**Beepocalypse Redux: Honeybees Are Still Dying — and We Still Don’t Know Why**

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Colony-collapse disorder is wiping out honeybee colonies

The honeybees are dying — and we don’t really know why. That’s the conclusion of a massive Department of Agriculture (USDA) [report](http://www.ars.usda.gov/News/docs.htm?docid=15572) that came out late last week on colony-collapse disorder (CCD), the catchall term for the large-scale deaths of honeybee groups throughout the U.S. And given how important honeybees are to the food that we eat — bees help pollinate crops that are worth [more than $200 billion a year](http://qz.com/81558/america-is-one-bad-winter-away-from-a-food-disaster-thanks-to-dying-bees/) — the fact that they are dying in large numbers, and we can’t say why, is very, very worrying.

CCD was first reported in 2006, when commercial beekeepers began noticing that their adult worker honeybees would suddenly flee the hive, ending up dead somewhere else and leading to the rapid loss of the colony. On normal years, commercial beekeepers might expect to lose 10% to 15% of their colony, but over the past five years, mortality rates for commercial operations in the U.S. have ranged from 28% to 33%. Since 2006 an estimated 10 million beehives worth about $200 each have been lost, costing beekeepers some $2 billion. There are now 2.5 million honeybee colonies in the U.S., down from 6 million 60 years ago. And if CCD continues, the consequences for the agricultural economy — and even for our ability to feed ourselves — could be dire. “Currently, the survivorship of honeybee colonies is too low for us to be confident in our ability to meet the pollination demands of U.S. agricultural crops,” the USDA report said.

So what’s causing CCD — and how can we stop it?

The problem is that there doesn’t seem to be a single [smoking](http://topics.time.com/smoking/) gun behind CCD. The USDA report points at a range of possible causes, including:

* A parasitic mite called *Varroa destructor* that has often been found in decimated colonies
* Several viruses
* A bacterial disease called European foulbrood that is increasingly being detected in U.S. bee colonies
* The use of pesticides, including neonicotinoids, a neuroactive chemical

Since CCD isn’t so much a single disease as it is a collection of symptoms, chances are that some or all of these factors, working in concert, might be behind the disappearance of the honeybees. The presence of the *Varroa* mite, for instance, can worsen the impact of existing viruses, while the [stress](http://topics.time.com/stress/) of shipping bees back and forth across the country — increasingly common in commercial beekeeping — may be amplifying the stress on the insects and leaving them more vulnerable to CCD. (If you think a cross-country flight is rough on you, just imagine what it’s like for a honeybee hive.) The fact that CCD is increasingly seen in other countries as well gives more weight to the notion that there may be multiple factors at work.

Still, environmentalists have [focused](http://www.motherjones.com/tom-philpott/2012/03/bayer-pesticide-bees-studies) most on the potential role of pesticides — especially the powerful neonicotinoids — and some lab studies have found that the chemicals can adversely affect bee health. It’s not that the pesticides — which are aimed at other insects — are killing the bees outright, but rather that sublethal exposure in nectar and pollen may be interfering with the honeybees’ internal radar, preventing them from gathering pollen and returning safely to the hive.

The USDA report mostly withholds judgment on neonicotinoids, citing the need for more research, and the Environmental Protection Agency is conducting a very slow review of the evidence. Last week, though, the [E.U.](http://topics.time.com/european-union/), which is also grappling with CCD, decided it was done waiting, and announced a two-year ban on neonicotinoids. The European Commission [enacted the ban](http://www.independent.co.uk/environment/nature/victory-for-bees-as-european-union-bans-neonicotinoid-pesticides-blamed-for-destroying-bee-population-8595408.html) on the recommendation of the European Food Safety Authority, which said in January that the pesticides should be restricted until scientists had cleared the chemicals of a role in CCD.

The chemical industry, unsurprisingly, disputes the finding. Bayer CropScience, a major pesticide manufactuer, said in a [statement](http://www.news.bayer.com/baynews/baynews.nsf/id/Restrictions-in-use-of-neonicotinoid-containing-products-is-a-set-back-for-European-agriculture?Open&parent=news-overview-category-search-en&ccm=800010) after the ban was announced:

As a science-based company, Bayer CropScience is disappointed that clear scientific evidence has taken a backseat in the decisionmaking process. This disproportionate decision is a missed opportunity to reach a solution that takes into consideration all of the existing product-stewardship measures and broad stakeholder concerns. The further reduction of effective crop-protection products will put at risk farmers’ ability to tackle important pests that can severely restrict their ability to grow high-quality food.

As Brad Plumer [pointed out](http://www.washingtonpost.com/blogs/wonkblog/wp/2013/05/03/why-are-bees-dying-the-u-s-and-europe-have-different-theories/) over at the Washington *Post*, it’s not that the E.U. necessarily has more evidence about the role that the chemicals might be playing in CCD. This is a classic case of policymaking by the precautionary principle. The pesticides are considered guilty until proven innocent, and so they’re preventively banned, even before the scientific case is rock solid. That’s [not unusual](http://www.gao.gov/new.items/d07825.pdf) for European environmental regulation, especially in regard to chemicals. In the U.S. it’s the reverse — before the federal government is likely to take the step of banning a class of pesticides, and pissing off the multibillion-dollar chemical industry, you’re likely to see a lot more science done.

So what we may get in Europe and the U.S. is a de facto field test of the real impact of neonicotinoids on CCD. In two years, if American bees are still dying and their European cousins are thriving, we might just have our answers. And if not, well, I hope you don’t like cashews, beets, broccoli, cabbage, brussels sprouts, chestnuts, watermelons, cucumber, fennel, strawberries, macadamia, mangoes, apricots, almonds or any of the other dozens of food crops pollinated by our hardworking, six-legged, unpaid farmworkers.