The Bee Line

Newsletter of the Oregon State Beekeepers Association

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IN THIS ISSUE

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Image above: The 2019 bee season has begun. May all go well!

Front story: The authors (of Bee Alert Technology, Inc, Missoula, Montana) invite "every beekeeper in the world with a smartphone" to download and use the Bee Health Guru app. We are invited to "become citizen scientists and contribute to [the] ability to accurately decode colony sounds."

Decoding the Songs of Bees for Improved Colony Health

Jerry Bromenshenk, Robert Seccomb, Colin Henderson, and *David Firth*

NPR 02/18/2019, Headline: Massive Loss of Thousands of Hives . . . .

This article underscores a fundamental problem. There isn't a system for early detection and rapid reporting of emerging colony health issues, when and where these occur, in the US, Canada, and most countries. Bees need the equivalent of the USA's CDC human influenza updates and mapping. This problem can be solved immediately by just one of the functions of *Bee Health Guru*—our app for smartphones, where the bees themselves are the guru, indicating colony health by the sounds that they produce.

For 12 years, we have been working towards providing a hand-held device for sensing, analyzing, and reporting colony condition. As with a Star Trek Tricorder™, our bee-sound recording and analysis system uses machine intelligence (AI) to analyze colony sounds. In 2012, we built several hand-held bee-recording devices that were big, expensive, and clumsy to use. Smaller, affordable, user-friendly devices with rapid processing and large storage capabilities were unattainable until 2018, when smartphones with facial recognition for security were marketed. Facial recognition uses AI, thus requiring fast processor speeds. It's a visual counterpart to our AI sound-recognition programs. Suddenly, our AI analyses that had taken several minutes on existing tablets, laptops, and earlier smartphones dropped to seconds!

The primary purpose of our Bee Health Guru app is to allow the bees themselves to communicate each colony's health status. Recordings of colony sounds are made using a smartphone's internal microphone or microphone port with a slender microphone. Analysis of a sound recording is immediately and automatically performed by our Bee Health Guru AI program. Our algorithms assign the probability that one of eight conditions is exhibited by the colony. A form then appears on the phone's screen that provides the user the option to visually inspect the colony to confirm its condition, and then save an inspection report.

These three actions, i.e., (1) recording colony sounds, (2) predicting the likelihood of specific diseases, and (3) reporting the outcome of colony inspection, provide data needed to fine-tune our AI modules and map occurrences of different colony problems. The latter will initially be based on visual inspection reports and eventually should be based on the AI analysis reports alone—no inspection needed as the app's accuracy improves.

A Bee Health Guru recording takes 30 seconds. My Android 8+ phone analysis for all eight colony health factors takes 12 seconds. Filling out the inspection form takes less than a minute, but visually inspecting a colony does take more time. This last step, colony inspection, is critical during the early stages of app use. It's where app users can become citizen scientists and contribute to our ability to accurately decode colony sounds.

Following recording and generation of an analysis report by the app, the user is asked to visually inspect the colony to either confirm or reject the app's sound analysis. A click of a button reveals a simple drop-down inspection form. The report is filled out at-the-hive and takes only a few keystrokes to complete, and then a click of another button

uploads the report, as well as any notes and photographs, to our Cloud-based data archive. The app automatically creates a copy of the recording, the AI colony health analysis report, and adds date, time, and GPS location. Resultant electronic records have safeguards for protecting data privacy, confidentiality, and security of beekeepers (i.e., names and hive or apiary locations) and the patients, bees who may be sick (e.g., locations).

Once all of this information is posted to our Cloud-based recording, analysis, and inspection data repository, we can accomplish two tasks: (1) refining, retraining, and upgrading the AI modules for each health factor analysis, and (2) mapping of colony health trends over time and geographical space to share with citizen scientists and anyone else interested in bee health.

Refining the App

Unlike other honey bee acoustic scanning and monitoring systems (mainly from Europe), our programs do far more than look for simple frequency markers of overall colony noise and do not rely on the user to interpret sonograms. Our custom AIs assess a broad and complex spectrum of sound attributes far faster and better than any person could accomplish. This standardizes the analysis. Results are comparable from colony to colony without observer inaccuracy or bias, and no training of the observer is required.

For example, if the app reports a high probability that a colony lacks a laying queen, the inspection report should either prove or disprove that analysis result. By having hundreds or thousands of examples provided from users of our app, we can take all of the recordings that the app got wrong, all of the recordings that the app got right, and retrain the AI. It's an iterative process that we know will refine and improve app accuracy.

Mapping Health Trends

As soon as visual colony inspection information is secured, automated updates and posting of incident maps can be readily produced using off-the-shelf interactive data visualization software. Posted maps will provide sufficient resolution to identify, for example, an outbreak area of Varroa mites, but will not pinpoint the actual location of affected colonies.

To enact the health trend mapping part of our app, we need beekeepers with smartphones, Android or iPhone, to download our app, inspect colonies, and in a timely manner, post the reports to our Cloud site. Our app stores all recordings and reports on each phone until the reports can be uploaded. Cellular service in the bee yard is not necessary. Obviously, we hope that every user also records colony sounds so that we get recordings and AI analysis results, but just the colony inspection reports alone can be used to generate bee health maps.

The inspection and reporting part of our app, by itself, should revolutionize bee health protection—early alerts, based on visual inspections, as soon as the reports are uploaded. Any beekeeper with a smartphone, anywhere around the globe, will be enabled to submit reports or bee colony health problems as they are discovered. Initially, we have limited the health reports to eight major factors, such as Varroa mites, foulbrood, Nosema, queen status, and other aspects of overall colony condition.

