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SPEAKERS

Guest, Amy, Honey Bee, Stump The Chump, Jamie

Jamie 00:10

Welcome to Two Bees in a Podcast brought to you by the Honey Bee Research Extension Laboratory at the University of Florida's Institute of Food and Agricultural Sciences. It is our goal to advance the understanding of honey bees and beekeeping, grow the beekeeping community and improve the health of honey bees everywhere. In this podcast, you'll hear research updates, beekeeping management practices discussed and advice on beekeeping from our resident experts, beekeepers, scientists and other program guests. Join us for today's program. And thank you for listening to Two Bees in a Podcast. In this episode of Two Bees in a Podcast, we will be joined by Doug McGinnis who was the former owner of Tropical Blossom Honey. He is an expert on the history of the honey industry, importing and exporting honey, he's just a wealth of knowledge about honey. That will be followed by a segment where Amy interviews me and I talk about arthropod invaders and honey bee colonies. How is it that honey bees have such a low number of arthropod invaders and how did those invaders that are there overcome honey bee defenses? And of course, we'll finish today's episode with our question and answer segment. Hello, everyone, welcome to this segment of Two Bees in a Podcast. In this segment, we're going to be talking about something sweet. Amy, what do you think it is? Bees, sweet. What do you think it is?

Amy 01:43

Hmm. I guess I could say candy or honey but bees don't make candy. But you can make candy from honey.

Jamie 01:50

You can make candy from honey. Of course, the word honey is in the phrase honey bee, so we're talking about honey. We're talking about honey with not just someone who knows a little bit about it, but we're talking about honey with someone who knows a ton about honey. We're talking about honey with Doug McGinnis. I know that's a lot of tongue twister. We're talking about honey with Doug McGinnis who is a Florida beekeeper here. He's the former co-owner of Tropical Blossom Honey based in Edgewater, Florida. He's currently a board member of The Atlantic Center for the Arts. He has a lifetime experience in the production of honey, but more importantly in the marketing and sale of honey. Doug, thank you so much for joining us on Two Bees in a Podcast.

Guest 02:33

Thanks, Jamie and Amy. It's a pleasure to be here. It's nice talking with you. I miss seeing the bee lab.

Jamie 02:39

Yeah, I know. I was gonna say for the benefit of our listeners, I just wanted to say, we're working at the University of Florida, you're a Florida beekeeper, but you really got a kind of international perspective on honey, honey production, honey, marketing and sales. But Doug, before I get there, I want to mention two things. Number one, you obviously have been a great supporter of the bee lab, helped get the thing built in the first place, and we're excited that you and your family sponsored the museum that we have here. But the second thing, Doug, I wanted to tell our listeners what it's like to be based in Florida. We were just interviewing another podcast interviewee right before we brought you on. And I was looking outside of my magnificent window of this new bee lab as I was listening to our interviewee. And lo and behold, I was looking at a tree, and out of this tree falls a gigantic raccoon. I don't know if it fell asleep. You know, Doug, that you're in Florida when you're staring out your window, and from 30 feet in the air, a gigantic raccoon just falls out, hits the ground, kind of stumbles a little bit, and walks off.

Amy 03:45

Did you check to see if it was okay?

Jamie 03:46

I didn't. I was in the middle of a podcast interview, Amy. Now, we have Doug who's also in Florida, who probably has a ton of raccoon dropping out of the tree stories, Doug.

Guest 03:55

Yes, I live way out in the country, and every day I have raccoons and deer. And now the air is just full of birds. So I love living out in the wild. I also love living in Florida. But it's totally unique. It's been very good for beekeepers for many, many years.

Jamie 04:16

Well, Doug, every time I'm around you and talk to you, you always bring up the rich history of bees and beekeeping in Florida. For our international audience, I know that this topic of honey marketing, sales, production, etc., the history that you have with it really is going to be of interest to them. So without further ado, Doug, let's just get straight into this. If you could just give us a brief introduction about yourself, your family and all that stuff. Amy's going to ask you specifically about your business in a moment but I just want to hear about you how you found yourself in the beekeeping business, just a little history about you where you grew up, etc.

Guest 04:50

Well, I actually have been in it in one way or another for many, many, many years since I was a little kid. My parents had the business here. We started with a fruit stand, where we had oranges and we had bees. So eventually, we had an extracting plant here where beekeepers would come in during the winter, they'd come down here for orange blossom and stay through gallberry season. So we had a lot of beekeepers in and out of our place. And so that's where the relationship really started. And I remember going to Florida State Beekeepers meetings at Charlotte Randles waxworks over in Umatilla

years and years ago, and it was a huge group. There were a lot of beekeepers here. So later on, I actually went to the University of Florida, got my degree in journalism, and after working in a few small newspapers, my parents called me and asked if I would like to come back to the business. And so I moved back here to Edgewater from Gainesville in 1976. And automatically, we were in this cycle of a lot of export work. So I got to know our export customers and got to do some traveling, and really got into the marketing end of the business. So that's how I started. But the company started here in 1940 and was always that sort of outlet for Florida, and later, Georgia, beekeepers to bring their honey for sale. So I've been in it all my life.

Amy 06:37

So are you second generation then?

Guest 06:39

Second generation, yes. My parents moved from West Virginia in 1937, came down here to live with my great uncle who had a little shack out in the woods, but owned half of the town out there, and he taught my dad beekeeping and also citrus production. So they found this place in 1940. And we began both a citrus and honey business selling right on US-1. There was no I-95. And so we had a fruit stand here, sold our honey and honey products, and we really started finding out more ways to sell honey gifts. And dad, in 1947, discovered along with a friend of his, designed a globe jar, which was a round jar that actually was designed to take the place of an orange and a citrus fruit pack so that when all these deluxe fruit packs went out at Christmas time, they would have a jar of Tropical Blossom Honey and and that's because the jar would actually fit in the box of citrus fruit quite easily. So that was probably the first part of our business, was really the tourist industry. And we developed many different honey gifts at the fruit stand. I sold things like coconut heads and there's little squeeze monkeys that bang their drums, and all sorts of different knickknacks and crazy stuff. In the early 50s, my sister even had a box full of Cayman alligators that she would feed them chicken necks and this was the only way to get to Miami. And so we had a constant stream of tourists and developed honey products that they could take home and enjoy.

Jamie 08:52

Well, Doug, I'm listening to all this and starting to think we should ask you a whole different set of questions than what we have scripted out.

Amy 08:58

Yeah, that's so funny. I mean you had also kind of mentioned the export/import products. So you kind of came into that. So it was that already kind of set in place? And let's go ahead and veer into what we were going to ask you about with selling honey.

