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SPEAKERS

Honey Bee, Jamie, Amy, Guest 2, Unknown, Guest

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. Welcome to Two Bees in a Podcast. In this episode, we will be interviewing Dr. Martin Bencsik from Nottingham Trent University. He will be here talking to us about some of his latest research on interpreting the sounds that queen honey bees make and using that information to predict when colonies will swarm. In our second segment, we'll be joined by Dr. Malcolm Sanford, a former professor here at the University of Florida. And we'll be talking about his career as an extension specialist here at the university. And of course, the podcast would not be complete without everyone's favorite segment, Stump The Chump, or questions and answers. All right, listeners we have an academic treat for you this morning. Amy and I are in our respective homes and we are recording this podcast. It's actually July 1, 2020. And back in June, just last month, a very interesting manuscript was published. It's called, "The Prediction of Swarming in Honey Bee Colonies Using Vibrational Spectra." That paper was published in Scientific Reports. I know it's important to beekeepers because a few beekeepers have shared it with me to ask me my thoughts about it. It's going to be linked in the show notes so that after you listen to today's podcast segment on this topic, you can go back and read the paper for yourself. To talk about this manuscript and the findings with us, we are joined by Dr. Martin Bencsik, who's an associate professor in the School of Science and Technology from Nottingham Trent University. That's in the UK. Dr. Bencsik, thank you so much for joining us on Two Bees in a Podcast.

Guest 02:24

Thank you for inviting me. I'm looking forward to this chat.

Amy 02:28

Me too. So Dr. Bencsik. "Ben - Chik," Is that how you say it?

Guest 02:32

That's how you say it. It's a Hungarian word; a family name. Oh, very nice. It's a very beautiful name. So can you tell us about yourself and your beekeeping journey? We love to hear everybody's story, how they got into beekeeping, and if you're not a beekeeper, how you got into beekeeping research, so we'd love to hear about you and your journey. Sure, so both my mum and dad are Hungarian. Beekeeping is a big thing in Hungary, and also in Yugoslavia, further down the south in Europe. So my dad started beekeeping in his 40s and I was a very young child, and I was surrounded by bees being a little boy, and very much hated it. My dad took me to the apiary, I helped him do some of the beekeeping. Bees always buzzing around me, it was really annoying to me. I got stung on numerous occasions and as a start of an encounter with honey bees, it was very unpleasant, but he gave me the opportunity to spin the honey. And he promised me the income of selling the honey if I did so. So for my own pocket money, I started spinning the honey every summer. And yes, indeed, any jar that I sold, he let me have the income for my own pocket. So actually, that was quite lucrative. I could buy my lemonade, the odd new tire for my bicycle when needed. And people loved the honey and it was very satisfying. That's part of the beekeeping, so I kept going with this until probably being a teenager, and then I had to stop. I studied at the university, I did my military service, etc. and then settled down in the United Kingdom, where I became an academic. I was still not particularly interested in beekeeping and bees or insects, but we then had a boy, my wife and I, my wife is British, we married in England. [After] we had our boy, one morning for breakfast, we were sitting in our kitchen with a window onto the garden and there was a cobweb outside on the corner of the window. The three of us were having breakfast and I walked out into the garden, I carefully picked up an ant and I deposited it onto the cobweb. My son, he was two years old, and he became absolutely transfixed at witnessing the spider detecting the presence of the ant by the vibrations that were taking place in the cobweb. Then the spider made a beeline to the ant and wrapped it around with silk and stored it, and it was a fascinating phenomenon for him to witness in the first time. Following this, it was impossible to go out on a walk with my son without him stopping at every spider cobweb that he saw, making sure he picked up an ant, and making sure he fed carefully every single ant we encountered on our walks. So because of that he actually became very, very interested in spiders and insects, and he would pick up any insect and any spider that we had on our walks. Because of that, and because he was little, I had to hold a spider in my hand on numerous occasions with him. And obviously, I was a grown-up man next to my two year old boy, and there was no way I would escape that thing which wasn't particularly attractive to me to have a spider in my hands. But I soon did it to help him; to help his passion, and I soon realized that there was no problem at all holding a spider in my hands. In fact, quite the opposite. I very soon enjoyed it. I was amazed at the beauty of a spider, witnessing her or him in my hand crawling around me, and I soon forgot any particular feeling of being put off that I used to have as a child of having an insect crawling on me. So that started with the spiders when my boy was two years old and it moved on to into the insect world, and I now enjoy nothing more than to have honeybees crawling on my hands. I just put my hand in front of my honey beehive, and they all start landing on it and crawling on it, and it's an amazing pleasure and privilege to have an insect crawling on my hands. Now, whilst when I was a boy, it's something that really would put me off. So this is the start of my relationship with honey bees and the continuation of it, and now it's a real pleasure to witness them, to monitor them closely, to watch them, and to have them on my hands. It's an absolute pleasure. I love it now.

Jamie 07:50

I think that journey is really interesting from selling honey for lemonade money when you were a boy all the way up to holding spiders as an adult to try to impress your son but also learn with your son. I think we all have similarly interesting journeys into the bee world. You've now found yourself as a faculty member at Nottingham Trent University, you do research with bees. When I was looking up some of your resume, I noticed that your research is not necessarily originally with entomology, you've got a lot of sound vibratory work, which ultimately paired significantly with what we're actually going to talk to you about today. You guys just published this interesting manuscript *The Prediction of Swarming in Honey Bee Colonies Using Vibrational Spectra*, and the thing that's interesting to me is this manuscript really does two things. Number one, it introduces us to the topic of queens and their ability to communicate using sounds, and then secondarily, it teaches us about swarming and how to predict it. So I really want the rest of our interviewer to kind of focus on those two aspects. So to kick this off, before we get to the swarming process and talk about what all of that means and how to predict it, I want you to talk a little bit if you will, about what is a quack or a toot. You talk about that in the manuscript. The terms that I'm familiar with queens is I'm familiar with piping, I've seen queens pipe many times, they'll, as you note in your manuscript, they press their thorax to the wax and they make that [piping noise] which is nearly perfect, there's queens everywhere responding to me right now, but nevertheless, there's these other terms. I've even heard Tom Seeley and others talk about these quacks, these toots. So what is piping? What is quacking? What is tooting? When is each done?

Amy 09:47

Do honey bees toot?

Jamie 09:49

Not in the sense that you're asking.

Amy 09:51

Okay.

Guest 09:53

Oh, that's a very good question. We are actually presently trying to find a generic definition for what a pipe might be. So beekeepers and scientists have been using the word pipe for a long time, and when you start listening to bees and listening to the vibrations they make, you often will realize that they are incredibly short pulses, typically a 10th of a second, typically the time it takes for you to click your fingers. This is the kind of pulse honey bees and other insects most often deliver. However, in the case of honey bees, there can be instances of a longer pulse, perhaps half a second, perhaps one second long pulse. Or perhaps in the case of the queen, many seconds, six to 15 to 20 seconds long vibration. And then I would say that this is what scientists and beekeeping start referring to as being a pipe. So a pipe is what you would hear as a sound, but it's actually a vibration produced by a bee, which is more than a snappy 10th of a second pulse, it's usually half a second to a second. So it goes [ooo] something like this, a tone, for half a second to a second, that is a pipe. That's what we understand under the terminology "pipe." Now there are worker pipes, so a worker bee can do a toot sound, but the most spectacular pipes come from the queen, and the queen can pipe for many, many seconds. And

there are two different types of pipes that the queen can deliver. Tooting is one of the two pipes, and the quacking is the second of the two pipes that the queen can deliver. Have I answered your question?

