# CENTRAL COAST BEEKEEPERS NEWSLETTER

Feb., 2025

NEXT MEETING Feb 17, 2025

**Important Notice: Our meetings are now the third Thursday of the month, usually at the Newport OSU Extension Office. Please see the schedule on page 4 for dates and locations.**

## PRESIDENT’S MESSAGE

**By Jeremy Egolf**

We wrapped up 2024 electing (actually, reelecting) our club’s officers plus adding Rick Olson to the Board. 2025’s leadership is
President: Jeremy Egolf
Vice-President: Jim Parrish
Treasurer: Steve Niles
Secretary: Dale Dawson
Board members: Max Kuhn (past president), Pat Wackford, Becca Fain, Rick Olson, and Buck Bowling.

Swarming into the 2025 beekeeping season, I am pleased we have established a meeting place that will permit greater stability of location than our previous "home" at the Newport Public Library. The Newport OSU extension office has reserved for us the third Thursday afternoon of each month, February through November. For those who haven't been there before, the OSU Extension offers a very attractive meeting room with good presentation capabilities and even adjacent kitchen space.

We've completed our line up of speakers - see the schedule on p. 4 - we have some fine knowledgeable presenters and great topics, well worth coming into town for.

After a spate of reports last spring that domesticated honeybee colonies were at an all time high, we're now seeing news from Project Apis m. and elsewhere of roughly 50% colony losses this past winter among commercial beekeepers surveyed. This is reminiscent of the 2007-2011 Colony Collapse Disorder crisis, but with a more rapid onset. We're already seeing reports that there are insufficient bees to guarantee a good California almond harvest, with concomitant concerns for the later flowering crops. So far, the Agriculture Research Service has not identified the cause, analyzing for viruses, parasites and pesticide residue. Some at Washington State University are predicting warmer autumns will extending the flying and foraging season, resulting in increased mortality for the summer bees and perhaps delayed and reduced production of diutinous (winter) bees. However, this seasonal effect is forecast for the future so this attribution may be premature. Some of us are wondering if hive losses we attributed to hornets or to low dose formic acid treatments were part of this other not well understood phenomenon. Last year, our club's responses to the annual colony loss survey painted a dismal picture - we were tied for the greatest percentage losses in Oregon - but in the spirit of citizen science it will be important for us all to respond as the researchers attempt to make sense of the current die-offs.

As Steve Niles, our bee acquisition coordinator, has informed you, we've arranged for Henry Storch to provide bees for paid members this spring. The deadline to place orders is the April 17th meeting. We're tentatively targeting May 7 for packages and May 16 for nucs, depending on the usual vagaries of weather and…

This newsletter's articles continue some ongoing themes, including university research, the ongoing saga of pesticide regulations and fighting the tropilaelaps mite. On the latter point, we note the Oregon legislature is considering HB 2679 (restricting use of neonicotinoids). It's worth looking in to. You can read the relatively brief (one and a half pages) and not too intimidating text here:
https://olis.oregonlegislature.gov/liz/2025R1/Downloads/MeasureDocument/HB2679

We look forward to seeing you at the first meeting of the year, Thursday, February 20.

Happy beekeeping!

## CCBA's Queens for 2025:

At last year's OSBA conference, we purchased at auction a set of five queens from Russell Heitkam. The queens are planned for delivery in 2025, so we expect to have them on hand to replace weak or otherwise failing queens as we do our spring colony checks. Russell is a second generation beekeeper & Northern California (Orland) queen producer, and is on the Project Apis m Board of Directors.

