CENTRAL COAST BEEKEEPERS NEWSLETTER

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NEXT MEETING JULY 22, 2020

July 22, 2020 Meeting

Please join us for our July 22nd virtual club meeting at 5:30 pm to hear Dr. Andony Melathopoulos, Assistant Professor Pollinator Health Extension at OSU. He will be speaking on “Building Bee Habitat: No fuss, no muss”. The session will be held on Zoom and you can connect as follows:

Join Zoom Meeting https://oregonstate.zoom.us/j/98297479570
Phone Dial-In Information +1 971 247 1195 US (Portland) +1 253 215 8782 US (Tacoma) +1 301 715 8592 US (Germantown)
Meeting ID: 982 9747 9570

PRESIDENT'S MESSAGE

By Becca Fain

So, here we are in mid-July and the virus has not yet abated. Lots of good news about the progress on development of a vaccine but wearing masks and social distancing is still important. Luckily for us, the bees just don't seem to care and have been out and about producing some honey while the blackberry bloom is in full flower. We are planning to take our honey supers off in 2 weeks and process what we hope will be a bumper honey crop. I hope that you all are looking forward to similar results. Do not forget that it is time to do some varroa management (treatment and follow-up) when the honey flow is complete.

We have a wonderful presentation coming up on Wednesday, July 22nd over Zoom. Dr Andony Melathopoulos, a fabulous and engaging speaker will be talking about how we can build, enhance our bee friendly habitat as well as helping our friends and neighbors to do the same. Don't miss it and feel free to invite any avid gardeners you know who may benefit from his advice.

I know that many of you are getting tired of Zoom meetings and given that the Newport Library is not currently planning to open any time soon, we are suggesting that we attempt an in person, socially distanced meeting on August 26th from 3pm to 5:30 pm where we will meet at Stu Willason and Britte Kirsch's property in the Florence area and have 2 hands on sessions with the group split into smaller groups to facilitate social distancing. The sessions will focus on a honey extraction demonstration and an in-hive assessment focused on preparing for fall/winter. The property sits on 40 acres which will provide adequate space and we will be utilizing an Ag building for the extracting demo where masks will be required and their apiary where we will have access to a hive. This will be followed by a social gathering and picnic, held outside next to Ag building under awning or inside building (with open bay door) depending on weather. This will be a great time for everyone to catch up in person rather than via Zoom. Light refreshments will be provided but feel free to bring your own food, drinks and utensils if you like. We will be observing social distancing, but face coverings are optional. We would gratefully appreciate your feedback as to whether or not you would attend so that we can determine if this is an

opportunity that the club is interested in. Please respond to the email that your newsletter came with to let us know your interest.

A Note from John Jacobs of Old Sol Apiaries and President of the Oregon State Beekeepers about some new Varroa Research!

I have recently learned about some exciting new research described simply as symbiont mediated RNA inhibition or RNAi technology. Doesn't that just roll right off the tongue? There was a good write up about this in the American Bee Journal a couple months ago, and the original research was published here for those of you who would like to dig a little deeper: Science, issue 6477, Volume 367, page 573. In a nutshell, scientists have discovered a way to alter an obligate bacterium of the bee gut to interfere with viral and mite genes through RNAi, thus conferring resistance to mites and some viruses on the honey bee. The naturally occurring bee gut bacteria is called Snodgrassella alvi, which is native to the bee gut and can only live inside a bee. Under laboratory conditions, the modified bacteria seem to thrive, are persistent, and are transferable between bees. While there is much field work yet to be done, this has the potential to completely transform beekeeping as we know it. The only beekeeping world that most of us have known is one in which the aptly named Varroa destructor has been a constant menace. It is exceedingly difficult to imagine a world where this is not the case.

This technology is far from deployment, so we probably won't know for a while if it can work at scale without harsh unintended consequences, not unlike vaccine development. What happens when a swarm escapes with the modified bacteria into the wild? Even if the bacteria prove to be harmless to beneficial, it could be very difficult to regulate and, once the genie is out of the bottle and if the

modified bacteria become endemic in honey bee populations, it could pose problems from proprietary and regulatory standpoints. Clearly, there still is much research to be done.

