Episode 109_mixdown PROOFED

Thu, Aug 25, 2022 10:27AM • 45:24

SUMMARY KEYWORDS

beekeepers, bees, queen, beekeeping, hive, mating, hives, species, work, apis, book, honey bees, apiary, frame, drones, honey bee, disabilities, helping, mom, accessible

SPEAKERS

Guest, Jamie, Serra Sowers, Cameron, Amy, Stump The Chump

Jamie 00:10
Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research Extension Laboratory at the University of Florida's Institute of Food and Agricultural Sciences. It is our goal to advance the understanding of honey bees and beekeeping, grow the beekeeping community and improve the health of honey bees everywhere. In this podcast, you'll hear research updates, beekeeping management practices discussed and advice on beekeeping from our resident experts, beekeepers, scientists and other program guests. Join us for today's program. And thank you for listening to Two Bees in a Podcast.

Amy 00:49
Hi, everyone, welcome to this segment of Two Bees in a Podcast. Today, I am joined by Dr. Cameron Jack and we are interviewing Justin Ruger, who is the author of children's books about honey bees. The one that I know him for is Henry Meets a Honey Bee. I've seen it all over social media. I've seen it on Google and Amazon, all of the above. Justin is also affiliated with Hippie Chick Apiary and assessiblebeekeeping.org. And he is calling in from Virginia and today we're talking about beekeeping with disabilities. And I'm really excited about this topic because I'm excited to hear about Justin's journey, how he got into beekeeping, a little bit about his background, and how we can work with beekeepers with disabilities as well. So, Justin, thank you so much for joining us today.

Guest 01:38
Thank you for having me on. It's a pleasure to be here and to talk about accessible beekeeping and get it across more platforms.

Amy 01:47
Yeah, absolutely. So before we jump into that, let's talk a little bit about your story and how you got into keeping bees in the first place.

Guest 02:00
I started off as a PhD student at Catholic University studying nuclear physics in their Particle Physics Department. I had a car accident over Thanksgiving break that gave me a TBI and seizures. So I was not able to return to school anymore. Sharing a little more, I started to become depressed, as you do when you lose things that are important to you. And my mom did everything she could to help me out of that depression, like teaching me crocheting and taught me how to knit, anything to take my mind off what was going on. And at the time, the Flow Hive in, I believe it's Australia, they put their Kickstarter online and my brother found that he was like, "Hey, Mom, we should back this." So that was back in like 2014, I think, that they backed this and then I had my car accident in 2015. And in 2017, they finally finished the fabrication of the Flow Hives. And they sent us emails saying, "Hey, your flow hives are coming." So they sent us the email in March and we were kind of freaking out because, to get bees in Virginia, you want to get them late March or early April to have a good season. So we rushed around, we got the bees. I was in and out of a wheelchair depending on the strength of my leg for that day after the TBI and the seizures. So I couldn't go into the apiary because my balance was really bad. So I would stand on the outside and take photos and videos, and mom took the reins on being the beekeeper and she would bring over the frames of eggs and brood and capped honey and she would share everything to me and I fell in love with, as Greg Burns in Nature's Image Farm in Ohio says, these bugs in a box. And so, in 2020, after three years of sideline helping her with beekeeping and doing what little I could in the apiary, I had a stroke from the stem from the TBI that I had from my car accident. That took me out for two years. I was in a wheelchair, full time, I went to a rehab facility, and I thought I was done beekeeping for good, but after the rehab facility and physical therapy, and working on my children's book was actually part of the therapy to get my arm moving correctly. The illustrations was part of how I was doing my therapy. I started looking online for places that focused on beekeeping with disabilities. And I found very little. There was one blog by Franklin, he is in New York. He's visually impaired and he has a blog on beekeeping disabilities. He shares stories of beekeepers that have disabilities and how they overcome it, equipment that helps. And I saw some documents from Slovenia about their AZ hives and how they help beekeepers with disabilities, whether they're physical or mental because they can go into a bee house and open the hives from the back and pull them out like book frames. I pull them out like books instead of lifting the boxes like Langstroth. And then the last thing I ran across was the 1919 manual for beekeeping as an occupation. After World War I, there was a big push in agriculture. After soldiers came back with shell shock, which is now PTSD, they didn't have an idea of what to do. And the US government says, "Well, we noticed we had a limit of wax and honey available during World War I so we need to make sure that we build up our beekeepers in the country." So they turned to soldiers. They actually had agricultural classes that taught the soldiers how to be successful commercial beekeepers. And they worked with them for soldiers that had one arm, soldiers that had shell shock, they did what they could to make these returning soldiers successful. But when I started looking for nonprofits, I saw a lot of nonprofits that focus on veterans and first responders, but nothing that really helped the general public. And that was where I fit in. Because of my hearing loss from birth, I was not able to join the military in following my sister's footsteps. So I didn't fit into the veteran category. So we started accessible beekeeping in March and got the 501c3 status at the end of it that is allowing us to do research, and once we fill out grants and get some more financial support, we're going to start helping disabled beekeepers build up their apiaries using equipment that we hope

