

# Episode 22\_proofed

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## SPEAKERS

Guest 2, Guest, Jamie, Stump The Chump, Amy

### Jamie 00:05

Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research and 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. In today's episode of Two Bees in a Podcast, we are joined by Dr. Chase Kimmel of the University of Florida. Dr. Kimmel is an expert on native bees and made a recent rediscovery of the blue calaminthe bee and he is going to be talking to us about that, as well as native bee research in general. That will be followed by an interview with Dr. Jay Evans, who is a USDA ARS bee research scientist. We are going to be discussing with him his new book, Found In Translation, that's based on a series that he writes for the journal Bee Culture where he takes current research and digests it on behalf of beekeepers. Of course, we'll finish today's podcast episode with the Question and Answer series Stump the Chump. So thank you for joining us on today's episode of Two Bees in a Podcast. Thanks guys for joining Two Bees in a Podcast we have a very special guest with us today we have Dr. Chase, Kimmel Dr. Kimmel is a postdoctoral associate for the Florida Museum of Natural History, as well as working in the entomology and nematology department here at the University of Florida. So he's someone that Amy and I have known for a while. Chase and I go back actually quite a few years. Chase, I appreciate you joining us here on Two Bees in a Podcast.

### Guest 01:59

I really appreciate you guys letting me join you.

### Jamie 02:01

Chase, we're excited to have you for a lot of reasons. But one principal reason is a bee that we're going to be spending some time talking about. I don't want to steal thunder from Amy, who's going to ask you to talk about that bee. So before we get to that bee, I want to just ask you quickly, if you could tell us a little bit about yourself, how you got into bees, how you got into pollinator research, how you found

yourself at the University of Florida and just an overview of the type of work you do before we dive in to why we really want to talk to you today.

**Guest 02:31**

Okay, so as you said, I am a postdoctoral associate the Florida Museum of Natural History. But obviously, that started quite a while ago, my journey and how I got there. So originally, whenever I went to undergraduate at Hanover college in Southern Indiana, I was a math major and I was a certified high school math teacher. And while I really enjoyed that I also had a passion for the environment. So I studied abroad in Australia and did some environmental work. And I really knew that I wanted to do something with land management, conservation, or restoration. So once I finished my undergraduate degree, I taught for a couple of years while I pursued some more coursework to help me get a master's degree. I went ahead and got a master's degree in environmental science focused on Applied Ecology. And it was during this time that I really got involved in beekeeping. And so I went to the local bee club, learned all about beekeeping, read lots of books, and really got passionate into how we can manage and create different habitats for bees to utilize. And so my parents and I would go to the state bee meetings. And in fact, it was in 2013 that I met you, Jamie, at Indiana Bee School. And at that meeting, we had actually gone out to dinner and I had asked you and told you about what I was doing and what I was interested in. And you had mentioned that there was a position down here at the University of Florida. And so I applied to graduate school, was fortunate enough to come down here and study how different management practices impact the pollinator community, whether that be in some agricultural systems, as well as some natural systems. So I finished my dissertation looking at how different fire management practices impact those in sandhill ecosystems. And once that wrapped up, I've been working on a couple of different postdocs mainly revolving around whether it be mowing or fire or utility vegetation management, how that impacts the pollinator community as a whole. And my co PI on the project that I'm currently working with, Jared Daniels, he and I applied for a state wildlife grant to investigate this relatively rare bee called the Blue Calamintha Bee. And so our goal in this project is to look at the distribution, the habitat use, and basically, more about the biology of this bee that we know very little about.

**Amy 05:16**

That's awesome. So Chase, you've already gone ahead and told the audience what we were here to talk about was the blue calamintha bee. So how long were you working on it?

**Guest 05:26**

I have known about the bee for a little while, but I really didn't dive into this research until early last year, probably about a year and a half ago, whenever we were filling out the proposal for this project. And the more that I learned, the more interested I was, because this bee is a relatively new species. We're describing - entomologists are describing, not me - are describing new species all the time. But this species was first described in 2011. So while it was first caught, the first known specimen was caught in 1983. I'm guessing or assuming it sat in a box somewhere for a really long time until there were a lot of them. And then researchers at Archbold Biological Station by the name of Molly Rightmyer, she and her colleagues, actually, were able to distinguish this from other bees in the genus *Osmia* and determine it as a new species in 2011.

**Amy 06:25**

That's really crazy. So just recently, well, what month is it? I don't even know what month it is anymore. It's June, the beginning of June. So just recently, a couple of weeks ago, there was an article that came out saying that there was this blue calamintha that was found in Florida, right? So can you tell us a little bit about that story that maybe we can dive into more about the biology and more information on it.

**Guest 06:50**

Yeah, so this bee, in trying to understand it and know more about it, we first have to know what bee we're dealing with. And so fortunately, from the researchers at Archbold Biological Station, we do have the groundwork for identifying a species and some other basic biological things that it goes to. So as the name implies, it is a blue bee. Now, there are other blue bees in the state of Florida, but we maybe we'll get to that here in a little bit. It is a dark metallic blue bee. And it's called the calamintha bee because its main host plant is called the Ashe's Calamint, or *Calamintha ashei*, is the scientific name. And so that's where it gets its name from. But the reason that it's caused kind of a big media stir lately is because we weren't really sure what to expect whenever we started surveying for this bee. The last time this bee was seen was in 2016. Originally, in 2011, when the species was described, it was only found in four locations. Three of those four locations were on protected or conservation lands, while one was not. And then in 2016, again, researchers from Archbold Biological Station went out and surveyed three of those areas, and they only found the bee on the unprotected area that was actually an undeveloped lot in an urban center, as well as in an area that was protected, but only metres from a citrus field. And so of the two places that we knew that bee was, they both had a pretty good chance of being impacted by humans. So realistically, we didn't know what to expect, whenever we went out to find the survey, we were open to the possibility that we might not find the bee at all, we were open to the possibility that we might find the bee in numerous locations, because an exhaustive survey had actually never been done on this bee. And so we were actually quite lucky to build upon research that was known about this bee and find it in many new locations, but where we actually would find it would be in scrub habitat, predominantly along the Lake Wales ridge. And so it is a very unique habitat. Like I said before its name comes from the plant that it mainly goes to. There is a record of it going on one other plant one time. We actually have found it on an additional host plant, but we're waiting to look at the pollen samples to confirm that we did find it there. But it is really a pretty unique bee.

