

Episode 158 mixdown PROOFED

Tue, Apr 02, 2024 12:06AM • 40:36

SUMMARY KEYWORDS

hive, beekeeping, beekeepers, bees, honey bee, jeff, work, bee, varroa, colonies, research, copenhagen, years, styles, hive beetles, good, apis, pollen, issues, amy

SPEAKERS

Guest, Amy, 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. Hello, everyone, and welcome to another episode of Two Bees in a Podcast. Today, we have an incredibly special guest. It's Dr. Jeff Pettis, who is currently the President of Apimondia, which is the International Bee Research and Beekeeper Association. So, Jeff, thank you so much for joining us on this episode.

Guest 01:08

Thank you, Jamie. Good to be with you and Amy, both. Yeah.

Jamie 01:12

Yeah, we've got a really good list of questions for you, Jeff. But the first question is always that easy question that we give our guests, which is tell us a bit about yourself and how you got into beekeeping and bee research in the first place. And, Jeff, while you're doing that, I want you to emphasize that you are from Georgia. All good things come from Georgia.

Amy 01:30

How did I know that was going to come up?

Jamie 01:33

So tell us a bit about yourself, Jeff and don't forget to leave out that important part.

Amy 01:37

That's great. Jeff. I was telling you, before we started recording that I just couldn't believe that we had taken so long to get you on the podcast. I feel like you're so famous in the honey bee world. Everybody

knows Jeff Pettis. And as you mentioned, you had an amazing career at the USDA-ARS as a honey bee research scientist. And so let's take the conversation there. So can you tell us a little bit about the research? You were talking about tracheal mites, which by the way, people do still care about tracheal mites. And so just tell us a little bit about your accomplishments.

Guest 01:37

Well, I'll say I grew up in Georgia, in rural Georgia, actually. And I won't predict the outcome of the Georgia-Florida game coming up soon because we know how good the dogs are this year, but anyway, over the past few years -- sorry, that was a digress -- I digress. So I grew up in rural Georgia, in Dublin, Georgia. I grew up in a farming community, but I didn't actually ever keep bees while I was growing up until I got to the University of Georgia and I was doing my undergrad degree. I was between entomology -- insects -- and horticulture. I love plants and botany. But I took Introduction to Apiculture and Beekeeping by Al Dietz, and I fell in love with bees. And the next semester, I was his technician. I was an undergrad, but I was already working as his technician to help teach that course because I really fell in love with it. We got to go down to Wilbanks Apiaries every year, to take the class down there, and it was just a good introduction to beekeeping. So I finished my undergrad and master's degree at the University of Georgia to do projects on beekeeping, got to travel in Latin America, looking at Africanized bees in Argentina and Brazil, then I went to Texas A&M for my PhD. And there, Bill Wilson and Pete Teel were my mentors. I had good mentors there. Finished the degree, PhD on tracheal mite biology. I'll touch on that, maybe, when we get to what were my some of my accomplishments. One of them was about tracheal mites, which nobody cares about anymore, but I had fun and I learned a lot. And then I went and did a postdoc with Mark Winston at Simon Fraser University. And after that, I moved to the US and Dr. Shimonooki, who was at Beltsville, hired me as a research scientist and I spent over 20 years there doing research on all sorts of beekeeping-related things with bees and beekeeping. So I think I had a really good career in that sense, in the scientific sense. And now I've moved on. I do some private consulting, I'm President of Apimondia, which takes up quite a bit of time, and I manage about 150 bees here on the eastern shore of Maryland with my family, so plenty to keep me busy. But yeah, I got a good introduction to bees at the University of Georgia. And yeah. Okay, before I get into the accomplishments, I'll tell you a really weird twist of fate with tracheal mites. So *Apis cerana*, the Asian honey bee, in Japan, is currently being plagued, if you will, by tracheal mites. I've worked, and we published a couple of papers on that. The fact that it affected *Apis mellifera*, the bees that we manage, but then just recently, in Japan, tracheal mites have become a problem in *Apis cerana*. So yeah, these issues all move around the globe. I've done a lot of different things. I've worked on *Varroa* mites and worked on mite control. When I was at Beltsville, we did early work on slow-release formic acid, and we got a patent for it and we tried to work with one of the beekeeping companies, and we never could get the packaging right. But I feel good about that, the fact that we worked and got a slow-release formic acid formulated and the idea out there, and then, of course, the Canadian company picked that idea up, and they've done really well with it. And slow-release formic acid is really good for the industry. I think it's a wonderful product. Some of the other things I worked on was we got amitraz legal. We worked with the EPA and got amitraz legal in the US, which was good and bad. It's a hard chemical. But we did at least make it legal while I was there. And then the last thing before I left was we worked to get oxalic acid labeled. That was because none of the companies would pick it up. It wasn't worth it. None of the companies would get behind the label. So the Beltsville lab got behind it with the help of APHIS and we worked with EPA and got oxalic acid labeled. So those are some of the things that -- and then I have one little bit of my research that I'm

