough to affect bees, the research team fed bumblebees the same low level of neonicotinoid and measured its accumulation in their brains.

The researchers discovered that at this level, some neonicotinoids very quickly shut down energy production in brain cells. At lower levels, neurotransmitters used to transmit information were affected. This creates a situation in which the bees' brain cells cannot function and their ability to learn skills important to their survival is impaired. For example, they don't learn that the scent of a flower signals a food source, or they can't find their way back to their nest.

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Study Is First of Its Kind Linking Neonicotinoid Consumption to Bee Population Decline

The study, which was published in the Journal of the Federation of American Societies for Experimental Biology,¹ is the best scientific evidenced produced to date linking neonicotinoid consumption to poor performance in bees. According to Connolly:

*"Our research demonstrates beyond doubt that the level of neonicotinoids generally accepted as the average level present in the wild causes brain dysfunction and colonies to perform poorly when consumed by bumblebees. In fact, our research showed that the ability to perturb brain cells can be found at 1/5 to 1/10 of the levels that people think are present in the wild."*²

Since insecticides are designed to affect the brains of insects, these results aren't surprising. "The bumblebees don't die due to exposure to neonicotinoids, but their brain cells don't perform as well as a result and this causes adverse outcomes for individual bees and colonies," says Connolly.

While this study isn't proof that neonicotinoids are the only contributor to the decline in insect pollinators, a clear linkage has now been established showing that even at very low levels, these insecticides disturb the brain function of bees, their ability to learn, and their ability to forage for food. These factors combine to limit colony growth.

The researchers believe it may be possible to improve the situation if more bee-friendly plants are available. They also recommend that neonicotinoids no longer be used on bee-friendly garden plants, and on land that is or may be used to grow crops attractive to bees or other insect pollinators.

10% of European Wild Bees Threatened with Extinction

Nearly 10% of about 2,000 species of European wild bees are now threatened with extinction, according to a study published in March by the European Commission.³ The report states that 9.2% of European wild bee species are threatened with extinction, and another 5.2% are likely to be threatened in the near future.

According to the International Union for Conservation of Nature (IUCN), the study emphasizes the urgency of investing in research to halt the decline of wild bees.

"If we don't address the reasons behind this decline in wild bees, and act urgently to stop it, we could pay a very heavy price indeed," said Karmenu Vellu, the European Commissioner for the environment.⁴ According to the commission, 84% of the main crops grown for human consumption in Europe require insect pollination.

Bees in Europe are threatened by loss and degradation of their habitats resulting from intensive agriculture and the use of insecticides and fertilizers. The commission also cited climate change as another important threat to most species of bees, and particularly bumblebees.

Neonicotinoids Are Especially Lethal for Bees During Cold Weather

A Harvard School of Public Health study published last year concluded that at least two kinds of neonicotinoids cause bees to desert their hives during cold winter months.⁵ Without the protection of their hives, the bees die.

The study evaluated two neonicotinoid insecticides, imidacloprid, and clothianidin. The researchers monitored 18 bee colonies in three locations in central Massachusetts from October 2012 through April 2013. The colonies were separated into three groups — one was treated with imidacloprid, another with clothianidin, and the third was left untreated.

As expected, all the bee colonies decreased in size during the cold winter months. But by January 2013, bee populations in the untreated groups began to increase, while populations in both neonicotinoid-treated colonies continued to decline. By spring, half the insecticide-treated colonies were gone, their hives empty.

How You Can Help

Pollinators support much of the world's food population and contribute over \$200 billion to the global economy each year. In recent years we've seen up to 30% annual honeybee colony losses, in addition to population declines in butterflies and other insects, as well as insect-pollinated wild plants.

Insect pollinators are also extremely important to the U.S. economy, contributing over \$24 billion, of which more than half is from honeybees alone and their vital role in the growth of fruits, vegetables, and nuts.

If you plant flowers around your home or have a garden and want to help out our insect pollinator friends, plant bee-friendly flowers that you are confident have not been treated with neonicotinoid pesticides on either the plants or the seeds they were grown from. Choose native flowering plants from your local area, or plant clover, alfalfa, or other flowering cover crops that replenish soil nutrients and prevent erosion.

Also avoid pesticides containing these neonics: Acetamiprid, Clothianidin, Dinotefuran, Imidacloprid, and Thiamethoxam.

Sources and References

¹ [The FASEB Journal, Vol. 29, May 2015](#)

² [Phys.org, February 5, 2015](#)

³ [European Red List of Bees](#)

⁴ [Discovery News, March 19, 2015 \(Archived\)](#)

⁵ [Mercola.com](#)