## The Year's Program -

**Meetings are 1:30 p.m. Thursdays, usually at the OSU Extension office in Newport, except the June meeting, planned for the Waldport OSU Extension Office.**

**Feb. 20 - Rick Olson, "Some Talks at the Recent NAHB Expo, American Bee Federation Conference and the American Bee Research Conference"**

**March 20 - Charlie Vanden Heuvel, "Bee Nutrition"**

**April 17 - Carolyn Breece, "Bee Diseases"**

**May 15 - Dewey Caron, "Swarming and Supering"**

**June 19 - Lincoln County Master Beekeepers, "Pollinator Gardening" (Waldport Extension Office)**

**July 17 - Andony Melathopoulos, "Nectar and Pollen Plants of Oregon"**

**August - Summer break, no meeting**

**Sept-Oct. - To be arranged.**

**November 20 - Officer Elections, Plans for 2026**

## ***Innovative Work from Penn State U:***

# 'Buzz me in:' Bees wearing itty bitty QR codes reveal hive secrets

January 22, 2025, By Ashley Wenners Herron

Researchers attached QR codes to the backs of thousands of bees to track when and for how long they left their hives. Credit: Provided by the researchers. All Rights Reserved.

UNIVERSITY PARK, Pa. — Several hundred bees in rural Pennsylvania and rural New York are sporting tiny QR codes on their backs. More than the latest in apiarian fashion, the little tags serve a scientific purpose: tracking when bees go in and out of their hives to better understand how long honey bees spend foraging for food outside of their hives. The work, a collaboration among entomologists and electrical engineers at Penn State, is the first step in solving a long-standing mystery of how far bees travel from their hives to collect pollen and nectar.

So far, the researchers have learned that while most trips outside of the hive last mere minutes, a small minority of bees can spend more than two hours away. The team said they expect to learn much more, thanks to the system they developed to track honey bees' time out of the hive.

"This technology is opening up opportunities for biologists to study systems in ways that weren't previously possible, especially in relation to organic beekeeping," said Margarita López-Uribe, the Lorenzo L. Langstroth Early Career Professor, associate professor of entomology and author on the paper published in HardwareX, an open-access journal that details the exact equipment and methods researchers use in their work so that it might be replicated or built upon by others. "In field biology, we usually just look at things with our eyes, but the number of observations we can make as humans will never scale up to what a machine can do."

Like workers at a high-security building, the bees "buzz" their way in and out of the hive, flashing the pass on their back. They have free access, but they are digitally tracked via an automated imaging system the team developed to monitor when bees leave the hive and when they return via a customized entrance with a camera sensor. The QR codes glued to bees' backs are known as fiduciary tags, which carry the smallest amount of identification information and can be quickly detected and logged via the imaging system, even in low-resolution conditions. The system is a break with conventional entomology field work in which researchers visually observe bees for limited periods, enabling far more comprehensive and expanded observations, the researchers said.

**Barriers to organic beekeeping**

In general, organic beekeeping means that hives are kept free of chemical pesticides, herbicides and synthetic chemical treatments, and are situated away from polluted areas. While the U.S. Department of Agriculture's National Organic Standards Board recommended specific standards for certifying honey and other bee products as "organic" in 2010, they were never passed. Honey bees are capable of flying long distances when they need to — estimated to be able to fly up to 10 kilometers from their hive — but the team hypothesized that such distance is uncommon and bees generally fly much shorter distances, perhaps less than one kilometer, according to López-Uribe. As such, the forage and surveillance zone requirements recommended for organic beekeeping in 2010 may be unnecessarily large.

That could change with a better, more precise understanding of bee foraging range, the researchers said. Honey bees communicate where the food sources are to other bees in the colony with a physical behavior called the “waggle dance.” López-Uribe said researchers spend significant time observing and attempting to decode the waggle dance to determine how far bees travel from their colonies — a process that could be aided by accurately tracking how long individual bees spend foraging.

“The waggle dance is the best source of information that we have about bee foraging, but that’s based on human observations, with maybe an hour of observations made once a day over two weeks. So, we approached the electrical engineering team to see if there might be technology that could better make these observations,” López-Uribe said. “The goal is to understand if that 10-kilometer estimation is biologically accurate. Can we determine exactly how far honey bees travel from their hives?”

