

Technology tracks 'bee talk' to help improve honey bee health

August 4 2017



SFU Mechatronics Systems Engineering graduate student Oldooz Poyanfar and her bee monitoring system PRO. Credit: Simon Fraser University

Biologists are working to better understand Colony Collapse Disorder given the value of honey bees to the economy and the environment.

Monitoring bee activity and improving monitoring systems may help to address the issue.

Simon Fraser University graduate student Oldooz Pooyanfar is monitoring what more than 20,000 honeybees housed in hives in a Cloverdale field are "saying" to each other—looking for clues about their health.

Pooyanfar's technology is gleaning communication details from sound within the hives with her beehive monitoring system—technology she developed at SFU. She says improving knowledge about honey bee activity is critical, given a 30 per cent decline in the honeybee population over the past decade in North America. Research into the causes of what is referred to as Colony Collapse Disorder continues. The presence of fewer bees affects both crop pollination and the environment.

Pooyanfar's monitoring platform is placed along the wall of the hive and fitted with tiny sensors containing microphones (and eventually, accelerometers) that monitor sound and vibration. Temperature and humidity are also recorded. Her system enables data collection on sound within the hives and also tracks any abnormalities to which beekeepers can immediately respond.

The high-tech smart system is being used to gather data over the summer.

Pooyanfar, who has been working with Chilliwack-based Worker Bee Honey Company, believes that better understanding the daily patterns and conditions, using an [artificial neural network](#) in the hive, will help to improve bee colony management. Current methods of monitoring provide less detailed information and can disrupt bee activity for up to 24 hours every time the hive is opened.

"To learn about what bees are communicating, we can either look at pheromones—the chemical they produce—or sound," says Pooyanfar, who initially received funding through the MITACS Accelerate program. The City of Surrey is providing the field space for her research.

"With this monitoring system, we are collecting data in real time on what the bees are 'saying' about foraging, or if they're swarming, or if the [queen bee](#) is present – right now we are collecting as much data as possible that will pinpoint what they are actually doing."

Pooyanfar, a [graduate student](#) in SFU's School of Mechatronics Systems Engineering, plans to eventually manufacture a sensor package for this application to help lower the costs of [monitoring](#) and allow more beekeepers to monitor their hives in real-time. Her initial-stage research was featured at the Greater Vancouver Clean Technology Expo last fall.

Provided by Simon Fraser University

Citation: Technology tracks 'bee talk' to help improve honey bee health (2017, August 4)
retrieved 20 September 2024 from

<https://phys.org/news/2017-08-technology-tracks-bee-honey-health.html>

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