New Resources from OSU Extension

Andony Melathopoulos

It's a wonderful point in history when you can run into a perfect stranger and they ask you, "Thank you for being a beekeeper, how can I help?" It's gotten so easy! But it wasn't always this way. I am old enough to remember the public hysteria around the approaching "killer bees" from South America. Let's not forget the closing sequence of the epic 1978 feature Swarm starring Michael Caine (aka "Batman's butler" for you, millennial beekeepers). How did they deal with the hoard of invading stinging vermin? Why, they lured them into the ocean, where they promptly ignited an oil slick with a missile, thus incinerating the bees! You won't see that in a 2020 film. Perhaps with the "Murder Hornet," we are trending back towards general panic. But we are not there yet and, as my dad always used to say, "Best to get out front of this one, son." I need to put my cards on the table at this point. Oregon State University Extension has been eyeing you beekeepers. We know you talk to a lot of people. We know you have endless passion for bees. But we also know you could use some help. So, we are very pleased to offer you a brand-new publication aimed at helping people in urban and suburban areas who ask you, "How can I help?" Warning: The publication title does not roll off your tongue: Enhancing Urban and Suburban Landscapes to Protect Pollinators. But we do have a great custom URL that's snappier: beav.es/forthebees. One way to describe this publication is that it's robust: 41 pages long, drawing on the immense experience of our Master Gardener faculty on both sides of the Cascades. We are not talking 41 pages of tiny text written in painful academic-ese. No. We break complicated ideas like pesticide exposure or keeping mason bees into infographics. The publication includes four stunning garden designs, with plants generated through an extensive literature of heavy hitting nectar and pollen plants as well as plants that are easy to find at big box and local nurseries. We also flag the plants that will invariably end in perpetual pest problems and

offer great alternatives that draw bees in without the need for routine pest or disease control. We also have a section on getting into beekeeping that, well, delicately breaks it to the reader that beekeeping is not easy and he or she needs to take a class, join a bee association, or find a mentor. And we have a great section at the back for professional landscapers to help them select better pesticides around bee-attractive plants. As soon as we have physical copies, we will send a few to each bee association. I also wanted to let you know the Oregon Bee Project had big plans this summer to provide OSBA members with seed packs for outreach events. We had high hopes of getting these to you by the state fair. Obviously, COVID-19 has put a damper on these plans, but it has given us an opportunity to plant plots with these seed mixes at OSU. We are hoping the images and data we collect will help entice people to push and shove to get these seeds at your outreach events next year. My dream is that 10 years from now people still love bees, that they continue, as consumers, to incentivize commercial Oregon land managers to increase pollinator habitat, and that we come across a virtuous circle where there is more nectar coming in than you can handle. That will not happen automatically. We have had a good ride, but now we might need to get out and push a little. Sorry to break it to you, but we may be coming into some lean years here, folks. Yet, with some new tools and your endless bee-enthusiasm, I am confident we can keep this current moving for decades. New seed packs to be made available to OSBA members doing outreach in 2021. OSU is testing this seed mix in 2020 and doing promotion through the Oregon Bee Project social media channels.

Beekeeping in July and August

Late July brings the end of the nectar flow and the beginning of dearth for most areas. Typically, by late July or early August all supers should be off, and hives configured for winter. Removing honey supers during the dearth can elicit robbing behavior so it is probably better to skip a tiny increase, if that, in honey yield and remove supers before full-blown dearth to avoid the hooligans.

You should reduce entrances, especially on weak hives and ones being fed. This will allow them to adequately defend themselves against robbing and reduce yellowjacket predation. For example, instead of 16 inches of opening, make it 3 or 4 inches.

At this time of year, look at consolidation and addressing underperforming hives. Folding up hives and allocating their resources to better prospects probably isn't a bad idea.

I liken the growth of Varroa to a tsunami wave. During the early months, the tsunami wave is crossing open waters, you hardly notice. Come late July or early August this tsunami wave is approaching landfall, and eventually—without intervention—will make landfall and reign destruction. Of course, in this story the initial wave is followed by aftershock waves that represent drifting and robbing which causes the reinfestation of previously mite-controlled hives. Keep this imaginary tsunami wave of Varroa in your mind. Prepare for it. Do not be caught off guard. Know how to deal with it. Be prepared for the aftershock waves. I'm talking about honey bees . . . Social distancing, wearing PPEs, reducing initial exposure are things that our honey bees simply do not do—just the opposite. We have longer summers now, more brood cycles, and more mites. We've kind of run out of silver bullets. I'm struck by the question, What percent colony loss do you find acceptable—30, 40, 50 percent? An occasional loss of this magnitude is painful, but consecutive losses of these magnitudes are just physically and monetarily exhausting. I have not been immune; I need to do a better job, too. It has been a boon for the nuc business. Each spring now beekeepers purchase hundreds of packages and nucleus hives. Are you ready to get off this merry go round? Now is your chance. I believe how well you take care of your bees in the third quarter (July, August, September/early October) to a great extent decides the fate of your hives. Keep Varroa in check until fall rains come and the robbing season ends. I know it is not easy. I've heard stories of extremely competent beekeepers—even our bee scientists —who've struggled and had to use multiple treatments and were still unsuccessful in getting Varroa below threshold levels. They tried. As Carolyn Breece reports, "I treat our OSU hives immediately after honey harvest (late July). Some years, our post-treatment mite counts reveal that we still have a mite problem and we need to treat again. So, we treat again in August/early September, but our options are usually limited due to high temperatures. Some years, we have had to treat yet again in late September/October because our mite levels STILL were not in our comfort zone. Why? Was it an ineffective product? Do we have rogue neighbors that don't treat their bees? I do not know the answer, but what I do know for sure is that if I hadn't taken posttreatment samples, I would have thought the bees were just fine after the first round in late July. I would have relaxed all autumn thinking my