**Buddying up for the bees**

The entomologists turned to Julio Urbina, professor of electrical engineering and co-corresponding author on the study, who tapped Diego Penaloza-Aponte, a doctoral student in electrical engineering and co-corresponding author on the study. “There wasn’t anything available like this before,” Urbina said. “This paper is the first step moving forward in the right direction, with opportunities to do more — in large part because of the growing synergy across our teams.”

The researchers emphasized that this was not a collaboration of silos, where biologists and engineers pieced together separate contributions. Rather, the experts spent time as novices in each other’s disciplines to better understand the specific needs and limitations. The electrical engineers worked in the field, learning first-hand how to handle and monitor bees, while the entomologists visited the lab to learn what considerations go into designing and building automated technology.

“Systems built in the past to monitor bees were developed to run in or near controlled laboratory environments,” Penaloza-Aponte said. “Our goal was to develop something that could run in a rural environment, away from the lab, on solar power and to make everything open source. Anyone can use this system and modify it.” According to Penaloza-Aponte, access was also of concern. All of the equipment used is commercially available and cost less than $1,500 in total per apiary, which includes six colonies

Researchers attached QR codes to the backs of young bees who were not yet able to fly and who did not yet have a sharp stinger. Over one season, they tagged over 32,000 bees. Credit: Provided by the researchers. 

**Buzzing with new knowledge**

The researchers used AprilTags, a QR code smaller than a person’s pinky nail that could be glued to the worker bee without impeding her movement or causing harm. Every two weeks throughout the active spring and summer season, the team tagged 600 young bees that had just emerged from their cells across six colonies. In total, they tagged over 32,000 bees across six apiaries.

“We targeted young bees so we could track their age more accurately, especially when they start to fly and when they stop,” said Robyn Underwood, Penn State Extension educator in apiculture and co-author on the paper. She explained that young bees are also softer and don’t sting yet, so they’re easier to handle. “Once the bee was old enough to fly, it would leave the colony and be seen under the camera. In real time, our sensor would read the QR code and capture the bee ID, date, time, direction of movement — leaving or entering the hive — and the temperature. Throughout the season, we could track individual bees. When did she leave? When did she come back? What was she up to?”

The researchers found that most trips typically lasted one to four minutes, which could be to check the weather prior to foraging or to defecate outside of the hive. Longer trips typically lasted less than 20 minutes, but 34% of the tagged bees spent more than two hours away from the hive. This could reflect an unusually long foraging trip, a bee who never returned to the hive or a missed detection if the bee entered the hive upside down, the researchers said. During some weeks, with fewer flowers available, more bees spent more time foraging, likely because they had to travel farther to find adequate food.

“We also found that bees are foraging for a lot longer over their lifetimes than initially thought,” said Underwood, explaining that honey bees are believed to live for about 28 days. “We’re seeing bees foraging for six weeks, and they don’t start foraging until they are already about two weeks old, so they live a lot longer than we thought.”

The cameras at each hive, running 24 hours a day and seven days a week, were each connected to a microcomputer, and the researchers uploaded the data to their laptops at weekly visits.

The researchers encountered an expected issue early in the monitoring — bees loitering in the hive entrance. The camera would detect their individual QR codes upwards of hundreds of times in a day. “Turns out, some bees just like hanging out in the entrance, and the camera will read them every time they walk by,” Diego said. “That’s why the programming is so handy. It can cut that outlier data and help make sure we’re tracking what’s actually meaningful.”


The researchers used commercially available equipment to install a tracking camera that runs 24 hours a day, seven days a week at the entrance of every colony across six apiaries. On this colony, the camera is housed in a protective box, labeled W5, above a small slit for bees to enter or exit. The equipment cost less than $1,500 in total per apiary, which includes six colonies. Credit: Provided by the researchers. All Rights Reserved.

## Waggling into the future

The researchers are now collaborating with a team at Virginia Tech to assess how foraging duration times match decoded waggle dances. Next, the researchers said they hope to tag and track other bee species, as well as other types of honey bees, such as drone bees or queen bees to learn more about those aspects of the colony. They also plan to host workshops for scientists and beekeepers to learn how to build and use their own monitoring systems.

