The Bee Line

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Newsletter of the Oregon State Beekeepers Association

IN THIS ISSUE . . .

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Oregon Master Beekeeper Program
A Joint Venture of OSBA and the Oregon State University Extension Service
info@oregonmasterbeekeeper.org

Reminder: In addition to stories, interviews, questions, and recipes, your event photos & reports—past and future—are welcome! You can see photos currently available from past **Fall Conferences** and **Oregon State Fairs** at: orsba.org.

Downtown New Hope in the Fight Against Varroa

Samuel Ramsey, USDA-Beltsville, with *Toni Burnham*, DC-area beekeeper

Note: The following article, which first appeared in *Bee Culture* in 2018, elaborates on the challenges faced in questioning a long-held belief. It provides not only an explanation of how researchers got from *hemolymph* to *fat body* in our understanding of that very clever little Varroa mite but also a reminder of the collaborative nature of science and the ongoing attention involved in managing our human tendency to make assumptions! Samuel Ramsey presented "Varroa After the Fat: Current Research Endeavors to Fight the Mite" during OSBA's 2021 Fall Conference.

One thing you might hear about Samuel Ramsey, Ph.D. from the University of Maryland, is that he is a great speaker: during one talk, he proved that hungry ladybugs can bite by letting one chomp his arm. He won the international Three Minute Thesis Competition, beating over 1,000 other brilliant young scientists.

But this is what you really should know about Dr. Samuel Ramsey: his work represents one of those potential, "change everything" moments for which we have been longing since *Varroa destructor* began its relentless siege of honey bees.

To quote Sammy: "We've been thinking of these parasites as vampires when they're actually more like werewolves. Maybe we've had so little success in killing them because we've been trying to drive a stake through something for which we needed a silver bullet."

Ramsey's work indicates that Varroa do not ingest hemolymph – the "blood"– of honey bees. They attack fat body tissue, an organ responsible for essential functions related to storing and releasing energy that the bee needs. We have been laboring under a critical misunderstanding of the most basic interaction between bees and the existential threat of over 40 years.

How is it to change received knowledge and be greeted with excitement?

"One concern is that when you tell people that something which they have believed for a long time is incorrect, often there is a tendency to get defensive, to feel offended that you would challenge things that way. It has been great to see that this really hasn't gored anyone's ox. People are seeing that the foundation of the earlier conclusion was not very sturdy."

Was it actually explored? Did someone do an experiment with erroneous results?

Multiple studies were conducted in Russia in the 1970s and 80s. Remember, *Varroa destructor* is from Southeast Asia: when it started increasing its geographic range, it moved through China into Russia, the first areas to be hit hard. Therefore, much of the earliest research is written in Cyrillic [which already presents an obstacle]. The studies at the time used a method which was then considered OK, but which is not up to current standards. Researchers used strontium isotopes and some other things that we tend not to use for these experiments because they don't stay in the tissues where they are supposed to be!"

"They were not measuring what they thought that they were measuring. Another of the

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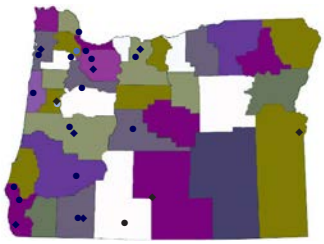
OREGON STATE BEEKEEPERS ASSOCIATION EXECUTIVE COMMITTEE



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• AFFILIATED REGIONAL ASSOCIATIONS

Central Oregon Beekeepers
Meets 6:00 PM, third Tuesday, The Environmental Center
President: Allen Engle—aengle@bendbroadband.com
Website: www.cobeekeeping.org

Columbia County Oregon Beekeepers
Meets 6:00 PM, first Thursday, Deer Island
President: Linda Zahl—503.799.7073
Facebook Page: ColumbiaCountyOregonBeekeepers

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

Douglas County Bees
Meets 6:00 PM, first Wednesday, Roseburg
President: Robert Baune—541.863.9414
Website: www.douglascountybees.org

Klamath Basin Beekeepers
Meets 9:00 AM, fourth Saturday, Klamath Falls
President: Lorena Corzatt—541.892.8402
Website: www.klamathbeekeepers.org

Lane County Beekeepers
Meets 7:30 PM, third Tuesday, Eugene
President: Brian McGinley—56magoo@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 Central Coast Beekeepers
Meets 6:00 PM, fourth Wednesday, Newport
President: Pat Wackford—pwacky@charter.net
Website: www.ccbaor.org

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

Portland Metro Beekeepers
Meets 7:00 PM, second Thursday, Gladstone
Pres: Paul Stromberg—president@portlandmetrobeekeepers.org
Website: portlandmetrobeekeepers.org

Portland Urban Beekeepers
Meets 7:00 PM, first Wednesday, via Zoom
President: Ian Horvath—ianhorvath@gmail.com
Website: portlandurbanbeekeepers.org

Southern Oregon Beekeepers
Meets 6:30 PM, first Monday, Central Point
President: Noah Clipp—541.254.4052; noahtitus@gmail.com
Website: southernoregonbeekeepers.org

Tillamook Beekeepers
Meets 1:00 PM, second Saturday, Tillamook
President: Brad York—dbradleyyork@gmail.com
Website: www.tillamookbeekeepers.org.

