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SPEAKERS

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

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 00:46
Welcome to this segment of Two Bees in a Podcast. Today, we are joined by Melanie Kirby, who is a beekeeper and wears many, many hats, as many of us do. She is a queen breeder. She's also the extension educator, a consilience researcher, part of the land grant programs with the Institute of American Indian Arts. Melanie joins us from Santa Fe, New Mexico, and has been part of the American Beekeeping Federation and a speaker there for the past couple of years. Thank you so much, Melanie, for joining us today.

Guest 01:19
Thanks for having me. It's a real pleasure.

Amy 01:21
So, something that we've wanted to do in 2023 is to focus on beekeepers, focus on their stories, and kind of highlighting some of the work that they do. And so, we always like to introduce our beekeepers, we always like to introduce our listeners to our speakers. And we first like to know, you know, about your beekeeping experience. And I know that you just wear so many different hats. You've had such a great experience in the world of beekeeping. And so, I'm just going to leave that as a pretty open-ended question and ask, you know, tell us about your beekeeping experience?

Guest 01:58

Well, I'll first start with the bees found me by assignment. I hadn't really thought much about beekeeping until I did the Peace Corps back in the late '90s. And that was my assignment, a beekeeping extensionist in Paraguay, South America. And I remember opening the letter saying what my assignment was going to be, and I just started laughing because I had, one, no idea that that could be an assignment, and two, I didn't know anything about bees or beekeeping. I had graduated from a small liberal arts college called St. John's, which has a great books program. So, we read a lot of old dead people and philosophy. And prior to that, I'd done a couple years in marine biology fishery, so I always liked science. But I also really liked asking questions and becoming a learner of all things and having an opportunity to really explore this magnificent world that we're in. So, getting that assignment letter was like, "Okay, this will be a journey, let's see where it goes." And I just really fell in love with the bees, very glad that they found me. And they've really become, you know, a guiding principle in my work and in what I do, not only on a professional career level, but also, you know, through my personal life, and also, spiritually as well.

Amy 03:27
That's so funny. So, did you -- I mean, did they even ask if you were allergic to bees at all? I mean, like, they basically were like, "Here, work with bees."

Guest 03:34
Well, there had been, you know, this was back in the day, you know, pre-digitization, so it was those little Scantron sheets that you had to circle all the bubbles in. And I remember there being a question saying, "Do you mind working with stinging insects?" And at the time, I really felt like, "Oh, what are they talking about, ants or something?" I was like, "Oh, no, that's fine." You know, I wanted to appear as flexible as possible. And yeah, I guess not very many people actually say that they don't mind. And so, me and four other volunteers happened to click that, yeah, we didn't mind. So, we were in the beekeeping extensionist program in the ag sector.

Jamie 04:14
I think that's really, super cool. I've actually met a couple of other people, over time, who were in the Peace Corps working with honey bees, and I think it's neat. They often fell in it kind of the way you did and maybe with no prior experience, but once they got into it, they really liked it. So, Melanie, I look at all the ways Amy introduced you: queen breeder, extension educator, consilience researcher, land grant programs, Institute of American Indian Arts. And so, this question I'm going to ask you is super open-ended because my guess is with all of those hats that you wear, you're going to have so many varied experiences related to those but let me just throw it out there and see what happens. What are some projects in which you are currently involved?

Guest 04:53
Yeah, so, I'm a very busy worker bee by nature. I tend to worry when I'm not busy, you know, the anxiety sets in. So, I like to keep a lot of irons in the fire. And then I can also kind of hop, skip and jump back and forth between projects so I don't get bored or, you know, I have time to process or insight will hit you that I can bring into it, you know, something else I'm working on. So, you know, after doing my Peace Corps service, I had met a really good friend there who was also a volunteer who was from Hawaii. S,o I started doing queen breeding and got to work out in Hawaii through invitation by her and her mom who had a small gardenia flower farm. And once I got out to Hawaii, I realized, "Oh, there's