really proud of that hardly has been picked up. I published a paper a long time ago about trying to understand supersedure. And I think what's happening is that the queen begins to slow down her laying of eggs, and there's some mark that she lays on the side of the cell or on the egg itself, a marker, and if that signal, I call it the brood signal, if that brood signal goes down when she's supposed to be really ramped up and laying eggs rapidly, then they'll start to supersedure. And I published a paper with Mark Winston and others about that, and no one's ever picked it up. But we need a good chemical ecologist to pick it up and find that signal. But anyway, there's what I think is some pretty good work over the years. And yeah, I've just worked on a variety of topics. Almost all of the work I've tried to do would have some direct benefit for beekeepers. And I'm pretty proud of that.

Jamie 06:54

Jeff, personally, I remember when I was pursuing my PhD, I was working with small hive beetles a lot at the time, and you had done some of the seminal early pivotal work with small hive beetles, and when I was a PhD student, I was reading a lot of your papers. Just like what you said, I mean, you're not going to brag, but you've done so much. I mean, your name is on so many papers. Just like what you mentioned, the huge wide variety from Varroa to small hive beetles to controls of various types to this pheromone that you mentioned, and really, so many more papers. I really like that you've contributed so much to help the industry, and I think the industry recognizes, and I know anywhere I go around the world you're mentioned. Folks really appreciate the efforts that you've put into it, which I think is probably why when Apimondia needed a new president, they chose you. So you are now the President of Apimondia, really the largest bee research, beekeeper group in the world. So could you tell us a bit about this organization, what it is, what it does for folks? Remember, we've got listeners from all around the world. So I suspect a lot of folks listening to us have actually been to one of your conferences, but you do so much more than that. So could you tell us about Apimondia? And take as much time as you need because there's a lot to share, I'm sure.

Guest 08:08

Our primary focus is our every two-year Congress. We're one of the oldest continually meeting organizations in the world. We started in 1895. We came together as a group of European beekeepers at the time, and met with the World's Fair in Brussels. So that started it. And then every two years after that, we would hold hosted meetings. So we started out very European-centric. But now all over the globe, we have beekeeping member organizations from over 100 countries. We're global. We have President, Vice President, Executive Secretary, but then, under that, we have seven different scientific commissions: bee health, bee biology, honey quality, things like that. So we have a bunch of different scientific commissions. And then, in addition to that, we have regional commissions in the Americas, which is very large, North and South America, Europe, Asia, Africa, and Oceania. So we have these regional commissions who look at issues there and they bring that to our attention. So we just work globally to try to get information out to beekeepers. I will say, there's something -- I don't want to say too much about it -- but a good friend of both of ours, I'm working with Peter Neumann a little bit in COLOSS, and we're trying to work on some co-funding ideas. So that would help because COLOSS is a huge, as you know, a huge group of researchers around the globe. And we think of ourselves as more of an extension arm trying to get information out. That might be a really nice marriage if we can get that going. And so, Peter's a good friend of mine and we've been talking about ways to maximize our two organizations. But back to Apimondia, I was working in bee health, I was the president of the bee health commission because I was a scientist and I'd worked a lot on different issues of bee health:

Varroa, small hive beetle, tropilaelaps, mites, etc, etc. And then we needed a president, so yeah, I raised my hand. It's been good. It's been really good to meet other beekeepers around the globe and to interact with a lot of different people. From the governmental level, we work with United Nations and things like that. So we're active all across the globe. I'm just back from Slovenia, and Slovenia is the country we have to thank for World Bee Day. So they pushed the United Nations to get World Bee Day, which is May 20, and I'm just back from Slovenia. I had a good visit there because those beekeepers are just passionate about bees. So anyway, it's nice to be President. I think my main role as President is to go around and socialize and interact and bring people together. It's a good thing. And I think we, as Apimondia, do work on problems. We work on things like honey fraud, and climate change and things like that. So we are trying to work internationally on some of the big issues facing beekeepers. But again, it's just good to be part of this organization.

Jamie 11:03

Jeff, I think that's fascinating. Apimondia does so much for beekeepers around the world. I don't want to underemphasize the impact that those conferences have every other year. I know, I've gone to quite a few myself. I love going to them and hope to be able to go to the most recent one. But I know as a scientist, I have grown. I've met beekeepers from around the world. I've met other scientists from around the world. You're always at these conferences presenting cutting-edge information. It's a great place for folks to come together globally to talk about the issues facing the world. So these conferences are incredibly important.

Amy 11:36

Yeah, so I actually met Jeff in-person in Santiago, Chile. So we were there in fall of 2023. And you know what, Jamie? Jeff had mentioned Peter Neumann earlier, and I know Peter, I've heard that he's a very, very tall individual. And Jeff, the way I recognize Jeff is he's also a very tall individual. So if you go to Apimondia, you look for the tall people and Jeff is definitely one of them. So you'll be able to recognize him. But Jeff, I wanted to ask you, tell us a little bit about where the next and when the next Apimondia conference is?

Guest 12:07

Sure, Amy. Well, first of all, it was a real pleasure to meet you because I knew about your work with Jamie, and because I've known Jamie for a long time. But it's nice to meet you in person. And we had good discussions about the 2025 meeting, which will be in Copenhagen, Denmark, in the fall of 2025. And I would encourage you to look at your calendar, maybe mark out the exact dates you can go. We have an active website now for Apimondia 2025, Copenhagen, Denmark. That meeting is actually represented by three countries. It's Denmark, Sweden, and Norway. All three went together and put together that bid. So we're really excited to be there. I know I've been to the venue, the Congress Center. It's a nice venue, and Copenhagen itself is just a beautiful city. Yes, Amy, on a personal note, we'll be able to follow up and have some education component-focused talks for, maybe, a whole day there about how do we reach and get information to beekeepers, how do we train young beekeepers, all that kind of stuff that we talked about in Santiago. So yeah. Oh, so that's 2025. And then two years later, we're supposed to be Tanzania. So Tanzania and United Arab Emirates bid in Santiago. We had two bidders for the Congress in 2027. And Tanzania won, so we'll go to Tanzania. Every two years, we pick out a new location. So in Copenhagen, at the moment, I think we have two bidders. One's from Germany, and one is from Poland, I think. So we may have more. So in Copenhagen, we'll have

another round of bidding and select a venue for 2029. But yeah, every two years, we move around the globe. And it is a really good opportunity to bring beekeepers and bee scientists and vendors and stuff from around the globe to interact. So yeah, thank you, Amy.

Amy 13:56

Definitely. So you had kind of mentioned the different scientific commissions, you mentioned that you work with beekeepers from all over the world. You connect with them, you socialize with them, and part of, I assume, what you do is you identify needs that are happening on a global scale. So part of my job here is to work with Florida beekeepers, understanding the industry, some of the needs that they have there, and then understanding things on a national level and a global level. And you had slightly mentioned one challenge and I heard you say honey fraud, but what are some just overall significant challenges in the beekeeping industry that you have seen globally?