Jamie 11:51

Absolutely. I think that's key to think about it. So a pipe is the general term for the vibratory noise that queens can make, and there are two types: the quack and the toot. So when do queens use them? How do they use them?

Guest 12:05

So most often, the toots and the quacks are heard immediately after the primary swarm. The primary swarm is your old queen, the queen that was fertile for the last year, she leaves your colony with half your bees. Most often this is a silent phenomenon. There are no queen pipes associated with this phenomenon, except very, very occasionally. So we can come back to that later on in this chat. But when your old queen leaves, this is called the primary swarm and this is usually a silent phenomenon not associated with any queen pipes whatsoever. Then you have a few days of silence in the colony, perhaps six to seven days of silence, followed by the clear appearance of queen pipes coming from virgin queens that have either emerged from their queen cells, or they may be still locked inside their queen cells. The first virgin queen that emerges, we call these virgin queens, the gynes, G-Y-N-E. The first one to emerge is tooting she goes, "oh oh oh", this is a tooting, and it comes from a free-roaming, free-running gyne queen, virgin queen in your colony. Each time you hear this tooting, if you have other queens in your colony, they will respond by the quacking and the quacking goes quack, quack, quack, sometimes for up to 20 seconds you will hear this response. When you witness this and when you hear it, you will be convinced that it's a tooting that stimulates a quack as a response. Why? Because you get silence, then you get a toot toot toot toot after the silence, and immediately after the toot you get the quack, the quacking, and then the silence for a minute, and then another toot and responded by quack. So there is definitely a human perception that it screams communicating amongst each other. And there is definitely the perception that a tooting is a challenging call which is responded by the quacking.

Jamie 14:40

Let me ask quickly, Martin, I know Amy's got a question she wants to ask you, but this brings up a lot of questions that I'm intrigued by as a scientist.

Amy 14:46

I have so many questions.

Jamie 14:48

Is a quack a toot that's heard from inside of a cell? I mean, are they truly different sounds, or are you just hearing a toot from a queen that's completely enclosed in a wax cell? It'd be like asking, if I'm in the room with my wife, and we're talking that's one sound, but if I'm in this room and close the door, and now I'm talking to her through a closed door, she might be hearing a different sound. So, but are quacks and toots, absolutely different? Differences in frequency, differences in length of time and pattern and all that as well?

Guest 15:25

What a fantastic question, they are definitely different signals. In particular, the tooting is always a first long burst of three to four seconds of a continuous tone. [Oooooooooo] It starts with this, the quacking is never starting with this long pulse, the quack just goes quack, quack, quack.

Jamie 15:51

Fascinating.

Guest 15:52

So there is absolutely no doubt that they are different signals. Absolutely no doubt. And the most dominant difference is this long initial tone, which is taking place only in the tooting.

Amy 16:09

Wow, that's amazing. It's just incredible. And I just want to know how long it's taken you to practice that toot.

Jamie 16:20

I don't know who said it better, his or mine I feel like we should have a toot off at the colony. He can do it. I can do it. We can see if the queens respond.

Amy 16:30

Well, I was about to say I must not be in the industry long enough, because I don't have a sound that I'm able to make like you guys can but I'll definitely practice.

Guest 16:38

If you're being impressed by how long I practice, you will be most impressed by how many hours I have listened to these.

Amy 16:48

Well, on that note, yeah. Can you tell us a little bit about how you guys conducted the experiment? I mean, I know that there's probably a lot that went into it. But just generally speaking for our audience, how did you guys go through this experiment to show this.

Guest 17:03

So what is unique to our measurement is that we are doing continuous recordings for colonies with no interruption. So we have written software on a simple computer, which allows us to record the vibrations continuously every second of the day, every day of the year, for several years. So we have continuous acoustic log, a vibrational log, of colonies and of multiple colonies. So we have a complete overview of the occurrences of tooting and quacking in multiple colonies during the swarming season before and after. So we are the only group in the world to have exhaustive recordings every second of the day, every day of the year, of these vibrational signals in multiple colonies. And from that, we ended up being in a very strong position to draw conclusions about the instances of the signals, when do they take place under which circumstances? And how do they lock in the timings of the swarming, the primary swarm, the secondary, the tertiary, and so on and so forth?

Amy 18:21

What sort of equipment do you guys use to examine this?

Guest 18:26

So we assemble it, I am fortunate to come from a background that allows me to assemble equipment. I am actually a physicist, I'm not a beekeeper. I am not a honey bee scientist, I am not a biologist, but I can knock up equipment. This is what I've been trained to do, and we assemble the equipment ourselves. We purchase the vibration sensor separately from the amplifiers from the computer, we write software. So we assemble it all together. But forgive me, I've forgotten your question. What did you ask?

Amy 18:59

How you guys conducted the experiment? Oh, and what tools you guys used?

Guest 19:04

Okay, so we use a vibration sensor, which is in the colony. This is called an accelerometer, I'm sorry for the long word. It's a little cube, which has no exposed surface, so you can plunge it into the honeycomb and it won't deteriorate the performance of the sensor. There's a little cable that comes out of your hive, it goes to a sound card of a computer to log the vibrations, and then the computer records it, and we record it, record it, record it. and then we write software to examine the instances of the tooting and the quacking and lots of other signals coming from honey bees. So in a nutshell, that's how the method is.

Jamie 19:52

So that's a really great story. In fact, I think it's probably your background in physics and other other things like that, that allowed you to make these novel contributions. Oftentimes, in the bee world, we kind of think about it from the bee perspective, because that's all we've seen and done, but it helps to have people who are not bee scientists to help unravel some of the mysteries of bees, I believe. So I want to read a quote from the manuscript that you guys wrote, because I think it's appropriate as we transition from talking about quacking and tooting to talking about predicting swarms, and you say in the introduction of the manuscript, usually the primary swarm, that's the one that leaves with the old queen. Usually, the primary swarm is not preceded by piping, you've already stated that, but nevertheless, we've also endeavored in this study to carefully examine the pipes logged within our continuous operational datasets, which you just mentioned, as it seems to strongly support the theory that tooting and quacking are produced to inform the worker bees about the need to release or keep captive unemerged virgin queen. So for our listeners, that simply means that once the primary swarm has left with the old queen, and she's taken, you know, 30 to 70% of the workers, the first virgin queen to emerge will go around tooting, the other virgins and their cells will quack, the workers will keep those virgins in those cells until that next swarm is issued, and that first virgin to emerge, when she leaves with that next swarm, there's the absence of tooting, therefore, the workers can allow the next quacking queens to emerge as it were. So that's very fascinating. So let's transition then to how this brings some applied. You say in your study, you make the claim, that you can predict swarming with over 90% accuracy, just by listening for these specific sounds? Can you talk about that a little bit?