to help develop inside this research. So that's basically how, sorry that was so long, but it's a big story, but that's how we got from a PhD in Nuclear Physics to writing children's books and nonprofit. Well, this could take 30 minutes itself, but I'll try to keep it short.

Amy 08:39
Okay.

Cameron 08:47
Now, Justin, this is a really amazing story. And I mean, I can only imagine how difficult it would have been to have something like the car accident so dramatically change your life, and understandably, the depression that follows after losing so many of the functions that you'd had your whole life. It sounds like your mom is just a hero who tried to do so many things to kind of get you involved in learning and using your body in different ways to kind of stretch you and push you. This is some amazing work. It's amazing products and the books and things that have come from this are just so unbelievable. So I mean, total kudos to you, your mom, and those that have helped you along the way.

Guest 09:43
Yeah, my mom is a hero. She's actually still my caregiver from the stroke. I can't drive because of the seizures so she takes us to all the bee functions. She's been through a lot. Her father passed away, my grandfather, her best friend passed away from COVID, and through all of that she's been able to overcome her personal struggles to make sure that I have been taken care of. So I'm very appreciative of everything that she's done.

Cameron 10:22
Yeah, absolutely. I wanted to ask you, I thought it was really interesting to hear about the hives that you said that you could open up from the back and you pull the frames out like a book to make it more accessible. And I was wondering, since this is something that I'm not as familiar with, could you describe maybe some other types of accessible hardware that those with disabilities might be able to use that could make beekeeping more accessible to them?

Guest 11:02
Of course, so one of the things that we are currently working on with accessible beekeeping is we have some businesses around the United States that are donating the hive that they are known for to a learning apiary that we are hoping to partner with Virginia Tech to have up there in Blacksburg, and then also one closer to where I live so that I'm able to do YouTube videos and teach on it. One of them is Horizontal Bees in North Carolina. The owner, him and his wife, Ricky and Ruth, they are building a horizontal hive for the accessible beekeeping nonprofit and that works fantastic. The difference between his hive and the typical horizontal hive is he is actually working on tilting. We met him at the Hive Life conference in January. He's been working on designing this since January, and he's working on tilting the hive so that when I roll up in my wheelchair, I can tilt the hive to me and it won't affect the bees. So I'll be pulling them out at a 45-degree angle instead of straight out like a book in the Slovenian AZ hive. So I'm excited to get that one. There is a company called Bearsville Bees in West Virginia.