queen production out here." And so, I went from a very rustic, you know, kind of, jungle experience to large-scale commercial, you know, factory farming USA. And that was really, that sort of, I want to say disparity between those two types of approaches was really fascinating to me. And I got to also meet a lot of beekeepers from around the world who worked at this queen breeding farm in Hawaii. And so, I was out there for five years learning about queen breeding. And so, queen breeding has really become a huge passion of mine. Not only did it become my focus for my small farms, Zia Queenbees, which I started in 2005, here in the southern Rocky Mountains, but then, it's also become a real fascination for me as I started to learn more about genetics and more so, even epigenetics, and just how, you know, environment plays with our bees, and we get to see this amazing behavior, just how adaptive they are. And so, a lot of my projects tend to be, you know, site-specific initially, but I'm always curious about how that relates to other places, or what other places are doing that. Through adaptation, we can all learn from each other and really integrate into our own systems. And so, one of the projects that I do is what's called the Adaptive Bee Breeders Alliance. And that's a very new one that I just launched, but it was really, I want to say, kind of, in response to my own, I want to say challenges and struggles with trying to learn, you know. I consider myself what I call a first generation beekeeper, meaning I didn't inherit a beekeeping operation. So, I'm the first in my family to try beekeeping, as far as I know. And, you know,the bigger producers have their own networks and kind of their own, I would say, support system, but a lot of us who are newer to it, or are starting our farms for the first time, really don't have that type of support network. So, the Adaptive Bee Breeders Alliance is really a result of that. And it connects bee producers or queen producers, I should say, with researchers, and right now we have 12 producers involved and 12 scientists involved from different institutions. And it's about setting up a network where we can better learn about our genetics. Actually, also get some in the tank for cryopreservation, do some targeted stock exchanges, learn more about our drone congregation areas and do comparative studies, you know, between different management systems. And so, these top producers are basically located from coast to coast and same with the researchers. And I will say this, that in addition to it sort of being an inspiration from my own experiences, it also is a direct result, I want to say, or was really catalyzed by an experience I had when I had the opportunity to go to France. I think it was in 2015. But I got to go to what they call ANERCEA, which is their national association of queen breeders. And I was just fascinated with the fact that they didn't care whether you had one hive or 10 or 100 or 1000. If you were interested in quality genetics and learning how to be a better steward, you were welcome. And I often thought, "Wow, we need something like that Stateside." And so, that idea kind of percolated for a number of years, and then, an opportunity came about through Western SARE, which is Sustainable Agriculture Research Education group. They had a new grant category called Research to Grassroots and it has to be based on previous grant projects. And through my queen breeding firm, I had already had a couple for some breeding collaborative projects I'd done. First one was the Southwest Survivor Queen Bee project in 2007. And then five years later, I did one called the Rocky Mountain Survivor Queen Bee Cooperative. And then 10 years later, now, we have ABBA or Adaptive Bee Breeders Alliance, so they've all kind of built on each other. And I'm just really pleased that there's interest in it. And I think it's a win-win for producers who want to learn more about the stock they have and how to, basically, come up with better strategies and plans, as we all, you know, deal with climate adaptation and mitigation and climate change mitigation efforts. And researchers really want their work to be, you know, to have an impact in a positive way. You know, they want to know, I don't want to put words in everybody's mouth, but that, you know, they want their work to have meaning and to be beneficial to the industry. And so, this is an opportunity for both producers and researchers to work together and see where it goes. But part of that is also slightly related to my work as an extension

educator. I've always loved sharing the wonders of bees. And after schlepping boxes for 20-some years on my own with my farm and having two children, my back started to crumble. And I realized that if I wanted to still be of service in the industry, I needed to evolve my skill set. And so, in 2017, I actually went back to school, and I was in the Sheppard Bee Lab at Washington State University. And I really appreciate that Dr. Sheppard took a chance on me, especially as a non-traditional, older student, you know, going back to school after being out for 20 years. You know, when I had done the Peace Corps, I thought I would put off grad school just for a few years. But I ended up working for commercial operators, you know, in Hawaii for five years, and then in Florida for three years. And so, my initial beekeeping experience was very tropical, or subtropical based, and bringing bees to New Mexico, I really learned, you know, how to take care of them here with my farm partner. And we learned together, you know, pretty much from scratch. And so, that's really hard when you're starting a business and it's in your smaller operator, you know, you don't want to put all your eggs in one basket. But we focused a lot on queen breeding and did some honey production, a little bit of pollination, started to meet other people. We used to actually do, Michigan to Florida because my farm partner is from Michigan. We did Florida, New Mexico, Michigan, New Mexico, now we do New Mexico, California. And that's actually what helped me to really see, just, the diversity of the landscapes across our country, and also how all these different beekeepers really adapt to it. And I was really pleased after I decided to go back to school that an opportunity came for me to apply as the extension dducator here at a contemporary art school. It's a tribal college, it's called Institute of American Indian Arts. It's the only one of its kind in the world. We have a lot of renowned tribal scholars and artists who have come to this school. And for me, as a self-described interdisciplinarian, I really love it because I'm able to not only apply some of the science, but also apply my interest in the arts and communication and really be able to help support education. So, it's kind of interesting how you go full circle with kind of what you do, but very pleased to be able to share what I do and what I have been doing with developing beekeepers here through the Institute of American Indian Arts.