Guest 09:14

Yes. So in 1965, we had built up this business selling to tourist outlets throughout Florida and even a little further up in the East Coast. And at that time, found out we have two main crops of honey here in Florida: orange blossom, of course, what everybody signifies Florida, really, and was our most popular but we also have this wonderful wildflower crop of gallberry and saw palmetto. We did not filter these honeys. They were cloudier, they were darker. The US population didn't seem to like them, but we found in Europe, this was the way they liked honey. They didn't want it filtered, they wanted it as natural

as possible. They love the flavor profiles of gallberry and palmetto, which are some of the best in the world. And so we developed relationships with various German importers and started bringing it in. And another thing was, the globe jar was actually a little bit larger than the standard one pound honey jar. It would fit 500 grams, versus one pound is 453 grams. So we can actually overfill the jars and meet the European requirements. That was just one of the European requirements that was necessary to get honey, our US honey, over there. And so that started and it just took off after that. So for a time, over half of our business was export.

Jamie 10:56

So Doug, one of the things I'm curious about, again, we've got some scripted questions, but when I hear you talking about this, it makes me think instantly, how easy was it to get into the export market? I mean, I think a lot of people listening to you are going to say, "Hey, you I've got a good honey, good honey products, etc. Or I'm not interested in keeping bees, but I'm interested in purchasing honey and exporting it. How easy is it to get in?" I mean, it sounds like it was fairly easy. You found a market quickly and and expanded from there. But today, it seems like it'd be a little bit more difficult. Could you talk about that?

Guest 11:28

Well, there are many constraints that have been put on us since the European Union got put together in 2000, I think. But before that, there was a very important part of the Florida honey production that gave us a great advantage. And that's where I have to shout out to the Division of Plant Industries and the Florida Apiary Inspection Department, because we could produce a document called a phytosanitary certificate, which said that, apparently, that the honey came from bees that were free of various diseases. And it was only because we had an Apiary Inspection Department, and we were one of only eight states in the United States that could produce a phyto and that phytosanitary certificate was absolutely necessary. And that also has to deal with the Codex Alimentarius, which is the honey standard that has been around since the 1920s in Europe, and is constantly getting revised. But we also had to meet the requirements of the Codex Alimentarius. And it still exists. In fact, it's being revised again. But at that time, we had an advantage with Florida honey because our honey was unfiltered, unprocessed, very little heat was applied, and so some of the criteria that Europe required, we could easily pass and we had that phytosanitary certificate. So I particularly want to point out a few people, Frank Robinson, Lawrence Cutts, who were always the signees of these documents, and also the inimitable Kathy Dewees, their secretary who made sure we got our documents signed, sometimes Lawrence was out in the field doing other things. I called Kathy and said, "Kathy, the boat is about to land in a few weeks, and we're going to have to get that paper signed." She'd made sure it did every time and she understood that so much. So I have the Florida Apiary Inspection Department to thank for a lot of our export business.

Jamie 13:55

But Doug, if you were in it all of this time, and you were watching it, as a child watching your parents deal with it, then you yourself having to deal with it as you started working with the business, what are some of the more significant changes you saw with the exporting and importing business over time, the marketing business? As you mentioned, one example, when the EU was created, there were some changes that happened to you. So how did you guys adjust to those changes? What changes did you see as you guys were in the business?

Guest 14:21

Yes, it was always about looking out for other markets around the world. And in 2000, when the EU formed, they changed all the requirements and they no longer accepted a state phytosanitary certificate. They wanted a federal phytosanitary certificate that did not exist. We tried for years to get a federal program that would sign these papers, but it was more expensive than it was worth. Plus, they put in a lot of other restrictions. So at that point, and we had been the largest US exporter of honey at that point to, of all places, Sweden, where they were using 30 containers a year. But we had already developed markets in Japan, and the Mid East, which included Israel up until 1979, Iran, and Saudi Arabia and the United Arab Emirates, and there was a market where good honey was really appreciated. And I just have to say that because there's no better honey than Florida honey. It has such great qualities. And our Saudi customer always said it had the great blossom flavor. So we continued to sell to the Mid East. And then later on, because things like honey with comb was our specialty and is important in traditional cultures that appreciate honey, that we developed a big market in the Mexican-Hispanic market out in California of all things. And who would have thought that? But the fact was produce trucks were coming into Florida with produce from California every week. And they always needed a backhaul. So we could get very cheap freight out there. We sold miel con panal, and it was another big boost. But we constantly, due to different restrictions, non-tariff trade barriers, all sorts of different things, we constantly had to look around for what's next, because we weren't selling the cheapest honey in the world, we were actually trying to sell a quality product at a good price. And so that always kept us moving. We were able to find other markets to go to but we've always had to look around because of the way the world is, things change. But we always found there was a market for good quality Florida honey. So after Europe, there was the Mid East and Japan, where our product was found in a lot of exclusive stores there. We would have friends visiting Japan, and they come back and say, "Oh, I saw Tropical Blossom Honey in the store." And in Japan, the exclusive food stores are like in the basement of the exclusive department stores. So our honey was always there. And then later, we would sell to the Mexican Hispanic consumer out in California of all things.

Amy 17:48

So it sounds like you guys are really just problem-solving and trying to figure out what the next best thing was. And it also sounds like there were a lot of connections that needed to be made. I mean, we're kind of here in our own little worlds, but to have to search worldwide for who we can sell to, who would take our products, and then also, just all the different restrictions and rules and regulations to get, it seems like a lot of moving parts. And I feel like you're kind of simplifying what you all actually did. And it just seems like there are a lot of connections that needed to be made. And I assume that it was more than just one person. It probably took efforts from a lot of different people.

Guest 18:30

Certainly, Amy. We exhibited for years at the National Association for the Specialty Food Trade, the Fancy Food Show, we were actually the fifth oldest members of that organization. And so we would meet a lot of our export customers there. The foreign agriculture service, which I mentioned before, really helped us. Then later on, we would exhibit at both Auga, which is the Big Food exhibition in Cologne, Germany, and it's there one year, and then SILL in Paris is the next year. So with help from the southern US Trade Association, which was so good, and the Florida Department of Agriculture and knowing the financing, I mean, we didn't like to do work under a letter of credit because there are so

many restrictions on doing that. We sold to Yemen for a while. And that customer even came over here because they wanted to see Disney World. We found out there was a huge market in Yemen because Yemen is that ancient center of great honey in the Arabian Peninsula. And they couldn't sell, they sold out of their own product fast so they couldn't find enough good quality, so that had to go through letter of credit and believe me, going from Yemen and getting paid It was always nerve-wracking, but we had a good customer there too. Our other customers, we had this long-term relationship, and whether it's a beekeeper and our many suppliers and Florida beekeepers that were really part of our chain, and that we felt like many of them were family, it's these relationships. I always said, although we did a lot of testing, I knew where every drum of honey that was in our plant came from, and I knew the people and I could talk to them if there was a problem. And they stayed in touch with us and let us know on how the crop was coming along all the time. So that was also very key.