Guest 21:42

Yes. So in my job, the way this works in the UK, in the USA, and in most other countries is that we have an idea, we want to demonstrate it, and we seek for funding, to allow us to run the study and do a professional job in demonstrating something. So this is how my profession works. I had the idea to predict the swarming, and I knocked up a project to convince a funding body that we would prove that, then we secured the funding, and then we run the study. So in this process, I wrote entirely the project on the prediction of the primary swarm, the one which we know is most often silent. So the primary swarm again is your first old queen, it's the first swarm, you get in the spring, and it's the loss of your old queen, the one that was fertile. So it is a topic that is very exciting to beekeepers, and to the industry, because it would be amazing to alleviate the need to inspect every colony to prevent that phenomenon. So we did get the funding on that basis. So it was the main thrust of the project. And we developed the methodology, we developed the study, specifically, to demonstrate our ability to pick up the preparation of the colony for the primary swarm. This was the big question. Then it took us many years to finalize the study and submit it. And when submitting it, I realized that there was a beautiful, unexpected add on to our project. It was this spectacular collection of tooting and quacking that we also acquired unintentionally, and a beekeeper in England flagged up to me the possibility of drawing conclusions on the function of the tooting and quacking. So we crammed it into the same scientific publication, and I'm delighted with it, and I'm very proud of it, but it's actually an unexpected add-on to a study for which we got funding, which was entirely dedicated for the prediction of the primary swarm, the one that has no tooting or cracking associated with. And so Jamie, I have forgotten the question you were asking me?

Jamie 24:14

Yeah, it's not a problem at all. Basically, I was asking you, you make the claim that you can predict swarming with over 90% accuracy. So could you talk about how you discovered that part?

Guest 24:29

Okay, so we endeavored at making sure that we had the vibrational logs of multiple colonies before the primary swarm, during the primary swarm, and after the primary swarm. This was, the main idea was to use these and then inspect them afterwards to see whether we could collect a signature that takes place in the vibrations in the colonies. A signature that would be an indicator of the colony preparing for the primary swarm. And this is what we call a phenomenological study. So we have been seeking for a phenomenon. The phenomenon is the following: is there a signature in the vibrational signals originating from the colony? Is there a signature revealing the preparation for the primary swarm? And so the paper is describing all our efforts to extract this signature, and we did it when we use the vibration that's just been measured for three minutes, and we do it also for a vibration that is taking into account the history of the vibration leading to where you are in the colony. So perhaps I could expand a little bit on this, if you like, I don't know where you want me to take this?

Jamie 25:55

No, absolutely. I think this is fascinating. I think beekeepers would benefit tremendously knowing that there's vibratory signaling prior to the swarm that you could use to actually predict when swarms will happen.

Guest 26:07

Okay, fantastic. So the idea has been raised many, many years ago, in fact, as long ago as in the book by Aristotle, so I think it's 300 years before Christ, the idea that honey bee's sounds changes before the primary swarm has been suggested by Aristotle, believe it or not. And then it's been looked into by scientists. We are not the first ones to look into this idea. So what our study, however, is pioneering, is this extensive continuous recording, of the vibrations and the sounds taking place in a colony. So we found that the vibrations that you get, and the sounds and vibration that you get in a colony can indicate the preparation for the swarming, but there is a big problem in the sounds and vibration in the colony. The big problem is the lack of specificity. I like to compare this with the blood pressure measurement in people. When I was a young boy, if the doctor was worried about your blood pressure, he would measure it at the clinic, and then he would draw conclusions about your blood pressure. This is completely not the case anymore. No doctor trusts a single measurement of your blood pressure anymore. Why? Because your blood pressure will vary enormously across the day. If you have too much coffee or alcohol or not enough of it, your blood pressure will go up and down accordingly, or if you have had a very stressful day or exciting day, and so on and so forth. So a single point measurement of your blood pressure is a very, very poor indicator of your blood pressure. If you want to know well, whether you have a condition or not, you need multiple measurements at different times of the day, perhaps across several days. So we found the same with the vibrational measurements, we found that sounds and vibrations in a colony vary enormously across the day across several days. And if it does reveal a preparation for swarming, it is not the case for a single measurement. So one of the things we claim in the paper and we demonstrate it means that you can't really draw conclusions from a single measurement. If you go to your bees, put your ear against them and listen to them, you will hear something that is a poor indicator of poor specificity to what they're doing. So that was the first part of the data. Sorry, did I interrupt?

Amy 28:57

No, no, I was just going to say, I'm thinking about everything you're telling me right now. I guess your normal beekeeper wouldn't be available to just listen or feel the vibrations or listen to the sounds, every day constantly. All day. Right. So I guess I'm trying to figure out how, what recommendations would you have for beekeepers as far as trying to know when a swarm is about to happen or prevent swarms from happening; that's really what we're doing most of the time when we're managing bees.

Guest 29:29

Yeah. So, my first one of the first conclusions of the paper is perhaps a little negative, if you like, you were saying Aristotle was wrong, or if he wasn't wrong, then he was over ambitious with his statement. We think we have evidence that an instantaneous measurement of your bees, if you listen to the vibrations, all the sounds, we think it's a poor indicator of their preparation for swarming, even though it's true that the sound changes prior to the swarm, it's not going to be of much use. So what we're saying however, just like for the blood pressure, is that if you look at the history of the measurement of the sounds, for a few days before the swarm, then there seems to be a signature that is far more specific to the preparation for swarm. So provided you have a little memory device, a device capable of storing the history of a few days of vibrations and sounds in your colony, then we seem to be in a very strong position, 90% or so accuracy, to sense the preparation of the colony for swarming. So if you want to convey this to the beekeeper, I guess what we're saying is that don't trust a single instance of

you listening to your bees. Don't trust that it's an indicator of anything specific that they're doing, because the sound and vibrations that a colony makes varies enormously across the day.

Jamie 31:00

One of the things that you said in your paper to that I want to highlight is, you mentioned the phrase "precision apiculture." Now, I work at a university that does a lot of agriculture research and in other fields of agriculture, they talk about precision agriculture all the time. But I've never heard the term precision apiculture and we talk about sensing when a colony can swarm, etc. What do you mean by precision apiculture?

Guest 31:30

It means that the decisions that are taken by the beekeeper are assisted by measurements that man can't possibly undertake. So we suggest the idea that if a beekeeper in addition to his or her skills, in addition to that, if they use devices, to provide measurements, for example, with a memory of the history of the vibrations and sounds, etc, then you can improve the decision taking, you can make more accurate estimates of what's taking place in your colony because you are assisted by measurements you can't possibly undertake manually. So I think this is what is understood. And that is expression of precision apiculture. It's apiculture that is being assisted by modern equipment, providing the beekeeper with refined measurements of the activity of the colony that they can't possibly get by visual inspections or by listening.

Jamie 32:35

Martin, I really love that idea. One of the things that I think is I feel like our industry has been relatively slow to embrace technology. When there's other commodities out there, where there's combines and tractors that are driving themselves based on GPS monitoring, and things like that yet, we still pick up these boxes and lug them around the country for pollination, we still have to inspect thousands of colonies thoroughly to know what's going on. You make another statement that I'll use to conclude. You mentioned in the introduction of the manuscript with respect to the swarming process, if a system were in place that could identify colonies' intent to swarm, a beekeeper would benefit from being alerted to those hives preparing to swarm and would prioritize the appropriate swarm management procedures to those hives, reducing the need and burden for every colony to be regularly inspected, often unnecessarily. Here, you're proposing to use sound to predict swarming. We know a lot of people are beginning to do work with temperature and CO2 and weight. I feel like there's so much opportunity for research in this area. That's why I really applaud the work that you guys published on this, just listening to the bees interpreting these quacks and toots and using this information to make predictions about when colonies will swarm. It's really fascinating. So thank you so much for joining us on this podcast and explaining to our listeners.