Guest 14:33

So the one that is kind of hard to get your hands around and think, because it has so many different facets to it, is climate change. And I'll elaborate just a bit about climate change. The issues are multifaceted. Is it heat? Well, it might be heat in this area, but it might be wildfires in another area, it's floods in another area. So all the erratic climate that we're experiencing, that's one. Sometimes, there's a direct effect, a flood. You wash out your bee yard. Or fire and it burns up your bee yard or burns up, in the case of Australia, it burned a lot of the eucalyptus trees and they lost a lot of forage. But for me, the other thing, and this is just on a beekeeper level, you can no longer go by the calendar. I mean, if you learned beekeeping 30 years ago, and you knew that on May 10 -- this was at the University of Georgia, Jamie, you'll like that -- we knew that on May 10, the honey flow started. I mean, it was just consistent. Or maybe that was in Beltsville. But anyway, May 10, the honey flow started. Those dates are now variable. So you might get honey flow, you might not get honey flow; it might be delayed two weeks or it may start two weeks early. Worse than that, let's say, then you're getting into summer. You think, "Oh, we'll get a little bit of summer flow." No, it's a drought and you get no flow. Fall, you get very little flow. So whatever beekeeping you learn, and all beekeeping is local. You learn to adapt to your local environment. Whatever you learned, you have to be flexible. And the way you know what's going on is to go into your bees and look at what they're doing and look at what's coming in. Scale hives and things like that can help. But for me, climate change is huge. It's affecting everything that we do. There are some winters, some areas are experiencing warmer temperatures, and they can grow different crops. So that's a good thing. But I think of the Middle East and some of the areas where it's getting so hot. Not to brag, but I published some papers on effective queen and sperm viability, and this is getting to areas of the world where I don't think queens can mate because the temperatures are too hot. So climate change is big. Honey fraud affects two things. One, it affects all beekeepers because it affects the price that we get. But worse than that is if the public thinks that we're not producing a quality product, then they're not going to buy our quality products. I think, every beekeeper can do a lot to promote his or her product locally and say, "Mine's pure, buy from me." So honey fraud is big. And then the last thing, so climate change, honey frog, and invasive species. Invasive species are everything. Just recently in the Port of Savannah, kind of down close to you guys down there, they found velutina, the Hornet that had been introduced into France and spread throughout Europe. So now there, and then of course, in the northwest, you have the big mandarinia hornet. So hornets are moving around, I'm working with tropilaelaps mite, a mite that hasn't moved around too much. But we think it is moving. In fact, there are reports that it could be in Russia or parts of Kazakhstan and Russia. So anyway,

invasive species continue to be an issue and we are to blame, generally. The humans are to blame for moving things around. So those are just three of the areas where, as a beekeeper, you can't keep your head in the sand. You have to be aware, you have to listen to the podcast coming out of the University of Florida, you have to stay abreast, you have to stay current, or else you won't survive, in my opinion. Yep. Thank you, Amy.

Jamie 18:04

Jeff, I think the climate change thing is so interesting because, at least in the Bee Informed Partnership surveys every year here, beekeepers list weather as a top five stressor of honey bee colonies. It's not listed as climate change. And people, obviously, in the US don't like to use that phrase. But weather/climate impacts are significant. Warming temperatures, drying temperatures, all these things can affect invasive species movement, it can affect forage, and it's really nice to see that Apimondia recognizes that and is doing something about it. Oftentimes, Jeff, when we have experts like yourself on, we talk about a lot of the discouraging things, but you do have a global view of beekeeping. I mean, you meet beekeepers all around the world in your position as President of Apimondia. So there has to be some good news out there as well. So, when you survey the global landscape of beekeeping, what encourages you the most?