They are known for their Layens hives. So we're getting one from them. They are deeper than Langstroth deep. And I'm interested to see how I can do with my disability. My arms, they're still a little weak, but the strength is coming back. They're deep frames with wires crossed in there so the bees can build the comb on the wire and to pull the frame out, you actually have to grip onto this wire. So one of the things that I'm hoping to do while I'm interacting with these different hive types is say, okay, I have my mom there, so the bees will be taken care of. She can do what I can't. But I can say, "Why did this hive stop me? What can we do to make this hive more accessible?" So whether it's a frame gripper or something like that, so that's the Layens hive. Then there is the top bar hive. That's a different one than a horizontal hive. So we're getting a couple of those from a nonprofit in Maryland. And then we're getting a new hive that's only been out -- it's not really mass produced but it's called the Parkinson hive and it was invented by Dwayne Parkinson, and I believe he's in Michigan, and it's actually a slanted hive where the bottom has a view window and the bottom is lower than the top, and they have frame holders, and the frames slide into the frame holders and the frame holders stack on to the slanted wood to make a little staircase of frames. He says that it is a natural way for bees to build because in the Langstroth, sometimes the bees will freeze or starve to death because they won't move one frame over. And he said his hive, and he is in Michigan so he does deal with extreme winters, he said that having it just slightly raised, when the bees naturally move up, they will move from the bottom up. And they'll be able to find that next frame a little bit easier just because it's slightly raised. But each frame comes out individually. So instead of having to work with a box of 8200 pounds, like Langstroth, you lift out each individual frame. And then that takes away from what you have to handle in terms of weight. And because of the frame holders, you don't actually ever touch the individual frames. So your risk of hurting the bees or getting your hands sticky or anything, those chances go down less. What else was there? We're getting one Slovenian AZ hive from a professor in Pennsylvania. He and I are actually working on a beekeeping with disabilities survey that I would like to talk about after this part. And I think those are the only hives that we're getting. Our goal is we're hoping to have them all by the end of July, early August, and this summer we're going to do videos on them, how they operate, how they're different from Langstroth, first impressions, what I think I might have issues with when they're full of comb and honey and brood, and what I think is beneficial for each hive. And then next spring, March, April time, we're going to get packages from the same vendor, and we're going to put them into the hives so that when people come to our learning apiary, they can see that bees from the same vendor in the same time, how they build out differently or the same in each different hive style. And then how I interact, how I'm able to keep bees with my accessible needs due to the differences in the hives.

Amy 17:41
Yeah, so I'm actually I'm at your website right now. And I'm just amazed at all the content that you have on your website.

Guest 17:47
Accessiblebeekeeping.org is where our podcast is, and there's a YouTube and audio one as well, and we do interview different beekeepers. Franklin actually came on. We've had a blind beekeeper from California, and she talked to us about how she was able to keep bees with limited help. We've had people with CMT, spina bifida, other stroke patients. So we're working in some businesses, like we had

Horizontal Bees on there as well talking about what he's working on, how his hives can benefit those with disabilities, and I believe Dwayne Parkinson was on as well.

Amy 18:40
Right, right. So let's get back to that survey that you wanted to discuss. You were talking about a survey. So tell us a little bit more about it.

Guest 18:48
In order for us to benefit the community, a lot of government entities want to see background studies and information on an apparent need for that kind of work. And I have met many beekeepers, whether their limitations come from a disability or from age, which, just getting older things become harder. And so we put together the first exploratory beekeeping and disabilities survey that asks you what is your disability, how does it stop you from beekeeping? What do you find difficult? What could make your life easier? So that survey's open until the end of July. And we are working on pushing it out. I think we have roughly 200 responses so far, and we're hoping to get much more so we actually have data to work with. There is a drawing for beekeeping-related items that were donated from authors and companies that we will do an anonymous drawing at the end of the survey being closed to thank people for participating in our survey. So we can't thank everyone individually, but we can leave it to chance that you might get thanked a little more than just our gratefulness.

Amy 20:35
Yeah, absolutely. And if you send me that link, what I can do is also link it to our social media pages and on the additional notes of this episode.

Guest 20:47
On our website, if you look at the top menu, it says survey.

Amy 20:51
Found it! Perfect.

Cameron 20:53
So, Justin, in addition to this survey, what other ways can people help with your mission's goal to improve accessibility for beekeepers?