Amy 20:45

Sure. So I guess, what Jamie had mentioned earlier, there are people that are wanting to start looking into export and importing their products. And so what recommendations or suggestions do you have for some of these people, especially, now that we can't go to shows, or at least we weren't able to due to COVID? What suggestions do you have for some of these people who are looking into starting this?

Guest 21:10

First thing I would do is contact the Southern US Trade Association. They have what's called a market access program. And that is funding to help you do promotions. And it's fairly easy, where they will do matching grants to help with some of your promotional work that you're doing and also pay for part of these trade shows that I was talking about. SUSTA is a wonderful resource. Highly recommend it.

Amy 21:40

I assume they have a website so I can go ahead and put that in the show notes.

Guest 21:44

They do. They do. They're out of New Orleans, but they also work with each of our Departments of Agriculture in the Southern United States.

Jamie 21:53

Awesome. So Doug, obviously, around the US, there's a lot of people who produce a lot of high-quality honey. Obviously, you've been bragging a lot on Florida honey, and I agree Florida honey is very good. I know when I lived in South Africa, there's a little area in South Africa where a particular type of honey is produced. If it's not the best I've ever tasted, it's awfully close. And so, there's a lot of groups around the world, a lot of beekeepers around the world who take a lot of pride in the production of their honey. This is just an opinion question. Outside of Florida, what are some of your favorite honeys? What are some locations on planet Earth that you know to make really good quality honeys?

Guest 22:31

I've actually been thinking about that, Jamie, because I've met so many people in the honey trade. And I feel like when we get together we speak a common language. But I'm talking about Yemen again. Their native honey bees are made from all those things that you read about in the Bible like frankincense and myrrh and all those odd things and they have a very, very dense honey that has a

real herbal taste that I really like. Besides saw palmetto, which is my very favorite Florida honey out and sourwood, it has this amazing sort of butterscotch vanilla taste that I really don't think I've ever tasted anything like it. But going overseas, there's several. At the Fancy Food Show we'd always trade with people from Tasmania for Tasmanian Leatherwood. I love Romanian Acacia, which makes some of the finest comb honey in the world. And there's probably a half a dozen heathers and interesting honey. So I do have a few favorites but I gotta say, I really love mountain sourwood, and recently, I was turned on to Oregon meadowfoam honey. I don't know if y'all have tried that but it's sort of like a combination of maple syrup and marshmallows and it's really, really interesting.

Amy 23:53

We'll have to try it.

Jamie 23:54

I'm sorry, what? Maple syrup and marshmallows, Doug?

Guest 24:01

Flavor note I would give it. It's really good. So I've got a bunch. Every time I get to try a new honey, it's just absolutely the best.

Amy 24:13

Sorry, I was distracted by the maple syrup and marshmallows.

Guest 24:20

The National Honey Board, the general comments are floral, herbal or earthy. But then if you go to UC Davis's huge list of flavor notes, you can see it's just as complicated as wine.

Amy 24:36

I was about to say, what does marshmallow fall under? Earthy?

Guest 24:40

Hmm. I would say that's kind of floral, but herbal too. I don't know. I don't know. It's hard, hard to say.

Amy 24:47

Alright, so I guess the last question that I have for you is where do you see the the export/import business headed?

Guest 24:55

Well, the thing that's happened here in the US, and even since I've left the business, in 2015, there's been a real differentiation in the market. Throughout my life, I've seen the honey prices go up and down and up and down to what beekeepers can get for their product that often is lower than their cost of production. That's happened a lot. It's really happening now, where a lot of our basic honeys are coming in from India and Vietnam because the price is very inexpensive. Even Canadian honey is inexpensive now. So I understand the problems that beekeepers are having. And that's why honey production is not as important as pollination services today, for so many of them. Another thing that happens is that we've had this great explosion of local beekeepers and buying local, which I highly

support. And I love my local beekeepers and try to help them out any way I can. They don't produce huge amounts of these varieties that we used to provide. And we would sell nine containers of orange blossom, that's 540 drums to Israel in a year or, just huge amounts. Even comb honey, it's getting harder to find comb honey up in the St. Marys River region and Homerville, GA. It's really become difficult because of the environment to make the huge amounts of honey that we used to make. And that really helped the export business. Today, it's going to be an exclusive product that meets the criteria of the export customer. And I could say that there is a great taste for Florida honey. Our Saudi customer used to say that our honey had the blossom flavor, and they picked our honey out of over 200 samples from around the world. But it's more difficult today, unless you have that little edge of something that's very, very special.

Amy 27:19

I was gonna say I know that people are starting to do other products like creamed honey, or they're infusing honey and so they're just trying to make it a little bit different than the unfiltered honey. So I think there is definitely a need for both. So it'd be interesting to see.

Jamie 27:35

So, Doug, hearing you talk about all this is a little bit away from exporting and importing but I want to make a series of comments and just invite your comments on my comments. But when I first started beekeeping about 30 years ago, and again, this is just my naivety, I'm from a very rural area and just didn't know a lot about the world growing up, still don't, but know a little bit more. But my idea is I produce honey and I put it in quart jars and sell it at farmer's markets, etc. But, to me, over the last 10 or 15 years and, again, this is naivety speaking here, it looks to me like honey is being viewed more as a very upscale product. And what I mean by that is, to me, the people who are really successful marketing and selling honey are those individuals who -- I might put mine in a one-pound jar and sell it for 10 bucks, but they'll put theirs in a jar that holds one pound of honey but it's a different, more ornate jar and that's a specialty honey and they sell it at a specialty market and get three four or five times the price of what I'm getting. And so I'm seeing that transition of honey from this kind of this bulk sweetener that I feel that I once saw in the past to this really fine, exceptional, high-quality, diverse, almost mysterious product depending on where it comes from around the world. Well, this is from citrus trees in Florida or Tupelo trees in the swamps of the panhandle, and it's got this aura and story about it that I think is really just causing it to take off. I mean, what do you think about all of that?