Amy 13:32
So, Melanie, just taking a step back, you know, you were talking about the Adaptive Bee Breeders Alliance. And you all met at the American Beekeeping Federation meeting in 2023? Is that correct? Did you meet?

Guest 13:44
We had our first in-person meeting, but yeah, the grant projects launched in November. We had a virtual meeting. And then at ABF this year was our first in-person meeting for those who were able to attend. And we had a few join us via Zoom as well.

Amy 14:01
That is so cool. I think I saw it. I was a little jealous. I was like, "All these cool beekeepers are together." But really, you know, I think our listeners may be interested to know where could they find more of this information if they wanted to read more about what you all do?

Guest 14:14
Well, we have an Instagram page, which is Adaptive Bee Breeders Alliance. And we'll be setting up a website soon. We're going to be documenting all of our projects. Some producers are interested in certain aspects of the project and same with some of the researchers, and so, we're going to be

documenting the journey for everybody as we learn more about the stocks we have and our different management strategies and really looking at how and what we can do to learn more about adapting to these changing times and climbs as the world turns, so to speak.

Jamie 14:54
I love hearing about your story, Melanie. It's just really neat to see how both personally and professionally bees have become a part of your life. And you were talking about all the things that you've been doing, personally, and your journey through Hawaii and Florida and developing the Adaptive Bee Breeders Alliance. It's really neat. But I want to focus a little bit more here, over the next few minutes, on your professional work through your institute, right? Your institute, the name of it's the Institute of American Indian Arts. There you are an extension educator and in some way, you've managed to integrate bees and apiculture into your work there. So could you please talk a little bit about that?

Guest 15:29
Sure. So, for those who aren't familiar, you know, you have the big state schools, which are considered land grant universities. And then, in the 60s, you have what they call the HBCUs, which is the historically black colleges and universities. And then, in the 90s, you have the tribal colleges and universities, which became land grant schools. And so, actually, IAIA, or Institute of American Indian Arts where I work, is actually celebrating its 60th year of existence. But they actually became a land grant school in the 90s. And so, because of that, they are able to have an ag extension program. What's really cool about the ag extension program is that we are able to integrate not only Western sustainable agriculture science, but also with indigenous perspectives and what we call TEK, or traditional ecological knowledge. And so, it's a really nice pairing of the two. I mean, we have food gardens where we grow some traditional foods, but we also grow a variety of different little crops. Of course, we do the three sisters, you know, corn, beans, and squash, but we have a fruit orchard, we have a tree nursery, we have a 1200 square foot greenhouse, we do use some drip irrigation, we have a small tractor. So, we, you know, we like to show a variety of ways to grow food, and some of them are definitely based on ancestral teachings, and especially here in the southwest, which is a pretty challenging topography and weather, we're able to also complement that with some more modern and contemporary approaches as well. And so, where the school is located is actually behind a housing subdivision that donated the land for the school. They do not allow large livestock, so, we couldn't have horses or bison or even chickens or goats if we wanted, but we could have bees. And so, my supervisor here knew that I had beekeeping experience and asked if I would help to launch a beekeeping program. So, we have our Thunder Bee Pollinator and Beekeeping Program. And we call them the Thunder Bees because they're based on our emblem for the school, which is actually a thunderbird.

Jamie 17:45
Melanie, tell us about what you do with this Thunder Bee Pollinator and Beekeeper Program. I absolutely love that name. And when you're done with that, or maybe while you're talking about it, could you tell us a little bit about the indigenous worldview as it applies to apiculture?