Tualatin Valley Beekeepers
Meets 6:00 PM, last Tuesday, virtually
President: Debby Garman—tualatinvalleybeekeepers@gmail.com
Website: tvbabees.org

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

Message from the President

Greetings, fellow beekeepers.

As I write this in early March, I struggle a little bit to think how these words will ring when this is published in April. After four years of writing these messages, two themes consistently remain true. We need to expect the unexpected, and our industry faces some strong headwinds. My greatest desire is that the most relevant and exciting thing to talk about would be some aspect of honey bee biology, but unfortunately that is just not the environment we are currently operating in.

As if a global pandemic for the past two years wasn't enough of a challenge, we clearly will continue to deal with a mega-drought, mega-fires, global unrest, and now budget-crushing inflation has set in. Take diesel fuel for example. When we started this year's pollination adventure, we were consistently paying well under $5 per gallon, and now at the time of this writing it is not uncommon to see prices approaching $7 here in California. Obviously, this represents a sea change in how we will operate this year. I sincerely hope that all of you have raised your prices enough to remain profitable in the face of extremely high labor and transportation costs. Hopefully, consumers of our goods and services can continue to afford them as we adjust our prices to cover rising input costs.

In addition to sticker shock at the pump, there have been some other interesting observations during the 2022 almond pollination. The first that comes to mind is the widespread frost that took out vast swaths of this year's crop. This will inevitably tighten the almond supply and put some direly needed upward pressure on almond prices in a year where there is still a 20 percent carryover of last year's crop. Almonds are very sensitive to frost. After petal fall takes only 30 minutes at 29˚F and is enough to cause a 25 percent crop loss and close to a 100 percent loss at 27˚F. The main tool to battle frost damage is heavy irrigation, and, as the drought persists and SGMA kicks in, growers' ability to stem frost damage will remain hamstrung for the foreseeable future. There are two other observations that stick out to me, and they are likely related. About mid-bloom we started noticing several broker holding yards still with thousands of unrented colonies, and as I write this there are more bees, trucks, and forklifts for sale than I have ever seen in 22 years of commercial almond pollination. Something is definitely afoot. Perhaps it may have to do with the following: www.wcngg.com/2021/11/10/the-outlook-for-californias-almond-market.

"We expect the growth in California's production to slow moving forward. Plantings have slowed to the point where, at the present pace, they are unlikely to match removals as trees planted in the early to mid-1990s reach the end of their useful lives."

It feels like we have some big changes coming. Despite consistent high annual colony loss rates, beekeepers have found ways to actually grow the bee supply. This may not pencil out for long. Most certainly shipping bees from halfway across the country without a pollination contract will become a thing of the past. Those of us within a day's travel of our pollination contracts should have an edge moving forward, provided there is enough water to produce crops. It all starts and ends with water.

Market forces, forces of nature, human nature . . . it is all so hard to predict; however, there are still some safe bets out there. One such bet revolves around one of my favorite sayings: "Food never goes out of style." I know that sounds flippant given how much of the world suffers from food insecurity already, but consider that by 2050 it is projected that our agricultural systems will need to produce 60 percent more food in order to feed an estimated 9.3 billion people. What does this mean for bees and beekeepers? It means what we do will become more imperative and important, not less, so set your prices accordingly. The world needs our industry to remain economically and biologically viable now more than ever. This is why I am so passionate about supporting honey bee research and proud of the work our organization does in this area. It is easy to lose sight of the big picture when the world seems so crazy and unpredictable. Even with all that is going on in this moment, it remains very important that we do our best to continue to raise funds for the Honey Bee Lab. The future will always be brighter with plenty of food in the picture, so please continue to share our gofundme link: www.gofundme.com/f/100year-anniversary-help-us-save-the-bees-event far and wide. Please remind people that the SAVE the BEE Foundation will match the first $100,000 that we raise. Every little bit helps, and we have a long way to go to meet our objective. Given the current economic environment, one may find it a challenge to ask someone to donate for research. I would just remind everyone that an investment in bee research is an investment in a food-rich future.

Well, that is about it for now. Growers are starting to get a bit anxious for us to remove our bees from the trees. I will close with a photo that captures the moment and may cause one to ponder. May your April be peaceful and prosperous.

John Jacob

Classified Ad

FOR SALE: BEESWAX FOUNDATION, shallow, western, and semi-deep, $5/pound. THREE BOTTOM-STYLE POLLEN TRAPS, $25 each. NUMEROUS PARTS to construct a hive loader, letting go cheap. **Contact**: Kenny Williams at (541) 456-2631.

Inspire Future Beekeepers at the 2022 Oregon Ag Fest

Bonnie King

The Oregon State Beekeepers Association will be at the 2022 Oregon Ag Fest to welcome thousands of kids and families, in person, once again at the Oregon State Fairgrounds in Salem.