Guest 27:35

Infused honey is not understood in other places in the world. You've got to remember that purity is a big thing about honey. It's one of our greatest attributes. So trying to sell honey that has had something added to it does not fit into the definitions of honey that most countries have. Well, that's what Tropical Blossom was all founded about, Jamie. We always made a higher quality pack that people liked and a gift. Honey gifts are great and because we have all this attention right now, we're in the center of the universe with attention on the problems of bees and how wonderful honey is. There are even more opportunities for things like that. But every year, we had to come out with a new gift pack and a new gift assortment. And this was what our company was founded on, and why we sold up and down to all the fruit stands and everything around the state. But we kept on always having some kind of exclusive pot, exclusive jar, always looking for things like that. So I think the potential is really there. But also this idea

of having very local honey, I think it really is a good thing to promote that. And it's easy to find jars, it's easy. You just got to get out there and look and look at what everybody else is doing.

Jamie 30:48

That's kind of my parting shot before we sign off with you. One of the things that I think we have a lot of room for improvement with regard to honey quality, and this is just a blanket statement, it's just my one person experience, but I travel a lot, speak to a lot of beekeeping clubs around Florida, around the US, and around the world. And people are always scrambling to give me their honey because everybody's so proud of the honey they produce. But I would guess, Doug, and maybe I'm a little off here, but I would guess at least 50% of the jars of honey that people give me, the honey is fermented. I sometimes think about one of the ways that we could just make simple improvements to the quality of our product is just by the handling and processing and know when to extract and bottle it. I know you work with commercial professional beekeepers who really knew their thing and were providing you a good product. But I feel like this explosion in beekeepers is great. And I feel that there's some improvement that we can make on this product of ours that's already a good product. So do you see that a lot? Or do you feel like a lot of your more hobbyists and sideline suppliers are providing you with a really good product already?

Guest 31:57

I totally agree with you, Jamie. The first thing we always did was check for moisture and color before we did any other analyses on what came in. But a lot of our Florida honeys are extra moist. And nowadays, for instance, over here on the coast, mangroves becomes such a huge, popular honey, but it's very, very wet. In the old days, it was actually sold in huge quantities to Europe. But we boiled it to get that moisture out and just cooked it and cooked it and cooked it, which ruined the honey. Today, it's very much harder to gently take out that moisture. But if you don't, you're going to get a product in the jar that once people taste that, they're not going to eat honey for a while. So it's something that we always had to do. And we try to treat our honey very gently. But I totally agree that a lot more education needs to be done. In the past, we were the place that beekeepers could bring their drums of honey. We knew how to market it and process it gently enough to make a fairly uniform product that everyone enjoyed. It's not so easy if you don't spend some time. Thank goodness you've got things like Bee College going on and other outlets where people can learn because I agree with you. People need to learn a little bit when they're putting their honey in the jar.

Jamie 33:28

Amy, I don't know about you. But the whole time we've been interviewing, talking to Doug, I get the impression that, like, Doug's the Encyclopedia of honey.

Amy 33:36

I agree. I agree, not just from our conversation today, but always because he's also very good gardener. I don't know if you know that. He helped me plant the lab.

Jamie 33:45

Doug, you need to get a t-shirt that says, "Ask me anything about honey. I'm the encyclopedia of honey."

Amy 33:51

"I'm your honey," that's what you should have on your shirt.

Guest 33:55

Just to kind of give you another thought, and it's just like, I always see us as beekeepers, and even as honey merchants as part of a craft and a trade that goes back for thousands and thousands of years. And wherever I go in the world, and just like you must, Jamie, I feel this kinship with other people in this trade. And I realized that we're even more important than ever. But that's why I like to share today. It's also because people really like to listen today. There's so much more attention. The one good thing that's come out of all the problems of bees is that people are much more aware and they want to hear. So it's like my duty because of my partnership with honey bees and what they've done for me and my family to try to share this knowledge.

Jamie 34:52

Well Doug, thank you so much for joining us on Two Bees in a Podcast. I'm sure our listeners are gonna love everything that you've said. I know they're gonna want to look into our show notes and find out more about about you and honey in general. So thank you for joining us on this episode.

Guest 35:04

Thank you. So nice to talk to both of you. I look forward to coming back over to the bee lab and working in the garden out there. And I can't wait. Thanks so much.

Jamie 35:13

Can't wait to have you. Everybody, that was Doug McGinnis, former co-owner of Tropical Blossom Honey from Edgewater, Florida. He is now involved in a lot of philanthropic activities, including being a board member of The Atlantic Center for the Arts, an expert on honey, and again, our guest today on Two Bees in a Podcast.

Honey Bee 35:37

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

Amy 35:51

Hey, everyone. So we've got a pretty interesting segment today. I'm going to be interviewing Jamie. It's going to be the Jamie-Amy-Shmamy episode segment. And I wanted to start out with, actually, the story. Elizabeth Westman is one of the beekeepers that we have here. And her and I used to work a lot in my past job as an extension agent. And I would do a lot of random IDs, Jamie, I don't know if I told you that. But I do like random insect IDs. And this particular person had brought in this sample, and they had brought it in their vacuum cleaner. And so as soon as I saw it, I was like, "That's termite poop." And Elizabeth just looked at me and everyone just looked at me. I was like, "Yeah, that's termite feces." And she goes, "How did you know that?" And I'm like, "If I could tell you the amount of times that I saw termite feces on a regular basis, it's pretty disgusting."

Jamie 36:38

Basically, you know your poo.

Amy 36:41

I know my poo. I know my insect poo. Yeah, exactly.

Jamie 36:45

That's embarrassing.

Amy 36:45

Anyway, what I wanted to talk about today were nest invaders. And, I guess different defenses that bees and honey bees have in general. The reason I brought the termites up is because termites are also social insects. So we will be bringing them in to this conversation. But as far as nest invaders go, Jamie, can you just tell the audience what that is? What is a nest invader?

Jamie 37:10

So Amy, I'm, like, totally stoked to be doing this segment. I'm going to sound almost like a little school kid excited 'cause Santa Claus is about to be here. Because when I was a PhD --

Amy 37:22

Because it's almost December?