Guest 17:58

Yeah, so, you know, I think for many of us, especially here in America, you know, we we kind of all get lumped together or, we are definitely a product of the melting pot, right? But there are communities that are still very much rooted in their ancestral teachings, and a lot of that comes to a philosophical perspective of interconnectedness. And so, for a lot of indigenous peoples and tribal communities, their reflection of the world and how they interpret the world is really all about relationships and how everything is interconnected. You know, we are a part of nature. And, therefore, it's not really within our needs to try and control it. But it's more about how to learn and grow with nature. And so, what's really cool, you know, especially having been in this industry now for, I'm going on my 26th year of professional beekeeping, I think, especially, you know, is a very male-dominated industry. I've often been, I mean, I'm putting words in my own mouth, but I guess it's what other people have sort of described me as is being slightly alternative, but really, I've just always been very connected with my heritage and with my approach to beekeeping. And so, part of that is my indigenous heritage, and I, as well am a product of the melting pot. My last name is Scottish-Irish, but I am a registered tribal member of Tortugas Pueblo, which is in southern New Mexico. And even within my own tribal community, we are not federally recognized, though we are cousins to two other federally recognized tribes. So, for those who aren't familiar with the very dramatic history of the states, you know, there are a lot of indigenous peoples across, what we call, Turtle Island or North America. And they're just like everybody else. They have such a diversity of viewpoints and interests, but for many of them, especially if they are connected to their tribal communities, they really do see the world as very interconnected and having a sense of responsibility to better support nature, biodiversity, and to try and live in more harmony with the world around them. Although, everybody has their moments, right? And so what's really cool about doing bees and beekeeping here is it's just an extension of our farming practices here. We actually have a lot of solitary bee nest box around. We have a huge pollinator garden. In fact, we create with our students what we call pollinator floral oases, which are different outcroppings of wildflower, sort of, saturation sites, so we can help support our different pollinators around and honeybees are just one of those. And interestingly, you know, when you look back, even pre-humans, there is fossil evidence of honey bees here in North America, Apis nearctica, which was some fossils found in Nevada that date 14 million years old. And so, of course, our modern contemporary bees, honey bees that we have now are not necessarily the same bee, but they are a cousin to that ancestral bee. And so, it makes sense to me that, you know, beekeeping is a part of everything that we can do here at the Tribal College. Our tribal college, as well, is not affiliated with any one tribe. So, we have over 100 tribal nations represented in our student body. We also, as a tribal college university, and that's a land grant school, we are open to everybody. So, we actually have non-Indigenous people who come to school here and also international students who come here. We have six BFA programs and also three MFA programs, and they're developing a doctoral program, in everything from theatre and studio arts to creative writing to entrepreneurship to museum and curation studies.

Amy 22:10
So, Melanie, I actually think I went to your talk at the American Beekeeping Federation last year in Vegas, and you were talking about, you were talking about your programs. And I just remember, you know, everyone kind of talking about your history, and you had, just, such a wide variety of experience. And so, what would you say, have been some of your highlights throughout your career. You've done so much. And so, you know, if you had to choose a highlight of your career, what would that be?

Guest 22:40
I would definitely say that I did not realize that I'm so grateful that the bees have taken me around the world. Beekeeping is a global endeavor. And I'm super fascinated, not only because of my own cultural heritage, but really just with cultures and the diversity of cultures around the world and how all these different communities have become fascinated with bees. And beekeepers are so innovative. So, there's so much we can learn. You know, I mentioned getting to go to France, I've had the opportunity to go to Morocco, Nicaragua, Jamaica, South America. It's just really humbling. But also, I'm just fascinated with how bees and beekeepers have developed these really beautiful relationships around the world with each other, you know, and we'd like to think that we're taking care of the bees, but definitely, they're taking care of us.

Amy 23:42
I feel like Jamie has, so Jamie gave a talk at our Bee College event this past year. And Jamie, you kind of highlighted your career. And that was also one of the things you discussed, right? I mean, just that bees have brought you all around the world.

Jamie 23:56
Yeah, it's kind of stupid to think about it, right? You know, this little childhood fascination kind of grew up to be what I do for a living and, Melanie, just like you, I've traveled to every continent except Antarctica, and that's because there are no bees there. But someday, maybe. But all that aside is, you know, our love for knowledge of bees, really, has given us opportunities beyond what I expected as an individual. Melanie, it sounds like you're really echoing the same thing. So, I'm curious, you know, talking about some of your highlights, I'm curious what this has led to from the learning culture for you. What have you learned along the way? What are some great take-home messages that you've been able to discover as a result of working with bees all of this time?