Oregon Ag Fest, April 23 & 24, is a unique event that celebrates Oregon agriculture. Organizers expect 20,000 visitors from all over the state. Everybody loves honey bees! Adults and kids, in greater numbers than at the Oregon State Fair, will be anxious to hear about the honey bee's important role in agriculture.

The OSBA booth will be located in "Ag Country." We are looking forward to helping share information about Oregon's beekeeping industry, and to inspiring young people to become future beekeepers!

Mark your calendar for Oregon Ag Fest the last weekend in April. We will BEE there! Saturday, April 23 (8:30 AM–5 PM) and Sunday, April 24 (10 AM–5 PM) at the Oregon State Fairgrounds.

This will be the 35th Oregon Ag Fest, and the OSBA has been an integral part of the event for much of that time. Each April, Ag Fest is presented as a two-day, hands-on, activity-filled festival. Ag Fest is aimed at helping families better understand where their food, fiber, and flora come from.

We continue our commitment to the future of beekeeping through interactive learning. We will have an observation hive where kids can "find the queen" and also a "selfie station" where visitors can take their photo in one of our stand-ins. Thank you to the Oregon Coast Honey Lovers Festival (Yachats) for donating a beautiful new stand-in to us at the 2021 Fall Conference. It will certainly get a workout at Ag Fest!

Visitors will want to touch, taste, and experience the incredible world of Oregon agriculture, and in our case that means coming away with useful and fun information about honey bees and a honey stick as well. What could be sweeter?

The annual event strives to bridge the gap between urban and rural life, and to share the wonder and abundance of Oregon's bountiful and diverse harvest. Kids will ride ponies, plant seedlings, watch sheep get sheared, pet farm animals, climb on a tractor, and see live honey bees. An event like this can change lives, opening new doors to the possibilities of the future.

We will have a booth there both days, setting up 2 days in advance of the event. We need volunteers! If you can help with a 3-hour shift or with set up/take down, please let me know. To volunteer or for other information, please contact me at bonjking@gmail.com, or 503 864-2100.

Keeping Bees in April

Max Kuhn

April is generally a happy time in the apiary of most beekeepers. Full of hope, thankfulness, and wonder. Hopefulness for the future season's success in each of our own endeavors. Health of the honey bees being at the top of the list for most beekeepers. Followed by success at their own pollination efforts, or efforts at queen rearing, honey production, pollen collection, and all the many other reasons why we keep bees. We are also thankful. Thankful for the colonies that survived the winter as most do. Sadly, some do not. But the memory of those that do not survive will soon fade and that sadness will be replaced with optimism for the future. Wonder is on many beekeepers' minds this time of year as we open our hives for the first time in several months. Wonder and amazement at what we see inside the hive. All the worker bees going about their duties in spite of our clumsy intrusion into their home. The sight of the queen going about her work with the majestic dignity that only the queen can display. All while being respectfully followed about by her loyal retinue. It is truly an amazing world inside the hive and never more amazing than in April. I look forward to it each year.

So what will we do on our first visit inside the hive this year? Well . . . As all the experienced beekeepers (all together now!) are saying in unison, "THAT DEPENDS." Yes, it does depend. But considering the limitations on time and space for this article I will only make a short list of things you may want to consider on your first visit inside the hive this year. I will attempt to list them in their order of priority.

#1 – Evaluate the overall health of your colony.

- ❖ Is it warm enough? (60˚F or above)
- ❖ Disease present? Mite count? Test? Treat?
- ❖ Population? Large, small, or appropriate to the season?
- ❖ Queen right? Observed or suspected? Marked?
- ❖ Brood? Eggs, larvae, pupae?
- ❖ Food supply? Nectar, capped honey, pollen?
- ❖ Bottom box empty of brood?
- ❖ Boxes rotated?
- ❖ Hive closed up in 15 minutes or less?

#2 - Log book updated after today's evaluation? Bloom log?

More comprehensive, printed, check-off sheets are available from different bee supply companies as well as some bee associations, the Oregon Master Beekeeper program website, and other outlets. If you want to try one, seek them out and choose the design you like.

Happy beekeeping and good luck with your bees in 2022.

Apiary Registration with ODA

Every person who owns, or is in charge of, five or more colonies of bees located within the state or Oregon, must register each year with the Oregon Department of Agriculture. The form needed to register colonies is located at: apps.oregon.gov/SOS/LicenseDirectory/LicenseDetail/606 or obtained in person by visiting: 635 Capitol Street NE, Salem OR 97301.

The current cost of apiary registration is $10 with an additional charge of $0.50 per colony for five or more hives. After July 1, the registration fee will increase to $20. The fee per hive remains at $0.50 per colony for five or more hives. The number of colonies that must be registered is equal to the highest number of full-strength colonies managed within the state at any point during the previous year, prior to the **registration deadline of June 1**.