Jamie 37:23

No, no, because of the topic. I'm so excited about this topic. Amy, let me tell you, before I answer your question, why I'm excited about this topic. When I was a PhD student in South Africa, I started reading a lot of books on social insects and sociobiology and things like that. And this is where I was introduced to this topic, and I happened to be studying small hive beetles for my PhD dissertation. So they just went hand-in-hand with this idea of nest invaders. So you asked me, what should we talk about in this segment? Beekeepers, this is purely a science nerd topic. You're not going to walk out of here saying, "Oh, well, I can manage my bees better." I think you're going to understand something about bees that you didn't know before. And I think you're going to be excited about it. So Amy, now let me answer your question. You said, what is a nest invader? Well, it kind of answers itself, right? It's something that invades the nest. And generally speaking, when we talk about this in entomology, we will use the word symbiont. Now, the word symbiont almost always has a positive connotation. When we talk about symbiosis or a symbiont, we think about things that are beneficial. But symbiotic just means relationship. It is a species that has a close relationship with another species. All right, so those relationships can be negative, neutral, or beneficial. So the symbiont is always benefiting. The question is, what's the other species? What is it getting out of it? So, in the rest of our discussion, the honey bee colony is the other thing. So for example, in symbiosis, you can have parasitism where the symbiotic benefits but the host is harmed. Varroa is a good example. The Varroa benefits but the colony itself is harmed. You can have commensalism, in which the symbiont benefits but the host experience is neutral. There's a wingless fly, called the braula that gets on honey bees. We'll talk more about this in a moment. But it benefits from living in honey bee colonies but it looks like the honey bee colony itself is neither benefited nor harmed. So as far as the fly is concerned, it's a commensalist.

Amy 37:28

Wait, does it have wings?

Jamie 37:31

It's a wingless fly. Nope. The adult females -- Is that the definition of a fly? It has wings? So you would think you'd have to call it a walk, but in this case, it's actually a fly. It's a Diptera, but it's a wingless fly. I know what you're saying but it's a wingless fly. We actually have an EDIS document on it for those of you who are curious about braula or bee lice you can look up our EDIS document, we'll link it in the show notes. But it's a good example of a commensal because it benefits from living in honey bee colonies but honey bee colonies, apparently, neither benefit nor are harmed. And there's also mutualism where both things benefit. And an example of that in the bee world would be plants. The plants benefit the bees, the bees benefit the plant. So it's mutualism. So, nest invaders can be parasites, commensalists, or mutualists. And all of this kind of wraps up in the world of symbionts. Now, those are the definitions. I think that's important because now we've got to get into what do we mean by nest invader? Well, I'm going to exclusively discuss, from henceforth, arthropods. So that includes spiders, scorpions, beetles, flies, mites, arthropod nest invaders. So you were kind of asking what is a nest invader? From this point forward, I'm going to be talking about social insect nest invaders from the arthropod perspective. Bees, mites, other wasps, scorpions, things like that. So that's kind of the background. I wanted to make sure everybody knows the terminology before we go any further.

Amy 41:13

All right. So tell me what the overall issue is just as far as what's going on with the nest invaders and honey bees.

Jamie 41:22

So Amy, great questions. And so I've been a beekeeper for 30 years now. And if you ask me as a beekeeper, "Are there lots of arthropods that live in colonies?" I'd be like, "Yeah, we have major things. We've got small hive beetles and Varroa and wax moths."

Amy 41:35

That's what everyone says. That's what they're concerned about.

Jamie 41:38

These things are terrible. That's true. But as a scientist, most beekeepers don't know that as a social insect, social bees have very few nest invaders compared to social termites and ants. So, as beekeepers, we tend to complain about all the things that bees get living in their nests. But if we were ant keepers or termite keepers, we'd really have --

Amy 42:06

Are there actual termite keepers?

Jamie 42:07

No, I just made that up, Amy.

Amy 42:09

I was like, are there managed termites? Just for someone you don't like? Termites?

Jamie 42:15

But, for example, when I was a graduate student 20 years ago, was it 20? Yeah, 20-ish years ago. I was reading about research that had been done on a species of army ant. That one species had over 12,000 different species of nest invaders.

Amy 42:36

12,000?

Jamie 42:37

12,000. Exactly. And that's one species of ants. So actually, I'm looking at the 1962 report. 12,566 species of arthropods have been found to be associated with New World army ants. Yeah, at the time, I could only come up with about 156 different things that live in the *Apis* species. So we're talking less than the fraction of a percent. And so, if you look at termites, and you look at ants, they host all of these arthropod invaders, but if you look into social bees, they have comparatively few.

Amy 43:18

Interesting. Well, so why is that? Are you talking bees in general or honey bees specifically? So why do they have such few?

Jamie 43:29

Yeah, so bees in general, but obviously, for purposes of this podcast, I'm going to use honey bees as an example. But there's a few basic reasons this is the case, Amy, and it's fascinating to me as a biologist. So here's a list of reasons that bees, especially honey bees, tend to have few nest symbionts compared to ants and termites. The very first one is that social bees, again, I'm going to focus on honey bees from henceforth, tend to nest in arboreal locations. In other words, in trees. So the would-be-arthropod-invader, the mite, the other beetle, the ant or the pseudoscorpion or scorpion or whatever, whatever. In order to get to bee colonies, they tend to have to go up into trees, so they have to be able to fly or they'll have to crawl a long distance without having anything to use until they get there. So the fact that a lot of social bees, but honey bees, specifically, nest in arboreal locations has limited its development of association with nest invaders. They also tend to eat concentrated food sources, nectar and pollen. So as a result, there's less debris left over so they keep cleaner nests because they eat concentrated food resources. And this is important because other arthropods that are invading these nests are doing so, oftentimes, because of the waste that scattered around the nest. Ants and termites have a lot of waste in their nest and that's because they eat less concentrated food resources. So there's a lot of debris and debris is attractive to arthropod invaders. The next thing I'll say is that honey bee colonies tend to be smaller and have fewer occupants than do ant and termite colonies. Ant and termite colonies have thousands, hundreds of thousands of individuals in really large nests that tend to be in or on the ground, which are easily accessible. They have all of this debris. They're so huge that there's so much space for all these arthropod invaders to move into. And of course, the final thing that I'll mention is that honey bees, bees in general, but honey bees specifically, have really good defenses that would limit the development of relationships with these other arthropods. They sting, they bite, they ball, they chase, they corral, they grapple, they utilize propolis, they express hygienic behavior. Collectively, all of these things limit the likelihood that an arthropod would be able to overcome these defenses to live in a nest, which is interesting if you think about it because social insect nest are like utopias. They're often thermoregulated, like in the case of honey

bees. They often have lots of food, they have defenseless brood, they're often huge, they're often out of the elements, there's no rain, etc. So they're great areas for arthropods to invade and arthropods have been really good invading termite and ant nests, but less so at bee nests, especially honey bees, for all of these reasons I've stated.

