

that farmers are applying the chemicals at too high of a dose. The Environmental Protection Agency, which approved these insecticides for sale, has been slow to acknowledge them as a threat to bees. The agency says research is needed before it will be ready to recommend action. When the pesticides were approved, the thinking was that the amount of the chemical it takes to kill bees was much higher than bees would actually encounter. But the problem has been trickier than scientists thought, because it doesn't take a lethal dose to affect the bee colony. The effects may be far subtler and more pervasive than a swarm simply flying into a fog of bug spray and dropping dead, like those comical cartoon advertisements for Raid insecticide.

So EPA officials say they now need to identify the actual "field-relevant" doses of pesticides that bees may be getting – the amounts they encounter day after day on their journeys in search of food. Bees from a single hive can cover an area of more than 8,000 acres, which leaves ample opportunity to sample numerous pesticides. The EPA also wants to know how multiple pesticides combine to affect bees, as most studies to date have only looked at the effects of any one pesticide at a time. And that's where scientists like Dr. Christopher Connolly come in.

Bee Brain Damage

Connolly, a neuroscientist at the University of Dundee in Scotland, showed in the peer-reviewed scientific journal *Nature Communications* earlier

this spring that bees exposed to these pesticides became brain damaged. "What we've done is taken the field-relevant doses, agreed by Bayer and everyone else, that bees are really exposed to: 1 to 5 parts per billion.... [And] we applied these to the brains," he says. Yes, that means Connolly and his colleagues really did strap electrodes to tiny bee heads in order to study their brain activity. They fed them pesticide-tainted pollen and watched what happened. "When exposed to this pesticide, bees will initially become very hyperactive and then quickly become very dumb," he says. Without any activity in this part of the brain, bees cannot learn. This has huge implications for their survival.

"They have to organize to bring food back, to store food for the winter. They need to tell other bees, "I found some good food. Everybody come here and check it out!" he says. "You need to learn by experience. You need to learn by communication and working together. All of these things require higher cognitive function and learning.

"Connolly's team also found that when bees are exposed to multiple chemical compounds, they can add up to prove more toxic to the bees." "So there is no argument here," he says. "This is field-relevant doses of these compounds that bees do see, and it does stop their brains from working so they cannot learn anymore."

Multiple Battles

Research like this led the European Food Safety Authority, the European Union's regulators, *Family Farm Defenders*

to call for restrictions on the use of these pesticides. Just over a month ago, the European Union announced that it will phase out the widespread use of the chemicals across all member nations, beginning in December. These products will no longer be used on major farm crops that bees pollinate, or be available to home gardeners for casual backyard use.

But here in the United States, regulators have gone a different route. The EPA is considering reauthorizing several neonicotinoid pesticides over the next few years. In March, a number of beekeepers and conservation groups sued the EPA, hoping to halt the reapproval of these pesticides, saying its studies failed to take into account the pesticides' effect on bees. Center for Food Safety attorney Peter Jenkins, who represents the beekeepers, says they hope to see an outcome similar to Europe's.

Beekeeper Nathan Clarke, whose business involves placing hives in backyards around Madison, thinks having bees in the city gives more people a reason to get to know these tiny creatures, lose their fear of "They're like the canary in the coal mine," she says. "They tell you if something's out of balance." Meanwhile Derald Kettlewell plans to soldier on, despite the high number of bees he's lost in recent years. "You pretty much got two choices. You can either get out of the business or replace 'em."

Biotech Ambassadors: U.S. State Dept.

How the USDA Dept. Promotes the Seed Industry's Global Agenda

BY: PATTY LOVERA, FOOD AND WATER WATCH

A new report by *Food & Water Watch* reveals a strategy by the U.S. State Department to promote agricultural biotechnology overseas. "Biotech Ambassadors: How the U.S. State Department Promotes the Seed Industry's Global Agenda" examines more than 900 State Department diplomatic cables from 2005 to 2009 and details how the State Department lobbies foreign governments to adopt pro-agricultural biotechnology policies and laws, operates a rigorous public relations campaign to improve the image of biotechnology and challenges commonsense biotechnology safeguards and rules — including opposing genetically engineered (GE) food labeling laws.

Although the U.S. commodity crop market is nearly saturated with biotech seeds, most of the world remains biotech-free. Even 17 years after biotech crops were first introduced in the United States in 1996, only five countries cultivated 89.4 percent of biotech crops in 2012 (the United States, Brazil, Argentina, Canada and India). The biotech seed (and chemical) companies need the power of the State Department to force more countries, more farmers and more consumers to accept, cultivate and eat their products.

Of the 926 diplomatic cables analyzed in the report, 7 percent mention biotech companies and 6 percent mention Monsanto specifically. The cables show that the State Department promoted the commercialization of specific seeds, acted to quash public criticism of particular companies and facilitated negotiations between foreign governments and seed companies like Monsanto over issues like patents and intellectual property. This corporate diplomacy was nearly twice as common as diplomatic efforts on food aid, which was mentioned in only 4 percent of the cables.

The report's other findings include:

- **Efforts to promote the biotechnology industry overseas:** The State Department targeted foreign reporters, hosted and coordinated pro-biotech conferences and public events and brought foreign opinion-makers to the United States on junkets to improve the image of agricultural biotechnology overseas.
- **Advocacy to press the developing world to adopt biotech crops:** The diplomatic cables document a coordinated effort to lobby countries in the developing world to pass legislation and implement regulations favored by the biotech seed industry. The report examines the State Department lobbying campaigns in Kenya, Ghana and Nigeria to pass pro-biotech laws.
- **Efforts to force other nations to accept biotech crop and food imports:** The State Department works with the U.S. Trade Representative to promote the export of biotech crops and to force nations that do not want these imports to accept U.S. biotech foods and crops.

The report concludes with the recommendation that all countries should have the right to establish their own policy on biotech crops without U.S. interference, and suggests how the State Department should approach agricultural development to put the interests of other countries before the interests of the biotech seed companies.

Download the report:

<http://www.foodandwaterwatch.org/pressreleases/biotech-ambassadors-diplomacy-or-marketing/>

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