Guest 21:05
That's a good question. So as a nonprofit, donations are always welcome and greatly appreciated. They help us get the word out, they help us keep the podcast running, they help us help others, because my goal with the podcast is that if somebody is visually impaired, eventually we'll have enough people on there as guests where they can go to YouTube and pull up the visually impaired playlist and just go through and listen to five or six beekeepers that are visually impaired and how they do it to motivate them that they can do it as well. So I'm hoping to get that going. So if you know somebody who is a beekeeper with limitations, and they'd be interested in coming to the podcast, you can get

them in contact with us. If you are a business that has a hive type or something that you have invented that you think would be a good addition to the learning apiary, we have set donations of hardware as well. I think that's it. I think that's about it. Mostly, it's donations of items or financial contributions. And because it is a 501c3, they are tax-deductible donations. Yeah, just, listening to the podcast and helping us spread the word of what we're trying to do was a great help.

Amy 22:50
Yeah, so I think your work and everything that you're doing is fantastic. I'm excited to see you grow. I'm excited to see how your nonprofit helps beekeepers all over. Is there anything else that you wanted to add to let our listeners know about any future goals or future projects? Short-term or long-term?

Guest 23:15
Yes, you mentioned a little bit at the beginning about the children's books. And I am grateful for that because it took a lot of work there. It's actually dedicated to my aunt who passed away from COVID, my mom's sister, and she was the one that pushed me to do the book. And I actually finished it the week before she passed away, but she never got to see the finished copy. So I wrote Henry Meets a Honey Bee to heal through my stroke and to teach kids about honey bees. So I was looking at books for my nephew and my nieces and cousins, all the kids in my life and I was like, all these books are cute. They teach about bees love flowers, they don't really teach about honey bees, these are just cute stories about honey bees. So I was like, "How can I make a cute story about a honey bee that also teaches about pollination, the roles of the queen, drone, and worker bees and the jobs of the worker bees inside the hive?" So I came up with Henry Meets a Honey Bee and it's actually a young boy who meets a queen bee named Honey and transforms into a bee and gets to go into the hive and learn about different jobs of the worker bees and why there are three types of bees and what the drones do and what the queen does and the responsibilities of the worker bees. And then we finished that book and we sold it for the first time in October and it did really well on social media. It did really well at the Hive Life conference in January. And I was sitting back, and my mom and I were talking and I was like, "Well, what are they teaching kids about beekeeping?" So we started looking for books about beekeeping. And there were a few books but not very many. We started writing two new books that came out on Mother's Day. One is Honey Teaches Beekeeping to Kids. And Honey Teaches Beekeeping. The 'to kids' one uses illustrations and live photos. So you'll see some of the book is illustrated, and then some of the book has pictures of the honey bees with pollen on the back legs, a live picture of a bee suit and what a swarm looks like. And so they can actually see what it looks like in real life from the safety of a book. The 'to kids' one is a larger font and about 30 pages and it's more of a broad overview, and it follows Henry Meets a Honey Bee. So first, you learn about the bees themselves. And then you learn about how beekeepers support these amazing creatures. And then I was like, "This book needs to be short enough that a young kid can be interested through it but not too long and overloaded with information." So we came out with Honey Teaches Beekeeping at the same time, which was double the length, about 62 pages, and it goes into treating for mites, painting your hive, and it's more for young adults. And even when we go to these conferences, it makes my mom and I chuckle sometimes, the people that are buying the young adult book are actually the spouses of the

beekeepers at these conferences that want to learn. They want to learn what their partner's doing without their partner explaining it.

Amy 27:32
I think that's so fun. And I think that's such a creative way to communicate with people of different ages as well.

Cameron 27:40
Yeah, absolutely. And, I mean, this is an amazing endeavor that you've taken on. I know that there's a community, as you had mentioned to us, I mean, some other beekeepers with disabilities that are trying to help get more people into, or at least aware and be able to help and assist. And this just sounds like a wonderful effort. And I applaud you and your mom and your family for pushing you to do these things. And it seems like it's going to be a really great benefit to all of us. I just want to say thank you for what you're doing and remind our listeners to check out the website accessiblebeekeeping.org and then you can find some of this information that we've talked about, and find the survey, and find how to donate so that you could be more involved in this process of helping others through accessible beekeeping.

Guest 28:47
Yes, thank you for bringing that back around. And also, if you guys decide that you ever want to make your apiary in Florida a little more accessible, we're always willing to work with other universities around the country. Our goal is to find at least one place in each state.