Other co-authors on this paper include Sarabeth Brandt, doctoral student in electrical engineering, and Selina Bruckner, postdoctoral scholar in entomology, Penn State; Erin Dent, an undergraduate student at Texas A&M University who participated on the project as a Project Drawdown scholar in summer of 2023; and Benedict DeMoras, with the Department of Entomology at Cornell University. This team is also collaborating with Margaret Couvillon and Lindsay Johnson, with the Department of Entomology at Virginia Tech; and Scott McArt, with the Department of Entomology at Cornell University.

The U.S. Department of Agriculture's National Institute of Food and Agriculture funded this work. Last Updated January 22, 2025

## ***Fighting Tropilaelaps:***

# Managing the parasitic honey bee mite *Tropilaelaps mercedesae* through combined cultural and chemical control methods

Rogan Tokach, Bajaree Chuttong, Dan Aurell, Lakkhika Panyaraksa & Geoffrey R. Williams; *Scientific Reports* **volume 14**, Article number: 25677 (2024)

## Abstract

The western honey bee (*Apis mellifera*) is severely impacted by the parasitic *Tropilaelaps mercedesae* mite, which has the capacity to outcompete *Varroa destructor* mites (the current leading cause of colony losses) and more rapidly overwhelm colonies. While *T. mercedesae* is native to Asia, it has recently expanded its geographic range and has the potential to devastate beekeeping worldwide if introduced to new regions. Our research exploited the dependence of *T. mercedesae* on developing honey bees (brood) by combining a cultural technique (brood break) with U.S. registered chemical products (oxalic acid or formic acid) to manage *T. mercedesae* infestation. To evaluate this approach, we compared four treatment groups: (1) Brood Break; (2) Brood Break + Formic Acid (FormicPro®); (3) Brood Break + Oxalic Acid dribble (Api-Bioxal®); and (4) untreated Control. We found that the mite infestation rate of worker brood in Control colonies rose from 0.4 to 15.25% over 60 days, whereas all other treatment groups had infestation rates under 0.11% on Day 60. Mite fall assessments showed similar results, whereby Control colonies had 15.48 mites fall per 24 h on day 60 compared to less than 0.2 mites for any other treatment group. Evaluation of colony strength revealed that Brood Break + Formic Acid colonies had slightly reduced adult honey bee populations. No treatment eliminated all mites, so additional measures may be needed to eradicate *T. mercedesae* if detected in countries that do not currently have *T. mercedesae*.

[The full article, including a downloadable pdf is available here: https://www.nature.com/articles/s41598-024-76185-4

[CCBN Editor's Note: These methods should be compared with the work by Dr. Sammy Ramsey, which we featured last year. Dr. Ramsey, working with beekeepers in Thailand, found they were treating with formic acid, with some success. He's been experimenting with other approaches, such as proprietary chemicals and cycles of heating and cooling to determine if these sufficiently disrupt the mites to minimize their impact.]


Early in her career, graduate student Skylar Mathieson had a deep interest in medicinal plants, particularly in the hills and mountains of central and southern Appalachia. "These plants have developed their medicinal purposes for a reason that wasn't for humans," she said. "What was the reason?" That question is powering eye-catching research at East Tennessee State University.

The work is happening under the direction of Dr. Melissa Whitaker, an assistant professor in the [Department of Biological Sciences](#) and a respected scientist whose work has centered on plant-insect interactions. Her team is examining the effects of chemicals that naturally occur in the nectar of some plants, from caffeine to nicotine, on bees. "We know that dietary caffeine makes some pollinators more alert, more efficient. It improves their memory. It makes them faster learners," Whitaker said. "So, these compounds act on pollinator brains in very similar ways as they do on the human brain. There might be some parallels that we can draw in terms of the natural history of some of these chemicals."