All money collected from apiary registration shall be spent on research at the OSU Honey Bee Lab predominantly focused on honey bees (honeybeelab.oregonstate.edu).

BEEKEEPER EVENTS

2022

April 1–30: BIP Loss and Management Survey. *Information*: beeinformed.org/citizen-science/loss-and-management-survey.

April 23 (8:30 AM–5 PM) and April 24 (10 AM–5 PM): Oregon Ag Fest. Oregon State Fairgrounds, Salem.

June 20–26: National Pollinator Week. *Information*: www.pollinator.org/pollinator-week.

June 28–July 1: HAS 2022. Evansville, Indiana. *Information*: heartlandbees.org.

August 1–5: EAS 2022 Beeing Social, Again. Ithaca College, Ithaca, New York. *Information*: easternapiculture.org/conference.

August 26–September 5: Oregon State Fair. Salem. *Information*: oregonstatefair.org.

August 24–28: Apimondia Congress. Istanbul, Turkey. Now rescheduled. *Information*: apimondia2021.com.

October 1–2: Washington State Beekeepers Association JamborBEE Conference. Othello, Washington.

October 28–30: OSBA 2022 Fall Conference. Florence Events Center, Florence, Oregon.

November 15–17: 2022 California State Beekeepers Annual Convention. Reno, Nevada.

REGIONAL NEWS

Regional Representative

North Willamette Valley

California almond pollination has wrapped up for the 2022 season. Reports from a few returning commercial beekeepers are that the bees are looking good and splits are being made. By now, most of the migratory bees have been moved back into the Willamette Valley to pollinate fruit orchards like apple, pear, and cherry.

After the orchards, these migratory bees will be pollinating early varieties of blueberries. The onset of blueberry blossoms is an annual reminder for me to be alert to the possibility of European foulbrood (EFB) in my colonies. There is a lot of information available online about EFB. If you're new to beekeeping or just looking for a refresher on what EFB is, I recommend reading this blog post by Rob Snyder from the Bee Informed Partnership: beeinformed.org/2013/12/13/european-foulbrood-efb.

For many, April means nucs are arriving! What is a nuc? Nucs or nucleus hives are small colonies of bees, usually made up of 5 frames of bees including brood, pollen, and honey. Nucs can be overwintered with a mated queen, or a newly mated queen is introduced in the early spring. These nucleus hives are a great way for new beekeepers to start a new hive or expand a growing apiary. I like to feed my nucs both sugar water and a pollen substitute this month to help them grow quickly and draw as much comb as they can before the later season honey flows start. If you haven't ordered a nuc yet, check with your local beekeeping supplier for availability.

Spring has sprung and there is a lot in bloom in April. April is the month most beekeepers will begin to add honey supers to their overwintered hives. In addition to the fruiting orchards, many of the wild trees will be blooming this month. Native maple trees have been blooming for several weeks now. Red maple (*Acer rubrum*) was reported to be in bloom last month and now we have big leaf maple (*Acer macrophyllum*) and vine maple (*Acer circinatum*) in bloom. For beekeepers in the North Willamette Valley, the maple flow is the first major nectar flow of the year. Make sure to find a maple to tree to stand under this month and listen to the buzzing in the canopy.

The trick to catching the maple flow is some dry weather. Some years it rains so much in April the bees miss most of the bloom period. That is, unless you have Carniolian bees (*Apis mellifera carnica*). The Carniolans have a tendency to fly in cooler and wetter conditions that other honey bee races. I like to think of them as being hardy, like a bumble bee. If you're lucky enough to get some maple honey this year, you'll know it when you taste it. Maple honey has a very distinct flavor that is one of my all-time favorites. It has a light maple syrup flavor to it.

In other news, the Willamette Valley Beekeepers Association met last month at the Commons Building near downtown Salem. They had 45 beekeepers in attendance, the largest group since pre-Covid meetings. I am excited to see the resurgence of beekeepers involved in local associations. They meet on the fourth Monday of the month 7–9 PM. For location, see: wvbahive.org/events. *Jeremy Mitchell*

Regional Associations

Central Oregon

In Central Oregon, we're not sure whether winter came or didn't. Now it's officially spring. I'm not sure about other areas of the state, but we've had a very early start of spring, starting with extended warmer dry periods in early February. We had many reports in the early part of February of the brood rearing starting with some of between 1 and 2 generations. During February and March, we had 3 or 4 hard freezes (single digits) breaking up the nice weather. It'll be interesting to see from our members, how much brood loss occurred, and how much brood induced starvation there was. Additionally, it's seeming that the forage plants are blooming a couple weeks earlier than usual. Will everything move up this year and in the future? Swarm season as well?

Our bee school in February was very well attended. We don't know if it's because of the prior Covid restrictions keeping folks from attending classes, or a general urge to do something new. This year, instead of trying to cover all the topics in depth (drinking from a firehose), our coordinator had the philosophy of covering the various topics using the most common and easiest to use equipment and methods, with the understanding that the students will learn other techniques and equipment as they do more learning in the future. It was very well received. We'll be having a field day, probably in Madras for the same students in April (when it's normally warm enough for those activities). We are also planning on another field day during the summer, hopefully covering skills and topics of interest to more experienced beekeepers.