Stump The Chump 29:13
It's everybody's favorite game show, Stump the Chump.

Amy 29:22
Welcome back to the question and answer time. And Jamie, this weekend I was in the Panhandle for the Beekeeping in the Panhandle conference and it was so much fun to meet beekeepers in the Panhandle. I had not been able to do that since pre-COVID. So I was really excited to be able to interact with beekeepers. The first question that we had, actually, I received from a commercial beekeeper in the Panhandle. And he was asking about mini-mating nucs for queen production versus normal nucs or normal colonies. This is so horrible. I've seen on Instagram and TikTok and social media some of the queen breeders out there that use mini-mating nucs for queen production and they race to find a queen, pull her out, mark her. This beekeeper specifically asked and said that beekeepers reported that their queens actually produced much faster in a mini-mating nuc and so I figured we just discuss it on air and I just ask you. Why would a commercial beekeeper or queen breeder specifically use a mini-mating nuc versus a normal nuc?

Jamie 30:28
So, Amy, I'm going to elaborate on this just a little bit because I know maybe a lot of you folks out there maybe don't have queen production businesses in your country. So maybe these concepts are a little bit foreign. But at the end of the day, in the queen production process, beekeepers will graft young

female larvae into these plastic or wax queen cups. They put those into colonies that are queenless and so the queenless bees will start pulling out those queen cells or making those queen cells and developing those larvae into queen larvae. Then, oftentimes, those cells will be moved to what they call finisher colonies whose job it is to cap over those cells. And then at that point, once the cells are right, they have to go individually into queenless colonies so that the new queen can emerge from those cells, sexually mature, fly away from that hive, mate, return to the hive, at which point the queen breeder will go through those hives, find those queens, cage those queens, and ship them to the individual who has purchased those. So that's a very quick and dirty, how it all happens. And so the question then revolves around what type of hive are these queen cells going into prior to the queen emergence. So generally speaking, commercial beekeepers, at least the ones that I'm most familiar with from the queen production standpoint, use what we call mating nucs. I don't personally call them mini-mating nucs, I usually just call them mating nucs. A mating nuc is a very small, probably the smallest of the small, type of hive that I've ever seen bees occupy. So it's a really small colony in a really small hive. And to explain it just a little bit further, beekeepers regularly use the term nuc, which is short for nucleus colony. And a nuc is essentially a hive configuration that accommodates fewer, but standard frames than a full-size hive would. So a full-size hive might accommodate 10 frames, a nuc would accommodate 3, 4, 5, something like that. But the key is that the frames are completely interchangeable between nucs and full-size hives. Well with mating nucs, there are no standard dimensions. They're much, much smaller, both in frame size and in hive size, than a standard nuc, which makes them much, much, much smaller than a full-size hive. And commercial queen breeders often use these mating nucs. There's a small but critical mass of bees that are in these mating nucs. And then they'll put these ripe queen cells into these mating nucs so that the queen can emerge from those cells and go out and mate. So the questioner is essentially saying, why do commercial queen breeders use these mini-mating nucs, the small mating nucs rather than just a regular nuc or full-size colony to produce their queens? Amy, it's interesting to me that you heard the commercial queen breeder say it's at least anecdotally reported that queens develop faster in those mating nucs, will reach sexual maturity quicker, go out and mate earlier, and come back to those mating nucs and start laying faster, I've never heard any of that. I think it would be a fantastic research project to compare queen sexual development, mating, and laying behavior in a small mating nuc compared to a regular nuc or full-sized hive. I've always just worked under the assumption and been told by other queen producers that queen producers use mating nucs because they're cheaper to operate. It might take five to 10 mating nucs to equal the size of one nuc. So are you going to invest in 10,000 regular nucs to produce 10,000 queens are you going to invest in 10,000 mating nucs to produce 10,000 queens? I've always understood to be just a cost and labor thing. You can work those mating nucs quicker and find the queens faster. You could have a lot more of them at a cheaper cost. There is one caveat that I learned when I was a postdoc at the University of Georgia years ago right after small hive beetles had been found in the US, queen breeders in Georgia were very quick to point out that mating nucs are far more susceptible to small hive beetles than regular nucs. And so the queen breeders I was talking to at the time were transitioning to stronger nucs for the purpose of producing a queen, but that was more in a reaction to the fact that mating nucs, these small hives were very vulnerable to small hive beetles. But I think a lot of those guys have switched back to using mating nucs, and what they do is they just ensure the mating nucs have ample populations of bees. So I've never heard it has anything to do with