**Jamie 09:28**

Chase, there's just really so much that you're mentioning it's kind of going through my head at the time. So one of the things that Amy said that which is true and I guess by the time people listen to this podcast, I may not have a point of reference, it happens to be June 2020. We're a few weeks after the crazed murder hornet issue that stormed the nation and that stuff loudly went around the world, the news articles, but similarly, your discovery or rediscovery of blue calamintha bee also made the news, in fact, it made a lot have news. It's on all types of news agencies. And I'm starting to see your name pop up everywhere interviewed. And so just like the murder hornet really started causing everybody and their brother or sister to start reporting that they've got murder hornets in their backyard, of course wrongly so, lots of things can be identified as it. I'm wondering, since you've now made this pronouncement that you've rediscovered the blue calamintha bee, how many people are trying to tell you they also have discovered it in their yard? In other words, what can be mistakenly identified for this

bee? And how much are you having to deal with people saying I've got it, you need to come here and study it?

**Guest 10:43**

Oh, that's a great question. And in fact, I still receive daily emails, I probably have over a couple hundred emails of people that are super interested in this bee, as well as saying, Oh, I've got it in my yard, I've got it living in my house, I've got it going to this plant. And unfortunately, I've actually not seen a single picture that actually depicts the bee itself, or what could actually potentially be the bee. But these people all have great intentions. And I'm really excited to see their excitement for it. But there are a few things that we could get confused with the blue calamintha bee. This bee is in the genus *Osmia*. *Osmia calamintha* is the name of the species. And there are interestingly, around seven other species of *Osmia* just in Florida. There's about 140 different species in the genus *Osmia* just in North America, so even though we get emails from all over the country, most of these blue bees that people are seeing many times could be in the genus *Osmia*. They could also be in the family Halictidae, there are many metallic green, and almost have a bluish tone to them, such as *Agapostemon splendens* that are also very common in Florida that many people might get confused with this bee. There are also some carpenter bees, some people send pictures of some metallic flies, a lot of cuckoo wasps. In Florida, there's also a blue mud dauber that people can get confused with. So there definitely are a lot of things that people are really keeping their eyes out for. And fortunately for us, Dr. Rachel Mallinger made a great IFAS blog on some of the other blue bees that you might come across in Florida. And in that she shows some pictures and describes some other things that we might actually see while you're outside. And she also puts a checklist of questions that you'd have to answer yes to, in order to actually come across the bee. So it was very well done.

**Amy 12:48**

So with the blue calamintha, as far as what it looks like, are there any major identifying factors? I don't really know the difference between them, honestly. So if I walked outside, what would be a primary factor that would make it look a little bit different from another blue or metallic green insect?

**Guest 13:08**

I'm not a taxonomist. But I have seen a lot of these different species underneath a microscope. And whenever you get them under a microscope, you can see many differences. However, whenever you're just, walking around amongst the flowers, it can be very difficult to identify this bee. In fact, whenever I identify them, I don't consider that I've identified it until I've actually caught it, placed it in a bag, where the bag has a little hole in it. And much like you might do a proboscis extension response experiment with honey bees, I stick the head of the blue calamintha bee or any of the bees that I catch out of that little hole and kind of confine it. And I use a hand lens and some macro photography to take pictures of its face. So the diagnostic characteristics of this bee are there's parallel ridges, on its mandibles and the dense short hairs that are on its face. And that really separates it from other bees that you might find in that area. Interestingly, there's another bee that's also blue, it's called the *Osmia sanhousei* [sp]. And it's also found on that same plant in the Lake Wales Ridge region. So even if we find a blue bee on the same plant, we still try to collect it to know that we've identified the correct bee and have records of it through some photography,

**Jamie 13:11**

I want to jump in quickly. So if you've got this bee that's potentially endangered, when you collect it for identification purposes, how does that work? If it's endangered, why collect it? What's your strategy there?

**Guest 14:52**

In many of our pollinator projects in the past, a lot of times we collect bees and we sample that environment, and there are very efficient ways of sampling for those environments. But whenever you're dealing with something so rare, we're trying to minimize any impact we have. So if I see what I suspect is the bee, so if I see either a blue bee visiting a flower, or interestingly one thing I haven't mentioned is that this little b has a very unique behavior, it will actually collect pollen on its face. Many times before it transfers that pollen to its abdomen. So unlike a honeybee, where it collects a lot of its pollen is on the underside of its abdomen. There are other bees that do this, many bees in the in the family Megachilidae do this. But this one uniquely will actually keep excessive amounts of pollen on its face. And so if you see pollen on the face, or if I see the unique behavior that it exhibits in getting that pollen on its face, which is literally rubbing its head on the flower back and forth. If I see that unique behavior, or a blue bee, then I'll catch the bee. And so once I actually catch the bee with an aerial net, I then transfer it into an itty bitty little Ziploc and from that Ziploc, I can make sure it's in the genus osmia. And then I will cut a tiny little hole in that Ziploc, and with the Ziploc still in my net, so I don't lose it, I kind of let the bee go up and towards the light and help it towards that little hole. And once it gets its head out, it will typically get stuck or I'll bend the Ziploc so that it does get stuck in there. And it just kind of sits there easily. Sometimes it moves back and forth, but it can't really go anywhere. And so after a while, it just kind of sits there. And so while it's there, that's whenever I'm looking at it, these characteristics on its face, to determine if it is that species and then I get numerous pictures of the face and other body parts to confirm that I've actually got that bee. Once I've actually got that bee I then let it go and subsequently, I also have pollen deposited inside that bag from the from excessive amounts that were on the bee and I save that bag to actually look at the pollen later. We're going to try to do some meta DNA barcoding to see what plants it actually has been visiting. But most likely it's been visiting, obviously the plant that we caught it on. But we're interested to see if there are other things that it might be utilizing in the ecosystem.

**Amy 17:27**

Chase, I just have to tell you, I'm the queen of really dumb questions. So I'm going to follow up with Jamie's question. Where did this bee come from? You haven't seen it the past three, four years, and all of a sudden it comes up? I'm going to assume that it's a solitary insect. And where would it just have magically appeared again, to where you all were able to find this?