April will be our first in-person meeting since the beginning of Covid. YAY! Our meetings, in person or online, are on the third Tuesday of each month from 6 PM to 7:30 or so. Please feel free to join us, either in person or online. *Allen Engle*

Klamath Basin Beekeepers

The beekeepers of the Klamath Basin were recently featured in the *Herald and News* for promoting the ancient art of beekeeping in the Klamath Basin and beyond. Our association membership continues to grow, and we are excited to see a lot

Only Registered Approved Treatment for Nosema

Nosema is a fungal disease commonly found in honey bees

Honey bees consume nosema-causing spores from contaminated honeycomb or interactions with other bees. Once consumed, the spores begin to germinate in the bee's mid-gut leacing the bee with nutrient loss and cell damage. The weakened bee is then more susceptible to disease and is also less productive.

One nosema spore can multiply into several million spores within one worker bee that can in turn, contaminate the hive and surrounding colonies.



Klamath Basin President Lorena Corzatt and Oregon Tech student beekeepers. Photos: Arden Barnes of the *Herald and News*.

of new people interested in beekeeping. We have 25+ people registered for our bee school on March 18 and 19.

At our February association meeting, Paul Stromberg of the Portland Metro Beekeepers Association zoomed in and shared on queen rearing. There were around 30 people in attendance, and it was a wonderful presentation. Thanks so much for joining us Paul! We hope in the future to do more cross-collaboration with other OSBA members.

Our March meeting is all about fun as we roll into spring. The board will share on spring hive maintenance. March 26 will be the last opportunity to place bee orders through the association. There will be a raffle at the meeting with prizes donated by area vendors, a hive smoker competition, and a 50/50 fundraiser to support the OSBA bee research fund where people can join a pool to guess the first official swarm call date.

Our bees are busy. They have been flying regularly in the last month, and most members have been feeding with drivert and adding pollen patties already. Overall, the overwintering success is looking good. All of the KBBA association-owned hives, which are kept at Mountain Valley Gardens, survived. The association has really been pushing the importance of mite monitoring and treatments, and we believe this is positively contributing to colony success in the basin. For up-to-date information about our association and upcoming events, please see: www.klamathbeekeepers.org. *Christy VanRooyen*

Oregon Central Coast Beekeepers

We did not meet last month, so there is no meeting news. On March 9, we will be teaching a Bee-ginning Beekeeping Class at the community college. There are 28 people signed up. There will be sessions on bee vocabulary, hive equipment, protective gear, and hive management. We will hand out information received from OSU and Mann Lake. There will also be discussion and questions at the end of class. We hope to attract the attendees to join our association even if they are not ready to have a hive of their own.

Upcoming events for the association will be the Master Gardener's plant sale on May 16 at the Lincoln County Fairgrounds. This will be the first inside plant sale in two years. We are looking forward to having a table there to provide information for gardeners and the public.

There have been a number of hive losses this year. Most association members are getting some hives through the winter. I amazingly still have three hives flying and am anxious to do a thorough examination. I started feeding sugar patties and pollen patties last month. Just in the last week some native trees are blooming and more pollen is coming in. *Pat Wackford*

Portland Metro Beekeepers

The Portland Metro Beekeepers Association (PMBA) members are in full beekeeping swing, enjoying watching the bees come out in bigger numbers every day. Bees have been very actively foraging, bringing lots of colorful pollen back to the hives to rear their spring brood. Our members are focused on spring management and all that comes with it: The good (preparing for the big nectar flows), the bad (such as deadouts), and the ugly (the ever-dreaded *Varroa destructor*).

Our association was treated to a wonderful and timely presentation on pollinator plants by PMBA alum Anne LaSenne, giving lots of us great ideas for spring planting. Dr. Dewey Caron presented to the association on Varroa and spring management, offering great suggestions for managing populations in the early spring, including supplemental feeding and swarm mitigation, as well as diagnosing the cause of a deadout.

Whether for queen failures or colony splits, everyone knows mid-April is a terrible time to be in need of new queen bees in the Portland metro area. That's why we are excited to be starting a new project, utilizing volunteers to help rear queen cells to be available to association members right in the middle of April. We are also looking forward to testing out a new swarm list, utilizing a call-in hotline that automatically routes callers to a beekeeper who can be dispatched to rescue a swarm.