All of this is based on relatively recent progress in insect and bee ethology (behavior). An excellent overview appears in *Insect Sounds and Communications* (Dropoulous and Claridge, 2006). We now know that in addition to the well-known symbolic dance language, bees also communicate via sound, using both vibratory and airborne-sound signals.

We can record these signals by laying either a phone's built-in microphone or a slender, external microphone on the bottom board of the hive. Our discovery, formalized in acoustic monitoring and recording system patents, published in the US and Canada (Bromenshenk et al., 2015) was that we can decode bee-produced signals to identify colony exposures to hazardous and toxic chemicals, including often the category of chemical, as well as discern a variety of colony health conditions, and even rank the level of infection or infestation of bee diseases and pests. Furthermore, bee sound or song repertoires are far more complex than can be perceived by the human ear, with frequencies beyond our audible range and additional components such as amplitude, pulses, shifts, and other related signals all contained in the airborne sound and vibratory spectrum.

Which raises the question: Can bees perceive these sounds and vibrations that they produce? Bees and many other insects have long been considered to be deaf to airborne sounds. Around 1940, Hansjochem Autrum and associates demonstrated that many insects perceive minute substrate vibrations and that some insects have hair-like structures can function as sound velocity and airborne sound receptors. But, it wasn't until the 1990s that scientists found evidence that flies and bees appear to be able to perceive airborne sounds through the Johnston's organ and movement of the flagellum of the antennae.

Modern capabilities for recording, manipulating, playing back, and analyzing the acoustic signals of honey bees and other insects have made acoustic behavior an advanced and active area of insect ethology. We are just now beginning to realize that the bee dance movements are only one part of a bee colony's communications. Communication processes of social bees that coordinate hundreds or thousands of individuals in a colony are fascinatingly complex. We have a means of tapping into colony communications.

Why do we need to fine-tune and calibrate? When using

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MESSAGE FROM THE PRESIDENT

Greetings, fellow beekeepers. By the time this message reaches you, spring flows will be in full force and most of us will have switched from solving the problem of ". . . where did all the bees go?" to ". . . what to do with all of these bees?"

Abundance is a much more enjoyable problem to have. Any decent, healthy colony worth its weight will be growing fast and beekeeping will seem easy again. Do not be fooled. There are still plenty of mites present, and the bees are just growing faster than the mites for only a little while longer. It is never too early to start counting mites. Solving mite problems early will always pay the most dividends, and its way easier to solve problems when they are small and the bees are naturally growing fast. In this day and age, waiting until late summer when colonies to begin to deteriorate and are rife with viruses is just not a good plan.

As to solving the problem of what to do with all of these bees, I always think about the advice given to me by an old time beekeeper when I first started beekeeping decades ago. He often said, "The secret to good beekeeping is to help the bees do what they want to do, and do not try and force them to do what you want them to do."

What does this mean when dealing with healthy abundant colonies? Healthy, prosperous colonies, left to their own devices, will want to swarm. This is reproduction at the colony level, and, after all, what organism does not strive to reproduce? This is where beekeepers can intervene in a positive way and help the colony to achieve its goals by making a split. Done properly, this will save the bees a lot of time and risk. Neighbors of apiaries will certainly be happy not having to deal with the nuisance of swarms, and you will have a nice hedge against the inevitable future losses. With annual colony loss rates of over 40 percent industry wide, you or someone you know is at risk of a depleted apiary. Managing this risk has become an essential element of modern beekeeping.

Speaking of risk management, I recently read an interesting article in the *Harvard Business Review* about the lessons bees can teach us about handling risk and incentivising behaviors, titled "A Beekeepers' Perspective on Risk" by Michael O'Malley (hbr.org/2012/06/a-beekeepers-perspective-on-ri). It is a great read and an excellent window into many of the things our bees can teach us, especially when it comes to running our businesses. In a nutshell, honey bees are experts at risk management, communication, and making the right mistakes. This is part of the reason these amazing creatures have been around 100 million years.

Honey bees are a phenomenal example of what working together can accomplish. Consider the fact that a single bee only makes about one-twelfth of a teaspoon of honey, and yet, together, through cooperation, communication, and group decision making, a colony can function as a cohesive unit and produce potentially hundreds of pounds of honey. Perhaps, if we humans can behave more like bees, we may have a chance to be around for 100 million years. Clearly, we will only have a real chance at this if we work together and make this world a better place for bees and beekeepers.

As always, it is a honor to work with such a great group of people to serve the cause of bees and beekeepers. Together we can accomplish great things. Be like the bee. Order up some queens and make some splits, count some mites, attend some meetings, and help create long-term pollinator habitat. *Tempus fugit* and the future will be upon us in the blink of an eye, so please take action now.

John Jacob

BEE EVENTS

May 18–19: Oregon Honey Festival. *Information*: www.oregonhoneyfestival.com.

May 19, 10:00 AM to 3:30 PM: Wonders of the Hive. Registration is limited to 40. 4565 Riordan Hill Dr, Hood River. *Information*: bg-bees.com/wonders-of-the-hive.

June 17–23: Pollinator Week. Plan, and let us know your plans—and how things unfold!

June 17–23: Forest Grove Raise the Vibration for Bees. *Information*: arrownhertert@gmail.com.

July 12–14: 2019 Western Apicultural Society Conference. Ashland. *Information*: westernapiculturalsociety.org.

July 17–20: 2019 International Conference on Pollinator Biology, Health and Policy. *Information*: honey.ucdavis.edu/pollinatorconference2019.

September 8–12: 46th Apimondia. Montreal. *Registration is now open*: www.apimondia2019.com.

