Saving bees from Indonesia's vampire mites

Kim H. Tan, Athens, Georgia | Opinion | Sat, June 06 2015, 9:21 AM

For more than a decade, honey bees have been disappearing, perhaps killed by the use of insecticides, fungicides and rodenticides in agricultural operations, or by pests and diseases.

Since approximately 1991, the number of bees frequenting flowers in the US has been noticeably decreasing.

Of the reasons given for the disappearances are attacks by a group of parasitic mites, discovered in Java during the Dutch colonial period by E. Jacobson.

The group of mites was named Varroa Jacobsini — after Jacobson — by AC Oudemans in 1904, and for some reason the group was subdivided in 2000 into so-called Destructor and Jacobsoni species.

Soon after being discovered in Java, the mite was sighted in Singapore, Malaysia, Hong Kong, the Philippines and China, after which it continued its global invasion into Europe and across the Atlantic, creating havoc in bee colonies on US soil and some countries of South America.

The Varroa Destructor has especially made headlines for its effects on the bee population, which in the US has declined to an alarmingly low level, raising concerns among US bee scientists for the development of the feared Colony Collapse Disorder (CCD), which may paralyze the required pollination of food, vegetable and fruit crops.

Along with the wind, bees are a major, if not the most important, pollinator of a variety of crops, since as estimated by US Department of Agriculture (USDA) scientists, 30 percent of crops and plants need bees for pollination to produce.

To insure the proper pollination of crops grown in different regions of the US, beekeepers, called apiarists, are offering to transport bees from one region to another to take advantage of flowering seasons.

From canola, sunflower and other oil crops, just to name a few examples, to melons, carrots, onions, cherries, apples and peaches in the US, and from avocados and oranges to mangos and other fruit trees in Indonesia, their flowers all need pollination for the production of seeds, vegetables and fruit.

No bees means no pollination is going to occur of the flowers of plants, aborting the development of seeds and fruit. This may harm the supply of fresh produce and food for humans and animals.

Particularly in Indonesia, lucrative horticultural activities — from Berastagi to Bukittinggi in Sumatra and from Puncak and Pengalengan to Salatiga and Malang in Java — such as growing cut-flower, tomatoes, cucumbers, onions, cabbages and other vegetables, will be severely threatened.

e chances are that if bees disappear, the production of palm oil, coffee, cacao, coconut and clove — all very important crops in Indonesia — may also be adversely affected.

The reduced supply of various food commodities may force prices to rocket, giving plenty of reason for housewives to gripe and accuse our government officials of doing a sloppy job in the nation's economic development.

A number of ways have been suggested to control the Varroa infection, from a two-year pesticide ban in Europe to the application of biotechnology in the US, including genetic engineering creating a so-called "superbee" that is resistant to pesticides, pests and diseases. This superbee is then a genetically modified organism (GMO) and GMOs as such usually have health and environmental activists up in arms over human health issues.

The Varroa mite jumps from its hiding place in the soil or plant foliage onto the back of an unsuspecting worker bee during the bee's busy foray collecting nectar from flower to flower.

The mite then lives as a parasite by sucking dry the interior of the bee's body, hence is also known as the vampire mite. It is carried "piggy-back" onto the beehives to infect other bees in the colony through a process of laying eggs, developing more mites.

Bee scientists at the University of Frankfurt, Germany have developed a ring or collar-like device, laced with pesticides, targeting only the mite, placed at the entrance of the beehive.

Since the ring opening is the size of a bee's body, it is supposed to scrape the mite off the bee when the latter enters the hive, killing the mite by leaving it exposed to the insecticide.

Another method of control that is more interesting and more innovative is the application of a micro circuit board used via an Internet connection by bee scientists at the University of Minnesota, US.

Sensors with 3G capacities monitor not only small variations in temperatures and humidity in hives, but also other bio-data.

The sensors are also capable of recording the time that female mites take to lay eggs, relaying it to the computer that then sends a command to raise the temperature before male mites have time to fertilize the eggs.

By raising the hive temperature slightly, the claim is that the male mites' sperm becomes infertile, aborting the fertilization of the mite's eggs.

No explanations are provided and the present author guesses that raising the temperature slightly in the hive has a similar effect as the denaturalization of egg whites during cooking.

Today, most of this kind of research applying biotechnology is conducted in secrecy since issues of patent ownership and huge profits are involved for chemical companies like Monsanto, which are willing to fund huge amounts for such risky investigations.

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