Amy 46:38

Okay, so now that you've kind of told us some of the defenses that bees have, I'm wondering how these other arthropods, what do they do to overcome all these other invaders, the nests invaders that they have in their colonies?

Jamie 46:51

Amy, you've hit the nail on the head because I've just told you that social bees have fewer nest invaders, arthropod symbionts than do social ants and termites. But despite that, they still have some.

Amy 47:04

Sure.

Jamie 47:05

As beekeepers, we know there are Varroa. There's small hive beetles, wax moth, the bee louse, these other things that have integrated successfully into honey bee colonies. And the key is that arthropod invaders have ways of overcoming social insect host defenses. It's harder for them to do it for bees, but it's still possible for them to do it, which is why we have a few arthropod invaders like Varroa slipped through the cracks. Whereas with ants and termites, you get thousands of things that slip through the cracks. So what do invaders do that permit them to overcome these defenses? So we can know that by looking at the ones that have successfully overcome honey bee defenses and we can ask ourselves, how did they do this? Okay. Number one, they can exploit weaknesses. So in the case of honey bees, when a colony is weakened because of other diseases and pests, it makes them less able to combat things. We see this with our eyes with small hive beetles. When honey bees are unable to handle Varroa or are queenless, etc., they now find it difficult to control small hive beetles and so beetle populations can build up. So they can exploit weakness. Also, they can switch hosts. Switching your host allows you to integrate into a new host colony at a way that is detrimental to the host. The poster child for this is Varroa. Varroa integrated nicely in *Apis cerana* colonies in Asia, and they were almost commensalists there. I guess you could argue that *Apis cerana* colonies suffer a little bit from Varroa and that Varroa benefits, but when you move Varroa to our *Apis mellifera* colonies, they're a true parasite.

Amy 48:54

They can't handle it.

Jamie 48:55

That's right. And there were no natural defenses. So basically, what happened is Varroa evolved the necessary strategies to overcome bees. But our bees didn't have all the necessary strategy to handle Varroa, so that when Varroa switched hosts, they were already built, as it were, to survive in honey bee colonies, but our bees weren't built, as it were, to survive in the presence of Varroa. And I'm going to talk a little bit more about this when I get further down. And then there's facilitated transmission. That

just means the ability of the symbionts to move. Small hive beetles can fly. That's how they got up into arboreal nesting honey bees, right? There are phoresy, phoresy simply means the ability to travel on the body of a host without being a parasite. So the bee louse is a good example of that. It can be spread between other colonies because it travels on the body of bees. Varroa, we tend to say Varroa have a phoretic phase, they technically don't because parasites can't have a phoretic phase. By definition, phoresy is traveling on the body of a host without being a parasite. Varroa is a parasite so it doesn't have a phoretic phase, but it does travel on the body of its host. So the last way that I want to focus on is actually the way that are the three most recognized methods of integration. This is what arthropod symbionts do to integrate into their nests. So the first way of this kind of last category is chemical integration. So they can use chemicals in some way to help them out. So one of those ways they can use chemicals is an adoption chemical. We see this a lot with things that live in ant colonies. When an ant is coming to attack it, this thing will produce an adoption pheromone that says, "Hey, don't attack me. Love me, appreciate me, adopt me."

Amy 50:53

It's like a love spell.

Jamie 50:54

Exactly. The love potion.

Amy 50:56

Is that what the beetles do?

Jamie 50:58

Well, we'll get there. Perfect question, but we'll get there in a moment. Another chemical strategy is defensive. When an ant or a termite goes after that thing that's invaded its nest, it might squirt out a pheromone or a defensive chemical that makes the ant or termite run away. The third way to use chemical is appeasement, where the ant or termite or bee comes to attack you, you produce something that appeases them. An example of that are some beetles that live in ant nests, and when the ants go to attack those beetles, the beetles will squirt something out of their rear end that the ants actually like to eat. It might be a sugary substance as an example.

Stump The Chump 51:37

What? They poop sugar?

Jamie 51:39

See, aren't you excited about this all of a sudden? You talked early on about recognizing termites by their poop. You just discovered that some things poop sugar.

Amy 51:48

Yeah, that's going to be my specialty. You'll see in 20 years, I'll be like the insect poop specialist.

Jamie 51:53

World expert on poop. Insect poop. So small hive beetles. You just mentioned it. They use chemicals to integrate into honey bee colonies. There's a yeast that gets on their bodies, *Kodamaea ohmeri*, and

when that yeast is deposited on pollen, it produces a component of honey bee alarm pheromone. Some scientists have shown that small hive beetles are attracted to honey bee alarm pheromone. So when beetles break free of the prisons that are in their nest, they run wild and deposit this yeast on pollen and that yeast produces honey bee alarm pheromone, which probably acts as an attractant to other beetles. So we know small hive beetles, Deaths-heads, Hawkmoth, etc, are capable of using chemicals to integrate in their colonies. The second way in that last category is body form. And there are a few different body form strategies that you can take. For example, things that live in ant and termite colonies often look like the ants and termites with whom they live. Now, we don't have any examples of that in the honey bee world. Beetles don't look like them, etc. So another strategy that you can use body form wise, is you can be built like an army tank. That's called a limuloid body form. You tend to be smooth, you tend to have a very hard exoskeleton that is thick, you tend to have limbs, legs, antennae, etc., that are fully retractable, and all of these things make it difficult for bees to flip you over, bite you or sting you. What does this sound like? Just a small hive beetle. So small hive beetles --

Amy 51:58

They've got their shell.

Jamie 52:16

Exactly. They can retract their appendages, and all of this has helped them integrate into honey bee colonies. And then there's that third body form.

Amy 52:54

Like turtles.