Guest 24:43
That's a hard question. I think bees really help us to recognize, just, how beautiful our world is, you know? Working in, as I like to call it an office in field of flowers, I never realized how much I was going to want to learn more about plants and horticulture and even atmospheric science and wanting to learn more about weather and, you know, wanting to learn more about even different technological tools that we can use to help facilitate and streamline more efficient management. Respectfully, I mean, they really have allowed us to explore a variety of interests that, you know, go beyond just bees. And I think that is truly a very dynamic type of endeavor. And someone such as myself, who you know, can have attention deficit issues, they just really have allowed me to explore anything that I've become interested in that they have inspired, you know, including the arts, you know, whether it's encaustic art, especially here working at an art school, we have film students who we did a music video about, you know, with the bees. We've done recordings, we had a huge art exhibit, which actually I got to talk about at the Entomological Society of America Conference. And bees and pollinators and insects, in general, really are super fascinating creatures that so many different cultures have connections to. And I think bees helped to really serve as one of those kind of gateway insects into learning more about the world all around us.

Amy 26:33
A gateway insect. Thank you, Melanie, for that.

Guest 26:38
I could've said a gateway drug. They are addictive, that's for sure.

Amy 26:43
Definitely. So, the last question I have for you, you know, a lot of listeners that we have are hobbyists, the majority of the beekeepers that we have that make up the beekeeping world are hobbyists, and so, I guess my question is, what recommendations would you have for any hobbyist or any sideliner who wanted to go into the industry? I mean, you've, again, you've had a lot of experience, and you went from the Peace Corps to working for queen breeders, and then you went and worked in academia. And so, what recommendations do you have for those out there wanting to do something similar?

Guest 27:16
I would say just throw yourself into it, you know. I had no idea that this was going to be my profession. I will be honest in that, you know, I had really gotten into DJing when I was in college, and so I thought I was gonna do Peace Corps and then move to San Francisco and be a DJ. And now, I kind of reflect back on that. And I realized that, you know, the bees have become my DJs. And the vibrations and the frequencies that not only they're emitting through their buzzing, but you know, from the perfumes of the flowers, I mean, there's a lot of broadcast and reception going on. And the more that you make yourself receptive to learning, the more you're going to be able to broadcast and really be of service and share your knowledge and your interest with your community and even beyond your community. I would highly recommend, for those who are interested, to go work for commercial beekeepers. Take to heart you know, just how difficult and challenging it can be. There's a lot of other careers that people, you know, can choose to go into that are not as tough, but for some reason, you know, we find bees and beekeeping fascinating. So, I think the more we can learn from each other, I owe a lot of my initial experience to, you know, what I've learned from working for commercial beekeepers. I myself am a small-scale commercial beekeeper. My farm partner started off with two packages, two buddies and two books. And then he, you know, the hobby got out of control. And the friends moved on. But then he had, you know, two hives to five to 17 units of he didn't know what and he realized he wanted to go work for commercial beekeepers so he could figure out how to better manage them. And so, you never know where your experience is going to take you. But there's a lot we can learn from each other. And I definitely found that after I had worked for commercial folks and then, even started working on my own, I never anticipated having my own farm. It just kind of happened. But then there was a point where I realized I really wanted to learn more and I couldn't learn it on my own. And that's what inspired me to go back to school, and I really developed, I want to say, a much deeper sense of appreciation for the scientific process and just even also how hard research can be, how much detail goes into it, how tedious it is and that sometimes your experiments don't always work, you know, but that's what makes you grow and that's what makes you try. All of us together are students for life of this beautiful craft of agriculture.

Amy 30:03
All right, is there anything else that you wanted to share with our listeners?

Guest 30:07

I would just encourage people to share their story. You know, we sometimes don't think that who we are, where we come from really plays into what we're doing, whether it's just an interest, is a hobby or whether it's a career path, but I think the more that we make ourselves vulnerable in terms of sharing about our stories, the more we're going to see how much we're alike. And, you know, it's a cliche, but I like to say it takes a community to raise bees. And also, you know, bees unite us. The beekeepers are united across the globe. We all have similar desires to want to have healthy bees and to be able to enjoy them and to share their honey and hive medicines with our communities.

Amy 31:02
All right, well, I just wanted to thank you so much, Melanie, for being part of our podcast today. It was really fun, just, listening to your story, listening to your experiences, your perception of, you know, the honey bee world. It's just been really great having you on today. So, thank you so much for joining us.

Guest 31:18
Thank you so much for having me. This is great.

Stump The Chump 31:25
It's everybody's favorite game show, Stump the Chump.

