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Neonicotinoids and Bee Die Off: GMO Agriculture and Chemical Pesticides are Killing the Bees

US Environmental Protection Agency (EPA) Slapped with Lawsuit

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Mondialisation.ca, 03 juin 2016
Mercola.com and Global Research 7 mai 2013

Thème: Biotechnology and GMO, Environment, Law and Justice

First published in May 2013

The US Environmental Protection Agency (EPA) has failed to protect bees from neonicotinoid pesticides, according to a lawsuit against the agency, filed by beekeepers and environmental groups. Said Paul Towers, spokesperson for the Pesticide Action Network (PAN), one of the groups involved in the lawsuit:

> "Despite our best efforts to warn the agency about the problems posed by neonicotinoids, the EPA continued to ignore the clear warning signs of an ag system in trouble."

Lawsuit Maintains the Link Between Neonicotinoids and Bee Die Off Is 'Crystal Clear'

Neonicotinoid pesticides are a newer class of chemicals that are applied to seeds before planting. This allows the pesticide to be taken up through the plant's vascular system as it grows, where it is expressed in the pollen and nectar.

These insecticides are highly toxic to bees because they are systemic, water soluble, and pervasive. They get into the soil and groundwater where they can accumulate and remain for many years and present long-term toxicity to the hive as well as to other species, such as songbirds.

Neonicotinoids affect insects' central nervous systems in ways that are cumulative and irreversible. Even minute amounts can have profound effects over time.

The disappearance of bee colonies began accelerating in the United States shortly *after* the EPA allowed these new insecticides on the market in the mid-2000s. The lawsuit alleges that the EPA allowed the neonicotinoids to remain on the market despite clear warning signs of a problem.

It also alleges the EPA acted outside of the law by allowing conditional registration of the pesticides, a measure that allows a product to enter the market despite the absence of certain data.

European Food Safety Authority Ruled Neonicotinoids 'Unacceptable'

The EPA's continued allowance of neonicotinoids becomes all the more irresponsible in light of recent findings by other government organizations. Earlier this year, for instance, the

European Food Safety Authority (EFSA) released a report that ruled neonicotinoid insecticides are essentially "unacceptable" for many crops.[1] The European Commission asked EFSA to assess the risks associated with the use of three common neonicotinoids – clothianidin, imidacloprid and thiamethoxam – with particular focus on:

- Their acute and chronic effects on bee colony survival and development
- Their effects on bee larvae and bee behavior
- The risks posed by sub-lethal doses of the three chemicals

One of the glaring issues that EFSA came across was a widespread lack of information, with scientists noting that in some cases gaps in data made it impossible to conduct an accurate risk assessment. Still, what they did find was "a number of risks posed to bees" by the three neonicotinoid insecticides. The Authority found that when it comes to neonicotinoid exposure from residues in nectar and pollen in the flowers of treated plants:[2]

> "...only uses on crops not attractive to honeybees were considered acceptable."

As for exposure from dust produced during the sowing of treated seeds, the Authority ruled "a risk to honeybees was indicated or could not be excluded..." Unfortunately, neonicotinoids have become the fastest growing insecticides in the world. In the US, virtually all genetically engineered Bt corn crops are treated with neonicotinoids.

Serious Risks to Bees Already Established

One of the observed effects of these insecticides is weakening of the bee's immune system. Forager bees bring pesticide-laden pollen back to the hive, where it's consumed by all of the bees.

Six months later, their immune systems fail, and they fall prey to secondary, seemingly « natural » bee infections, such as parasites, mites, viruses, fungi and bacteria. Pathogens such as Varroa mites, Nosema, fungal and bacterial infections, and Israeli Acute Paralysis Virus (IAPV) are found in large amounts in honeybee hives on the verge of collapse.

Serious honeybee die-offs have been occurring around the world for the past decade but no one knows exactly why the bees are disappearing.

The phenomenon, dubbed Colony Collapse Disorder (CCD), is thought to be caused by a variety of imbalances in the environment, although agricultural practices such as the use of neonicotinoid pesticides are receiving growing attention as more research comes in. As written in the journal Nature:[3]

> « Social bee colonies depend on the collective performance of many individual workers. Thus, although field-level pesticide concentrations can have subtle or sublethal effects at the individual level, it is not known whether bee societies can buffer such effects or whether it results in a severe cumulative effect at the colony level. Furthermore, widespread agricultural intensification means that bees are exposed to numerous pesticides when foraging, yet the possible combinatorial effects of pesticide exposure have rarely been investigated. »

This is what the Nature study set out to determine, and it was revealed that bees given access to neonicotinoid and pyrethroid pesticides were adversely affected in numerous ways, including:

- Fewer adult worker bees emerged from larvae
- A higher proportion of foragers failed to return to the nest
- A higher death rate among worker bees
- An increased likelihood of colony failure

The researchers said:

> « Here we show that chronic exposure of bumble bees to two pesticides (neonicotinoid and pyrethroid) at concentrations that could approximate field-level exposure impairs natural foraging behavior and increases worker mortality leading to significant reductions in brood development and colony success.
>
> We found that worker foraging performance, particularly pollen collecting efficiency, was significantly reduced with observed knock-on effects for forager recruitment, worker losses and overall worker productivity. Moreover, we provide evidence that combinatorial exposure to pesticides increases the propensity of colonies to fail. »

Why the Food Supply Could Be Dependent on Urgent Action by the EPA

The EPA acknowledges that "pesticide poisoning" may be one factor leading to colony collapse disorder,[4] yet they have been slow to act to protect bees from this threat. The current lawsuit may help spur them toward more urgent action, which is desperately needed as the food supply hangs in the balance.

There are about 100 crop species that provide 90 percent of food globally. Of these, 71 are pollinated by bees.[5] In the US alone, a full one-third of the food supply depends on pollination from bees. Apple orchards, for instance, require one colony of bees per acre to be adequately pollinated. So if bee colonies continue to be devastated, major food shortages could result.

There is also concern that the pesticides could be impacting other pollinators as well, including bumblebees, hoverflies, butterflies, moths and others, which could further impact the environment.

Four Steps to Help Protect the Bees

If you would like to learn more about the economic, political and ecological implications of the worldwide disappearance of the honeybee, check out the documentary film Vanishing of the Bees. If you'd like to get involved, here are four actions you can take to help preserve and protect our honeybees:

1. Support organic farmers and shop at local farmer's markets as often as possible. You can « vote with your fork » three times a day. (When you buy organic, you are making a statement by saying « no » to GMOs and toxic pesticides!)
2. Cut the use of toxic chemicals in your house and on your lawn, and use only organic, all-natural forms of pest control.

3. Better yet, get rid of your lawn altogether and plant a garden or other natural habitat. Lawns offer very little benefit for the environment. Both flower and vegetable gardens provide excellent natural honeybee habitats.
4. Become an amateur beekeeper. Having a hive in your garden requires only about an hour of your time per week, benefits your local ecosystem, and you can enjoy your own honey!

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