**Guest 17:54**

It is solitary. But I mean, based upon its closest relatives, it is a solitary bee. But just because this might be more of a story of because no one actually looked for it. It most likely was still in these locations. And in fact, because we found that many new locations, no one had actually ever just looked for it. And so it didn't necessarily disappear. We never considered it to be extinct per se. We were worried that because of the sheer impact of the Lake Wales Ridge region, there's a lot of habitat loss, a lot of agriculture, a lot of urban development, that the habitat that it's utilizing is much lower in number than it

used to be. And it's due to this as well as being adjacent to a lot of citrus crops. We were worried about some pesticide exposure, we weren't really sure what to expect. But I wouldn't say that it disappeared per se, it's more the fact that it was still out there and people just never looked for it.

**Amy 18:55**

Well, that's a great reason to not see it is when you're not looking for it. So thank you for that. It's very scientific of you. Okay, so what should someone do if they do believe that they've seen this bee?

**Guest 19:08**

Well, the first thing to do, if you see a blue bee, one, this bee is very unique, and it exhibits that head bobbing behavior. So that would be not necessarily a diagnostic characteristic of the bee but something to make note of, but to try to get a photo of it would be a really good thing. So most of the time whenever people talk about, "oh, I've seen the bee," unless you have a photo to go on, and unless you're trained in entomology to see some of these these finer cues. It can be really difficult to say "I found the bee." So even myself, personally, who has seen all - well, I've seen many of the bees in the Archbold collection and in the state collection as well as many live bees. I still like to catch them and look at them underneath the hand lens at about 30x to 60x just so I can actually confirm these, so even whenever I catch one, I'm not completely sure I have it until I actually look at it underneath that lens. But if you do find it, and you do think that you found it, it's best to take a picture of it and note the location, but you don't need to catch it. You don't need to disturb it. And knowing that information you could let us know, you can also, there might be other things that you might also not completely know what it could be. So you can check out Dr. Malling's article on other things that it could be. But that's what I would probably do is take some pictures, and note the location if you can get a picture of the flower that it was on. But realistically, this bee is, is mainly predominantly in the Lake Wales Ridge region, and only on a select number of flowers. So it's yet to be found in someone's backyard. But again, given all the things that we found in this project, and given that there haven't been surveys and a lot of these areas, we're always open to those possibilities. So, take as many pictures as you can.

**Jamie 20:59**

So Chase, this is a really interesting story about the blue calaminth that sounds like you've been telling a lot. Your oratory skills sound rehearsed. So I'm guessing since you've gotten all of these great press interviews about this that a lot of people -

**Amy 21:13**

You can't tell everyone all our secrets, Jamie.

**Jamie 21:15**

I think he sounds great. This bee sounds really interesting. So I really want to, as we kind of wind down thinking about it, I want to just take a step back. So there's, I don't know, 20,000 species of bees on the earth, I keep hearing between 4000 /4500 in North America, and somewhere around 320ish in Florida. Alright, you're so excited about one bee. And this one bee is the one that makes all the news. And it's gotten a lot of attention. So I guess my broader question to help our listeners think about this, why study endangered or presumed lost bees? Why study bees that have limited distributions? Why? Why is this important? You've talked about habitat loss. And this one bee that sounds so exciting, but in the



grand scheme of things, why is it important to look at bees that are potentially endangered or restricted habitat or things like that?

**Guest** 22:13

Well, I think ultimately, a lot of these insects and don't get me wrong, all these other insects and pollinators are, very important. And this bee is by no means, do I think, more important than any of these other bees. I think honey bees are the All Stars of the pollinator world.

**Jamie** 22:33

Whoop whoop!

**Guest** 22:33

But there are a lot of native bees too. We don't know -

**Amy** 22:36

That's what I was gonna do Jamie, I almost Whoop Whooped!

**Jamie** 22:39

Beat you! But you can keep going, Chase.

**Guest** 22:41

They definitely are. But there's definitely a role that a lot of native bees and a lot of native pollinators have. And just because we don't necessarily understand or know their importance, they still can be very important. There's a lot of things that we just don't know, but we study these to try to learn more about them. Because ultimately, I believe we as humans have impacted the world and potentially lead to some of these species not doing very well. So I believe it's our responsibility to try to understand them as much as we can, potentially before they're gone, or try to help them recuperate. Unfortunately, in this situation, this looks like this is a bee that is in more locations than what we suspected, however, it's still very rare. And sometimes it takes many hours and many days just to find one bee or find no bee. So I think it's very important to try to understand all these bees and there are definitely other bees out there, even within the same genus, that haven't been found in Florida for 50 years at time. So fortunately, this one is getting a lot of publicity for a lot of the the other lesser known bees, but the other bees are also very important.

**Jamie** 23:53

So Chase, I think that's great. I really appreciate you joining us today. Your information has been great and discussion about pollinators and their importance in general is great. And then of course, this particular bee, it's really exciting that you've rediscovered it. Do you do a little dance every time you see one?

**Guest** 24:08

Well, I really enjoy it. It's hard because I don't even know if I would use the word rediscovered at times. We definitely discovered it in many new locations but because it was never really gone for extensive

periods of time, I don't know if I would always use the word rediscover. We definitely discovered it in many, many new locations. We weren't really sure if we were going to find it at the same time we were -

**Jamie 24:31**

Is all that saying that you don't dance?

**Guest 24:37**

I definitely get very, very excited. And I've been very shocked at how fortunate we have been and again this is all this is not just a one man show by any means. We're only able to do this by numerous partnerships. In fact there are around 16 different partnerships. This is a FWC funded grant. I stay down there and build upon the research done by Archbold Biological Station, we have over 20 different volunteers in the museum that do anything from build bee nests. Because a nest of this bee has actually never even been found. And so we're trying to find some basic information about this bee that hasn't been known before, but it's definitely good. I get very excited every time I find it because it just there's there's more information to always be collected.

**Jamie 25:23**

I don't know about you, Amy, but it sounds like he dances to me. He sounds like a politician answering that question but it makes you feel more comfortable when my oldest son was really young every time he caught a catfish he would do this very specific dance that my wife and I now call the catfish dance. So there's probably a blue calamintha dance and I cannot wait to the next time I see you to request blue calamintha dance.

**Guest 25:46**

Oh that's hilarious.

**Amy 25:47**

We'll add that.

**Guest 25:48**

It would probably be like like a rock and roll head bob or something like that.

**Jamie 25:53**

The whole time you said it was head bobbing and all I could think about it was it wearing headphones playing. Oh yeah, I used to listen to when I was a wee young whippersnapper. Anyway, Chase has been great to have you on Two Bees in a Podcast.