developing faster. It may be the case, it would be a great research project, but in the very least, it's a very resource friendly way and economically friendly way to produce queens.

Amy 35:01
Right. Yeah, I would love, if you're a listener out there, and you're a commercial beekeeper and you're a queen breeder, I'd love to hear what you use and your reasoning for it. That'd be really cool to hear about. So for the second question that we have, so Jamie, we are always talking about Apis mellifera, Apis mellifera, Apis mellifera, Apis mellifera. But Apis mellifera is just one species of honey bees, right? And so how many species of honey bees actually exist? Maybe let's talk about how many species of honey bees exist in the United States, and then how many species of honey bees exist throughout the world.

Jamie 36:04
So I mean, you think this would be an easy answer. But I will tell you in the field of taxonomy, so taxonomy is essentially the scientist in charge of figuring out what critters are related to what critters, how they're related, etc., and so taxonomists at the moment tell us that there are roughly 20,000 species of bees, in general, on planet Earth. Now, taxonomists are a lot like beekeepers. If you ask two taxonomists a question, you're going to get eight answers. If you ask two taxonomists a question about, "Hey, are these two individuals related? How many species of this insect exist? How many genera of this critter exists?" You're going to get incredibly varied answers because taxonomy is not an exact science. It's people using the best available information that they have to classify organisms. So the reason I'm telling you that, Amy, the first question you asked, how many species of honey bee are there in the United States, it's pretty easy. There's one, the genus is Apis, the species is mellifera. This is the bee known as the Western honey bee. And the reason it's called the Western honey bee is because it's from Europe, the Middle East, and Africa, which is west of what is traditionally called the East, which would be Asia. So Apis mellifera was brought to North America in the 1600s. And we have just one species, that one species being mellifera. Now, the debate lies with how many other species of honey bees there are. So our team over the past eight or 10 years has always referred to nine total species. So that would be Apis mellifera being one, which means in Asia, it would include the other eight species. But there are some taxonomists who say that there are 12 and 13, and 14, and so on species. Amy, it all depends on if you are a lumper, someone who groups things, or a splitter, someone who splits things. So let me explain this briefly, and we'll core down to what I think would be a good answer, hopefully, for our listeners. There are, generally speaking, three divisions of honey bees, so three groups of Apis. One of those groups is the giant honey bee. Another one of those groups is the dwarf honey bee group. And then the third group is the cavity nester group. So we know that there are two species of dwarf honey bees. They're Apis florea and Apis andreniformis. There's not a lot of debate about that. But within the giant honey bees is where people start splitting hairs. So our lab has historically recognized two species of giant honey bee, Apis dorsata and Apis laboriosa. However, we would say, within Apis dorsata, there are three subspecies: Apis dorsata dorsata, Apis dorsata binghami, and Apis dorsata breviligula. A subspecies is basically like a race of bees. To think about it from the Apis mellifera perspective when we talk about Italian bees, we're talking about a subspecies of Apis mellifera. When we're talking about African bees, we're talking about a subspecies of Apis