ADM PORTLAND WELCOMES BEEKEEPER

Harry Vanderpool

Recently, I was invited to sit down and meet with Kevin Lewis, Plant Manager of ADM Portland, to review policies and procedures for beekeepers obtaining syrup in their facility. The management and staff of ADM are grateful for the business that the beekeeping community generates and happy to support our industry. ADM staff and many Oregon beekeepers are on a first-name basis after many, many years of acquaintance.

Because new beekeepers come on line from time to time, I have been asked to pass along the following guidelines:

1. ADM does not fill buckets or barrels; 275-gallon totes are the minimum.

2. ADM no longer allows feed additives to be handled inside their facility. If you wish to add anything to your tanks, please do so prior to entering their facility. They will disallow additives in the filling station.

3. If you require water to be added to your tanks, please do so prior to your visit to ADM. ADM is charged for water and has not been passing that expense along. Add your own water at home and help keep syrup prices low.

4. The ADM facility in Portland is a food-grade facility. Please make sure that your totes and truck are clean. They don't expect you to do a paste wax job on your truck, but pine needles and mud patties dropping off of mud flaps will not be allowed. Mold on or around the filler cap will not be allowed. If you are asked to leave and return with a clean rig, you have been warned.

5. When you arrange for syrup, realize that your date for filling needs to be firm. If you cannot make it to the ADM facility as arranged, please call them at 503.286.0124 and make new arrangements. Ask for the filling station.

6. Optimal hours for beekeepers.

6–8 AM: Optimal for beekeepers

8 AM–NOON: 11,000 gallon tankers are regularly filled

You are welcome to come during this time, but need to be aware that your wait time may be considerable.

NOON–2 PM: Optimal for beekeepers

7. Please call to avoid problems. If you cannot make it to ADM by 2:00 PM, please call to make arrangements. If you can make it on time but are traveling a long distance, by all means call first to ensure everything is running on schedule and you will be able to return home with your syrup! Prior to leaving home, call 503.286.0124. Ask for the filling station. Add this number to your contacts.

Pacific Northwest beekeepers have a great friend in the management and staff at ADM in Portland. Let's work to keep this relationship for future years.

KEEPING BEES IN MAY

Lynn Royce

A lot of what you did in April needs to continue in May. But if you are new to beekeeping, here are some thoughts that could help you get started or provide a review of what books and classes have already taught you.

May is the month when packages and nucs with bees become available in Oregon. Many stores that sell bee keeping gear will also sell packages of bees, but you need to order them ahead. You can also order bees in advance from commercial beekeepers who will then order packages from mostly California and sell them here. Also some local commercial beekeepers sell packages or nuc boxes with excess bees raised in their colonies that have been in California pollinating almonds. Bees should be ordered in March or April to guarantee delivery up to late May or early June.

Now is the time to check what you have in terms of equipment and make sure it is ready for new bees. To get your package bees started, you will need to set up the first box with frames on a bottom board and have an inner cover and a top to complete your hive. A stand for the hive should also be ready in the place where you want your bees to stay. You will need to feed your bees to help them get started. There are many options for feeding your bees. The shipping box may still have a fair amount of sugar syrup and may be placed over the vent hole of the inner cover. If the can does not cover this hole, do some temporary plugging of the space beyond the can to prevent bees from exiting their brood into the empty super. The bees usually empty the can quickly, depending on the amount they were given in their package. There are many other options for feeding and that should be figured out as part of getting ready to receive your package of bees.

Many of us older beekeepers have back trouble, and you may want western boxes to make up your hive. Western boxes will weigh less than a deep box. You can use western boxes for the entire hive and only have to work with one size frame. Or you can use deeps and westerns or all deeps. Find what works best for you. Remember that a deep with bees and honey stores is heavy if you have to move it. A deep full of honey is not for those of us who are not into weight lifting at the gym.

A package of bees is a box with wooden top, bottom, and ends, and screen sides. Usually 3 pounds of bees are in a package. The box has a four-inch diameter hole in the top middle of the box for a can of syrup that will be inside the package—i.e., the bottom of the can will be flush with the top of the box and a caged queen is hung in a slit from this hole. When you get home with your package and are ready to

install the bees, take the package to your hive, which should be placed where you want the bees to live on your property and should have frames in it. There are two ways that I know of to get the bees from their shipping box into your hive. The method I prefer starts with removing the hive lid and inner cover and taking out five or six frames—enough to fit the shipping box inside your super. Now remove the can of syrup. You will need your hive tool to lift the can and get a hold on it to lift it up out of the box. There will be bees hanging in a cluster over an opening that gives the bees access to the syrup. Move the can and adhering bees gently over the frames and shake the bees off the can. Set the can aside. Slide the queen cage over to the open top of the package box and lift it out. Hang the queen in her cage between two frames near the center of the frames left in the hive. Take the box with the remaining bees and shake some of them gently over the frames around the queen cage. Keep the bees on the frames and not in the space where you removed frames. Then set the box with remaining bees in that space. Put the inner cover on and turn the syrup can over and place it over the hole in the inner cover so that the bees in the box can access the syrup. Now put an empty super over the can, and put the lid on the hive.

After about 24 hours, take the box out. Most of the bees should be out of the box. Then gently put the frames that were left out of the hive back, and, if there are bees still in the box, set it as close as possible to the entrance top hole facing the hive. Hopefully after another 24 hours those bees will also have found their new home. If there is still syrup in the can, you can set it over the inner cover as before. You should leave the queen in her cage for several more days (4–5) as she may not have had time to be accepted by the bees in the package.

If you want to leave all the frames in the hive, you can put the queen in her cage in the between two frames after removing the syrup can. You may want to take a frame out to give yourself some room to work in the hive. When you have the queen in place and the frame back in the hive (if you took one out), then shake the bees out of the package box into the hive. Sometimes a few bees remain in the package box. That is okay. When you are done, put the package box on its side in front of the entrance. Put on the hive inner cover and place the can with remaining syrup over the inner cover hole. Put an empty super over the can and the lid on top. When the can is empty, you may want to replace it with a feeder jar and continue to feed the bees.