**Guest 26:07**

Hey, thank you so much for having me. I really enjoyed talking with you all.

**Jamie 26:10**

Guys, you've been listening to Dr. Chase Kimmel. He's a postdoctoral associate for the Florida Museum of Natural History here at the University of Florida. And I just want to make a couple of statements, Amy, before we sign out of this segment. One of the things that's kind of excited me about



you know, Dr. Kimmel's research and the things that Chase has been talking about here is that you know when honey bee populations were believed to be declining starting in 2006, it is my opinion that the attention that honey bees got began to spread to the other pollinators. And I think I think a lot of this work a lot of these new wild bee or native bee pollinator research labs that are popping up around the country, for that matter around the world, often have their roots in honey bee losses. And what this has done is it's just greatly expanded the number of individuals who are looking at pollinators in general, but these specifically and they're making great discoveries, like those discoveries by Dr. Kimmel and his colleague, Dr. Jarrett Daniels here at the University of Florida, as well as so many other great bee scientists around the world. So, listeners, that's just kind of one little snippet of what's going on with one bee, the blue calamintha bee here in Florida. But there are stories like this everywhere. And it's really an exciting time to be living, if you're interested in pollination, ecology, or bee pollinator research. So thank you guys for listening to this segment of Two Bees in a Podcast.

**Amy** 27:34

Have questions or comments? Don't forget to like and follow us on Facebook, Instagram and Twitter @UFhoneybeelab.

**Jamie** 27:49

Welcome to Two Bees in a Podcast. I appreciate you joining. Amy, I've got a question for you. It's gonna be easy question. So you work in a Bee Lab at a university. I'm not gonna ask you any science-related question. I'm just gonna ask you. Do you read books about bees?

**Amy** 28:06

Yes, I read books about bees.

**Jamie** 28:08

What's your favorite book about bees that you've read?

**Amy** 28:11

I honestly I really like Honey Bee Democracy.

**Jamie** 28:14

Tom Seeley's book. A lot of people like Tom Seeley's books.

**Amy** 28:17

Is that a generic answer? Did I fail?

**Jamie** 28:19

No, that's pretty generic, most people would say something like that. I'm okay. But I'm just happy that you read bee books because in today's segment, the segment we're doing now we're going to actually be talking with an author. We're going to be talking to him as an author. We're going to have him on separately and talk to him about what he does in his day job. But we have with us Dr. Jay Evans, who is the Research Leader at the USDA ARSP Research Laboratory in Beltsville, Maryland. I've known Jay for some time, I certainly admire his work as a scientist. In fact, last week, when I was telling my

wife that we were going to have him on the podcast, I was kind of bragging about him, because he's not just a great scientist. He's a great guy. So if you ever receive emails from him, they're super polite. And he's very kind and diplomatic. Is it possible, Jay, to make you mad? Welcome to Two Bees in a Podcast. Are you always a nice guy, Jay?

**Guest 2** 29:11

Yeah, I guess I rarely do get mad. I think my family would attest to that.

**Jamie** 29:17

Your kids must be very happy about that.

**Guest 2** 29:21

There are other means to make them be less unruly, I guess.

**Jamie** 29:28

Well, Jay, like I said, I've known you for a while and admire your work as a Research Leader at the USDA. We're going to talk to you about all of that in another segment. But what I'm really interested in talking to you about now is your new book *Found in Translation*. But before we get there, I just wonder if you could tell us a little bit about yourself, your background in bees, how did you find yourself in honey bee research, how you got to where you are, and then we'll kind of launch into this new book that you have out?

**Guest 2** 29:55

Sure. Yeah, well, so as you mentioned, I'm working at the USDA ARSP Research Laboratory and have been there for 21 years starting as a research entomologist, and research leader. So it's been a long haul, my first job as they say other than mowing lawns and teaching and doing student research. So I've been here a bit and I've enjoyed it immensely. Prior to that, I was always interested in sort of biology and nature and science, like a lot of us. I ended up getting a passion for ants, and that was my gateway to bees, I suppose. So I studied ants starting as an undergraduate for a project and did that for about 10 years. So through grad school and a two year project as a postdoctoral project. And these are all ants in Colorado, as it turns out, ants without any noticeable economic or human interactions. They were fascinating to me. And I just, you know, one memory, I just realized it and someone else asked this question. Last week is my first visit to a beehive was actually in Athens, Georgia, and it was interesting to your very own mentor Dr. Keith Delaplane.

**Jamie** 31:21

This interview keeps getting better, Jay.

**Guest 2** 31:23

I know, just for that, I'm sure Keith has brought many into this group, but I was working on ants. There is a postdoc, and just to date me, but this is 1996. So a long time ago.

**Jamie** 31:41

So you weren't like you were a postdoc at UGA.

**Guest 2** 31:44

I was yes.

**Jamie** 31:45

I had absolutely no idea. 1996 is when I graduated high school, and I started working. I did my undergrad at UGA as you know, and then I started working in Keith Delaplane's lab in August of 1996. Because I worked all four years there as an undergraduate in his lab. So when did you visit his beehive in 1996?

**Guest 2** 32:07

Well, I know he was there and also down in Tifton. I think at that point. I was an itinerant postdoc, so I had a grant to keep working in Colorado, but my home base was with Dr. Ken Ross, who's a fire ant guy there. And yet, I never fell into that sway of fire ants. I kept with this other obscure ant and so I wasn't actually doing a lot of research right in Athens. It was kind of a home base. And I absorbed a lot from the genetics folks and entomology folks there. But in the midst of that one of my genetics colleagues there, he and his wife had a housemate named Elizabeth Smith and she was taking Keith's introductory beekeeping class and on a whim, I said, Hey, can I see a beehive? Then she took me down, there's an array of 12, 14 nucs or single box hives, I guess at that point and she had her assigned package that she was tracking and we opened it up looked inside and I said, wow, it was everything I looked for in these ant colonies, but it wasn't underground. So it wasn't destroying them to see the ants and it was truly beautiful. So that probably settled in and then it was two and a half years later that I actually had a chance to work with bees but it was neat and I've always loved reading older bee literature and modern as well and seeing the human connection to beekeeping and that was really my first kind of like personal inkling that it might be fun to do this myself, but I was still pretty much sure I'd be an ant biologist till I died. In the back of my mind it was churning that bees were okay, too.