Guest 32:47

My pleasure, can I add the last sentence? So I'm so glad you picked up that sentence because it took me a long time to appreciate the real help to the beekeeper, and not only did it take me a long time to appreciate it, but now that I use it for my own beekeeping practice, I can tell that it is the case. So unexpectedly, this precision apiculture business, I believe, is really helpful to the beekeeper, unexpectedly by alleviating the need to inspect those colonies that you know will not swarm. So when I

started this work, I thought wow, it would be great for the beekeeper to know which colony is going to swarm because he's going to manage that swarming and he's going to intervene and help it. Now I've completely changed my mind. This is not the beauty of this work in my opinion. And I have benefited from it myself as I said because I do it myself. The big amazing advantage is that I am less stressed. I am far less stressed because those colonies I know who will not swarm, I leave them alone to do their honey, to do their business. And that is an amazing drop of my own personal stress.

Jamie 35:16

So I want to ask one question that I don't have scripted but do you think similar technology can be used to predict Varroa loads or small hive beetle populations or nutrition, stress, etc, in colonies? I know you look specifically at swarming, but there's these other management things we have to go into colonies to address. Do you think this the same technology can be used to predict those?

Guest 35:41

Keep an eye on our publication. I think it's coming out next year. We have an amazing discovery with the Varroa so you mentioned the Varroa infestation levels. This is something we've looked into. You will find one scientific paper by Condor on the detection of Varroa infestation level with acoustics. Unfortunately, the paper is not very convincing because they only have two colonies, one with Varroa, one without. They show that the two sounds are different. It's not convincing that the difference is due to the Varroa infestation level. But I have a PhD student who has dedicated herself for the last two years on their on the effect of Varroa on our measurement and we have some some amazing news. Keep an eye on this. I am very much hoping...

Jamie 36:32

Well, you know Martin, we've there's a scientist here in the US who's also been working on sounds and vibrations for some years and he's made similar predictions about Varroa and beetles, and even potentially the subspecies of bee that we're dealing with, whether it's European descent or African descent. So, to make a long story short, I have no reservations at all believing that this precision apiculture using technologies like this are going to go a long way to helping beekeepers in the future. I think it's great that scientists like you - I look at your specific manuscript. It's got a large author team. So there's a lot of individuals involved, no doubt students and colleagues, etc. So I'm happy to see that people are heading in this direction. For our beekeeper listeners, you just need to know that these technologies are coming that may not be here today, but they're coming and hey should make your beekeeping it easier. Martin, thank you so much for joining us on Two Bees in a Podcast.

Guest 37:28

Thank you, Jamie. Thank you, Amy.

Jamie 37:30

So folks, you've been listening to Dr. Martin Bencsik, the Associate Professor at the School of Science and Technology at Nottingham Trent University. Again, in our show notes, you'll be able to see a link to the paper that thoroughly covers all the topics that we've discussed with Martin in this interview. Thank you so much for listening to Two Bees in a Podcast.

Honey Bee 37:52

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

Jamie 38:04

So, Amy, I've got a trivia question for you.

Amy 38:08

I'm not good at trivia. What is it?

Jamie 38:10

It's really simple. You know how long I've been working at the University of Florida?

Amy 38:15

Let's see, you started in 2006, and it's 2020. That would probably be 14 years. Did I do the math right?

Jamie 38:25

For the benefit of the listener, it's June 2020. And August 6, 2020 is my 14 year anniversary, which is hard to believe it's been 14 years, but it has been. And the reason Amy, I'm asking you that because before there was Jamie at the University of Florida, I had a predecessor who blazed a trail with honey bee extension as well, and it is my pleasure to be introducing him, and you and I interviewing him, on today's Two Bees in a Podcast. That individual is Dr. Malcolm Sanford. He is a professor emeritus in the entomology and nematology department here at the University of Florida. Malcolm, welcome to Two Bees in a Podcast.

Guest 2 39:02

Well, thank you so much. I appreciate the invitation. And I'm glad to be the predecessor of you. Now you're the guy that does all the stuff.

Jamie 39:13

I guess if you're my predecessor does that make you my ancestor? Are you my academic ancestor?

Guest 2 39:23

Just on ancestry.com. But I didn't see you there.

Jamie 39:25

We're probably not related. But academically we are at least so Malcolm, you had the job here at the University of Florida before me, we're gonna get into a lot of that. But before we get there, could you kind of briefly tell us your story, how did you arrive at University of Florida in the first place? How did you get involved with bees? What steps brought you here?

Guest 2 39:43

Okay, well, I've got kind of a long history of sorts. I was in the Peace Corps back in the 60s. And then back in 1966. I got out of the Peace Corps and I went to the American Institute for Foreign Trade at that

time, an international business organization and then it was 1968 and I was potentially draftable at that time for the Vietnam conflict. And so I went down to Phoenix, Arizona, where I lived at the time. I went downtown and I joined the Navy. I joined the aviation part of the Navy, I thought, well, I got to do something so and I had a friend who was a Marine, and he was in the Marine aviation. So I went down there and joined the Navy. I went through Officer Training School, then I went a little bit of time as pilot training over Pensacola. I didn't like that. It didn't really, I wasn't really a flyer much.

Jamie 40:42

But before you go any further you can fly an airplane. I mean, this is new.

Amy 40:46

Maybe that is why he didn't continue because.

Jamie 40:49

Well, he is talking to us, so he didn't crash an airplane.

Guest 2 40:55

Well, no, I can't, I quit before I became a pilot.

Jamie 41:00

Oh, okay.

Guest 2 41:03

You know, it was just too much of a was too much of an investment of my time. Because I would have had that two years of training and flight school then I would have been have have spent five years of being in the fleet for piloting, that would have been 10 years out of my life. I just couldn't do it. So I quit. I was in the aviation branch of the Navy. That's the brown shoe Navy. And so I was sent to California, basically I was a desk guy, a desk jockey. I was an administrative officer. And for that in 1969, we went to Vietnam on the USS Ticonderoga, and CVA 14 at the time, and we were stationed off the Yankee station, we bombed North Vietnam for six months. When I came back home, that was the last deployment of that ship. And then when I started to come home, the war started to wind down. And so I got back kind of at the right time when I got out just after the war was over. So then what was I going to do? Well, I went home, my folks were in Georgia. So I went to the University. I didn't go to University of Georgia at that time. And I went home. And I worked around looking for things. And finally I went to the University of Georgia.

Jamie 42:28

Yes, you did go Dogs. It all comes back to the University of Georgia.

Guest 2 42:34

We in the hedges, baby.

Jamie 42:37

Just thought I'd say that. Thank you.

Guest 2 42:40

Oh, yeah, I forgot. Yeah. You know, problematic because I'm not much of a gator fan. Frank, I'm not sure much of a foot. But let me tell you my football history.

Jamie 42:54

You a retired quarterback for the University of Georgia, I also learned how to fly airplanes; what else are you gonna pull out of your hat.

Guest 2 42:59

All right, I'll tell you about as we go along here. So anyway, so I went to University of Georgia, because I was involved in Latin America, in the Peace Corps, and I speak Spanish and I liked Latin American I visited down there and all the rest of it. I studied geography, Latin American Geography at the University of Georgia. And while in my situation, I was going to have to develop a thesis, a kind of concept for what I was going to do, what kind of geography can you do? And so I got this idea. My father was a fisherman way back when. I got this idea that I could go down to Latin America, I could study the fishing industry. So I proposed that topic to my boss at the time. And he says, Okay, fine, and I actually got a grant ready from the US Steel Corporation to go down to Yucatan Peninsula, and study fishing, the fishing techniques. And before I did that, I took a course in beekeeping from Dr. at that time... Was it Georgia? Was it Al Deets? Yes, that's exactly right. Thank you. You're very welcome. I'm liable to have some senior moments.

Jamie 44:24

But it's okay. I am liable to have some junior.