There are many kinds of queen cages and each one is a little different regarding release of the queen. I will tell you about two of these cages. One made of wood has three round spaces in a wooden rectangle with a hole in each end and a screen top. One hole will be filled with queen candy and may or may not have a cork closing that hole to bees outside the cage. The cork is to make sure the queen is not released before you are ready to hive the package. The candy will be eaten by the workers, and the time it takes should give the queen enough time to be accepted by the bees in the package. So, when you are moving the queen in her cage from the package to the hive, remember to remove the cork. If the frames are drawn out, the cage can be pushed into the wax cells between two frames below the top bar. The cage must be placed so that the screen side of the cage is accessible to the workers and the candy filled hole is down. The workers should eat the candy in 3–4 days. Check that the queen has been released after 4–5 days. If the candy is eaten and she is no longer in the cage, take it away and gently adjust the frames where the cage hung by reversing one of the frames so that the damaged wax cells will be repaired correctly. Do not do anything else. The workers may still be anxious from the trauma of packaging and shipping, and anxious bees may kill the queen. If you leave them alone another two weeks or so, but watch what they are doing at the entrance, your queen has a better chance of being accepted. Watch the workers as they come and go over the next couple of weeks. They should start bringing in pollen to make food for new larvae. So, pollen loads coming into a hive is suggestive of a queenright colony. After a couple of weeks, you should be able to see brood and look for new eggs and young larvae. You do not have to find the queen. The more frames you move and the more time you spend in the hive, the harder it is on your new colony. Look at it this way: if a giant came by your house and took the roof off, how would that make you feel?

The other type of queen cage that I have seen in these shipping packages is smaller with only one hole into which a black tube has been placed. The tube is filled with candy and plugged with a cork. I do not like these cages because, if you remove the plug and the bees eat out the candy too soon, the queen may be killed. If you wait a day or two to remove the plug, then you have to disturb the bees one more time before they are queenright. It is a toss up as to what is best. I would remove the plug when the bees are first set up and cross my fingers.

If you start with a nuc box of bees, they will most likely come on five deep frames. The frames are drawn out and the queen should be laying. The hive will have to be a deep to accommodate the frames from the nuc. This limits your option to start beekeeping with a different size hive box. But it is an advantage as the queen is already established and laying, or should be. Transfer the nuc box frames to your hive set up and add five frames to fill the space, and your colony is ready to go.

If you do not have deep frames with drawn comb, then you



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should be prepared with frames that have foundation. There are many options for frames these days: all plastic, wooden frames with a plastic foundation that has been coated with beeswax, wooden frames with all wax foundation, or wooden frames with no foundation.

If you expect the bees to draw comb on a wooden frame with no foundation, you must think like worker bees. I am told that a hive facing true north and south will draw comb in these frames correctly. That is without cross comb or other designs that inspire the workers. Placing the empty frames between two drawn frames also helps them draw comb correctly, but with only five drawn frames that gets challenging. You want to have the frames from the nuc centrally placed in the hive.

Personally I do not like plastic in my colonies, being an old opinionated beekeeper, so I use foundation and then I don't worry about true north/south or give the workers any choice of their own design. I also have a feeder in my bottom deep box, so I only have four frames to worry about if I get a 5-frame nuc of bees.

What about disease in old frames? The color of the wax gives an indication regarding the age of the frame. The older the frame, the more likely it is to harbor disease. When you have new comb being built, it will be white. As comb ages, it gets colored by stores and brood rearing, going from white to yellow brown, and eventually it becomes very dark. The older the comb, the more likely disease organisms are to be present. I make it a practice to replace one or two combs every year from each box, except honey supers. Yes, a lot of work, but my bees are healthier.

Give the bees several days to allow the queen to begin to lay eggs before you do your first examination of your new colony. Things to learn from a mentor should include finding brood and identifying eggs, young larvae, older larvae, pre pupae, and pupae. When you find lots of eggs on a frame, the queen is often on that frame. Moving slowly and using as little smoke as possible will increase your chances of seeing the queen. However, if you see eggs, you can assume your colony is queenright. Looking for the queen takes time and can be hard on a colony, especially a new colony.

This is spring and weather can give lots of wonderful flowers and good weather for bees, and it can give cold, rainy weather. Feeding bees can be critical to colony survival. Checking the weight of your colony can help you identify the need to feed. If you are new to lifting your hive, you may need a season or two to know what the weight feels like on a colony in need.

Feeding can be critical, especially for a strong colony if the weather has been good and then takes a turn to cold and wet. The strongest colonies are in the most danger of starving if workers cannot get to forage. It is heartbreaking to open a colony that was doing really well after several days of rain and have bees fall off the comb as you lift it out, lots of heads down in the cells and lots of bees dead on the bottom board. It is difficult to save a colony in this state. So, if you have strong colonies and the forecast is for rain, get out there and feed. If the rain lasts more days than two or three, you may want to feed when it is raining. Try not to stress the colony by opening it just enough to feed and being as quick as possible.

Spring and early summer feeding is critical here in the Willamette Valley if weather is rainy for several days. I use 3 units water and 5 units of sugar whatever the season to feed my bees. Other beekeepers like a lower sugar solution in spring and higher sugar solution late summer and fall. This more closely mimics the nectar flow. You get to decide how you want to do it.

If you are lucky enough to have overwintered colonies, watch their growth. If the queen is good and the colony gets strong, they are susceptible to starvation if the weather gets bad for several days. Feeding is a challenge in the Pacific Northwest as we do tend to get rainy weather.