We are excited to host our annual Bee Day event, fast approaching on April 30. Bee Day is an opportunity for new beekeepers, or those who are thinking about beekeeping, to explore beekeeping hands-on and learn from experienced beekeepers. Attendees get to look inside real, live colonies and see how bees are handled, ask questions of honey bee experts, and form relationships that will help along the beekeeping journey. It is also the biggest fundraiser for the association. We invite anyone interested to join us for Bee Day. Attendance is limited, register today! We are also still seeking event sponsors and raffle donations. For more information, visit our website at: portlandmetrobeekeepers.org. Cheers. *Jamie Caldwell*

Tillamook Beekeepers

Tillamook, Oregon, Wednesday, March 10, 2:00 PM. The outside temperature is 57°F. The sky is blue without a cloud in view, and my bees are loving life. My apiary is in the back yard with several hundred bees buzzing about each hive. I have two Italian plum trees in my front yard that we call Guido and Gina Lola Plumida. I also have other fruit trees, but this tale is about Guido and Gina. Gina was supposed to have been a semi-dwarf tree, as was Guido. Gina must have non-semi-dwarf DNA as she is

about 15 feet tall whereas Guido stands about 5 feet 9 inches tall on his tiptoes. Gina is in full bloom. She is covered in thousands of blossoms as never before seen. Guido is clueless that his bride is luring these bees on with her charms and hoping to be cross-pollinated with him, and yet he hasn't a bloomin' bloom on him. Silly boy.

Currently there are three honey bees, yes (3) on Gina, and I can even see pollen gathered on their legs. I'm playing Italian music on my iPhone hoping that the music will inspire these three girls to go back to their hives and waggle their sisters to join in the fun. Everything is perfectly aligned. Italian bees, Italian plum trees, good warm weather, and music to motivate the ritualistic affair. I'm trying to be patient and let nature take its course, but I am struggling. My gut instinct as well as the Farmers' Almanac suggest that this is too early for any of this to happen. We could still experience freezing nighttime temperatures, and for sure, spring is not really here yet. But alas it feels like spring. The bees feel it, Gina clearly feels it, I feel it. Please spring, come!

As for the rest of the beekeepers in Tillamook, spring can't come too soon either. We have had our fill with rain, two major floods so far, and literally hundreds of new nucs have been purchased. We are ready to install them and get this season going. Hundreds of colonies have survived the winter, with far too many losses, but still sufficient survival rates to keep us going. Of our 130 members, 33 joined during 2021 and another 19 have joined since January 1 of this year. The newbees are excited, the seasoned beekeepers are ready to function as bee buddies, and we are all looking forward to 2022 being the best year ever for beekeeping in Tillamook.

This month's association meeting will be a discussion on how to install nucs and all else that we should be doing to prepare for and continue to maintain our bees and keep them healthy. We are as always encouraging and teaching mite treatment, Varroa-monitoring techniques, feeding, and caring for these wonderful little creatures of nature. Here's to a great 2022. *Brad York*

Tualatin Valley Beekeepers

We plan to continue online meetings while we learn how to present "hybrid" meetings. We are aiming now for meeting in May in person, and plan to bring in expert presenters from all over in person and via Zoom at our monthly last-Tuesday meetings. We delivered a great online Bee School in three sessions in March, and have begun to offer small in-person field days at local apiaries. The TVBA board continues to work diligently to deliver the best education and support we can to our members, including lots of resources at our website at: tvbabees.org. We will be delivering nucleus colonies to members in mid-April, and look forward to another successful year of beekeeping for all of us. *Debby Garman*

Varroa—*Continued from page 1*

problems that came across was translation, as well."

"Using these problematic results, they stated 'Varroa are feeding on hemolymph.' Many saw only that statement. When a paper is written in a language that isn't translated into English often, sometimes the abstract [only] is translated: this particular abstract did not include enough detail to tell that the methods used were not solid."

"Using the abstract, people began to cite this paper, stating 'Varroa are feeding on hemolymph.' No one really questioned this until Dennis vanEngelsdorp, Allen Cohen, Jerry Hayes and I started discussing it in more detail."

"Allen Cohen, an insect diet expert, was the one who said, 'I don't think that organisms with fast reproductive rates are able to get all the nutrition they need just from hemolymph.' Hemolymph is mostly water."

"Consider: Varroa produce an egg that is more than 33% of their body volume. The egg is HUGE, and she does it every single day. To be able to put that much biochemical energy into an offspring of that size, you need a lot of very potent nutrition which you can't get from a source that is mostly water."

"It also fails to account for the osmoregulatory burden – to explain: if you drink a lot of water, you can overwhelm your body's ability to drain it, and your cells will grow and actually burst. They are not able to deal with the influx. Insects and arachnids that feed on things that are mostly water have special changes to their digestive systems to allow them to do so without exploding. Varroa does not have any of these changes. That was my observation."

"Allen Cohen said, 'Maybe they are feeding on the muscles? Maybe they are feeding on the fat body? They have to be feeding on something that isn't hemolymph.'"

"That is what *really* got things going. Jerry Hayes had also thought of this, and mentioned it to Dennis vanEngelsdorp."

Joining The UMD Lab

"When I got to Dennis' lab I was thinking, 'If I am going to do a project now – it has to go somewhere. I don't have time to start something and find that it doesn't pan out.'"

"I love work that's on insect behavior, parasite behavior, predator behavior. I'm very interested in the behavior of organisms, how they get their food, etc. But that particular project sounded very risky, because it's going to be a binomial answer: *Yes* or *No*. People have believed this for a long time, and they probably had good reason."

