

Food Safety News Presented by Marler Clark LLP, PS.

Bees May Be Bellwether of Food Supply Challenges

by [Cory Minderhout](#) | Oct 30, 2010

Empty honey bee hives that set the media abuzz in 2006 were attributed to everything from cell phones to pesticides, but researchers now say many things interacting with each other are contributing to the decline.

"It's not a single mystery thing that's causing problems," said Marion Ellis, professor of entomology at the University of Nebraska. "There are probably lots of little components."

For those who see bees as a bellwether, the stresses they face seem to echo the environmental consequences of contemporary, large-scale agriculture.

According to Ellis, the three biggest factors hurting hives are likely nutrition, pesticides, and parasites. Poor nutrition is significant. Ellis said, because without enough nutrients, bees are less able to fend off the harmful effects of pesticides and parasites.

Modern farming practices, including the conversion of pasture land to row crops and the use of herbicides to clear field margins and ditches of blooming plants, have led to poorer nutrition for honey bees, Ellis said.

"Bees are only getting one source of pollen," Ellis said. "It would be as if we didn't get a balanced diet." Weaker bees may be more vulnerable to pests and chemicals.

And the pesticide load on bees may be significant. Researchers at Washington State University found five dozen different pesticides in hives they studied. A majority of the pesticides were insecticides, any one of which might be toxic to bees; WSU is looking at the combined effects of these chemicals.

But Kim Kaplan, a spokesperson for the U.S. Department of Agriculture's in-house research agency -- Agricultural Research Service -- said pesticides have not been scientifically confirmed as a cause of colony decline and no specific pesticides have been named as potential culprits.

The best way beekeepers can prevent colony decline is by watching their colonies closely and giving them extra feedings to keep them healthy, Kaplan said.

Many of the bee losses are being blamed on Colony Collapse Disorder, which the USDA defines a bee hive that still contains a live queen bee, but little or no male honey bees. There are no dead bees in the hive. [Apiary Inspectors of America](#) says the disorder hasn't gone away; that beekeepers throughout the U.S. have lost one quarter to one third of their bee colonies in each of the last three years.

A research study led by University of Montana researchers and U.S. Army scientists, peer-reviewed and published recently by the online science journal [PLoS One](#), was hailed as a breakthrough in solving the mystery of colony collapse. It suggested that two particular viruses may be a cause; the study found the virus pair in many of the honey bee colonies they tested.

The study said that either of the viruses on their own are not lethal, but when combined they become increasingly deadly. The virus combination was not found in colonies that had no history of the collapse disorder, the study said.

At WSU, which two years ago launched its [Honey Bee Colony Health Diagnostic Laboratory](#), researchers have also found that a mite particularly harmful to bees proliferated after pesticide contamination delayed one hive's larval development. The mite has become resistant to safe control measures, so the long-term answer to warding off many of the problems plaguing bees may lie in making bees stronger through genetic improvement.

Honey bee health, while not yet causing a food-production crisis according to the USDA, is nonetheless vital to the food supply. Honey bees pollinate approximately 95 different crops, including almonds, raspberries, blueberries, and cranberries; one-third of our food is directly or indirectly influenced by honey bees.

California almond growers use approximately half of all the managed, commercial honey bees in the U.S. to pollinate their crops, and that number could soon be as high as 75 percent, Ellis said.

Mohnish Sets, owner of Farmers International, grows, processes, and exports almonds out of Chico, CA. He agreed that colony collapse could pose problems for the almond industry, but said it hasn't yet. He sees some evidence that the bee population could be improving.

"We had a good supply of bees (last year)" Sets said. "I think the bee supply is getting better."