

2nd study links pesticide to bee epidemic

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Courtesy of the Harvard School of Public Health
and World Science staff

The likely culprit in sharp worldwide declines in honeybee colonies since 2006 is imidacloprid, one of the most widely used pesticides, a study from the Harvard School of Public Health indicates.

It's the second report to link that pesticide or closely related ones to the mysterious bee die-offs, though the previous one [focused](#) on die-offs in Europe primarily and used a different methodology.

Members of the Harvard group, led by biologist Alex Lu, a specialist in environmental exposure, said they found "convincing evidence" of the link between imidacloprid and a phenomenon called Colony Collapse Disorder, in which adult bees abandon their hives in droves.

The study is to appear in the June issue of the *Bulletin of Insectology*.

"The significance of bees to agriculture cannot be underestimated," said Lu. "And it apparently doesn't take much of the pesticide to affect the bees. Our experiment included pesticide amounts below what is normally present in the environment."

Bees, beyond producing honey, are prime pollinators of roughly one-third of the crop species in the U.S., including fruits, vegetables, nuts, and livestock feed such as alfalfa and clover. Massive loss of honeybees could result in billions of dollars in agricultural losses, experts estimate.

Lu and his co-authors hypothesized that the uptick in colony collapse disorder resulted from imidacloprid, a member of a family of pesticides known as neonicotinoids introduced in the early 1990s. Bees can be exposed in two ways: through nectar from plants or through high-fructose corn syrup beekeepers use to feed their bees. (Since most U.S.-grown corn has been treated with imidacloprid, it's also found in corn syrup.)

In the summer of 2010, the researchers conducted a field study in Worcester County, Mass. Over a 23-week period, they monitored bees in four different bee yards; each yard had four hives treated with different levels of imidacloprid and one non-treated hive. After 12 weeks, all the bees were alive. But after 23 weeks, 15 out of 16 of the treated hives had died. Those exposed to the highest levels of the pesticide died first.

The previous, European study focused on neonicotinoids more generally, and employed a different methodology.

Lu said the characteristics of the dead hives in his study were consistent with colony collapse disorder; the hives were empty except for food stores, some pollen, and young bees, with few dead bees nearby. When other conditions cause hive collapse—such as disease or pests—many dead bees are typically found inside and outside the affected hives.

Scientists, policymakers, farmers, and beekeepers, alarmed at the sudden losses of between 30 percent and 90 percent of honeybee colonies since 2006, have posed many theories as to the cause of the collapse, such as pests, disease, pesticides, migratory beekeeping, or some combination of these factors.