Guest 2 44:27

Anyway, yeah Al. And so then I took from Al Deets the geography I mean, the beekeeping thing. And then I went down and my young wife and I at the time we drove down to Yucatan, from Gainesville. I mean, from Athens, Georgia. Gosh, yeah, right. And so when I got down there, though, and before I found out that, really there wasn't much data about fishing, I didn't have any in with the fishing industry. I knew nothing about what was going on. There was no real industry anyway, it was just a bunch of guys, fishing with nets and so on and individual basis. But when I got to Yucatan, what did I find?

Amy 45:10

Let me guess, bees.

Guest 2 45:11

Bees! That's right at that time the Yucatan Peninsula was the largest beekeepers, largest honey production unit in the world. And most of that honey was going to New York City, and was being purchased by a guy by the name of Harvey Wilson company. And so in Yucatan at that time, there were cooperatives, there was people doing all kinds of things with bees and all that. And so I switched from fishing, I switched to bees. And so I had a good time down there, I spent a lot of time and I talked to people and I wrote a thesis on that. And then I came back. And then I went and tried to do something else otherwise still, I'm still interested in academics and I'm all of a sudden I'm interested in bees. Like I

got bee fever. I guess you... Why do you say that so surprised. I mean, bees are very addictive. That's what's funny. The whole irony in the story is that you meant to go get hooked by fish, but you got hooked by bees. That's right. And beekeeping is something that comes on people. It's kind of like the COVID virus, it's out there. We'll catch it at any moment. And so then I said, Okay, well, hey, I can go to entomology. So I went over there and I got a job. Al Deets gave me a job in the lab to raise queens and do all kinds of great stuff with bees, and so on. And I spent, you know, a couple three years there. And then he, just as I graduated, he left on a sabbatical. And I became the extended professor of agriculture at the University of Georgia for a short time, before I was hired at The Ohio State University as extension specialist in beekeeping at that time, in 1978, if it was yet '78. And the guy that hired me was Walter Rothenbueller.

Jamie 47:09

Wow, that's really neat.

Guest 2 47:10

Yeah, Amy probably doesn't know who Walter Rothenbueller is. But if you look at my stuff, you'll see what he was, he was the guy for beekeeping research in terms of breeding honey bees, and so on, he was the guy. And so I was really proud to be an extension guy under him for a while. And then all of a sudden, a job came up at the University of Florida. I applied to that, and I was all of a sudden hired at the University of Florida.

Jamie 47:44

Malcolm, what that was... What year was that?

Amy 47:47

Yep, what year was that?

Guest 2 47:48

'81.

Jamie 47:49

Hey, so Malcolm, we're about to get into your career here at the University of Florida. That's what the rest of our questions are about before I get there, with your varied background, and the fact that you're retired now, I'm just curious if you could briefly list what some of your hobbies are. What do you do now, when you're not working with bees?

Guest 2 48:09

Oh, well, I'm one I guess what I have as an actor. So, of course, anybody and you are one too, anybody that's involved in the extension teaching, or academics. You got to become an actor. I mean, that's the way it is.

Amy 48:27

We're all actors. This is our fake personalities or radio.

Jamie 48:31

We're much nicer in real life. Oh, yeah.

Guest 2 48:35

So that's part of what I am beyond. But I'm really a writer. And the most thing I'm most proud about in terms of writing are my two books. I've got two books that I've written. One is, is the Storey's Guide to Keeping Honey Bees, which is really a good seller, and I'm very lucky to be involved with a publication outfit that is not involved in bees. And that means that they have an incredible reach for selling this particular information because they're not involved with bees. They're involved in everybody else. So I'm very happy to be there. And then in 2006, I wrote a book called Beekeeping Without Borders. And that book, published in the UK at the moment, northern bee books is a history of my two sabbaticals during my career at the University of Florida.

Jamie 49:36

Malcolm, we'll make a point to link both of those books in our show notes on our website for Two Bees in a Podcast so that our listeners can find them.

Guest 2 49:43

Wonderful. Okay. In 1989 I was in Italy, and in 1997 I was in France for six months.

Amy 49:52

Awesome. So you're an actor, you like to write, and that is a lot of what we do in extension sometimes. And just communicating through writing, through acting, when you're teaching in front of an audience on a stage. And so my question to you is, what were your primary extension focus when you were at the honey bee lab? Were you familiar with extension before that? Or were you kind of just learning along the way?

Guest 2 50:22

Yeah, I learned along the way, I was never a researcher. I was always an actor. So when I became an academic, I became an extension specialist. And so I'm not a researcher, I don't have any research focus. I'm the guy who goes out and tries to find people doing research, and tell the public what the hell they're doing, I'm a translator in a way. I'm a translator too because I speak Spanish and English, and so I translate between Spanish and English, just like I translate if you talk to people, between bees and the other world.

Amy 51:06

So at the time that you were in extension, you were hired on as 100% extension.

Guest 2 51:12

At that time, probably the last guy to be hired at that rate, I don't know. But after I was there for a while, again, became obvious that 100% extension doesn't exist anymore.

Amy 51:24

Yeah, well, I'm 100%. Extension, well, then it does exist.

Jamie 51:29

He's talking about the faculty.

Amy 51:31

That's true. That's true.

Jamie 51:33

You're right, most, I'm trying to think about this, I'm actually 70% extension, that's probably the largest extension appointment of any faculty members. I know, most faculty members are 50% or below, and in fact, probably most have zero to no extension appointments.

Amy 51:48

So now I have a new goal for you, Malcolm, how many beekeepers were in the area? How many beekeepers were you working with when you were an extension?

Guest 2 51:59

Well, that's a good question. Not only was I an extension guy, but I was involved in international stuff. So yes, I was Florida extension specialist. But I was also; the thing I'm really kind of proud about is, I was the guy who was the international representative for beekeeping extension in the United States for the whole career that I was existed in, which means I went around the world to talk to people about bees in their own language and all the rest of it, in a lot of different areas. That was my focus, that would have been my focus at that time. And there was no UF honey bee lab, of course, there was only me, there was no money. That's the other aspect of it. Jamie came and he got all the money.

Jamie 52:53

Well, you're actually raising an interesting point. I was hired 2006, which is when, quote, colony collapse disorder was first discovered. But you mentioned being in there in '81. And there were a couple of decades scattered through there where bee research, bee extension, etc, was kind of dwindling. In fact, I was told at the time that it was possible that UF position might be the last true bee scientist position that comes around and of course CCD happened and everybody and their brother's opening a bee program at universities all around the world. But you're right, during your time, there was less funding for bees, less emphasis on bees which is odd given that you were hired in '81. But '87 was when Varroa was found in the US, right? So you had a really big thing happen. While you were serving on the faculty at the University of Florida.

Guest 2 53:46

I had three big things happen.

Jamie 53:48

All right. What where they?

Guest 2 53:49

The first one was the arrival of the tracheal mite in 1984. Then the arrival of the Varroa mite in 1987, then the arrival of the small hive beetle in 1996.

Amy 54:03

But did you introduce all these things Malcolm from your travels? I feel like there's...

Guest 2 54:09

I went through three real critical kinds of developments during my career at the University, and they were informed by those particular things. And then what happened, of course to the industry before I came when I started as a extension guy, the primary industries in Florida were making honey, of creating honey and selling it and creating bees and queens, rearing queens and package bees. Well, 1984 came, and most of the packages were sold at that time. And then when I got there, and that '81 were sold to Canada. Well, why was that? Well, the Canadians had this wonderful area up there for making honey during the summer, but boy, you didn't Winter bees in Canada so what became an issue as they killed all the bees in Canada and they bought new bees every year from Georgia and Florida, Mississippi and all across the southern states. And that was their business model until guess what? They close the border in 1984 [because] tracheal mites came and then finished the whole thing.