Guest 18:58

Yeah, this is a podcast so you're not able to see what I'm holding up on my end. But for me, beekeeping is one of the things that is so nice to get away from this. I'm holding up my cell phone. I think one of the real beauties of beekeeping is it takes you out into nature. It connects you with nature. We talked about weather changes, well, you have to be aware of what's blooming, you have to learn plants, you have to get engaged. So, for me, one of the benefits of keeping bees, whether on a commercial scale or hobby scale or whatever, is that it takes you out of this busy world that we live in where you're posting some video or something like that. No, you're in your bees and you're experiencing things and understanding and working with a different organism. Urban beekeeping is on the rise. Maybe, in some cases, too much of a rise. The other thing that's happened with people hearing about losses and stuff is that they've made a connection with pollination and their food supply. So I think public awareness is another thing that's a real positive benefit. The fact that pollinators are threatened, honey bees are not doing well, health-wise, and that's raised public awareness. So I think we can capitalize on that. We can work with environmental groups, farming groups, whatever kind of group, to preserve parts of land and diversify agriculture, etc. And so just this raised awareness with the public, if I'm in an elevator, and somebody goes, "What do you do?" and I say, "I'm a beekeeper," they'll go, "Oh, bees aren't doing well." They'll even know the name Varroa mites. Some people, they'll know Varroa mites, they'll know pesticides, they'll know all these things. It's like, yeah, you're pretty well-informed. So I think a real positive thing is that beekeeping is a great hobby. It's a great way to connect to nature, and it's raised public awareness about the value that pollinators play in providing food for humans. So yeah, a lot of good positives.

Amy 18:59

Yeah, so Jeff, you just, you picked up your cell phone and showed us that we could get away from it. But I also feel like the technology is definitely a blessing and a curse, right? So my next question for you, you've probably seen lots of different apiaries around the world. Where do you see the future of the beekeeping industry headed? I mean, is technology part of that future? Or what are your thoughts?

Guest 21:22

So you're not gonna like my answer, Amy. No, no,

Amy 21:27

I'm ready for it. We're ready.

Guest 21:28

I'm super old school. I'll tell you what I really see -- the value in these hive scales and the fact that I can monitor. I have eight yards around Salisbury, Maryland, and I can monitor my weight gain or weight loss with my cell phone. I mean, I think that's a beautiful thing. I'm not -- not that I'm not enamored -- I'm less optimistic about some of the claims like, "Oh, it'll tell you if your hive swarmed." I don't need to know if it's swarmed. I mean, it's already gone. So I'm less optimistic about some of the other add-ons. But I do think there's a lot of room for disease identification, taking a picture of your diseased brood and educating beekeepers. So there's a lot of value to be gained. But what I always want to do is bring that back, and couple that with being inside the hive and looking at the brood pattern, the cappings, and looking at and learning myself. But again, yeah, there's a lot. If you use the plant ID and the flower ID things that are out there, there's a lot of progress that can be made, I think in disease identification with cell phones and others. The hive scales are invaluable for knowing what's going on without wasting a lot of resources driving around to check your yards. But, having said that, this is where the old school comes in, I think there's no replacement for opening the hive, looking at it, you can smell it, you can smell American foulbrood. You can also just, as soon as you open it, you get a sense of, "Oh, they're queenright. I know they're queenright because they're calm, compared to the last hive I was in, which was jumpy. And I looked and sure enough, they're trying to raise queens." So that one-on-one with a hive, I think, will be hard to be replaced. But I do think there's a lot of room for technological advances that we can take advantage of.

Jamie 23:26

Well, thanks, Jeff, for your insight on that. Now, I want to touch on something before we let you go. You're still involved in research, somehow, as a beekeeper with lots of colonies and, somehow, as President of Apimondia, you still find time to be involved in research. So can you tell us a little bit about the type of research that you're doing now? I guess you do that through your research consulting company?

Guest 23:45

I'm a consultant. So I've done a couple of projects in Europe, in France, in particular, funded by a group called Polonius out of Paris. And first of all, the food is great, as you can imagine, but what we were looking at was a surviving population of *Apis mellifera mellifera*, the dark German bee or the dark European bee, that surviving Varroa without treatment. We think it's using a multitude of defense mechanisms, but they were very successful in this ile du gua, it was called, in Brittany, France. And so we documented that they are, in fact, surviving Varroa without treatment. They're probably using a lot of different mechanisms to resist Varroa but they're doing quite well. The beekeepers don't treat, they don't feed, they're survival of the fittest beekeepers and they're doing quite well. The other one was looking at whether the *Apis mellifera mellifera* populations had rebounded and begun to occupy the forest and the National Parks of France, and that's more of a mixed message. Most of the swarms and