Critical to the research has been the work of graduate student Joshua Foley, who helped construct robotic flowers in Brown Hall. Bees interact with the 3D-printed flowers, feeding on artificial nectar in a way they normally would outside a lab.

This research happening at ETSU puts the university in a global conversation about the decline of bees, a species humanity depends mightily on for pollination. Across the world, farmers are having to work much harder to keep crops pollinated as bees die off at troubling speeds. "It's really important to understand everything we can about them, as well as these plant-insect interactions," said Mathieson.

Whitaker has found herself floored by the ingenuity of her graduate students. "This has been such a hands-on project from the very beginning. We conceived and designed and built this project from the ground up, and with some heavy collaboration from Engineering, Engineering Technology, Interior Architecture and Surveying," said Whitaker, noting that the research is still in the early stages. "It's an incredible testament to how critically important graduate students are as the driving engine of research at ETSU."

# UK Government moves to outlaw chemical that could kill 1.25 billion bees with just a teaspoon: 'Vital to our food and economic security'

Simon Sage - Wed, January 29, 2025 at 2:30 AM PST

Government moves to outlaw chemical that could kill 1.25 billion bees with just a teaspoon: 'Vital to our food and economic security'

British bees could soon be getting a break as legislators aim to ban a popular type of pesticide known as neonicotinoids.However, agricultural lobbyists may be carving out an exception for a popular neonicotinoid, Cruiser SB, the Guardian said.

### What's happening?

According to the report, legislators have forged a path to banning three neonicotinoids: clothianidin, imidacloprid, and thiamethoxam. Brexit allowed British farmers to dodge a ban on these pesticides from the European Union. The U.K.'s Department for Environment, Food and Rural Affairs has approved emergency allowances for the use of thiamethoxam every year since 2021, though that consistency has earned it an investigation by the Office for Environmental Protection, per the Guardian.

"These neurotoxins persist in soils for years, and they are now known to be found in hedgerow plants, streams and ponds," explained ecologist Dave Goulson, professor of biology at the University of Sussex, in a response to a news article posted on a university web page. Goulson continued: "One teaspoon is enough to deliver a lethal dose to 1.25 billion honeybees (it would kill half of them, and leave the others feeling very unwell). But they do not just pose a threat to bees; any insect living on farmland or in streams that flow from farmland, and any organisms that depend on insects for food (e.g. many birds and fish) are likely to be affected."

**Why are pollinators important?**

U.K. pollinator populations have been in steep decline for some time, though that trend has also been visible worldwide. Bees are vitally important to the growth of crops, as they facilitate seed production in plants. Without pollinators, human food supplies are in deep danger.

"An end to the previous government's annual pantomime of granting the 'emergency' use of these deeply harmful pesticides is long overdue," said Paul de Zylva, nature campaigner at Friends of the Earth, per the Guardian. "But we're not out of the woods yet — the government must follow through by fully committing to a complete ban come January. And it must go even further still, by scrapping the current, weak national pesticides action plan and instead produce a credible version."

“There should be no place in this country for pesticides that poison our bees, period," added Doug Parr, Greenpeace UK's policy director. "So it's good to see ministers confirming their commitment to a complete ban on these bee-killing chemicals, but now they should waste no time in bringing it into effect."

**What's being done about pollinator loss?**

The U.K. plans to publish a National Action Plan, which will dictate how pesticides can be used. "A healthy environment is vital to our food and economic security. Protecting bees by stopping the use of damaging neonicotinoids is an important step in supporting the long-term health of our environment and waterways, and our farming sector," Environment Minister Emma Hardy said in a statement in December when the ban moved forward.

Other organizations, such as the Natural Resources Defense Council in the U.S., are running public awareness campaigns about neonics at large and their public health concerns, including a major NRDC petition, and using legal actions to try to get regulations on companies such as Bayer who are profiting from these insecticides.