Jamie 55:24

Wow. Well, let's dive into that. Amy has asked you what was your primary extension focus while at UF? I'm curious, what are some of your main extension accomplishments while you were here at the University of Florida? I know what some of them were. But tell us a little bit about your programs, your newsletter, your institute, things like that?

Guest 2 55:45

Yeah, well, there were two things basically, that at the time I was hired, were the big deals here. One was a big hit that was called the Beekeepers Institute. That was like the first sort of bee college idea. It wasn't a bee college, it was a summer camp. That's really what it was. And so around the state, I was responsible for developing every year, some kind of an academic venue, and some kind of a program to entertain and teach beekeepers, for a particular week, generally in August in Florida.

Jamie 56:28

Wow you sure pick the hottest month

Guest 2 56:31

I didn't pick it, this was all picked for me. I just stepped into it and there I was. That was a particular focus of mine. The other thing is because I told you, I'm a writer. So I started my newsletter back when I was in Ohio. And then I continued my newsletter when I got to Florida. And my newsletter, at that point, when I retired, had about 3000 people on the list.

Amy 57:02

That's great.

Guest 2 57:02

It wasn't just Floridians, it was other people.

Amy 57:04

What did you put on the newsletter?

Guest 2 57:05

Everything, yeah I was a reporter, this is what's happening here. This is what's going on here. This is where we're doing this and et cetera.

Jamie 57:14

Now, Malcolm, those are still archived on your website, or they've been there...

Guest 2 57:16

After 30 years. You can see all my stuff for 30 years on the website.

Jamie 57:21

Okay. Well, we'll make sure to link that in the show notes again, for the listeners. Right.

Guest 2 57:25

Right. So that was my charge at the time. And then I did other things. There was the state association, I was involved with that. And there were other kinds of things that come up; I did a feeding study as part of an actual research study on what was called at that time, the Beltsville bee diet. It was a kind of interesting diet developed by the Beltsville bee lab. I was one of the first people to do that, or try to do that. I didn't do it very well. The reason I didn't, which I realized afterwards, was it was partly my fault. But it was also partly the fault of the design, because it had to do with beekeepers. We bought this food, we brought this food in from Beltsville and said beekeepers, here's what we want you to do. We want you to feed this stuff to bees and give us a report about what it's doing. Is it working? Is it not? According to your observations. Now, there's beekeepers that I started out with, the guys were in the panhandle, of course, I live in Central Florida. So I wasn't out there every day out in the field. But I go over there once a month and say, Well, how are you doing? You know, what's with this thing, we had a whole research protocol, a guy who was a bee inspector at the time. Over time I realized I'm not getting the information from these guys. We've got a plan, we told them what to do, what's going on. So I was in a truck with a guy when they asked, what is happening here? Where's your report? He says, what do you mean report? Well, I said, we're giving you this food, we expect you to have some kind of a research report. Where is it? He says, well, I don't know. Well, it turned out it was under the seat of his truck.

Amy 59:23

He's never used it.

Guest 2 59:25

He never used it. Yeah. So basically there was no data to come out of that. You can talk about things, but it really wasn't very significant, because obviously you can't have significance if you don't have any data. And so it kind of blew up but that was my one and only real actual research.

Jamie 59:46

I think you're raising an interesting point that's kind of worth mentioning. I don't want to chase this rabbit too much. When we do research, we have usually two options: to manage the colonies ourselves, or to work with beekeepers, and both systems have drawbacks. You definitely mentioned, potentially one of the drawbacks working with beekeepers, we know a lot of you beekeepers out there, don't panic. This isn't intended to be mean. It can be difficult because beekeepers have management systems that they have to live by and work by, et cetera. And sometimes it's hard to fit in the rigidity of a research project into the system that they're trying to follow. So I can certainly sympathize what you're saying, Malcolm.

Guest 2 1:00:25

Well if you look at one of the first articles on my new website, beekeep.info, you'll see a title there: What Beekeepers and Researchers Want. And it goes very deeply into this area we're talking about there.

Amy 1:00:40

I feel we're definitely gonna have to share that. But I think it's so funny that Jamie asked about extension accomplishments. And Malcolm told us one of his fails that he had, which wasn't all you, but it's just so funny, because those stories they last forever. They never go away. Malcolm, it sounds like you were working primarily with beekeepers. It sounds like you were traveling, talking about bees, I assume to non beekeepers as well. Obviously, you had to teach but I'm wondering, did you have to teach for undergraduate students or have grad students as a faculty member? Even if you were hired on as 100% extension did you do teaching and have courses.

Guest 2 1:01:22

I did do teaching. I taught the introductory bee class and then after the end of my career, I was teaching the introductory entomology class. And so I definitely did. I had one graduate student, that was it, and he didn't make it through. He had some problems and so on, and so I finally realized this guy just isn't going to make it, so we parted company, but that was the only graduate student I had.

Amy 1:01:55

Were your beekeeping classes in person?

Guest 2 1:01:58

Oh yeah! Well, always the actor! I gotta get in there to get acting in front of them. The standard stuff. Introductory entomology was the same way. Insects are just absolutely incredible organisms and the honey bee is just one of them. I love insects, all of them. That's one of the things, I'm in this cohousing complex over here and every quarter guess who shows up? Florida pest control. Plastic thing stick on the lawn. Don't walk here. Pesticides are being applied. They run around, and I'm going what in the? Why? Why? Why? The problem is I live with people who can't stand insects. They don't even want to see a single one around, and so I'm just stuck with that mindset. But for me, it's just crazy.

Jamie 1:02:57

Well, Malcolm, let me get you to think back about your career that spanned three decades here. So when you were here at UF, over the two decades that you were here, what are some of the significant

changes that you saw in your time working with extension? You already talked about the introduction of tracheal mites, the introduction of Varroa, the introduction of small hive beetle. So clearly these have had substantial impact on the industry. And it brought about a lot of changes, not only here in the US, but around the world. But what are some other things that you feel like you've noticed change over the years while you were a faculty member? And even since then?

Guest 2 1:03:34

Have you seen my opus video that Umberto developed?

Jamie 1:03:41

I did, yes.

Guest 2 1:03:42

Well, that basically covers a lot of what I saw, even after my career was over. And of course, the big thing is this incredible shift from being honey producers to being pollinators. And the industry became a pollinating industry instead of a honey production industry. And all the stuff that was involved in that and still going on. And of course, Varroa and all these other kinds of organisms. You had to be on the lookout for the next fix, the next pesticide or the next way to do something to keep these things at bay. And so that was part of it as well, the shifts that are going on, they're continuing to go on and I'm still involved in some of that.

Amy 1:04:30

So Malcolm, what were some of your favorite moments during your career?

Guest 2 1:04:34

Well, that's a good question. Specific moments? I met a lot of great people in beekeeping. I went to a lot of meetings and a lot of international meetings. And so I became the International Outreach for beekeeping extension at that time. So I knew Italians, I knew French people, I knew Spanish people, I knew people in Latin America. I mean on on. So possibly my biggest thing, really at the moment that you can look back on are these two books that I wrote. And my 30 year, and I'm still doing the newsletter, as a matter of fact, I've shifted a little bit. It'll cost you \$1. Right now, if you want to get my newsletter, it costs you a buck. Can you afford a buck or not? Well, 30 people have said they could. So I'm writing a newsletter now for 30 people. For \$1 apiece? So it's kind of a hobby for me right now. And that may go away. It's hard to know exactly. But the shifts that have occurred have all been, again, that kind of magnitude, that went from something really high to something really low. So I hope that answered your question.