things that we looked at had originated from commercial colonies and moved into the parks but there is some hope that, in fact, kind of like Tom Seeley showed in Arnot, Arnot forest that the bees can recover and they can live on their own. If we let them co-adapt with Varroa or anything else, there's good news there that they can survive. So I've been active in those projects. The most recent project now is on tropilaelaps mites. It's an exotic mite from Asia. It's in Southeast Asia, it's moved into northern parts of Korea and China. And now, there are even reports that it might be in Kazakhstan and moving. So we thought for a long time that it would not be an issue where we had a break in the brood cycle because it needs brood to survive. It can't survive on adult bees, so it doesn't feed on adult bees, as far as we know. It only feeds on brood. So if there's a break in the brood cycle, then it would die out in the winter. We thought that was kind of limiting it to Southeast Asia. It doesn't look like that's the case and there's a number of us working on that. I have a grant from the European Union to work on it, a grant also from Project Apis m., I have to give Danielle Downey and the group at Project Apis m. a shout-out because they fund a lot of really good directed research, and I'm working on that with some PAM funds. So yeah, I'm staying active. I get home and I try to manage my 150 hives, which I do with only oxalic and formic acid. So I'm not using any hard chemicals. I'm doing a little bit of my own selection from bees that I've gotten up and down the East Coast of the US from different breeders and stuff. So yeah, it keeps me busy. But I'm having fun. I'm still having fun. So I'm enjoying it.

Jamie 26:35

Well, Jeff, all I can say is what a career and what a contribution to beekeepers and beekeeping around the world. I'm excited about all you shared, I'm excited about seeing you do so many different things that are important, globally, for this craft that we all enjoy participating in. And just thank you so much for joining us on this episode of Two Bees in a Podcast.

Guest 26:55

It has been a pleasure, Jamie, and hats off to you guys. You got one of the most active bee research programs down there in Florida. So keep up the good work.

Jamie 27:03

Thank you, Jeff.

Amy 27:14

Like I mentioned in the podcast, Jamie, I can't believe we haven't had Jeff on earlier.

Jamie 27:20

Yeah, he's just so well-known. In my young career when I was showing up at international meetings and, heck, for that matter, national meetings, when I was reading research papers and things like that, he was just a prominent force. He was in a lot of the meetings I was at. He was a co-author on a lot of the papers I read. So he's definitely one of those individuals who spent his career trying to help beekeepers and improve bee health. It's really neat to see him as the President of Apimondia because it's really, I mean, if you think about it, it's one of the top post, if not the top post for beedom in the whole world, right? He's so influential in the position he's currently in.

Amy 27:58

So I had also mentioned in the podcast, I work with beekeepers here in Florida, and I try to keep up with the times, I try to keep up with everything. It's just amazing that he's able to be traveling globally and helping with the collaborations, putting together Apimondia. I just, when I went to Apimondia, it kind of helps you, I think, realize that you are part of the bigger picture. Like, you are having some of the same issues with Varroa, with nutrition, with queen issues. And so how many Apimondias have you been to? And what have your experiences been?

Jamie 28:32

I was trying to think about that while he was talking. So I'm not going to be able to answer conclusively. But I know when I was a PhD student in South Africa, actually, Apimondia was hosted in South Africa during my time there. So I went to one in South Africa. I know I went to one in Ireland and France, I went to one in Ukraine, and of course, I was supposed to go to one in Chile, I love going to them. They're great places for me to watch other scientists talk about their latest research, but it's also a great place for beekeepers to go hang out with beekeepers and see scientists do their thing and beekeepers do their thing. Listen, I would recommend everybody try at least one. Plus, they're every two years, they're always in these great places, so it gives you a chance to travel, you can meet old friends. It's just really a great place for professional development, both for scientists, as well as for beekeepers. So I've been to quite a few and I plan to go to a lot more before I retire.

Amy 29:25

Yep, I hope to see all of our listeners there. I know at the last one in Santiago, I did meet, actually, a huge handful of listeners, internationally. So I look forward to everyone sharing this podcast and, of course, in Copenhagen, we will see you there as well.