**Jamie** 34:13

That's a crazy story. I had no idea you had UGA roots, which I do as well and Jeff Pettis, I don't know there's a handful of us.

**Guest 2** 34:20

I remember Al Dietze's office door on the main campus and I don't think I ever talked with him but he had just retired was about retired at that point, I believe.

**Amy** 34:38

It's always so fun to hear everyone's backgrounds and stories of how they got into bees, because it almost always seems like it was either, not a mistake, but you just see yourself falling into the honey bee world somehow or another so that's pretty neat. Okay, so instead of letting you guys talk about this all day, we'll just go ahead and jump into what we're actually here to talk about.

**Jamie** 35:04

I thought the University of Georgia was the theme.

**Amy 35:06**

I mean, it could be, we could just get all the researchers from, people who have been to UGA and get together for that. But, Jay, the way that we put our podcast together, the way that we coordinate it, we have a huge Excel file of all the people that we want to bring on to our podcast and all the people that we want to bring on to hear speak, your name was on that list. And so we were about to email you when you had actually reached out to us asking if we could talk about something called Found in Translation. And so we thought that this would be a really great podcast segment to talk about it. Because we have talked about other journals and other articles and other resources that beekeepers can have. And I think that our podcast is a really good platform to share some of these other resources that people have. So can you talk to us about what is Found in Translation?

**Guest 2 35:55**

Sure, I'd be happy to. So these are very light essays, but they're an attempt to connect beekeepers, maybe others in the beekeeping industry, to current research, as has been done, and continues to be done quite well, by many people. But I'm also hoping to prod researchers like myself, who are often in the lab, often doing long term research, to kind of reflect on their research, how it could help in an applied sense a bit more, but also to see connections with other papers. So the logistics of it is, I don't have a stockpiled set of essays, as my editor will attest. So I will look in electronic literature for what's kind of come out in the last month or so. And then try to pick a paper on a theme that seems interesting and go from there often connecting three or four other research papers together just to kind of explore a topic. It could be mites, and often is, it could be genetics, but it's also forced me to get out of my comfort zone and look at look at the plant side of things quite a bit, and honey, and propolis, other hive products and such. So yeah, it's a hodgepodge, as it were, of topics, but the main theme is to collect very recent research that seems like it's a tipping point for some direction of bee health or, or understanding or just enjoying honey bees, for their many great traits.

**Amy 37:33**

It sounds like you're doing science communication, taking that and doing exactly what it's called, translating it, for people to apply and understand. How did you come up with this idea? And how long have you been working on this?

**Guest 2 37:49**

Yeah. Oh, good question. So in 2016, I basically cold-called Kim Flottum, Dr. Kim Flottum, at Bee Culture and said, I would like to do this. And I've been thinking about it for a while, had done some kind of ad hoc essays over the years, and he was willing, so thanks to him, I was a volunteer writer for bee culture by the end of that year. And so I've been doing it about four years. And I will say this spring, actually, currently, the International Bee Research Association has kindly pulled together 34 of these essays and published them. And they're out. They are on Amazon here in the States, but also through through IBRA's site, which is based in the UK, actually. And Jamie knows them well. It's a long standing consortium of researchers and folks interested in honey bees. So and that set of essays is called Bee Optimism. And it's on translational research. So it's basically pulling together a number of these essays that have come out in Bee Culture.

**Jamie 39:05**

So Jay, I've got a couple of questions for you. First of all, I'm going to ask you who the intended audience is, but I know that you told me that you're writing these articles for Bee Culture first before they were kind of pulled together into a book. So I have a sneaky suspicion, but I'll let you tell the listeners. The second thing I want to ask is, how do you decide which articles to translate? How do you decide which ones to provide to this audience? So first, who is the audience? And second, how did you figure out which articles to use?

**Guest 2** 39:37

I certainly have an eye towards beekeepers as an audience, and this could be hobbyist beekeepers, the side liners, and then the big folks, the commercial beekeepers who keep so much of our pollination going and our testers themselves have many new ideas as they run their thousands of colonies. So on that end, yeah, the beekeepers for sure, and maybe inspectors, maybe those teaching about bees are really the intended audience. I do hope some of the researchers read it as well, not maybe to see how their work in some cases connects to others and to the challenges that bees are facing. But I have, in my sort of mind voice, the beekeepers reading these magazines.

**Amy** 40:31

Alright, Jay, so what would someone expect when they read this column? And do people have to pay for this? Or is it free.

**Guest 2** 40:39

So the column is in Bee Culture, so I guess defer to them on their policies. They do put the essays online, often, I think without charge, and they are short, they're about 1000 word essays, maybe a photo or two, no data slides, or no data graphs, no tables, and then web links to the papers themselves. And I've tried, and it's an increasing trend, I think, in science, to have papers that are open access. So they're freely available to anyone in the public, which fits with our mandate with USDA and also at universities, the idea that, we're funded by state or federal funds. And so it's always nice if we can have our work out there in the open. So a lot of them are sort of a web link away, or a Google search away to find the actual root papers of people wanting to really get into the details. And then the essays, of course, have been coming out through Bee Culture.

**Amy** 41:46

I think it's funny that you're saying that there aren't any, like graphs or anything on the articles that are sent out. Are you saying that I can't read a graph Jay?

**Guest 2** 41:56

No, not at all. I just - It's against my inner nature too, because I am infamous for power-pointing people to death with graphs and unreadable tables. So I guess I just think this has been a moment of self control, if nothing else,

**Amy** 42:16

no, I'm just kidding. I totally understand. It's actually very difficult to communicate science sometimes, especially when you're a scientist, I think, because it kind of feels like a given to you as far as what everything means. But I'm still learning about statistics. So what can I say?

**Guest 2** 42:32

I'm sure you can understand the papers as well, and it's important to see the numbers, of course, and to see the basis behind arguments and that, but I've deferred that to the authors of those papers, and to those beekeepers, who really want to delve into it, make it easy on them to find these papers.

**Jamie** 42:56

So Jay, just I'm curious, what's been your favorite subject to learn? Because I'm guessing since you're translating a lot of these for Bee Culture, you're having to scour the literature, and you're probably trying to do things that aren't necessarily things with which you are intimately familiar, things that you do in your own lab. So what's been that kind of surprise topic? What's been that one column that you're like, oh, wow, this was a really fun one to put together. This is a neat field, and if I had 50 more years, I might go into it.