Amy 31:35
Welcome back to the question and answer segment. All right, Jamie. We are at the American Beekeeping Federation 2023. It is the first week of January. I'm excited for this year. We have questions from our audience. So, are you ready for your question?

Jamie 31:49
I'm ready to try, for sure.

Amy 31:52
Well, the last episode, you got a pretty easy question. So, these are going to be way harder.

Jamie 31:56
Okay.

Amy 31:58
The first one is, what is the size of a bees brain in comparison to a human brain?

Jamie 32:06
So, let me just say --

Amy 32:09
I did not make these questions up, by the way. This is from you all.

Jamie 32:12
Okay. There's an easy answer. It's smaller.

Amy 32:18
Okay, but whose brain?

Jamie 32:20
Yeah, I was gonna say, is the question Amy's brain or my brain? Definitely, no, hers is bigger.

Amy 32:26
Mine is bigger.

Jamie 32:27
Yeah. It's really tiny. And I want to remind, that's such a scientist answer when you don't know the answer. It's really small, very infinitesimally small. In reality, you know, bees have brains, right, in their head. But their nervous system is not centralized. Everything doesn't run through the brain like you and I have everything running through our brain. They also have ganglia scattered throughout their body. So, as you march down the body of a bee, there's different nerve centers that kind of collectively represent the brain. And each little nerve center, itself, controls the section that's nearest it. But the thing that we call the bee brain is obviously in the head. And there's parts of it that are most significant, are the sections that deal with sensory perception. So, you'll see the lobes that the eyes connect to and the antenna connect to and the mandibles connect to are all the largest sections of the brain. And that's because it's not exclusively sensory perception, but it's a very sensory perception-rich part of the body. Now, it's very small, relative to the human brain. I don't exactly know the size, right, really tiny. If you dissect the head of a bee, it's not a pin tip. It's about half of the size of the other side of the pin, the pin head, right? And I know the follow-up question that's coming. Wasn't there a bee intelligence question?

Amy 33:48
She actually answered the question. I just didn't want to tell you that she answered the question.

Jamie 33:52
Let's hear what it is.

Amy 33:54
She said -- Karen, are you in the audience who asked his question? All right. It is one one billionth the size. Yep, they operate frequently, more intelligently.

Jamie 34:11
So, let me just ask this question. How many of you guys have read Honey Bee Democracy by Tom Seeley? So, one of the interesting things about that book is he's talking about collective intelligence with honey bees, right? And obviously, an individual bee is really small. Its brain is, apparently, it's one one billionth that of a human, if that's the size, and so that's really small. And it'd be easy to say that bees are stupid, but bees have what we call a hive intelligence or a colony intelligence. So, when you put a lot of small brains together, you get a pretty high-functioning organism and a colony is a very high-functioning organism and Tom Seeley's book Honey Bee Democracy uses that idea about honey bee intelligence to make decisions like during the swarming process, how to locate nest, how to decide how to get there and all these things. But what's interesting to me, most interesting about that book, besides describing the biology of honey bee swarming, is at the very end of that book, he says, there

are things that we can learn from honey bees. And he gives an example that, for example, when choosing nest sites, honey bees choose the most appropriate nest site, like, more than 95% of the time, right? So, of all the available nest sites in the environment, they are making the most correct decision, they are choosing the best possible nest site 95% of the time. And then he's like, you know, we can learn a lot about leadership and allowing opportunity for people to spread their ideas and about making decisions. And then he talks a bit about elections. And I'm curious, how many of you would be happy if 95% of the time we elected the right person? Right? Right, I mean, I think the House of Representatives is struggling with that right now. Right? I just read news that they've now voted 12 or 13 times for a Speaker of the House and still can't decide, but honey bees would be building comb in their nest by now. But there's certainly a collective hive intelligence that humans can learn a lot about if we study it more, which is why there are scientists like Tom Seeley and others who study that kind of collective intelligence in honey bees.

Amy 36:12
So, your answer to what is the size of a bee's brain?

Jamie 36:16
It's smaller?

Amy 36:17
It's smaller. Oh, great.

Jamie 36:19
Yes. All right. Did I get that one right? I got it right.

Amy 36:23
Only one person said you got it right.

Jamie 36:25
Ok, to the rest I'm a chump. Well, the answer, apparently, is in the question. I've got to go look up and see if it's really one one billionth. That's pretty small.

Amy 36:32
I believe it.

Jamie 36:33
Okay.

