

## Honeybees' plight takes a nose dive

Staff Reports

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During my childhood, I planted trees each spring with my dad and brother, and the bees always intrigued us. Last year, when I finished my book "The Incomparable Honeybee and the Economics of Pollination," I was cautiously optimistic that the overall death rate among honeybees was trending downward.

In April, the winter and spring bee survey numbers from across our nation were released and they were startling.

Honeybee deaths in 2010 were much higher than those reported in 2009, up 34 percent, from the previous year's 29 percent. On average, beekeepers in the U.S. lost 42 percent of their bees in 2009-10, compared with 23 percent in 2008-09. Moreover, honey production dropped by 12 percent, or about 20 million pounds, to a total of 144 million pounds last year.

In America, more than 50 billion honeybees have perished within the last year. Scientists call this eerie condition "colony collapse disorder." When the honeybees get sick they will not return to the colony. Nature designed these social creatures, like the ants, not to infect one another when they get ill. The queen bee is the only insect left in the hive; helpless, she quickly dies.

Worldwide, honeybees account directly for at least a quarter of a trillion dollars of commerce annually and every continent, except Australia, is suffering badly from the decline of the bees.

As early as 2005, some of my colleagues were alarmed by the amounts of pesticides that were turning up in hives. For instance, one study found 66 different pesticides in one hive. Not only were three-quarters of these pesticides toxic to bees, but the combined effects or what farmers call stacking, increases the toxicity effects of the chemicals by 10, 100 and/or 1,000 times. The pesticides also affect bees' nervous systems, behavior and larval development.

The pesticide impact can also ripple throughout a colony. A tainted forager can contaminate the hive with pesticides, which reduce the number of eggs laid by the queen and impair the workers' memory and spatial orientation. Even low-level pesticide exposure weakens bees' immune systems.

Since 2005, scientists have discovered what appears to be going on. Interestingly, it turns out that bees and humans share a great deal in common. Of immediate interest is that bees, like humans, are much more susceptible to illness when they are stressed. Stressed bees are highly susceptible to mites that spread viruses, and to fungal parasites like *nosema ceranae* which cause “bee diarrhea” in combination with other insect-infecting viruses.

A combination of factors is causing colony collapse disorder: parasites, viruses, bacteria, poor nutrition, climate change, electromagnetic cellular radiation and pesticides. Research conducted in 23 U.S. states and Canada recently found 121 different pesticides in 887 samples of bees, wax, pollen and hive samples. Scientists strongly believe that pesticides are a key component of colony collapse disorder.

Of even more concern was that three out of five pollen and wax samples from 23 states had at least one systemic pesticide — a chemical designed to spread throughout all parts of a plant.

Essentially, bees are harvesting pollen laced with lethal poison and feeding it to their young. In addition, many of these systemic pesticides are from a family of highly toxic chemicals called neonicotinoids. Bees exposed to these chemicals exhibit symptoms similar to humans afflicted with Parkinson’s disease or Alzheimer’s disease.

Although cell phones and towers are not found in any concentrations on farmers’ fields or wild forests and meadows, recent studies have shown some disturbing results that impair any bees foraging near towns or cities around the globe. A cellular phone placed in a bee hive, powered up twice daily for 15 minutes over a three-month period, caused during each 15-minute period, honey production to cease, the queen only laid half as many eggs and the hive shrank, dramatically. Cellular phone radiation in the frequency range of 900 to 1,800 megahertz also disrupts the bees’ ability to navigate.

On the brighter side, a unique population of honeybees, *Apis mellifera*, isolated for perhaps 10,000 years has been found living at an oasis in the northern Sahara Desert. This pathogen-free population is currently being studied for it may contain genetic traits able to fend off destructive parasite mites and, therefore, help beekeepers worldwide.

In the meantime, a colony of bees requires the equivalent of 20 football fields, without end zones, each full of flowers, to make a living for 30 days. In the wild, about 40 full-sized maples, basswoods, black locust, magnolias, eucalyptus, apple and tulip trees per acre have about a million blossom that can also support one colony of bees for part of their harvesting season.

Support organic farming and local beekeepers, eat locally and consider what Albert

Einstein said: If the bees disappear from the surface of the Earth, man would have no more than four years to live.

— Reese Halter is a conservation biologist at California Lutheran University, public speaker and author of “The Incomparable Honeybee and the Economics of Pollination.”



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