bees are OK. And then, without a doubt, I would be devastated to find that my hives crashed in winter. Post-treatment sampling is everything!”

I am not going to tell you what to do, or how to do it. I struggle, too. You have got to make a serious attempt though.

. (Photo: Adkin Alexandr/Shutterstock)

WESTERN REGION HONEY BEE RESEARCH WEBINAR FOLLOWUP

For those of you who may have missed the Webinar or who want to refresh the information, here are some links from Carolyn Breece from OSU.

The webinar was recorded and is located in our "In the Bees with the OSU Honey Bee Lab" video channel. Here is the link to the webinar: **https://media.oregonstate.edu/media/t/0_umlk6owu**

Andony Melathopoulos and Ramesh Sagili are requesting that you complete a survey for each on the event. This will help them assess impact of programming and identify areas for future planning.

Link to survey for Andony Melathopoulos

Link to survey for Ramesh Sagili

Many important sources of information came up in conversation. Here are the links to some of the organizations mentioned:

Project Apis m.

Bee Informed Partnership

Honey Bee Health Coalition

Oregon Bee Project

Some useful publications:

Enhancing Urban and Suburban Landscapes to Protect Pollinators

How To Reduce Bee Poisoning from Pesticides

And here is an **excellent list of resources** put together by Montana State University. Here are the links to each speaker's lab website:

Dr. Michelle Flenniken: **http://www.montana.edu/pollinators/**

Dr. Brandon Hopkins: **http://bees.wsu.edu/**

Dr. Andony Melathopoulos: **https://agsci.oregonstate.edu/pollinator-health/pollinator-health**

Dr. Elina Nino: **https://elninobeelab.ucdavis.edu/**

Dr. Ramesh Sagili: **https://honeybeelab.oregonstate.edu/**

Soap bubbles pollinated a pear orchard without damaging delicate flowers

Soap bubbles facilitated the pollination of a pear orchard by delivering pollen grains to targeted flowers, demonstrating that this whimsical technique can successfully pollinate fruit-bearing plants. The study, from the Japan Advanced Institute of Science and Technology in Nomi, Japan, and published June 17 in the journal iScience, suggests that soap bubbles may present a low-tech complement to robotic pollination technology designed to supplement the work of vanishing bees.

"It sounds somewhat like fantasy, but the functional soap bubble allows effective pollination and assures that the quality of fruits is the same as with conventional hand pollination," says senior author Eijiro Miyako, an associate professor in the School of Materials Science at the Japan Advanced Institute of Science and Technology. "In comparison with other types of remote pollination, functional soap bubbles have innovative potentiality and unique properties, such as effective and convenient delivery of pollen grains to targeted flowers and high flexibility to avoid damaging them."

Miyako and colleagues previously published a study in the journal Chem, in which they used a tiny toy drone to pollinate blossoming flowers. But although the drone was only two centimeters long, the researchers struggled to prevent it from destroying the flowers as it bumped into them. While searching for a more flower-friendly artificial pollination technique, Miyako spent a day at the park blowing bubbles with his son. When one of the bubbles collided against his son's face -- a predictably injury-free accident -- Miyako found his inspiration.

After confirming through optical microscopy that soap bubbles could, in fact, carry pollen grains, Miyako and Xi Yang, his coauthor on the study, tested the effects of five commercially available surfactants on pollen activity and bubble formation. The neutralized surfactant lauramidopropyl betain (A-20AB) won out over its competitors, facilitating better pollen germination and growth of the tube that develops from each pollen grain after it is deposited on a flower. Based on a laboratory analysis of the most effective soap concentrations, the researchers tested the performance of pear pollen grains in a 0.4% A-20AB soap bubble solution with an optimized pH and added calcium and other ions to support germination. After three hours of pollination, the pollen activity mediated through the soap

bubbles remained steady, while other methods such as pollination through powder or solution became less effective.