## With $2 million in new funding, Montana State research lab continues explorations into viruses and honeybee health

By Reagan Cotton, MSU News Service
January 30, 2025

BOZEMAN – With the help of two major grants from the National Science Foundation and the U.S. Department of Agriculture, a team in Montana State University's College of Agriculture is furthering investigations of honeybee antiviral defense mechanisms with the goal of developing strategies to reduce honeybee colony deaths. According to Michelle Flenniken, a professor in MSU's Department of Plant Sciences and Plant Pathology and co-director of the university's Pollinator Health Center, annual honeybee colony losses have averaged roughly 38% in the U.S. in the past 15 years. Despite these losses, beekeepers in the U.S. have maintained the number of bee colonies at roughly 2.5 million by dividing one colony to make two – a process called "splitting."

While splitting helps to offset some of the impact of colony losses, Flenniken said the core problem of population decline is concerning. Many factors, including mite infestation, chemical exposure and pathogens – including viruses – contribute to those losses. In Montana, Flenniken said, beekeepers maintain over 250,000 honeybee colonies for honey production and crop pollination, both in and out of the state. Therefore, pollinator health is a crucial area of research for Montana and beyond.

Many of the viruses that affect honeybees cause observable symptoms for which they are named, such as deformed wing virus. However, scientists have learned that many virus-infected bees don't exhibit symptoms, even when they harbor high viral loads. The impact of these asymptomatic infections on honeybee health is not clear, Flenniken said, and since viruses use the cellular and energetic resources of their host to replicate, she hypothesized that these overlooked infections may be more detrimental to honeybee health than is currently appreciated.

Supported by a $1.4 million grant from the NSF, Flenniken's team of graduate and undergraduate student researchers is working to better understand the impact of virus infections on honeybee health. One study, by MSU doctoral student Naomi Kaku, is using flight performance as an indicator of overall bee health. Kaku uses flight mills, machines to which an individual bee is attached by a leash, measuring its flight distance and speed. The mills were made by associate professor Mark Jankauski in MSU's Department of Mechanical and Industrial Engineering. Kaku's research compares the flight distance, duration and speed of healthy bees to virus-infected bees.

So far, Kaku has found that bees infected with some viruses don't fly as far or as fast as healthy bees. The reduced flight distance in infected bees may reduce the ability of forager bees to obtain nectar and pollen to feed their colony, extending the impacts of infection to a community of roughly 30,000 bees. In addition, Kaku and Flenniken are examining the role of the honeybee heat shock stress response in combatting viral infection. Flight generates heat, and we know that for at least some viruses, that heat shock response can reduce infections," said Kaku, who is in her fifth year of doctoral studies in Flenniken's lab. In addition to investigating that hypothesis, Flenniken's team is researching the potential of two supplements to boost honeybee immune strength, a project supported by a $680,000 grant from the USDA's National Institute of Food and Agriculture.

Previous research in the Flenniken lab, as well as data from other labs, indicated that the honeybee immune system is activated by double-stranded

RNA, which is produced by replicating viruses. Therefore, Flenniken's team is experimenting with the use of synthetic dsRNA to stimulate the immune response, which in turn is expected to reduce virus infection levels.

Similarly, thyme oil and thymol, which are naturally produced by thyme plants, have been shown to activate honeybee immune responses. Therefore, members of the Flenniken lab, including doctoral student Hunter Charles in MSU's Department of Microbiology and Cell Biology, are carrying out studies to determine the potential virus reducing efficacy of these compounds.

"Research in our lab is aimed at understanding how bees have evolved to fend off viruses on their own," Flenniken said. "By better understanding that process, we hope that will lead to strategies that we could use to promote bee health." These strategies may include the development of feeding supplements, but for now Flenniken encourages bee enthusiasts to plant for pollinators; a list of pollinator-supporting plants can be found on MSU's Pollinator Health Center's resource page. In addition, she encourages members of the community to join her team at volunteer events held every summer at MSU's Pollinator Garden, which is the home of MSU's own honeybee colonies. "We love having groups come, learn about bees and volunteer in the garden," Flenniken said.

## Club Information and Contacts

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