"I started looking through the literature, and it didn't look like anybody was questioning it! My concern was that everyone cited earlier papers that said 'Varroa feeds on hemolymph,' but no one cited the original. As a researcher, you are supposed to cite the source that information comes from, not someone quoting someone quoting someone . . ."

"I had to trace the chain back years and years. It took me months to find the original source. When I found it, I realized, 'OK, there could be something here, because these methods don't get you to the conclusion that everyone has been using.'"

It Was Personal

"The part that often grabs people is that one reason for this project involves my dad. I was considering three different projects, 'Which one?' I talked to my dad after only a small amount of research, and he said, 'I don't know what I am going to do about this gout thing. I don't know what I can eat, what I can't eat!' It's a painful joint problem he'd had for months: my dad would think that he'd figured it out, but would have another flare up."

"Of course, he asks his scientist son for help to understand what gout is and how it causes problems. When I found that gout was related to purine crystals, a bell went off in my mind, 'Wow, that's weird! That's what the Varroa mites use as their waste product!'"

"I started trying to figure out the source of the problem with purine crystals in his blood, causing painful arthritic friction. What source is it that high in purines?" [Purine is the name for the chemical group of which guanine is a part.]

"I thought, 'If I can figure out what my dad *should not* be eating, I might be able to find out what these mites are eating.' At the top of every list was *Don't Eat Liver*. I thought, 'Where is the bee's liver?' The equivalent in insects is the fat body. This is something Dr. Cohen had mentioned."

"It's hard to move forward by starting with a negative, 'It's not hemolymph.' There are a lot of things that aren't hemolymph. When the guanine, fat body connection arose, I was surprised and found a paper that discusses the functions of the fat body in some detail, and a ton of other papers looking at the fat body. It is a *fascinating* organ! I learned that the fat body is the organ that creates guanine in insects. Pieces started to fall together."

"That's the story of how things started, and I am glad for the opportunity to tell it, because it's helpful for people to know that science moves along, building on other researchers. One: when you fail to cite the original paper, it can end up being like the Telephone Game. That can create problems itself, but it also prevents people from seeing the original methods used to come to those conclusions. Most researchers probably wouldn't have continued citing that paper if they had seen the methods. But they were citing people that they trusted."

"It is also important to remember that science works as a conglomerate, we work together. Working with Jerry, Dennis, Allen, the other coauthors, I moved questions forward, and decided how things would be structured, but I could not possibly have done this without Dr. Cohen, without Ronald Ochoa, Gary Bauchan, and Connor Gulbronson."

Bee Fat, Not Bee Blood

"I'm excited about this project specifically because the

pathologies that are associated with Varroa have been all over the place. When I first started studying Varroa, I was overwhelmed by the sheer amount of negative consequences that it causes – early onset foraging, reduced overwintering success, reduced lifespan, viral transmission, difficulties with metabolic functions, ability to navigate properly – all of this stuff! It seemed strange that all of this could be related to the removal of a small amount of hemolymph."

"It also reminds us not to discount how clever and important Varroa is. I have presented to a lot of researchers and beekeepers, and with many beekeepers there has been a disconnect. Researchers say, 'Yes, Varroa are very important creatures, reducing their populations is of the utmost importance.' But beekeepers will often say, 'Oh, that's the lowest on my list. I never see Varroa in my colonies, if I see them it's just a couple. Not a big deal.' My research has helped to show that you are unlikely to see them, because the places where they are most likely to be are always going to be hidden if your bees are at any kind of natural standing or flying position. The image that we have of the mite conspicuously on the bee's thorax is misleading because they spend so little of their lifecycle there. These [results] have been helpful, because when I explain this to beekeepers now, they say, 'Why have I never heard this before?! I had no idea.' It has helped people see that there is an important utility to tests and monitoring for mites aside from just opening colonies and looking."

"It also makes the point that it is important to keep these populations low, because they perforate *the liver* of a bee. If I had a parasite on me that was the size of my hand, that was sucking out parts of my liver, there is just no way that I would let that go on!"

"It has helped these beekeepers understand, 'I've gotta do something about this!' It has created an imperative to do something to reduce the population of these parasites. What is exciting is to have beekeepers come up and say, 'This [research] has changed the way I think about beekeeping.' Some of them have been keeping bees for years, for decades. I am a young guy, it is cool to hear people say that some work I have accomplished has helped change the paradigm on something they have been doing for decades."

Is Varroa Resistance Possible?

"When talking about breeding for resistant stock, I ask people to think about a 'genetic arms race' or an 'evolutionary arms race.'"

"People often use the term when talking about antibiotic resistance. Antibiotic resistance works like this: we have a weapon, a drug, and we want to use it to kill the bacterium. But the bacteria have very short generation [reproduction] times. They can reproduce very, very quickly, and in a day you can have hundreds of generations that have grown and divided, and it is crazy how quickly some of them can. [Like] an arms race, every time they mate and produce new offspring, there are choosing new weapons and new defenses to block the old antibiotics. Therefore, we need to constantly use new forms of antibiotics to treat these bacteria."

