Gardening Etcetera: Colony Collapse Disorder revisited

CINDY MURRAY Special to the Daily Sun

A couple weeks ago I republished my article from 2016 entitled Colony Collapse Disorder (CCD). CCD afflicts honey bee colonies when worker bees (those that collect pollen and nectar from flowers) go missing from the hive, leaving behind the queen and nurse bees to care for the proliferation of larvae. This malady has decimated honey bee colonies worldwide, and because one-third of our food originates from plants pollinated by honeybees, the disorder has endangered world food supplies.

In 2016 entomologists believed contributing factors could include parasites, pesticides, malnutrition, and climate change.

During the past several weeks of researching the status of honey bee health, I was bewildered to find almost no studies conducted since 2016 on Colony Collapse Disorder. Hence, I took my search to experts on the subject: Patrick Pynes, longtime local beekeeper, Dr. Boris Baer of the University of California at Riverside, and Daniela Zarate of the University of California, San Diego.

Pynes told me, “For now, at least, CCD is no longer a major issue for beekeepers.”

In the American Southwest, many entomologists are attributing some of the diminishment of CCD to the intermingling of genes from our domestic European honey bees (EHBs) with Africanized honey bees (AHBs).

When Africanized bees arrived in Texas in 1990, agriculturists and beekeepers were unnerved. They believed that if AHB genes became intermingled with domestic bee genes, commercial hives would become aggressive, unmanageable, and even dangerous. At first, there was a problem, but after 30 years of interbreeding, many aggressive traits have been diluted. In fact, most American Southwest domestic colonies now have various combinations of EHB and AHB genes.

Studies have shown these bees to be better adapted than the EHBs to the dry, warm environment of the American Southwest. They have also shown better survival rates from varroa mites, parasites, and apparently, CCD.

But this doesn’t mean honey bees are not in danger. In the United States, beekeepers lose an average of 39.6% of their bees from year to year. Beekeepers worldwide are in a constant battle to restock their hives and find new queens. Plus, they must be persistent in surveying each hive for parasites, predators, disease, and more. For now, U.S. honey bee populations are fairly constant, but with an ever-expanding global demand for pollination — now twice as much as it was 50 years ago — the agriculture industry is alarmed.

Years after the CCD scare, its causative concerns remain, playing roles in present-day honey bee decline, including:

Climate change: Honey bees haven't had the millennia required to adapt to extreme temperature fluctuations. Unseasonal heat spells or cold snaps are often lethal.

Varroa mites and viruses: We've known for years that the varroa mite can kill bees by sucking out their hemolymph; now we also know the mite transfers a number of harmful viruses as well.

Pesticides: Bees of all kinds are exceptionally sensitive to pesticides.

Nutritional deficiencies due to herbicides and monoculture: Bees require a balance of nutrients from many food sources, not just an almond or orange grove. Years ago, crops were often surrounded by wildflowers and weeds, offering a healthy and diverse diet. These days, this type of vegetation is all too often treated with herbicides.

Despite all the challenges, I am upbeat about honey bee survival — there are many promising ongoing studies. Through selective breeding of AHB and EHB populations, a team led by Boris Baer and Barbara Baer-Imhoof is on a quest to create honeybee strains capable of withstanding heat and other stressors. On top of that, they are also researching the development of a chemical scent that would keep honeybees away from flowers treated with pesticides. The team has already uncovered several substances produced by the larvae of EHB and AHB hybrids that repulse mites.

Presumably, a plethora of honey bee populations can be found across the globe. I speculate that, through survival of the fittest, their genes have evolved to endure the particular hardships of their environments. Suppose there's a population of bees inhabiting northern latitudes, displaying greater tolerance to winter cold snaps. Perhaps entomologists can find these populations and crossbreed them with EHBs to produce offspring that will strengthen commercial colonies.

I am optimistic that efforts like these will greatly advance honey bee health across the world.