Miyako and Yang then loaded the solution into a bubble gun and released pollen-loaded bubbles into a pear orchard, finding that the technique distributed pollen grains (about 2,000 per bubble) to the flowers they targeted, producing fruit that demonstrated the pollination's success. Finally, the researchers loaded an autonomous, GPS-controlled drone with functionalized soap bubbles, which they used to direct soap bubbles at fake lilies (since flowers were no longer in bloom) from a height of two meters, hitting their targets at a 90% success rate when the machine moved at a velocity of two meters per second.

Although this approach to pollination appears promising, more techniques are still needed to improve its precision. Plus, with soap bubbles, weather is key -- raindrops can wash away pollen-bearing bubbles from flowers, while strong winds might blow them astray.

Next, Miyako and colleagues plan to tackle the issue of waste generated by the artificial pollinator prototype, since most bubbles still fail to land on their target flowers. "I believe that further innovative technologies, such as state-of-the-art localization and mapping, visual perception, path planning, motion control, and manipulation techniques would be essential for developing autonomous precision robotic pollination on a large scale," says Miyako.

Story Source:

Materials provided by **Cell Press**. Note: Content may be edited for style and length.

Group genomics drive aggression in honey bees

Researchers often study the genomes of individual organisms to try to tease out the relationship between genes and behavior. A new study of Africanized honey bees reveals, however, that the genetic inheritance of individual bees has little influence on their propensity for aggression. Instead, the genomic traits of the hive as a whole are strongly associated with how fiercely its soldiers attack.

The findings are reported in the Proceedings of the National Academy of Sciences.

"We've always thought that the most significant aspects of an organism's behavior are driven, at least in part, by its own genetic endowment and not the genomics of its society," said Matthew Hudson, a University of Illinois at Urbana-Champaign professor of bioinformatics who led the research with Gene Robinson, an entomology professor and the director of the Carl R. Woese Institute for Genomic Biology at the U. of I. "This is a signal that there may be more to genetics as a whole than we've been thinking about."

The researchers focused on a unique population of gentle Africanized honey bees in Puerto Rico, which have evolved to become more docile than Africanized bees anywhere else in the world.

"We wanted to know which parts of the genome are responsible for gentle behavior versus aggressive behavior," Hudson said. "And because these are Africanized bees but they're also gentle, they are an ideal population to study. There's quite a bit of variation in aggression among them."

Africanized bees are hardier and more resistant to disease than their European predecessors on the island, so scientists are eager to learn more about the genetic underpinnings of the Puerto Rican bees' gentle nature.

When a honey bee hive is disturbed, guard bees emit a chemical signal that spurs soldier bees into action. The response depends on the nature of the threat and the aggressiveness of the hive. Whether the soldiers sting their target is another measure of aggression, as soldiers that sting will die as a result.

In general, foragers do little to defend the hive.

The researchers compared the genomes of soldier and forager bees from each of nine honey bee colonies in Puerto Rico. They also tested how aggressively the soldier bees responded to an assault on the hive.

To their surprise, the scientists found no genome-sequence differences between the soldiers and foragers that consistently explained the different responses.

But when the researchers conducted a genomewide association study comparing the the most-aggressive and least-aggressive hives, they saw a strong correlation between hive genomics and aggression. The analyses revealed that one region of the genome appeared to play a central role in the hives' relative gentleness or aggression.

"Mostly these bees' genomes look like Africanized bees," Hudson said. "But there was one chunk that looked very European. And the frequency of that European chunk in the hive seems to dictate how gentle that hive is going to be to a large extent.

"What that tells us is that the individual genetic makeup of the bee doesn't have a strong influence on how aggressive it is," he said. "But the genetic makeup of the society that the bees live in -- the colony -- has a very strong impact on how aggressive the bees in that colony are."

"Many behavioral traits in animals and humans are known to be strongly affected by inherited differences in genome sequence, but for many behaviors, how an individual acts also is influenced by how others around it are acting -- nature and nurture, respectively," Robinson said. "We now see that in the beehive, nurture can also have a strong genomic signature."

Such behavioral genomic influences may be particularly pronounced in honey bees, which live in an extraordinarily cooperative society where each individual has a defined social and functional role, he said.

Hudson also is a professor of crop sciences at Illinois.

Story Source:

Materials provided by **University of Illinois at Urbana-Champaign, News Bureau**. Original written by Diana Yates. Note: Content may be edited for style and length.

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