Varroa mites will also be doing well in strong colonies. It is critical to know how to sample, what your thresholds are, and what treatment you will use. Talk with other beekeepers to see what your options are and how they should be applied. Companies selling treatments should also be able to help you. Mite populations can grow quickly, and it is important to sample often. Maybe twice a month in spring and early summer when both bee and mite populations are growing. If your mite treatment is working, mite populations should decrease—although they will probably not disappear.

Out of the Classroom and Into the Hives

A. Hartwig

Two weeks ago, a few of the bee team six ladies were called out to meet at inmate processing where Cpl. Johnson would take us out to the beehives to assess the damage that had taken place to the hives from a long winter. We had a lot of wind which caused the plastic to be blown off the top of the hives, creating havoc on the hives. This was our first adventure to the hives assisting in some much needed cleanup. Unfortunately, we lost quite a few of our honey bees, which was a sad loss to see. A feeling of pride was shared amongst us all to be able to physically contribute to the well-being of these amazing and magnificent bees.

We cleaned up all the propolis (bee glue) and wax, scraping it from the frames and boxes along with any mold that was present. We were treated to some fresh honey,

which we ate right off of the frames. It was thick, sticky, sweet, and rich in color. We got things all cleaned up and resituated.

Then on Wednesday, March 20, 2019, I was at my bunk when around 1:50 PM. I and five others were called to the Inmate Processing to suit up and get ready to go out to the hives. At first I felt excitement, and then I was hit with a large dose of reality of where I was going. I began to question myself. "What did you get yourself into?" Because bees can sense nervous energy, I knew how important it would be for me to remain calm and remember to breathe.

First, we all met in the chow hall where Cpt. McCorkhill and Cpl. Johnson taught us how to recreate the sugar from the sugar boards into a sugar syrup, adding Honey B Healthy to the sugar syrup, which aids in preventing mold in the sugar syrup along with stimulating the bee's immune system—not to mention the spearmint and lemongrass oils used in it, which smelled incredible! Once we had our sugar syrup made, off we went. It was warm outside, and I wasn't prepared for the heat that I could feel from wearing the bee suit, gloves, and veil, which are needed to protect oneself from potential bee stings. With most of us eagerly waiting to take off the tops of the hives, I reminded myself to stay calm and enjoy the process. As we began to slowly pull frames out, witnessing the busyness of these complex creatures, it was an awe-inspiring moment to see just how significant these honey bees are to our world as a whole. It is still astonishing to me how something so small can be so vitally important to our universe.

I'm happy to report that three of our queens are alive and appear to be doing well. We didn't bother them much, just eyeing their living situation.

No one got stung while we visited the bee hives and the experience was 100 percent positive. I am thankful that I chose to step out of my comfort zone, becoming more educated in the importance of the honey bees and how they affect our livelihood.

Note: A. Hartwig is participating in the beekeeper program at Coffee Creek Correctional Facility, part of the Oregon Prison Beekeepers program.

REGIONAL NEWS

Note: All affiliated associations invite and welcome visitors to join them at meetings. See page 16 for meeting day, website, and/or contact information. Many regional associations also offer additional opportunities for learning; they are posted on their websites as well as on orsba.org, under *Events*.

Regional Representatives

North Coast

The north coast is well into their "half-and-half" days . . . days when you can count on half the day, morning or afternoon, being nice and the other half being wet. It gives the bees a chance to get out, gather some pollen, and start scouting out nectar possibilities. Most beekeepers are anxiously awaiting the arrival of their new bees in nucs and packages. A big thank you to Rick Olsen and Becca Fain of Central Coast and Rick Stelzig of Tillamook for the amount of work put in picking up tens of thousands of bees and seeing to it that they are distributed in a timely manner. And thanks also to Foothills Honey and Nick VanCalcar for providing those bees.

At their last meeting, Central Coast hosted Dr. Dewey Caron, who reported on committee hearings that were held on chlorpyrifos and neonicotinoid usage and spoke, as well, on spring management of colonies. Dr. Ramesh Sagili gave a comprehensive talk on bee nutrition at the last Tillamook meeting. Tillamook is also anticipating the upcoming Home and Garden Show, where they will have loads of information to share as well as plants and honey to sell and a hand-crafted, hand-painted hive to raffle off. Good luck!

Kathy Cope

Regional Associations

Central Oregon Beekeepers

In April we had an extended, more than two-week period of cloudy, cold, and stormy weather. Kind of unusual for the desert side of the state, but it sure made things green up well. We were very thankful to be missing the flooding seen in the Willamette Valley though and hope everyone there makes it out with a minimum of damage. It has, however, postponed a lot of the early spring adjustments and inspections, with high temperatures consistently in the forties. We're now looking forward to some sunny, warm spring days to get everything back on track. We're also looking forward to the nucs and packages coming in to replace the winter losses.

In April, we had a great discussion on beekeeping best practices. The wax currants and Manzanita bushes were blooming. In May, we will be talking about splits and swarms. Bloom will include many of our fruit trees as well as the bitterbrushes. On this side of the mountains, more tender annuals need to wait until later May and early June to avoid late-spring frosts, or we need to be prepared to protect at night. We are continuing to present portions of the usual Beginners Bee School at our beginners corner, just prior to the association meetings. *Allen Engle*

Columbia Gorge Beekeepers

With the advent of spring comes renewal of spirit ardently

Twelve years ago, the US Senate's unanimous approval and designation of a week in June as "National Pollinator Week" marked a necessary step toward addressing declining pollinator populations. Pollinator Week has now grown into an international celebration. Do you have plans for **June 17–23**?

needed to sustain the commercial as well as hobbyist beekeeper. The winter losses challenged the best to dig in for another year. Two areas of loss appear to be the culprit: Varroa mites with their associated viruses and Starvation. Once again, the fall of 2018 sustained warmer temperatures allowing the girls to continue foraging but also consuming their vital winter stores.