**Guest 2** 43:28

That's a really good point. One branch, which is not new to you, nor to I, is in Varroa. There's been just a couple of really cool discoveries in the last couple of years. The one, I think, also followed in your research lab, in terms of feeding by Varroa and their interactions with the bee and the ways they interrupt the organs of the bee, the fat body, as it were, as they chomp away. And then also on Varroa, there's been some really intriguing work at the moment from Europe on single traits in bees that might actually turn the switch off for mites. There's some work in France on survivor bees that also had a genetic tracking component. I think both of those to me were like, wow, we've been saying this for 20 years, of course, but we're really, really close maybe to cracking the nut on how to turn mites off as they interface with bees. Then the other one and this is truly new for me has been the folks doing monitoring of bees at the hive. So bees coming in, bees coming out, behaviors within the hive and basically, very patiently, gluing these RFID tags to hundreds and hundreds of bees and as you know, and I'm not a really active bee behaviorist, but papers in that field, five years ago, were painstaking. They involved, you know, folding chairs and fans and undergrads sitting outside of hives and trying to mark, and trying to watch a pink painted bee fly out and come back. And they were wonderful studies, but they were so hard to get hundreds of data points. And now it's the realm of, gluing those on the backs, which still is tedious. But then computer science kind of compiling this massive data points and the discoveries there are immense, they're when do these give up the ghost as foragers. And when are different stresses impactful, a lot of them are later in life, maybe middle aged bees, and we were starting to get a better sense of these really important questions, I guess, of how nutrition, chemical stress, and other stresses affect the colony by kind of subtly knocking off bees as they forage, and I love reading those papers, just been really neat to picture the whole hive, kind of reporting back, like a worker reporting back of what they did today.

**Jamie** 46:10

I think that's true. Now, when I would go to meetings and see presentations, a lot of people are really beginning to talk about these RFID chip use or talking about this behavioral software out there, they'll have camera use at the hive entrance, or physically on a frame in an observation hive that really is neat. And I know, first of all, I really appreciate the fact that you're writing this column for Bee Culture, Found in Translation. And that these some of these essays are pooled for a book published by the



International Bee Research Association. And one of the things I don't think scientists tend to do so well, is, in fact, translate their work. One of the things that we're trying hard to start up here at the University of Florida is that every time we publish a refereed manuscript to develop a blog about it, that's just for beekeepers. And maybe even soon we'll start requiring whoever public lead authors of paper out of our lab to do a little five minute PowerPoint presentation or video or something that we put up forever, on YouTube, just so that we can take our research, translate it, make it, applicable or useful for the people who are out there. And that's really what you're doing for your column in Bee Culture. So I really think it's neat. I'm glad that they put it together in the book. Can you remind me the title of the book again?

**Guest 2** 47:22

Sure. It's Bee, B E E Optimism by IBRA International Bee Research Association and Northern Bee Books, which is a really neat book publishing outlet also in the UK.

**Jamie** 47:37

That's right. So Amy,

**Amy** 47:38

I think that's my favorite. That's my favorite book now.

**Jamie** 47:41

Okay. Well, good, that's good. That's an appropriate answer, Amy. So for all you listeners out there, we're gonna make sure and link all of this in the show notes, you'll be linked to Jay's column for Bee Culture, Found in Translation, you will also be linked to IBRA bookshop, where you can purchase this or for Northern Bee books or Amazon links so that you can know where this new book is. Jay, thank you so much for your work. And thank you for translating science on behalf of beekeepers. And thank you for joining us on Two Bees in a Podcast.

**Guest 2** 48:11

Thanks to both of you. And thanks, of course for the immense way that you're bringing bees to the public and bee research. It's fascinating to see these different forms of media and the impact that you're having. It's neat.

**Jamie** 48:26

Well, thanks, Jay. I really appreciate that.

**Stump The Chump** 48:34

It's everybody's favorite game show, Stump the Chump.

**Amy** 48:46

Alrighty, welcome back, everybody. It is that question and answer time. Jamie, I've got three questions for you. And I'm sure you have more than three answers.

**Jamie** 48:55

I have at least three answers, hopefully.

**Amy 48:58**

So the first question we have is from someone named Reed Sellars. Well, that's his Instagram name, I'm going to assume, but he is wondering -

**Jamie 49:07**

You're not supposed to assume. You know what they say about it?

**Amy 49:10**

What do they say about it?

**Jamie 49:11**

I can't say it because I'm Southern Baptist. I'm not allowed to say the word. You've never heard? You've never heard this? You've never heard the saying? When you assume it makes a -

**Amy 49:20**

Oh, an arse? A donkey out of you?

**Jamie 49:23**

Yeah, of you and me. That's how you spell it. It makes a blank out of you and me, but my Southern Baptist won't permit me to say some of the words. That's hilarious. All right. Let's move on before it's too late.

**Amy 49:35**

I'll let the audience fill in the blank. Okay. How do we deal with bull ants?

**Jamie 49:41**

All right, it's a great question. So ants can be a pretty significant problem in bee colonies, especially in warmer climates, like we have here in Florida and other places around the world. So instead of answering that question, what I want to do is we have a fantastic podcast a few episodes ago where we interviewed Dr. Bill Kern, who is a faculty member of the University of Florida Entomology and nematology department. He's based at Fort Lauderdale Research and Education Center. We had a whole podcast interview with Bill, as he talked about how to determine what ant species you have attacking your colonies, what they eat, and how to combat it. It is so good that I know that if I answered your question specifically, it wouldn't be as good an answer as what Bill did. So not only that, but on that particular podcast episode, we linked to a document that Bill wrote about controlling ants in apiaries. So what I'm going to do is I'm going to ask you to do just a little bit of homework, and I'm going to see if you can find that podcast. And I bet, Amy, just because you're a nice person, for this question, on our show notes, I bet you'll link that podcast and that EDIS document anyway, won't you?

**Amy 50:55**

I will. And it's kind of funny, because the title of that podcast, I think has something to do with you saying that you're an entomologist, but not an exomologist. That's a really good one.

**Jamie 51:06**

So I'm not skirting your question. What I'm really thinking is that there's a better expert to answer it than I can. And he did a great job in that podcast. And we've got a great document that he produced. And both of those will be linked in today's show notes, just so you can find it easily.