Jamie 53:41

Exactly. They're built like Army tank turtles. In fact, some people call that retraction where they retract their legs and antennae, they call it turtling behavior. So there's kind of three ways to do body form. There's look like your host, or be built like an Army tank, or the third strategy. And you can tell me if you've heard this before or know of any pests that do this, where you can be incredibly small and flattened, where you can fit between the segments of the host or hide really well from the host. And clearly, that's what Varroa does. So their body form, their flattened body form allow them to integrate successfully into honey bee colonies. And then, the last example of method of integration is the use of signals to ensure being fed. So a lot of things that live with ants and termites are able to trick the ants and termites into feeding them. And at least two of our arthropod invaders, the bee louse and the small hive beetle, have been shown to be able to trick their host, the honey bee, into feeding them. In the case of the bee louse, when two bees feed one another, the bee louse might move to where the bees are exchanging food and simply drink from that food while it's being exchanged. They've also been shown to be able to use their feet, their tarsal segments, to rub the mandibles of bees and cause the bees to regurgitate honey, and then they'll feed. Small hive beetles do the same thing. They'll come up to the edges of the prison where they're being confined, they'll use their antennae to rub the mouth parts of bees, which causes the bees to regurgitate nectar, and then the beetles sit there and eat. So if you think about it, how can symbionts overcome host defenses? They can exploit weak colonies, they can switch hosts, they can have facilitated transmission, and within methods of integration, they can use chemical strategies, they can use body form strategies, and they can use signals to ensure being fed. A lot of our pests or arthropod invaders of honey bee colonies use the strategies. Wax moths use

some of the strategies, bee louse uses some of the strategies, Varroa uses some of the strategies, small hive beetles use some of these strategies. But Amy, they're the exception rather than the rule. These critters are hyper-designed to live in honey bee colonies. So they're a pain for beekeepers, but they're a novelty biologically, because not many things could overcome honey bee defenses. So the fact that these could make them biological marvels and allow us to explore methods of integration into nests even closer. So what do you think about all that? Pretty fascinating, huh?

Amy 56:36

That's awesome. Honestly, I would love to see videos and footage of this happening. I assume that there's something like that out there. What do you think?

Jamie 56:45

Yeah, there are definitely some videos. I know when I was a PhD student, a colleague of mine videoed, in great detail, the small hive beetle tricking the honey bee into feeding it. And I use that video a lot when I give that particular presentation. But this topic is kind of near and dear to me. I love the idea that honey bees are really good at limiting arthropod invaders, but the ones that have overcome those defenses really, truly are integrated in ways that are quite fascinating.

Amy 57:09

Yeah, that's really awesome. Well, so let me ask you this last question, I guess, about honey bees and them being in trees versus you were saying that it's a little bit more difficult for some of these arthropods to go up into their nest. Would you say that there are more nest invaders while they're managed closer to the ground than they would be in a tree up higher?

Jamie 57:32

Well, I would say, Amy, that a lot of what we do for our management purposes and beekeeping promotes arthropod invaders in heightened densities. Let me explain what I mean. When I lived in South Africa, if you look in the wild, there's a lower density of honey bee colonies in the wild than what we manage in our apiaries. We'll slam 30 bee colonies in an apiary and that just promotes explosive Varroa reproduction. It promotes sharing of small hive beetles. It promotes wax moth issues, whereas in the wild, the density is considerably lower than what we manage. So absolutely, there's a lot that we do as beekeepers that facilitate higher populations of these pests than what we would normally see for colonies in the wild.

Amy 58:23

Okay, cool. Well, this was a really fun segment. It was totally random. And I'm just going to throw this out there. If listeners really enjoyed the segment, the topic that we're discussing, you all would really love the master beekeeper program. And I'm just gonna throw that out there while we're at it because, I mean, this is one of the the modules that we have in the program that we're building right now.

Jamie 58:45

Absolutely. And I think it's a fascinating topic, and it fascinated me. I hope to build research projects on it in the future, but I really hope you guys got something out of it. Again, I know it's just kind of science-based, but I hope the story is interesting to you because I just find it fascinating.

Amy 58:59

Yeah, they'll be able to go to parties and let them know their fun facts that they learned from Jamie Ellis.

Stump The Chump 59:08

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

Amy 59:20

Okay, we are at that Stump The Chump section. I've got three questions. I think I have like 50 questions in front of me from the audience. But we're just going to do three right now, and then we'll just have to keep having podcast episodes, Jamie, I think from now until the end of our life.

Jamie 59:36

One of the things I like about the questions is they give us good ideas about maybe who to invite to do some segments. So a lot of what the listeners are saying to us, I'm like, "You know, that would be a great segment. I know who to interview about that." So keep those questions coming. They really do give us ideas on how to improve our podcast.

Amy 59:52

Yes, absolutely. I think a lot of people are pretty happy with the podcast. So as long as they're happy with it, we'll continue producing segments. All right, so the first question is from JK, our favorite, I can't say favorite. He's one of the extension people who is running my old program in Orange County in Orlando, Florida. So he reaches out to me frequently. So I do ask his questions, but he's wondering how to limit the growth of your colonies. He only has enough space for a certain amount of gear, and he has room for about five hives, but right now he needs to make some splits. So how do we control the growth? And what do we do with those extra bees?

Jamie 1:00:33

JK, I've had exactly the same problems before in the past. When I was a young beekeeper and had the ability to have more colonies, I would split colonies just like what you're mentioning. But when I moved to Florida and had a backyard where I didn't really want more than about five colonies, I had this issue after every major honey flow. I'd have these incredibly strong colonies and all these bees and wasn't quite sure what to do with all of these bees. And so let me just give you a couple pointers. Pointer number one is there's no reason to have to split colonies. You can just keep strong colonies whose populations will naturally weaken as they approach winter. So a lot of people will say, "I've got all these bees, they need to be split. What am I going to do?" Well, they technically don't need to be split. You could just add more space on the hive and control swarming and try to stop that process and know that their populations will shrink normally. However, I took a slightly different approach, and this approach won't necessarily work for you other beekeepers listening. But let me tell you what I did here at the University of Florida where I work. I always needed bees for research projects, and I wasn't treating my colonies at the time. So my bees always had a lot of Varroa. And so what I would do was shake packages, queenless packages off of my colonies that I would then donate to the University of Florida for Varroa projects and stuff like that. And I'm not saying you should run out and do that. But what I'm saying is everybody needs to bring their spare bees to us -- no, but what I am suggesting is that sometimes creating queenless packages that you could share with beginner beekeepers, that you

could sell to other beekeepers. Another option is to make splits that you sell. One of the things that you've got to watch out for is having colonies makes the beekeeper want to have more colonies. But oftentimes, the other person in the house, the husband, the wife, whoever, the kids, etc., they might not want more bees in the backyard. So rather than splitting your five to have 10, split your five to create five nucs that you then sell to other beekeepers. You're not in the nuc production business, but you can still generate a few nucs that you sell to other people. So I get what you're saying. So there are essentially three approaches here. Number one, you could just do nothing and manage strong colonies that are going to naturally weaken as they head into winter, in which case it'll self-correct, but you'll have to manage swarming and add space. You can shake queenless packages that you donate to other beekeepers or you sell to other beekeepers or you could make splits that you sell. And all three of those things will keep your numbers kind of where you want them to be while allowing you to get rid of some of the bees, these excess bees that your colonies are producing.