Jamie 1:06:02

Yeah, Malcolm, you mentioned some things that I think too, about my own careers. I've also been to a lot of meetings and met a lot of beekeepers, not only in the US, but around the world, and that's always one of the most rewarding parts is to see how they live, how they keep bees, what the issues are that they face, and just how they're people, they're people like everyone else, and the struggles that they have and the successes they have. And so it's rewarding to see that. Yeah. And that's one of the really interesting things about the bee industry, if you want to call it an industry and that's where the

beekeeping, the activity of bees, is that they're every place you go. There are beekeepers societies, and are people that are asking the same questions. You know, if you're in Slovenia, you get the same questions as if you're in the United States. Well, Malcolm, let me ask this final question with all that you've done and all that you've accomplished and all that you've seen and been a part of over the years, what do you consider your legacy contribution just to the University of Florida in general, but also the beekeeping industry? What are you most proud of having done and that you believe has made the most impact for the beekeeping?

Guest 2 1:07:08

I hope it's my publication record. I've not just written a newsletter. I've written for the beekeeping press for 30 years, too. And so Bee Culture magazine, American Bee Culture, Bee Business when it was available. I mean, all kinds of things like that. So really, it would have to be my publication record.

Amy 1:07:31

Yeah. Sounds like you had a huge influence, and you're pretty active as far as having your fingers in lots of things around the world. That's great.

Guest 2 1:07:39

Well, again, one of the problems there is, probably one of the issues there is, how do you measure your impact?

Amy 1:07:47

Yeah, that's a question Jamie and I ask each other every day

Guest 2 1:07:50

I'm sure it is. The educator, that's the educator's dilemma. You're gonna go out there and develop something and you think it's important, and you deliver it, and then how do you judge your effectiveness, in terms of whether it was understood and are people actually doing it?

Jamie 1:08:12

Well, Malcolm, my guess is, is that your generation, the academics that were retiring maybe in the early 2000s, your generation is the one that really went through some fundamental paradigm shifts in the beekeeping industry. You know, Varroa was big, the change from a focus on honey production to the change of a focus on pollination is big. There's been an explosive growth of beekeepers, even recently, all of that training you did for hundreds, probably 1000s of beekeepers, all the individuals who would have read all your written works, attended a Malcolm Sanford presentation, etc. They benefited and it really paved the way for what we're having to do today in our own programs. I inherited the position that you had here at the University of Florida. So a lot of your legacy continues on. I know when I travel a lot, I hear a lot of people refer to you and mention you, even when I'm going nationally or internationally. So everyone, as we wind down our interview with Malcolm Sanford, he's already mentioned earlier that one of his hobbies is acting, he's in a lot of play productions. You can see all that on his bio link that we will include in the show notes, but in there, he's had to put some songs that he's recorded. I'm assuming Malcolm, you had to do that to show off your vocal range for the plays that you are hoping to be a part of, but your recording was specifically about honeybees. Can you tell us just

briefly about that, because what we're going to do is as we're kind of fading out of this segment of Two Bees in a Podcast, we're going to play excerpt from your song, so tell me all about that song.

Guest 2 1:09:41

What's the name of the song?

Jamie 1:09:43

It's the one about honey bees, be my lover or something like that. I listened to it recently. It's been going through, I even let my kids listen to it and they've been humming it around the house. It's honey bee honey be my girl or something. Honey Comb! Honey Comb, listeners, you're going to be able to hear it again as we finish out this segment.

Guest 2 1:10:06

It is me singing! It's not the other guy!

Amy 1:10:07

Wait, that's you singing? Oh my goodness, I had no idea, that is so funny.

Jamie 1:10:15

Oh it's not me so. Malcolm, I think our listeners are gonna - it's going to put the icing on this episode. So I just want to say thanks for joining us on Two Bees in a Podcast, I want to thank you for all that you've done. And again, we're going to link as much as we can about you and your books, your website, etc in our show notes today. So if anybody wants to hear more, or read more, they can do that as well. So Malcolm, thank you so much for joining us.

Guest 2 1:10:42

Well, I appreciate very much the opportunity and take a look at my videos that Humberto did, I think those are important things to take a look at.

Jamie 1:10:52

All right, absolutely. And guys what he's referring to is Doctor Humberto Boncristiani here in our laboratory has an inside hive TV series that he has on YouTube. And so he interviewed Malcolm and we can make sure to link that in our show notes as well. Everybody, that was Dr. Malcolm Sanford who is professor emeritus of the entomology hematology department here at the University of Florida. He was my predecessor, so thank you guys for listening to this segment of Two Bees in a Podcast.

Unknown 1:11:19

and they called it honey comb. / And they rode the world and they gathered all / of the honey comb into one sweet ball / and the honey comb from a million trips made my baby's lips / Oh, honey comb wontcha be my baby / well Honeycomb be my own / got a Hank of hair and a piece of bone / I made a walking talking honeycomb. / Well honey comb wontcha be my baby. / Well, honey comb be my own, / what a darn good life when you've got a wife like honey comb. / And the Lord said now that I made a bee, I am going to look all around for a green green tree and he made a little tree...

Amy 1:12:00

Okay, and we're back for the question and answer segment. Jamie, you've got three questions. You've got a couple of answers.

Jamie 1:12:07

Eighteen answers probably.

Amy 1:12:10

Took you a little bit to figure out how many answers you had. 18?

Jamie 1:12:13

I'm sure it's gonna be 18. I want you to count me as I'm trying to answer the questions.

Amy 1:12:19

I don't have 18 fingers though. So I don't know how to do that. All right.

Jamie 1:12:23

Neither do I.

Amy 1:12:27

So the first question we have, what does it mean when beekeepers are treatment-free? I hear this all the time that people are using natural beekeeping practices. And I mean, honestly, I guess I have that question too. What does that actually mean?

Jamie 1:12:41

I was about to say, Amy, that it means their bees are dying, but I know that we'd get a lot of hate mail if I said that. In all seriousness, there's an huge range of what that means to beekeepers. There's no formal definition, but generally what it means is that they're staying away from the synthetic treatments for the various diseases or pests. For example, they won't use antibiotics to control European foulbrood or respond to American foulbrood. They won't use Apiguard or they won't use Apivar or they won't use Checkmite or Apistan to control Varroa. They won't use Checkmite for small hive beetles, etc. The idea is that they're using a lot of more natural things to try to address the issues. They might be investing in resistant stock, VSH queens, or hygienic queens, or new world Carniolans, or Russian honey bee queens. They might be using things such as screen bottom boards. It's important to know that there is a distinction between natural beekeeping and treatment-free beekeeping, because natural beekeeping, and again, this one also has a sliding definition, but natural beekeeping most commonly means you let the bees do what the bees do, and you just kind of step back and maybe here and there trying to facilitate what it is that they do. To give you an example, a lot of purest natural beekeepers, they allow their colonies to swarm. It's just a natural part of the bee lifecycle. So why should we stop that, is kind of the premise. So what you'll see in natural beekeeping is things like that. They might keep bees in smaller hive boxes, etc. But there is a growing movement towards this. I've seen treatment-free and natural beekeeping seminars and symposia popping up all around the world. But it's this idea that we are going to try to keep bees the way the bees want to be kept: more hands off, fewer chemicals, fewer acaricides, fewer or less management strategies. And the idea is that if bees are allowed to do what

they do best, then they don't need so much intervention from us. I will tell you, like I've told thousands of people who asked me this question, I have no problem with people keeping bees the way that they want to, but I will tell you, again, this might get some hate mail. This often produces populations of bees that have very high mite loads or other disease and pest loads. And there's been no good research on this. So I'm not saying that this is a problem, but I will tell you a lot of commercial or even sideline beekeepers believe that a lot of their problems might be harbored in high numbers and these kinds of treatment-free beekeepers who say, "I'm going to just let my bees do what they want to and the best survive," etc. That can promote high populations of Varroa and other things. So there's this kind of battle between the two groups at the moment. And what I would say is the jury's still out. There's just not a lot of data. But I will say that, my official opinion is that as beekeepers we have responsibilities to manage the diseases and pests that bees might otherwise struggle to manage. So I have no problem doing what it takes, within the realm of what's legal, to control diseases and pests. But that's a big umbrella overview. Really hard to define at the moment. It's a bit amorphous.