We were blessed to have Jan Lohman travel from Hermiston to Hood River and grace us with a practicum on "how to inspect a hive" using the three Extension Service hives. Jan then presented "Hive Management Throughout the Season."

Our young association has been very fortunate to have the Extension Service support, especially their hives, purchased by the Master Gardeners. Monthly speakers travel several hours to share educational morsels. Beginning in 2019, we are proud to support the Oregon Master Beekeeper Program by having classes at the Extension Service for ten new Apprentice students. Our goal on initial forming of the association was to bring education to beekeepers throughout the Columbia Gorge and also to our communities at large.

Jerry Frazier

Lane County Beekeepers

With the rains of April in the Willamette Valley, we find many of our members anxious to get to the drier weather. We have not heard of any flooded beehives in our area, but putting the hives on higher ground seems reasonable.

The LCBA had an update from Dr. Dewey Caron in March. His subject was the Pacific Northwest Honey Bee Survey. If you have not yet taken the survey for 2019, please consider giving your yearly results at: pnwhoneybeesurvey.com/survey. We continue to lose hives all year long, but specifically from October through March in dramatic numbers. We hope the efforts of the survey will yield results to help us all keep our bees alive. Our speakers in April are addressing the arrival of packages and best spring management practices.

Mike France

Linn Benton Beekeepers

A typical Oregon spring is upon us in the valley. A few nice days sprinkled here and there, and then the occasional flash flood warnings with 3–6 inches of rainfall within 24 hours. With this uncertainty, somehow the bees are still managing to get out and find resources. We have seen hazelnuts, willows, and dandelions in bloom. These April showers will soon bring May flowers of seabush, iris, shooting stars, larkspur, mariposa lily, Kincaid's lupine, nootka rose, and a host of nonnative flowers. Let's hope that the honey bees and other pollinators can dodge the showers to find them.

This month's guest speaker is Dewey Caron. He will be highlighting how to manage colonies mid-May through June with an emphasis on keeping strong colonies growing and avoiding swarming. In addition, how to manage weak colonies and newly established colonies from divides, swarm captures, nucs, and packages. This will be an interactive presentation with audience involvement. *Amber Reese*

Oregon Prison Beekeepers

See "Out of the Classroom and Into the Hives," page 9.

Oregon South Coast Beekeepers

Just as it looked like spring was perhaps trying to arrive early this year, our south coast freeze struck in February, catching both plants and "coastal bees" a bit off guard. The freeze took out some hives. Then came lots and lots of rain, so much that 10 counties in Oregon were declared to be in a state of emergency, Curry being one of them. We lost part of Highway 101 when saturated land allowed an existing slide area to slump down the draw toward the ocean. February was followed by even more rain in March. April then brought us the atmospheric river known as *The Pineapple Express,* which continued to dump even more rain. The bees (and keepers) are ready for summer! Coupled with this has been what we've coined as *B-pocalypse*. Bee suppliers have faced the same weather issues this year. Honey bee availability has been negatively impacted by as much as two-thirds this year because of weather. *Jesse Fletcher*

Portland Metro Beekeepers

With spring weather in the Pacific Northwest (or Northwet: yep, my original typo seems appropriate this week!), with some simply beautiful days followed by some dreadfully wet days, the March meeting was perfect. Dewey Caron, recently returned from South America, asked each member, "What's the plan for March and April?" to better ensure healthy bees and hives: Check last year's survey; make sure your bees have adequate resource (so, feed, feed, feed!), plan for mite control, plan for swarms, splits, and even small hive beetles. Dewey encouraged everyone to participate in the overwintering survey.

Next on the agenda was installing a nuc, with details such as how to deal with downpours on the delivery day, which is exactly what occurred on April 6.

Even though the weather keeps bees and their keepers inside sometimes, maples are beginning to fill out, Oregon grape and other natives are blooming along the trails, dandelions are hale and hearty, fruit trees, laurel, and rosemary are flourishing. Our hives are beginning to fill


Delivery Day Downpour

out with eggs, larvae, and brood. It's so fun to watch our lovely queens make their way around the frames for the perfect empty cell. These days do highlight the promise of new life.

Looking ahead, Carolyn Breece will address brood disease for the April meeting. At our meeting in May, Ellen Topitzhofer will cover bee nutrition and Sherry Sheng will talk about attracting pollinators to our gardens. *Nancy Winston*

Portland Urban Beekeepers

Spring could not get here fast enough! In early April, we watch the buds break into flower with joy, only to fade later in the month with cool, rainy days. During the warmer days, we took the opportunity to quickly peek into our colonies and get a sense of success or demise. There was a general feeling that we experienced significant losses this year, but we will have a better idea after we see the statistical analyses from the 2018–2019 Bee Informed Partnership survey.

Bee school 2019 was a success, albeit with a few minor inconveniences—like a major water main break that caused our venue to have a total power outage, with subsequent deafening generators set up next to our room. We prevailed; after all, beekeeping is challenging. We will make up for it on May 18 and 26, when we will have our Bee School field days at Green Anchor Apiary.

Our April meeting was well attended with 89 bee keepers; 25 were new to PUB. Our speaker, Travis Owen, enlightened us on the diverse native pollinators and their unique morphology that allows specific flower pollination. Owen's photography was stunning in its beauty and detail! Glen Andresen from Bridgetown Bees finished the evening with a photographic review of what's blooming in Portland.

