

STUDY FINDS PESTICIDE AFFECTS HONEYBEES' ABILITY TO FLY

UC San Diego researchers find erratic flight patterns

BY JOSHUA EMERSON SMITH

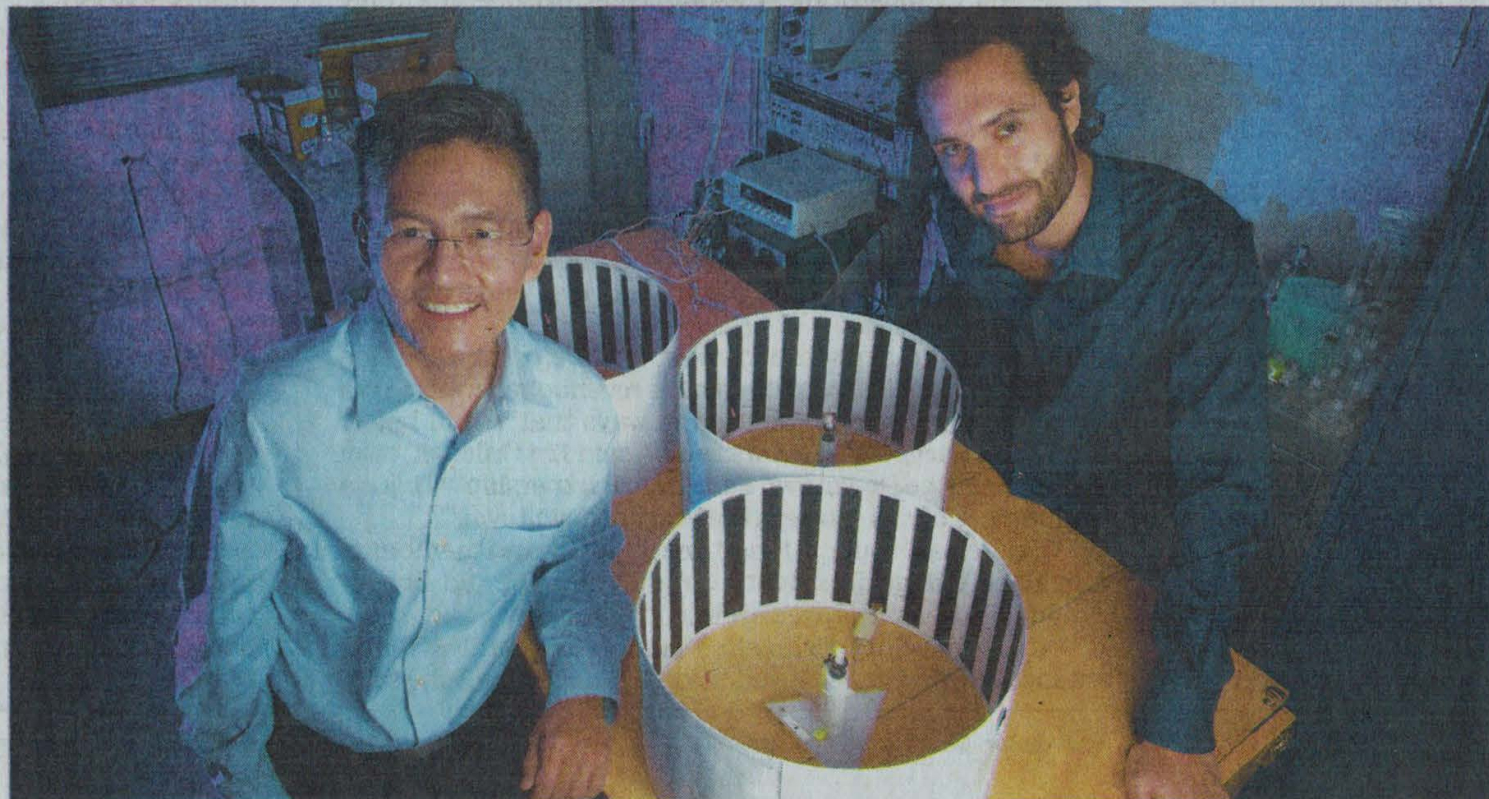
A new study finds that a controversial pesticide, restricted in many parts of Europe but allowed in the U.S., significantly impairs honeybees' ability to fly.

The findings are the latest to link neonicotinoids, a nicotine-related class of pesticides, to harmful effects on bees managed for agriculture — which for years have been subject to high rates of colony collapse around the globe.

The experiment led by UC San Diego exposed honeybees, in a controlled setting, to the chemical thiamethoxam, a commonly applied type of neonicotinoid used on corn, soybeans and cotton, as well as other fruits and vegetables.

Initially, the bees exposed to the pesticide flew faster and longer. But

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James Nieh (left), a UC San Diego biologist, and Simone Tosi, a post-doctorate fellow, co-authored the study on the effects of neonicotinoids on honeybees.

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after several days of contact with the chemical, their flight distances were more than cut in half and their speeds reduced.

The researchers concluded that honeybees exposed to thiamethoxam are more likely to exhibit erratic flight patterns followed by bouts of lethargy, increasing the likelihood a bee could get lost from its colony or become significantly less productive.

"Based upon estimates and mathematical assumptions, we show these exposures could reduce a colony's foraging area by nearly 80 percent," said James Nieh, a biologist at UC San Diego and co-author of the study, which was published in the journal *Scientific Reports*.

"They're going to get far less food, meaning a colony's health could decline further," he added.

For years, honeybee colonies managed for agriculture have suffered from severe collapses during winter months. While beekeepers have used labor-intensive breeding and management practices to keep pace with die-offs, many fear the bee populations are becoming increasingly unstable.

That's particularly worrisome because honeybees directly pollinate about \$15 billion worth of crops a year, from almonds to apples to cucumbers, according to the U.S. Department of Agricul-

ture.

While many studies have found that pesticides have negative impacts on bees, other research, often backed by industry, suggests the parasitic varroa mite is the main culprit in colony collapse.

In a report last year, the USDA said the mite was the primary cause of stress for beekeeping operations with five or more colonies.

The new study "shows interesting results, but I'm not sure it claims much in the way of explaining increased loss rates," said Dennis vanEngelsdorp, a professor at the University of Maryland who researches honeybees. "The three major drivers are varroa, poor nutrition and pesticides — varroa being the primary. I think this is the growing consensus view."

Wild bees are far less studied, but several species are at significant risk of extinction, according to conservation groups. Earlier this year, the rusty patch bumblebee became the first wild bee in the continental U.S. to be listed by the federal government as endangered.

"If we are to help restore these struggling populations, we must address key risk factors including the widespread use of pesticides as well as loss of habitat," said Aimée Code, pesticide program director of The Xerces Society for Invertebrate Conservation in Portland, Ore.

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