"With Varroa, this time we have two different organisms facing off. It's not a drug, it's a bee that we are trying to breed to have a resistance to this mite. While the bee can get a leg up, the mite can get a leg up, too. One problem is that the bee's generation time is MUCH longer than the mite's. If we think of this as an arms race, every time that bee gets the chance to choose one weapon to use against Varroa, the mite has the opportunity to choose *several*."

"Over the course of a year, *Varroa destructor* may have nine generations, sometimes 12 or 14. That's a lot of weapons that they get to choose. The bee? Maybe one, just one opportunity to [mate and] create a new set of offspring. Sometimes we even stop that from happening: when we stop swarming from happening, stop the colony from splitting, you don't even have that opportunity for new genetic stock to present itself."

"I am not one who believes [in a system where] people breed resistance in their own bees by letting the mite populations get really high, and that the best will survive, the other ones won't – I don't believe that it is a good method, because the mites have a head start, and too many opportunities to continue building upon their current progress. Systems that researchers are currently using in the lab [that speed up honey bee generation time] seem promising in some ways. But I don't think that it is a good idea to let your bees die in hopes that you will emerge with this new super bee. That is very unlikely. I think it takes a lot of work and genetic conditioning and time in the lab and generation time that won't happen out in the field."

"A good example is to look at what happened to the bees in the US. Within 10 years of the introduction of *Varroa destructor*, we've lost our feral honey bee colonies. Anything that wasn't managed, died out. All the diversity that the bees had was not able to stand up to how quickly Varroa generation times are able to ratchet forward."

"I don't think that it is an option for us to let their [mite] populations spiral – I don't think that the permanent answer is constantly treating for Varroa. The amount of chemical input into the colonies currently is unsustainable. I think while we are figuring out what the answer is, we have to continue reducing their populations. It is not an option to just let them run wild."

"It is fair to say that breeding for survivor stock in the field is highly unlikely to yield a resistant bee because of the evolutionary arms race that is going on. In the field, we can't help the bee replicate at that speed."

In the Future

"Options like RNA interference and approaches of that nature hold great potential to reduce the chemical input into the colonies. It won't get rid of it entirely, because we do need to

make sure that we vary the ways used to reduce the populations of Varroa to prevent resistance."

"If we can introduce something that disrupts the reproductive cycle of the mites. They feed on the bees, they get sterilized, they go into a cell and try to produce offspring, and they don't. They die."

"Or perhaps an approach where, when the mites feed, it disrupts their ability to continue digesting their food. They stop feeding, they get sick, they die."

"These kinds of things are exciting, but in some way they are still science fiction because they have not reached a point yet where they are ready to be introduced."

"There is still the concern about the Law of Unintended Consequences when a particular technology is very new. We need to look at all of the different angles of how this could affect an organism before we introduce it into the market. At the moment I am ready to say that I am happy about the potential."

Looking Forward

"I've had the opportunity to work with a lot of different groups of people. I tend not to do just one thing – I sing, I love music, I am an entertainer, work on doing weddings with some people – I have worked with a lot of groups of people! I am very involved with my church . . ."

"One thing is that beekeepers are some of the most caring, amicable, pleasant people whom I have ever worked with. Beekeepers and bee researchers are a tight-knit group. There is an excitement around research in bees."

"Few things make me more excited than seeing people who aren't researchers being so interested in research. It takes a lot of work and a lot of trust to create that partnership that we are seeing. Things like the Bee Informed Partnership that help make sure that information is disseminated – also people like Randy Oliver. This is something that I have never seen before, a partnership between the researchers and people who are not, but who are so interested in their work."

"I didn't start out as a honey bee researcher: I researched predators and parasites and their behavior. When I started researching Varroa behavior I would think of myself as primarily a parasite researcher. But I have become so enamored of the beekeepers and the bee researchers and this incredible partnership! People talk all the time about how research rarely gets across to the people it needs to reach: they have not paid enough attention to the beekeepers and the bee researchers, because they are wonderful and now I am hooked! I am hooked!"

"I want to use my knowledge of honey bees and honey bee parasites to benefit the beekeeping community and the bee research community. This has changed the way that I think about my own career going forward. Now I want to do research on bees, and do as much research on bee parasites as I can!"

Oregon State Beekeepers Association Membership Form

The **Oregon State Beekeepers Association** is a 501(c)(3) 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. Members 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, swarm call listing, four free online classified ads per year, 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:*

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4207 SE Woodstock Blvd, Ste 517, Portland, Oregon 97206

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Thank you!

New memberships entered extend throughout 2022.

Oregon State Beekeepers Association
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orsba.org

"Spring is when life's alive in everything."

—Christina Rosetti

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 **May 2022** issue. The deadline for submitting copy is **April 10, 2022**. Please let me know if you find difficulties with the deadline so we can work out the space and timing for the material.

May all be well!

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