Finally, over the past year PUB has developed a partnership with Portland Bee Balm, and this month they presented us with a very generous donation that will go to support the association, mainly to offset the development of our swarm hotline software, in addition to extractor repair and the Zenger Apiary. Big thanks for supporting the bees!

Cheryl Wright

Tillamook Beekeepers

The Tillamook Beekeepers Association is having an awesomely busy spring. Wet, but very busy. Most of our bees that survived the winter are being tested now. March had just enough warm weather that the queens went into action and the rest of the girls joined in by early foraging. Now it is so wet (the sun hasn't been seen for three weeks) that they are stuck in their hives, hoping to survive until the real spring shows up.

The humans are also busy getting ready for the annual Home and Garden show the weekend of 13 and 14 April. In addition to demonstrating bees with a newly redesigned demonstration hive and selling honey to the public, we are selling thousands of dollars worth of bee-friendly plants, shrubs, and herbs. It's all-hands-on-deck time, and many member volunteers are pitching in to pull off this incredible annual event.

Of course, we need to mention that our beautiful handcrafted, hand-painted hive is being raffled off at the show. The hive has been on display for almost two months at the local library and has drawn a ton of attention. This hive was handcrafted by Rick Stelzig and hand painted by Kathy Cope.

Our website has been a boon to our group. Our foraging team has recently added a list, complete with beautiful pictures of bee-friendly, bear-resistant, flowering plants, shrubs, herbs, and trees that are perfect for our climate. The education team has also added dozens of embedded videos on every subject of value to beekeeping practices.

In April, we had Dr. Dewey Caron as a guest speaker, and, as always, his presentation was extremely informative and added great value to our monthly meeting. *Brad York*

Tualatin Valley Beekeepers

Our members enjoyed a fascinating presentation from OSU Research Associate Priya Chakrabarti Basu on bee nutrition in March, and in April we are looking forward to hearing from Dr. Dewey

Caron on Varroa mite updates and colony survival statistics. We are excited to pick up nucs soon, and we are planning to do our best to support them in shepherding those new colonies to success through the year. Pollinator education outreach requests are coming in thick and furious, from local Girl Scouts to Earth Day tabling requests and National Pollinator week celebrations—our board and community members are working to keep up!

Debby Garman

2019 Western Apicultural Society Conference Comes to Ashland, Oregon

The theme of the 2019 WAS Conference is "Hive Mind for the Greater Good," built on the values of persistence and authenticity and celebrating community, women in leadership, and, of course, bees and their keepers. The weekend of July 12–14 will be a mix of dynamic keynote talks, workshops built on the themes of art, beekeeping, social media and marketing, bee habitat conservation, education, native bees, and global research.

In an effort to create community, they will also provide plenty of opportunities for networking:

- A "storytelling hour" in the theme of #beekeeperfail
- The "Community Waggle Dance Tabletop Show," where attendees can apply to show off a hive design, their research, a tech innovation, etc.
- A "Roundtable Speed Swarm" event where guests will rotate (in groups) to speaker-hosted tables
- Multiple breaks scheduled throughout the conference and a happbee hour each evening to encourage beekeepers to meet up

Keynote Speakers & Workshop Leaders include: Dr. Judy Wu-Smart, University of Nebraska-Lincoln; Katrina Klett, Elevated Honey Co.; Hilary Kearney, Girl Next Door Honey; Dr. Meghan Milbrath, Michigan State University; Anna Gieselman, Bee Amour Jewelry; Sarah Red-Laird, Bee Girl; Molly Romero, Active Acupuncture of Ashland; the native bee team, Logan USDA-ARS Pollinating Insects Research Unit; a streamed opening welcome by Dr. Marla Spivak.

More information and registration at:
westernapiculturalsociety.org

Bee Health Guru—*Continued from page 2*

high-end recorders and desktop computers, the accuracy of detection for the eight included factors ranged from 86 to 98 percent detection, based on over a decade of our own intensive research. Our AI programs learn and improve when we've got real recordings from colonies with specific visible health factors. We now need to know which phones provide an accurate recording and which do not. We've also learned the bees have accents. New Zealand bees produce somewhat different sounds than North American bees, and bees from the UK are different from either America or New Zealand.

When launched in the fall of 2017, we anticipated that it would take three months to produce and beta test our Bee Health Guru app. It took two years! It's not a finished product, but we are close to the finish line. That's where lots of beekeepers and bee colonies are needed. It's what we intend to do this summer—calibrate the sound and vibration signal decoding!

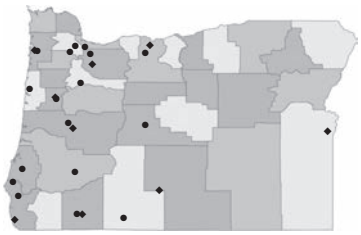
This spring (April) we will launch our app to the public on Kickstarter. We hope that every beekeeper in the world with a smartphone will support this launch and then download, use our app, and upload the results. That has the potential to generate a massive data set. To properly address that rich resource, we need to be able to have a team ready and willing to process the initial data, retrain the AIs, and enact regional bee health mapping—for the US, for Canada, for Europe, for New Zealand, for Australia—for any English-speaking nation. And then we need to produce versions of the app in other languages so as to truly go global.

Bromenshenk et al. 2015. Bees as Biosensors: Chemosensory Ability, Honey Bee Monitoring Systems, and Emergent Sensor Technologies Derived from the Pollinator Syndrome. *Biosensors* 5(4), 678-711; https://doi.or/10.3390/bios5049678.

Drosopoulos, S. and M.F. Claridge. 2005. *Insect Sounds and Communication: Physiology, Behaviour, Ecology, and Evolution*. 32 Chapters. CRC Press, 553 pp.