**Amy 51:22**

Yeah. And I think what's awesome about our episodes is, every time I see questions on Facebook, or I start getting questions on our honey bee email, I'm starting to see trends between some of the questions that we have. So it's nice, because I think that some of our episodes can be recycled and reused. And so we'll start sharing that when people start emailing us asking questions about certain things, which is great. All right. So the second question we have is about installing packages. So this person had just installed packages of bees into a new hive, the queen's in her cage with her sugar cork. About an hour later it looks like the bees are bearding around the outside of the cluster, and it looks like the cluster is getting bigger. It's not really hot outside. So it doesn't really make sense in that case. So what should this person do? Should they sweep them into a cardboard box? And then dump them back into the hive? Or are we just gonna start just watching them fly away and say goodbye?

**Jamie 52:15**

So that's a really good question. And maybe by the time we're answering it on the podcast, it may be too late for this individual. So we need to, for you to actually email us or text us or however you got a hold of us on the first time and let us know what you did and whether or not it worked. And I will tell you now what I would have done had I been in your shoes. First of all, what you're describing is something that is alarming. If I saw it personally, and I saw bees coming out of the hive that I just installed them into and saw them clustering on the nest entrance, I would be alarmed, I would be worried essentially that I was about to lose that package, which is essentially what you are saying as well. So there's a couple of things that can produce this. First of all, if you think about it from the bees' perspective, it's a pretty traumatic experience, to be shaken into a package, mailed to you, and even if you pick them up, it's still traumatic, then to be misted with sugar water or water and then dumped into a new hive. And so it's pretty natural for there to be just some significant confusion on behalf of that colony. So the fact that they're migrating to the nest entrance, they're starting to beard on the hybrid cluster around the face, would concern me that they are ready to leave. However, on the other hand, the fact that they are clustering, and not flying is a little bit better for me. When I see them leave, I tend to see them coming out with purpose and not necessarily just clustering on the nest entrance. What I would have probably done is I probably would have collected that cluster, put it back into the hive, and I would have probably reduced the entrance significantly using an entrance reducer a block of wood or heck, I even use just wet grass that I pull up from around the beehives, stuff that entrance and leave it open for about one or two inches, I would only reduce the entrance significantly if I had a screen bottom board so that there's plenty of ventilation that that hive can get or if the temperatures were you know, under 70 degrees so that they wouldn't have a problem thermo regulating. And then I would watch it over the next couple hours and see if they start to do that again as well. The only reason they might leave is if they have a free-running virgin queen or queen in that cluster with them and they elect to swarm with her and leave behind the queen that's in the cage. This happens quite a bit or they might leave if you've got other packages that you've installed. Because sometimes what I'll see is, I'll see this kind of collect - can't describe it any other way than calling it a collective panic where the first colony starts to swarm

and that just kind of becomes a domino effect and you start seeing other bees contributing their bees to that gigantic swarm. But, your case, it sounds like you installed one package. I think just putting the bees back into the hive, reducing the entrance, might encourage them to stay. But if you see it and it's super alarming, the second kind of radical step that I would have taken, if they have a screen bottom board would be to close the entrance all together and take them into a room that I'm keeping the air conditioner on somewhere in the 60s, just keeping them cool for 24 hours before I take them back and open the entrance and try to release them. A lot of beekeepers, what they'll do to keep their packages home is they'll mist the bees with sugar water. They'll provide a sugar water feeder to the hive at the time of installation as well. And they'll put a frame or two of brood from another hive into that hive in which they shook the package just to make sure that they have ample reason to want to stay put.

**Amy 55:48**

Of course, naturally. Yeah, I did. I'm just thinking it's so funny. I always kind of automatically assume that, what would happen if this happened to people, in humans, right? If I just got taken out of my home and was stuffed in an elevator with random people I didn't know, the first thing I'd probably want to do is get out.

**Jamie 56:06**

That'd be among the first. So let me ask you have you ever seen Happy Gilmore?

**Amy 56:13**

I haven't.

**Jamie 56:15**

Okay, well, let me just set the stage for because I think about it every time someone asked me this. Alright, so Happy Gilmore, right? He's, if I'm on the right movie, but he was a hockey player and was taking up golf. So he was really good at smacking the willies out of a hockey puck. And so he was trying to put that same energy into playing golf. And he had a terrible short game. So every time he'd putt it, he would miss, and like I remember one time he putt the ball, it rimmed the hole and came out, and he just gets you know, this is Adam Sandler. So it's slapstick comedy. So he gets on the green and says, "Are you too good for your home? Why won't you go in your home?" So every time I install a package that instantly wants to leave, I have a Happy Gilmore moment going. "Are you too good for your home?" So it's I call Happy Gilmore packages. But that's like an inside joke, but it's like only inside me. Now everybody listens to it on the podcast so it will be all of our jokes. And you know what's funny, is hopefully, it will be my goal to see Happy Gilmore packages to be such commonplace in beekeeper vernacular there will actually someday be an entry in the ABC and XYZ in Bee Culture or the Hive and Honey Bee. So help me start Happy Gilmore packages so that we can have people around the world know exactly what I'm talking about.

**Amy 57:34**

Well, now I have to go watch it. I know it's a classic, but I just haven't had time to sit down.

**Jamie 57:38**

As much as an Adam Sandler movie can be a classic.

**Amy** 57:42

They're all classics.

**Jamie** 57:43

He's the same character in every movie. It's just a slightly different category.

**Amy** 57:47

All right, let's move on to the last question. I guess we can start talking about bees again. So the last question was actually a comment that we got from someone named Shelly Thiess. And she said that she listened to a series and another bee podcast. I just realized what I had read and I just -

**Jamie** 58:12

I'm just kidding. We'll be happy to help Shelly, thank you for listening to us as well.

**Amy** 58:17

The other podcasts only covered the first year of beekeeping. So you know what would be really cool is if we did the second year beekeeping or maybe a one to three beekeeping series. But that was just her recommendation. And so that kind of brought a question to me to ask you, if someone told you you are a beginner beekeeper or an intermediate beekeeper or an advanced beekeeper, what would you consider those to be? I mean, if I said I was an advanced beekeeper, what skills or what knowledge would I have had to have to be able to say that I'm an advanced beekeeper?