Amy 1:16:07

Yeah, I feel like we could have a whole segment on it.

Jamie 1:16:09

It would be really good to bring in some people who are treatment-free, people who consider themselves natural beekeepers. But I know Tom Seeley has written very recently about Darwinian beekeeping and this idea he's got.

Amy 1:16:25

Darweenian?

Jamie 1:16:27

Darwinian, sorry. I don't know, it's such a new term, it's however you want to say it is how it can be said, but Darwinian beekeeping, this idea, I think he's got a 10 commandments that he's put out based on all of his years of research, the size of colonies, how spaced the colony should be. So the idea is that it's growing, and maybe he'd be a good person to interview about this, but I can tell you, Amy, it's a hot-button topic. Both sides of the coin believe in themselves to be adamantly right, and they both often scream at the other. And the truth is, is probably it's somewhere in the middle, and it certainly needs to be explored further.

Amy 1:17:14

That's fair. It is lunchtime. So you're probably think about corn. Okay, let's go to the next question.

Jamie 1:17:19

Oh, it's always lunchtime in my world.

Amy 1:17:22

So the second question we have is Amdro safe to use around the hives? What is Amdro?

Jamie 1:17:30

So Amdro is an ant control agent. And I always answer questions like this, when I have problems with ants around my hives that some of the other ant control strategies aren't working, that I use Amdro around hives or products like it. So that's not an endorsement, it just is me saying that I've considered it safe enough to use around the hive to actually use it myself. I will give you an example. My wife actually did her PhD work at the University of Georgia. And she had a tremendous fire ant problem around a lot of her research colony. So we actually put out products like Amdro around the hive and never noticed any negative effects on our bees. So some people are concerned because Amdro specifically, are these kinds of yellow granules type things that like pollen pellets. So the concern is bees might pick it up like pollen. I just never saw that. Now, you could argue that if bees are on the ground and being exposed to this stuff around the hives, that might could be an issue. I just never saw populations of bees go back when we were using this, but I did see the population of ants go back. So it seemed to be helpful in our very specific scenario.

Amy 1:18:44

Okay, talking about bees and the decline in population numbers, this leads to my last question for you. I've had calls from people who will see one or two dead bees on the ground. And so my question is, how many dead bees is enough to actually be concerned? Are we worried about a couple of bees?

Jamie 1:19:05

Great question. People panic and freak out about everything in the bee world. Me too, when I was a brand new beekeeper, it goes back to the small hive beetle questions that we've had in the past, people open the lid of a colony and see a small hive beetle and want to throw everything they can in that colony to try to stop the beetle. Yeah. And likewise, you just asked me about ants around the hive, and we talked about the use of Amdro or similar products, "just because I see an ant maybe I've got to go out and treat around it?" Well, my question is, is do you really have a problem that warrants treatment? Now you're asking specifically well, what about dead bees? How many is too many? Well, if you think about it, practically, a beehive can have 40,000 individual worker bees and and they're all alive. And what do we know about things that live? They die! They're going to die! Yeah, exactly. So if you've got a 40,000 bee colony, you're going to see dead bees outside the hive, that's just a fact of life, these things are going to die, every one of them's going to die in six to eight weeks and their bodies are going to have to go somewhere. Generally speaking, bees are pretty good at hauling off their dead. They'll fly him some meters away from the hive, 10, 15, 20, 40 meters away from the hive. So usually around my hives, I'll only see 15 to 100 dead bees or decaying carcasses. I would argue that when you start seeing piles of bees, where bee bodies are accumulating 50 to 100, it warrants looking in the hive to see what's going on. But if everything in the hive is otherwise normal, you've got a laying queen, brood pattern is solid, you've got a population of bees representative are appropriate for that time of year, then I wouldn't be too concerned. I've had situations where I've had 100 dead bees in front of my hive and not be worried at all. But I've had situations where I've had 100 dead bees in front of my hive and been scared to death because I've looked in the hive and seen what's happening. I think it's a bigger issue if you see a lot of crawling bees on the ground outside around the hive 10, 15, or more. Or if you're starting to see piles of bees, 50 or 100, then you'll want to go into hive and determine am I seeing something in this hive about this colony that gives me concern and gives me reason to believe that that pile of bees outside the hive is a problem, or am I seeing things that are absolutely okay, strong populace, life looks good. Now all of a sudden, that little pile of 50 to 100 bees, it's not a

problem. So look for wandering bees, look for that accumulating pile of bees, and that should be a trigger to go into the hive. But it's possible to see both of those things and get into the hive and still say you know what? Things still look good.

Amy 1:21:50

Yeah, and I was also gonna say, so when I was living up in Virginia and beekeeping, we had something called winter, which we don't really have here in Florida.

Jamie 1:21:59

I know not of what you speak.

Amy 1:22:01

So we would have like, you'd have two feet of snow, and the snow would go and hit the entrance. And of course, once it started to warm up, that was just the hygienic behavior of bees tossing dead bodies out. So that's totally normal. So some of this could be normal as well.

Jamie 1:22:16

Yeah, it could be. But I will tell you Amy, by the time I'm seeing 150 - 200 bees, I mean that does start to trigger me to say, okay, even if things look normal in the hive, that's still a palette, and now I'll tell you a couple of reasons for this. Number one, the bees should be carrying off the bodies, so I shouldn't be seeing a whole lot. And number two, when bees that are deposited outside of the hive, there's ants and all kinds of stuff that very quickly take out those bodies. So if I'm starting to see 100, 150 bees pile up, then there's a problem with the undertakers who are hauling off those bodies, or their bees are dying at a rate that's faster than the ants themselves can eat it. And so those things kind of give me pause for alarm. Certainly, if I'm seeing 1000 bees, or more, than I have a reason to believe that there's massive die offs and significant problems. So like I said, just summarize my statement. If I'm seeing 10 or 15 living bees wandering on the ground outside, I'm going to go in that hive and figure out what's going on. If I see 50 to 100 dead bodies outside of the hive, I'm going to go in that hive and see what's going on with the colony.

Amy 1:23:22

Great. All right. Thank you for that. So everyone, thank you so much for your questions. Jamie, thank you so much for your answers. If you guys have more questions, please feel free to email us. I know people have been emailing or messaging me on Facebook or Instagram on our honey bee page. And of course, if you do like the podcast, don't forget to go to your podcast app and rate us if possible. That would be great. 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 Allenje. Without their hard work, Two Bees in a Podcast would not be possible.

Jamie 1:24:11

For more information and additional resources for today's episode, don't forget to visit the UF IFAS Honey Bee Research and Extension Laboratory's 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,

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