Amy 1:03:10

And joining your local association, I'm sure someone would be okay with bees.

Jamie 1:03:15

Amy, that's great advice. There's local bee clubs all over the place. No matter where you are listening to us, there's probably a local bee club within an hour of you. And those are always great places to offload extra bees. I'm sure a lot of people might need a colony topped off because it's weak, and they'd be happy to take a queenless package from you. And you might even trade it for 50 bucks or something like that. So there's a way to get rid of some of these excess bees without increasing the number of colonies that you have.

Amy 1:03:40

Sure. Alright, so the second question we have is from Mike through Instagram, and I've actually received this question pretty often from some of our Florida beekeepers. They're wanting to know when to add a honey super in the fall in Florida. He's asking specifically, North Florida, but I know that I've gotten this question just from a lot of people from different areas around the nation, actually.

Jamie 1:04:01

Yeah, so this is a little bit of a tricky question because I'm not quite sure what the implication behind the question is. So let me tell you what I mean. If you are asking from the perspective of when do I need to have a super of honey on those bees in fall so that they can survive winter, there's one series of answers. If you're saying my colony already has that super, but I'm wondering if I should super again because there's a whole fall flow, that's kind of another question. So let me just start with the idea that you've got a colony that needs some food to survive winter. Generally speaking, the average colony needs about a medium super full of honey to survive the coming winter. So if you are late September or October, in most of the warmer areas of the world that are warmer temperate climates, in your case, North Florida, but in the southern half of the US or southern part of Europe, etc. you're going to want to make sure that you have that medium super full of honey, probably by October because at that point, resources become less available, etc.

Amy 1:05:11

Are you talking capped honey? Are you talking about nectar?

Jamie 1:05:15

It doesn't really matter. I mean, I prefer it to be capped but bees will eat uncapped honey as well throughout the winter if necessary. But if you're asking from the perspective that, "Hey Jamie, my bees already have all the honey they need. I'm asking because there appears to be a fall flow." Then what I would say is when that medium super's full, the one that you want to leave on them for winter, and you see that there's clearly nectar coming in, you could put a super on top of that. But I will tell you, fall flows tend to be really short. And even when I lived in an area where I had a fall flow, I didn't usually make a ton of excess honey. But nevertheless, I might super in September or October to kind of catch a little bit of that extra honey. And I know a lot of you out there listening are saying, "Well, Jamie, you answered the first question from the perspective that they need a medium super of honey. What about double deeps? Or what about beekeepers who only use shallow supers?" I tell people you probably need about two shallow supers of honey for this standard colony to survive winter. If you're wintering colonies in double deeps, that's where you have two deep brood boxes, probably the uppermost deep needs to be around three quarters or more full of honey heading into winter.

Amy 1:06:30

Cool. All right. So the third question we have is from Dave and he wrote to us on Facebook. He said he loved this episode. I'm not sure which episode it was, but he loved an episode, at least one of them. He really would like for us to talk about mite mauling, ankle biting, or any other honey bee traits that can reduce the need to treat for Varroa. So is it possible to pay for an extra type of honey bee that could fend off mites?

Jamie 1:06:57

So thanks for that question. There's a few different breeds of bees in the US and actually around the world for that matter, depending on who's running breeding programs where. But a few different breeds of bees in the US that are tolerant of Varroa. One of those is the Russian queen, a lot of those are the Minnesota hygienic lines, there's some VSH lines, etc. Purdue University in Indiana, Greg Hunt, when he was a faculty member there, he's retired now, he spent a lot of time selecting bees for what he called ankle biters. And what they did is they discovered when you put sticky screens on the bottom board of colonies, and those sticky screens collect mites, and they were looking at those mites under a microscope, he discovered that a lot of those mites were physically damaged. They were missing legs, their carapace, their exoskeleton on their backs was clearly chewed or misshapen, and so he believed what they were seeing was evidence that the bees were, with their mandibles, physically grooming one another, or grooming themselves, removing the mites, chewing them to damage the mites and then dropping them. And so, the ankle biter idea came up because a lot of these mites were missing legs or parts of legs. And so they started breeding a line of bees that was really good at this grooming behavior. They, again, call them ankle biters. But really, it's just grooming behavior, allogrooming where they self-groom or groom one another. And they'll groom off these mites, they'll bite them, etc. And so there was a line of bees produced at Purdue University of Indiana. And if I'm not mistaken, in fact, I mean, this would be good to have as a podcast episode, there's still a faculty member there working on this breeding program. But this mirrors some of what a lot of other people around the world have been seeing where bees have a natural defensive behavior to bite at these mites. And so what I would tell you to answer your question specifically, I always tell beekeepers, they, in fact, should invest in queens that are produced as a part of a stock that's resistant to Varroa. In the US, again, that would be

Russian, VSH, Minnesota hygenic, perhaps, these ankle biters from Purdue. I know in Europe as we've already had, we had Raffaele Dall'Olio with us in a past podcast where he was talking about European breeding programs where they were looking at VSH and other traits. So all of these are things that, in my opinion, are worth investing in, because it's just that extra step that you can take to address Varroa and your colonies from a more natural perspective where the bees are doing the work themselves. So I always think it's worth paying that extra money to get those queens that do that. Just one caveat. If you're going to invest in the stocks, you've got to be disciplined to maintain those stocks in the colonies. What do I mean by that? A lot of beekeepers get really excited. They'll requeen all their bees with a certain stock and they're like, "Well, I can allow them to requeen themselves because I'll still have the daughters and the daughters' daughters." It does not take long before you lose that trait if you're allowing subsequent queens to open mate. So if you are going to truly give stocks a fair shake, you've got to requeen yearly with bees that have been bred to have that trait. So it's not something that I would tell beekeepers, "Don't let your colonies requeen themselves." Every year, make sure that you're requeening with that stock to ensure that the traits you want are in there all the time.

Amy 1:10:28

Cool. Well, thank you. That's some great advice.

Jamie 1:10:31

My pleasure.

Amy 1:10:40

Hey, everyone, thanks for listening. Today, we'd like to give an extra special thank you to our podcast coordinator Lauren Goldstein and to our audio engineer James Weaver. Without their hard work, Two Bees in a Podcast would not be possible.

Jamie 1:10:52

For more information and additional resources for today's episode, don't forget to visit the UF/IFAS Honey Bee Research 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, Instagram or Facebook @UFhoneybeelab. While there don't forget to follow us. Thank you for listening to Two Bees in a Podcast!