**Jamie** 58:49

So that's a good question, but it's also a tricky answer. So this is my 30 year anniversary of being a beekeeper. And in my case, I've always been a hobbyist beekeeper at home. At work, we've kind of been the equivalent of sideline beekeepers because at UF and other jobs I've had, we've had somewhere between a hundred and three hundred colonies. But I've also worked with a lot of commercial beekeepers even in high school, I worked with a commercial beekeeper. So I've been in situations where we've worked hundreds or thousands of colonies, so over those years am I experienced because I've got the years? Am I experienced because I've studied bees? Am I experienced because I've worked lots of colonies? It's just a weird sliding scale. So I would argue that a beginner beekeeper is easily years one to five, you're just trying to figure out what bees do. And that's if you have one colony or 100 colonies, you're still a beginner, you're just trying to understand what they do, how to make money with them, how to keep them alive or whatever. Now this is a very loose scale. And I would argue that people don't solidly fall into these categories necessarily, but it's a good healthy way for me to think about it when I'm answering this question. I would guess somewhere around years, six to 15, you're kind of intermediate, you've started to take that next level, you might have reared your own queens or made your own splits, you might now be firmly established in your local farmer market selling honey. You may be using your bees to pollinate crops, you may be growing your business, things like that. I would argue that once you're in the 15 to 20 years range, and you have had uninterrupted beekeeping years that you're really starting to get at the experience level. Now, it's tricky, because a lot of people would just argue, having bees for 20 years is enough to make me experience. But I would argue that you also need to do continuing education through that process. So what do I

mean by that? You need to be a member of a bee club, you need to go to State Beekeepers meeting, you need to listen to our podcast. The point that I'm trying to make is you can learn a lot by just working bees. That is true. In fact, that's how I learned the most about bees is I just did it by myself for years. But to get to the next level, you have to be thinking about the newest things, of bees, the newest stressors, the newest stress management techniques, the newest ways to move bees, the newest thought about bee biology and to do that you really have to be surrounded by other beekeepers, read bee science, listen to Two Bees in a Podcast, etc. So it's a little difficult to say that if you've been in it for 20 years, and you're an expert, if you've been in it for 20 years and only work five colonies in your backyard, and that's all you've ever done, and you've never go to a be keeper meeting, I still probably consider you intermediate. And someone would argue to me, Well, I jumped straight in and by year three, I had 3000 colonies. Are you telling me I'm not an expert at that point? Yeah, I kind of am. I think you have to do something 10 or 15 years before you really know how the system works, and so that's kind of my feeling. One of the things, Shelly, that I will say that I absolutely confess it's true. One of the things that we need to do on two bees in a podcast. And Amy and I have talked about it, we'll try to figure out how to do it here in the future, is we need to include more management discussions. Oftentimes, we were very theoretical, right? We interview great guests, great scientists, we talk about their work, that's good. We'll talk about, you know, diseases and pests, but I do feel we need to sprinkle in kind of some management minutes as it were, we like today we're going to tell you how to control swarming. Tomorrow, you know, this, I will tell you how to feed bees, and it's our pledge, we'll definitely try to do that, it will try to vary the topic so that some of them will be kind of beginner focused, or some of them more intermediate focus, and some of more experienced beekeeper focus so that all of our listeners can find something that they want to hang on to in our discussion. So that's a really good question. Good suggestion.

**Amy 1:02:45**

Yeah, I think it's really interesting. So, little fun fact about me, I'm a scuba diver. And I think they're very similar things between diving and beekeeping. And just it being a hobby and also being professional in it is just the more active you are in it. And the more you surround yourself by it, that's really more of the experience part of it. I think, instead of just saying, Oh, I've been diving for 30 years, well, if you've only been diving, once every other year for 30 years, that's different than diving for five years and diving everyday for five years. So that's pretty interesting. I don't know if you've ever seen, I think Randy Oliver, and don't quote me on this, I'll have to find it after we record this podcast. He has this meme. And it's this chart. And it's this graph about beekeeping experience and knowledge. And it's like year one you don't know anything. And I think year three is like you are an expert, you could mentor anyone around you. And then you get to year four, or five and all of a sudden that just starts to decline because you start to realize that you know nothing as soon as you get more experienced because bees just do the craziest things.

**Jamie 1:03:53**

That's actually kind of the point I'm at my career when I was a postdoc or a graduate student, I knew everything about honey bees, and when people questions, I would definitely answer those. Here's your answer. If you just follow what I told you, you will be like me. But now I answer questions this way, I do questions and answers for the American Bee Journal, the classroom section. People send me emails or in talks. And the older I get the worse I get at answering questions. I don't really know that or



that's known or well, there's three possible answers to this one scenario. So what would I do and so a lot of it too, is dictated by how detailed the questioner is. Because if they just say I had a colony swarm, why did it swarm? Well, did it swarm in spring? You know, a lot of its context driven. So yeah, I agree that there's years, there's experience, there's education that I think all roll into what level you are. So I think holistically addressing bees. And you gotta pay your time. You got to work a lot of colonies. You've got to read a lot of things. And I think education and practice together equal experience.

**Amy** 1:05:15

Well, that's great. All right. Well, we are looking forward to everyone sending more questions, more comments, even if you send us a comment, we could surely find a way to turn that into a question that someone else surely has out there. So we really appreciate all the listeners out there and and hope that you all, Jamie, go ahead, tell them what to do next.

**Jamie** 1:05:34

We would love for you, if you like this podcast to go to your favorite podcast platform and like us or leave some comments. Again, Amy and I, we're not getting extra pay for doing this. We just want to help beekeepers and the more people we can get the message to, the better and we can get this to more people if more people go and provide comments and like us or share us, or rate us on your favorite podcast app and at our social media accounts. Thank you guys so much for submitting questions and for listening to Amy and myself on Two Bees in a Podcast.

**Amy** 1:06:13

Hi, everyone. Thank you so much for listening to this week's episode of Two Bees in a Podcast. We would like to give an extra special thank you to our audio engineer James Weaver, and to our podcast coordinator Jacqueline Aenlle. Without their hard work, Two Bees in a Podcast would not be possible.

**Jamie** 1:06:30

For more information and additional resources for today's episode, don't forget to visit the UF IFAS Honey Bee Research and Extension Laboratory website, Ufhoneybee.com Do you have questions you want answered on air? If so email them to honeybee@ifas.ufl.edu or message us on Twitter, Instagram, or Facebook @Ufhoneybeelab. While there, don't forget to follow us. Thank you for listening to Two Bees in a Podcast.