Amy 36:35
All right. Okay, so, for the second question. With backyard beekeepers making the majority of beekeepers and commercial beekeepers having the majority of the colonies, what is something that backyard beekeepers can do to support commercial beekeepers?

Jamie 36:50

Oh, gosh, I feel like this is a politically loaded question. And so, I will give you a politically loaded answer. And the good news is, since this is a podcast, we can edit it however we want to so I get tomatoes thrown at me, I'll be okay. One of the first things that I would say that backyard beekeepers could do to help commercial beekeepers is to keep your bees. You know what I mean by that?

Amy 37:12
Tell me.

Jamie 37:13
Yeah, so a lot of backyard beekeepers just have bees. Right? And they don't treat their bees or they don't take care of their bees or they don't limit swarm control. So their bees can be a constant source of feral colonies and problems for commercial beekeepers. Listen, we are all human. And someday, we've got to figure out how to live together on this planet. We need to live to figure out how to live together in the same room sometimes. But one of the common complaints I hear from commercial beekeepers, when they're talking about backyard beekeepers, is the idea of a disease and pest reservoir. That's not been shown and I'm not a full subscriber to that idea. I know in the state of Florida, commercial hobbyist beekeepers make up more than 80% of the beekeepers in the state, but they hold 5% of the colonies. So, it's a bit of a stretch for me to believe that 5% of the colonies can really impact the other 95% in the way that a lot of commercial beekeepers claim. But that said, I do feel that any beekeeper who is going to keep a colony of bees, which is by definition what a beekeeper is, we have an ethical obligation to minimize the stress on that colony's life. And if we do that, I think that will go a long way to helping commercial beekeepers. I also think there are some other things that hobbyists or sideline beekeepers can do as well for commercial beekeepers. A lot of hobbyist beekeepers just want bee experience. And commercial beekeepers often want bee labor. So, a really great way to learn how to keep bees is to volunteer to help commercial beekeepers, maybe on nights and weekends when you've got opportunities to go and help and learn from commercial beekeepers. You know, if commercial beekeepers aren't good at what they are doing, they don't survive as a business. So, the ones who are thriving as a business, those guys and girls know what they are doing. And so, I think hobbyists can learn a lot from commercial beekeepers by just volunteering and assisting. So, I would say two things. Again, to kind of summarize my point on this, and I'm sure there are other things I could think about later. But number one, keep your bees. Make sure that you are keeping your bees in a way to minimize any issues that your bees, your beekeeping practices may cause for other people, but also consider assisting commercial beekeepers and learning from commercial beekeepers. Don't be a parasite. Don't go to just gain knowledge, but go to contribute also to their operation. And I think both of those things should go hand in hand. I would also, too, I will say this because something else just popped into my mind. Hobbyist beekeepers, because they make such large numbers of beekeepers, have really big legislative influence in a lot of our state and federal political situations. For example, I know here in Florida when we were trying to build the University of Florida bee lab, the Florida State Beekeepers Association did a lot with commercial beekeepers to raise money to do all that kind of stuff. But there were tons and tons and tons of hobbyists that were taking that news to their respective legislators, so hobbyists can be powerful allies when you need voices of support for beekeeping and beekeepers at political levels that can move and shake. So, I would argue that hobbyist beekeepers can also champion commercial beekeeper causes in a way that's mutually beneficial.

Amy 40:19

Yeah, you know, Jamie, I'm thinking about, just, the American Beekeeping Federation Conference. I don't know if everyone realizes that the American Beekeeping Research Conference is also being held right now. We also have AIA, which is the Apiary Inspectors of America, who are here right now. There are lots of different moving pieces. And it's kind of fun to think about how we all kind of contribute to the industry in different ways, right? I mean, I'm not a commercial beekeeper. I am a hobbyist beekeeper. I try to advocate for the commercial beekeeping industry as often as I can. I try to learn about it as much as I can. I'll sit in on some of those conversations just to know. I'm an educator, I'm a voice but I think that we can all really be a voice for each other, which is kind of neat. And we all kind of have a completely different take and perspective of our beekeeping world and what that looks like. Right? So, I think that's kind of cool. All right. So, for the last question that we have, oh, did you need to look over here to practice and think about what I'm going to ask you?

Jamie 41:19
No, I was looking over. No, I've got this. No, I know this one.

Amy 41:19
Okay, so, we actually, we've had this on the podcast before, but I do want to answer it today because I know that there are many people in the audience that have not heard this answer. So, the question is if a queen stinger is a modified ovipositor, how can she sting and lay eggs?