Oregon State Beekeepers Association

EXECUTIVE BOARD AND AFFILIATED REGIONAL ASSOCIATIONS



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South Willamette Valley
Tim Wydronek—541.740.4127; tim@aldercreekhoney.com

• REGIONAL ASSOCIATIONS

Central Coast Beekeepers
Meets 6:30 PM, fourth Wednesday, Newport
President: Jon Sumpter—jonsmptr@msn.com
Website: www.ccbaor.org

Central Oregon Beekeepers
Meets 6:00–7:30 PM, fourth Tuesday, Bend
President: Allen Engle—aengle@bendbroadband.com
Website: www.cobeekeeping.org

Columbia Gorge Beekeepers
Meets 6:15–8:15 PM, third Wednesday, Hood River
President: Jerry Frazier—jerry1.frazier@gmail.com
Website: gorgebeekeepers.org

Coos County Beekeepers
Meets 6:30 PM, third Saturday, Myrtle Point
President: Randy Sturgill—541.430.4095; randys@rfpco.com

Douglas County Bees
Meets 7:00–8:30 PM, first Wednesday, Roseburg
President: Ivory LosBanos—ivohart@gmail.com
Website: www.douglascountybees.org

Klamath Basin Beekeepers
Meets 9:00 AM, last Saturday, Klamath Falls
President: Paul Davitt—president@klamathbeekeepers.org
Website: www.klamathbeekeepers.org

Lane County Beekeepers
Meets 7:30 PM, third Tuesday, Eugene
President: Mike France—michaelj62@gmail.com
Website: www.lcbaor.org

Linn Benton Beekeepers
Meets 6:30 PM, third Wednesday, Corvallis
President: Everett Kaser—everett@lbba.us
Website: www.lbba.us

Oregon Prison Beekeepers
Program Manager: Chad.E.Naugle@doc.state.or.us

Oregon South Coast Beekeepers
Meets 6:00 PM, third Tuesday, Gold Beach
President: Jesse Fletcher—jesse.l.fletcher@gmail.com

Portland Metro Beekeepers
Meets 7:00 PM, second Thursday, Clackamas Comm Coll
President: Rex McIntire—503.720.7958
Website: portlandmetro.org

Portland Urban Beekeepers
Meets 7:00–9:00 PM, first Wednesday, Portland
President: Mandy Shaw—president@portlandurbanbeekeepers.org
Website: portlandurbanbeekeepers.org

Southern Oregon Beekeepers
Meets 6:30–9:00 PM, first Monday, Medford Public Library
President: Risa Halpin—303.807.1830; rhalpin906@aol.com
Website: southernoregonbeekeepers.org

Tillamook Beekeepers
Meets 6:30–8:00 PM, second Tuesday, Tillamook
President: Brad York—dbradleyyork@gmail.com
Website: www.tillamookbeekeepers.org.

Tualatin Valley Beekeepers
Meets 6:00–8:00 PM, last Tuesday, North Plains
President: Eddie Frie—503.929.6279; ejfrie@frontier.com
Website: tvba.weebly.com

Willamette Valley Beekeepers
Meets 7:00 PM, fourth Monday, Salem
President: Richard Farrier—rfarrierfarms@gmail.com
Website: wvbahive.org

Oregon State Beekeepers Association
Membership Application

The **Oregon State Beekeepers Association** is a nonprofit organization representing and supporting all who have an interest in honey bees and beekeeping. Membership is open to anyone with an interest in bees and beekeeping. You do not need to own bees or reside in Oregon to join. Membership includes the ongoing work of the organization on behalf of the honey bee and beekeeping, a vote in OSBA elections, discounts on publications, and an annual directory and subscription to *The Bee Line*.

*Please send check made payable to OSBA with a **completed form for each individual** to:*

Oregon State Beekeepers Association, Membership
4207 SE Woodstock Blvd, Ste 517, Portland, Oregon 97206

Date: _____ ❑New Member ❑Membership Renewal

First Name:_____MI:____Last Name:_____

Company name: _____

Type: ❑Small scale (less than 25) ❑Sideliner (25–300) ❑Commercial (more than 300)

Mailing address:_____

City:_____ State:_____Zip:_____

Telephone number: _____ e-mail address: _____

Newsletter: Please select version: ❑**Digital** ❑**Print** **County: _____**

Membership Directory: The OSBA respects the privacy of members. Please indicate contact information to be included in a directory mailed to OSBA members only:

❑**Do not include contact information**

❑**Share all information *OR* Share:** ❑**mailing address** ❑**phone number** ❑**e-mail address**

Local group, if member: _____

Membership dues: $40 per person ($50 per person outside the US) $_____

Voluntary contribution(s):

General Fund $_____

Research Fund $_____

Total amount enclosed: $_____

Note: To renew or join online, please visit:
http://osba2018.orsba.org/product/osba-membership/

Thank you!

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It's not too early to make plans for attending the OSBA Fall Conference, October 25–27, in Florence!

If the date on the mailing label is May 2019 (or earlier), this is your friendly renewal notice.

The Bee Line

The Bee Line is the official publication of the Oregon State Beekeepers Association. Annual subscriptions to the newsletter are included with membership.

Please send news about your bees and your experiences in keeping them, as well as events, corrections, comments, questions, photographs and stories, interviews, recipes, points of view—and ads/advertising—to: Rosanna Mattingly, *The Bee Line*, 4207 SE Woodstock Blvd Ste 517, Portland OR 97206; e-mail: osba.newsletter@gmail.com. It's *your* newsletter—we want to hear from you!

The next issue to be printed will be the **June** issue, **2019**. The deadline for submitting copy is **May 10**, **2019**. Please let me know if you find difficulties with the deadline so we can work out the space and timing for the material.

Be well!

Advertising

Per Issue

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