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LOYAL TO LOCAL

Eyes On Hives

Citizen Scientists and the Mindfulness of Monitoring Honeybees

by Jaime Lewis

PHOTOGRAPHY BY JENNIFER OLSON

Other than the constant hum of a few busy beehives, all is quiet in Kelton Temby's downtown Santa Barbara garden.

"I like sitting with a cup of coffee and watching my bees in the morning," says Temby, a soft-spoken robotics engineer who grew up among a family of beekeepers in his native Australia. "When you start beekeeping, you connect with your creatures as the custodian of their existence. You start to notice what's flowering. You start paying attention to the bigger picture. That's the incredible thing beekeeping does for people: It cultivates mindfulness."

Mindfulness is, in fact, the idea behind Eyes On Hives, a system that Temby created to track the health of beehives via video analytics.

Temby originally came to UC Santa Barbara in 2010 to study engineering on a year-long foreign exchange program, but the area's innovative, conscientious community compelled him to stay for good. After graduation, he moved into the healthcare field as a robotics engineer helping physicians to treat patients remotely. It was from his experience with "telemedicine" that Temby first had the idea for Eyes On Hives.

"Seeing one-third of our bee colonies dying every year for 10 years, I thought, 'Why don't we have the same healthcare-like approach to beekeeping? Why don't we use remote technology to give beekeepers insights into bee health?'"



The app portion of Eyes On Hives.

As he researched approaches to stabilizing bee populations, Temby found biologists attempting to breed stronger bees and beekeepers trying to manage their bees' exposure to pesticides. But no matter the measures they took, it was always a surprise when a healthy colony they'd inspected two or three weeks prior collapsed.

"As someone who's used to dealing with real-time monitoring in medicine, I wondered what happened in the in-between time. At what point did the hives collapse? Yesterday? A week ago? I saw that, by using real-time data collection and monitoring the hives, we could help beekeepers understand exactly what changed and when." And thus, Eyes On Hives was born.

The Eyes On Hives system comprises two parts: a device that resembles a radar gun and an app. The device is a camera with a small computer behind it that, when positioned in front of a hive, uses infield video analytics

to recognize what a bee looks like and to count those flying in front of the hive. The app then stores and collates the information transmitted by the device in real time. The system retails for \$300, with a \$10 monthly fee for use of the app. ("It's like the Netflix of bees," Temby jokes.)

On his iPhone, Temby taps the EOH app and pulls up a high-quality video of his hives, abuzz with activity. Viewable from anywhere in the world, EOH video check-ins total 400 per day. Temby shares that just last week, ants attacked the hive we're watching—a fact he discovered remotely via EOH.

Opposite: Kelton Temby, creator of Eyes On Hives, with his bees.





The Eyes On Hives device is comprised of a camera with a small computer behind it that is positioned in front of the hive.

“I made some adjustments to the hive stand to better enable the bees to fend off the ants. I wouldn’t have caught that issue had it not been visible through the time lapse I see here.”

Temby beta-tested Eyes On Hives with local beekeepers and beekeeping associations, and later launched a capital-raising campaign on Kickstarter. The product’s ability to

quantify and analyze hive health appealed to hobbyists, researchers and commercial beekeepers alike. Last December, the Kickstarter project reached 150% of its goal and, today, the product is available for purchase on Indiegogo.

To date, EOH has 35 systems installed across the U.S. and Canada with requests for units coming from as far away





Kelton Temby finds pleasure in connecting with his bees.

as France and New Zealand. As of March, EOH had 550,000 videos of users' hives—a huge data set to which Temby and his now-six-member team has unprecedented access.

“We’re constantly analyzing the data set—that’s what’s really special,” he says. “Collecting data is one thing, but having a data-based approach to understanding bee health is the new play.”

EOH partners with several organizations like the Western Agricultural Society, UCSB, UC Davis and Washington State University. Temby’s team also works with the Pesticide Research Institute out of Berkeley, which supports one of the most important uses for EOH: observing the effect of pesticides on colonies.

“A couple years ago, there was a big pesticide incident in Montecito that killed many colonies, perhaps due to improper application,” says Temby. “As backyard beekeepers and citizen scientists, we now have a record of hive activity to share with those writing legislation. Personally, I feel empowered to use the data to make changes.”

But while fighting colony collapse and the effects of pesticides remain major motivations for Temby, at the end of the day it’s the pleasure of connecting with his bees that most inspires his work.

“My friends tease me, calling me an urban homesteader because I have honeybees, brew my own beer, eat organic

foods, et cetera,” he says. “But I believe my life is more typical of what a lot of people want. We want a connection with our food, with nature. When we go to work and leave our backyard behind, it feels good to maintain that connection.” He laughs. “I mean, we expect to have access to everything on our smartphones, don’t we? Well, now we can use our phones to remain connected to a part of what makes us happy.” 

Jaime Lewis is a food and drink writer whose work has appeared in *Life & Thyme*, *The Clever Root*, *Edible San Luis Obispo* and elsewhere. She is a regular columnist for *805 Living* magazine as well as *The Tasting Panel Magazine*. She lives in San Luis Obispo.

Resources

You can find out more about **Eyes On Hives** at KeltronixInc.com and at **Indiegogo** at Tinyurl.com/eyesonhives.

Santa Barbara Beekeepers Association
SBBA.org

Beekeepers Guild of Santa Barbara
BeeGuildSB.org

Santa Barbara Beekeepers Google Group
Groups.google.com/d/forum/santa-barbara-beekeepers