Jamie 41:38
Alright, so a little bit of entomology here. All of you guys are budding entomologists, right? If you're a beekeeper, you're a budding entomologist. Alright. So there are multiple orders. This is, I promise, a relevant answer to this question.

Amy 41:53
I believe you.

Jamie 41:53
Sometimes, I start really too high, but we'll get there together. All right. There are multiple orders of insects. For example, beetles are coleoptera, flies are diptera. Well, bees, wasps, and ants and sawflies are all in an order called hymenoptera. And so, if you know Greek, hymen means membrane, optera means wing, so membranous wings. So, bees, wasps, and ants and sawflies are all hymenoptera. Why am I telling you this? Because hymenoptera, female hymenoptera are the ones that have stingers. Bees, wasps, and ants. The vast majority of those, especially in the vast majority of wasps, still use their stinger for what it actually was designed to be used for, which is to lay eggs. So, if you've ever seen a wasp with a really long thing coming out of the end of it, that might have been an ichneumon wasp, for example. And they will stick that stinger through, like, openings in trees where there might be some insect larva tunneling through that, and she'll stick that stinger through that tunnel, find that insect larva, push the stinger in, and lay an egg through it into it. So, a lot of our parasitoid wasps still sting their insect prey and lay eggs through that stinger. The stinger is an ovipositor, an egg-laying device. But in the higher hymenopterans, they quit laying eggs that way because stings became defensive mechanisms. So, in the social wasps, as an example, the yellow jackets, the hornets, etc., things like ants and the bees, the stingers aren't used to lay eggs anymore. The eggs come out the vaginal duct at the tip of the end of the abdomen, much like you would have a bird. It's just that that

stinger is now secondarily there as a defense. It didn't go away. It just is used for something else. And that something else is pretty potent because a lot of people who -- okay, let me start the statement over. When I was trying to get started keeping bees, a principal reason my parents wouldn't do it is because, I mean, what do parents know about bees? They sting and nobody wants their kid stung to death, right? So, my family was worried about stings. A thing that big drives absolute paranoia in people. Have you noticed that? If you take someone to work bees with you, they want to be completely suited up the first time because something that big utterly terrifies them. And you giggle, but it terrified us too before we finally got comfortable with it. So, that little stinger, when it switched from laying eggs harmlessly to delivering venom, began to freak the world out. And the social insects accomplished exactly what they wanted, which was stay away from my colony. We want to live, and we don't want you stopping that. How's that? Yeah. Now I know totally the difference between ovipositor -- There you go. Go look it up. But you need to look up parasitoid wasp because they're super cool. They lay eggs in the bodies of insects, out of their eggs come young larvae that eat their prey alive. And then, right before they're ready to pupate, they burst out of the body of their hosts, have these little cocoons, and it's just like that -- which movie was it? Alien, predator, alien? It's just like that, except it's real folks. It, like, comes out, boom, it's sitting there. And so, I mean, imagine if there was a creature that laid eggs like that in us? Well, there are, but not things that -- there's not like baby-size things that come bursting out of our bodies after -- Well, women are saying, okay, there are but I feel like -- no, imagine if those things were eating us? And then burst out? Next question, please.

Amy 46:04
And this is why we have a podcast editor.

Jamie 46:07
Serra, please, work your magic.

Amy 46:11
Is there anything else you'd like to add?

Jamie 46:12
Oh, that's it. I have said what I wanted these folks to know.

Amy 46:18
I wish I could tell you all we practice these questions, but we definitely did not.

Jamie 46:22
No. There's a whole -- we get so many questions. So, one of the things we do at the end of our podcast is we give out our social media -- I'm so old -- handles? Handles. Thank you, sir. So, we're at, you can find us @UFhoneybeelab. So, you can find us on Twitter, Instagram, and Facebook @UFhoneybeelab. And we get, just, bitrillions. That's a big word. That's a big, big number. Having a baby -- a bitrillion. Alright, so, we get bitrillions of questions and we have them up on an Excel sheet and we try to get through as many as we can. And we just get more questions than we can handle, which is a good thing.

Amy 46:50

Bitrillions, yeah. That's like the size of a human brain compared to a worker. It's a great thing. Alright, listeners. If you have any questions, feel free to send us an email. Or, you can go to our social media handles, @UFhoneybeelab.

Serra Sowers 47:12
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 @UFhoneybeelab 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.