mellifera. Well, Apis dorsata has subspecies. Now, some folks claim that the dorsata subspecies aren't subspecies at all, they're actually species. So Apis dorsata dorsata would be the sole species, Apis dorsata, and Apis dorsata binghami wouldn't be a subspecies of dorsata, it would just be Apis binghami, and Apis dorsata breviligula wouldn't be a subspecies of dorsata, it would just be Apis breviligula. So, two dwarfs, two giants, but recently I saw a presentation that was really convincing that Apis breviligula is, in fact, its own species. So I think our lab is about to adjust and say that there are 10 species based on that. Now, the third group, those cavity nesters, there are five known species. Mellifera is one of those we've talked about it, Apis cerana would be the second, that's the Eastern honey bee or the Asian honey bee. And then there are three lesser-known species that a lot of folks don't know about unless you live where they are, and that's Apis nigrocincta, Apis koschevnikovi, and Apis nuluensis. Incidentally, nuluensis, for a long time, was just viewed as a subspecies of cerana. But now there's enough evidence to suggest that it's own species. So long story short, there are probably at least 10 species of Apis: andreniformis and florea, the dwarfs; dorsata, laboriosa, and breviligula, the giant; and then koschevnikovi, nigrocincta, nuluensis, cerana, and mellifera, the cavity nesters. But remember, taxonomy is an ever-evolving subject. So some of those might be grouped in the future. Some of those may be split in the future. And heck, there might be new species discovered altogether. That was a long answer for a short, simple question.

Amy 41:31
That really was. Oh my gosh, I don't even know if I would be able to say all of the species and subspecies names. I don't know if you just made up the way that they were actually called but good job.

Jamie 41:43
I did. No. But the thing about it, I tell you, it's are you a lumper a splitter? Like within Apis mellifera, I've seen as many as 35 subspecies described, and I've seen as few as 20. We, at our lab, tend to recognize somewhere in the neighborhood of 28 to 30 subspecies of Apis mellifera. But even recently, a few years ago, scientists in Western Asia are making the argument that they found, yet again, another subspecies of Apis mellifera. And it's a big long word thay I can't say, but the point is this is an ever-evolving topic. And as new evidence comes out, people will change their minds, and they'll lump things or split things as what they deem necessary.

Amy 42:24
All right, so for the third question that we have, this question is, how high do drones fly in the sky? Am I going to get in airplane and land in a drone congregation area a thousand feet in the air?

Jamie 42:38
Well, I hope this is a much easier answer than what I had to do for the previous question. And I don't know how high they are capable of flying. In other words, I don't know what their upper limit is. I'm not sure that that is known at all. But I do know that drone congregation areas, these places where queens fly through to mate, and where these drones congregate waiting for these queens, tend to occur 30 to 80 feet or so in the air. So the majority of drones then wouldn't be flying over about 80 or so feet. I'm sure that's not their upper limit, I doubt their upper limit is known. But the vast majority of them in these

DCAs are kind of hanging out in the 30 to 80 feet height. It's rough math here, but I'm going to say that somewhere in the neighborhood of 10 to 30 meters or so.

Amy 43:35
That's pretty neat. I'm trying to just think of drones and how would you even do research? If you have a balloon with a queen pheromone on it, how high is that balloon going to go? And how are you actually going to be able to catch those drones? That's a pretty hard project to do.

Jamie 43:51
Yeah, I mean, that's key. That's how people kind of figure this stuff out. That's why they know the limits are kind of about 30 to 80 feet because they'll walk around with hot air balloons with lures that are impregnated with queen pheromone and they can capture drones at these heights. How you'd figure out how high they can fly is you would just have different sets of these traps up and available and see at what height you're catching drones or you could tag them to figure out what the record height would be. I'm not sure that that's been done. Like I said, most DCA research that I've seen are trying to simply figure out what's the average height of these DCA's that are happening, these drone congregation areas?

Amy 44:29
Alright, so those are questions and answers. Keep those questions coming. We keep receiving them in our emails and in our direct messages on Facebook, Instagram, or Twitter. And we're happy to answer any questions that you have related to honey bees.

Serra Sowers 44:47
Thank you for listening to Two Bees in a Podcast. For more information and resources on today's episode, check out the Honey Bee Research Lab website at UFhoneybee.com. If you have questions you want answered on air, email them to us at honeybee@ifas.ufl.edu or message us on social media at UF honey bee lab on Instagram, Facebook and Twitter. This episode was hosted by Jamie Ellis and Amy Vu. This podcast is produced and edited by Amy Vu and Serra Sowers. Thanks for listening and see you next week.