Jamie 29:39

That's right. We'll all see you in Copenhagen. Amy, I love the stories you came back with about meeting podcast listeners while you were in Chile. So we know you're out there, and Amy and I plan to go to Copenhagen in a couple of years. I can't wait to see you guys there.

Stump The Chump 30:00

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

Amy 30:10

Welcome back to the question and answer time. So Jamie, a lot of our segments recently have been talking about the Cape honey bee. So that's just been a really fun topic to discuss the Cape honey bee in South Africa. One of our listeners was asking us the issue of the Cape honey bee as explained, but how does the Cape honey bee actually get to the hives? Do they go and are they drifting? How are they ending up from one colony to another and eventually kind of just taking over?

Jamie 30:39

So I will say this behavior is not thoroughly understood. There are a lot of pieces to the puzzle that scientists do know happen but I'll explain it a little bit, I'll broaden it just a little bit, too, for our listeners. So Cape honey bees, *Apis mellifera capensis* is the subspecies name. It is a subspecies of honey bee that's native to the southwestern part of South Africa. This bee, when the colony goes queenless, if they fail to requeen themselves, their workers can lay diploid eggs, not fertilized eggs. They're unable

to mate, but they are able to lay diploid eggs, which means when a Cape honey bee worker lays an egg, the result can be a female, even though she's unable to mate. So as a result, some of these workers can end up in colonies of other subspecies of honey bees, most notably *Apis mellifera scutellata*, which is the other subspecies in South Africa. Where Cape bees and *scutellata* co-occur in an apiary, Cape bee workers can take over *scutellata* colonies, the queen in the *scutellata* colony is lost, and the Cape laying worker becomes the laying queen, so to speak, in that *scutellata* colony. So the question is how does this happen? Well, it's through a process called social parasitism. So what is believed happens is that a Cape worker will drift into a *scutellata* colony. It's less so that she's moved there. It's not necessarily the beekeepers moving frames of bees from a *capensis* colony into a *scutellata* colony, but rather believed to be happening through Cape worker drift. So this leads to a lot of questions. Are Cape workers that are laying eggs more prone to drift than workers that are not? Are Cape workers that are laying eggs purposely drifting so that they can engage in social parasitism? All of these questions remain on the table. But at the moment, the best answer that we have is that they are drifting into *scutellata* colonies and taking over those colonies as the laying matriarchs in those nests.

Amy 32:51

Got it. All right. For the second question that we have, so someone's asking about different hive structures. So do we here at the lab have multiple hive structures that we keep bees in? And if we do, is there a difference that we've seen in the health of the colonies? Have you noticed anything about the colonies' sanitation? Are there different hive structures that give different airflow? So let's discuss different hive structures.

Jamie 33:16

Yeah, a lot to think about there. So Amy, I'm going to just open a can of worms and say that we exclusively use Langstroth-style hives at the University of Florida Honey Bee Research and Extension Laboratory. There are lots of reasons for this, but it boils down to a few key ones, which is, it's the industry standard in the US, that's number one. So because of that, we need to study, basically, what most of the beekeepers use. Number two, because it's the standard, it's available. The whole mechanized commercial beekeeping industry was built to accommodate Langstroth-style hives. And so that's why we do it here. I will tell you, just gently, and as sensitively as I can, there's a reason that the Langstroth hive is the industry standard in the US, and for that matter, a lot of other places around the world. I fully acknowledge that there are lots of other hive styles, top bar hives, long box hives, all kinds of hive styles, and all of these have their pros and cons. But there's a clear reason that those haven't become the industry standard and it's just ease of use and other things. So here at the lab, we do what most of the industry does, we use the Langstroth-style hives. So then the question that came up from the listener is, well, is there any difference when it comes to the health of pests? I have seen lots of advocates for various hive styles advocate that their hive style -- the Top Bar hive or whatever -- is superior to the Langstroth hive for X reason and Y reason and Z reason but it's always anecdotally supportive. I don't usually see really any research to support those statements. Also, just kind of throwing out hypotheses, I have no reason to believe that, say, *Varroa* are controlled better in a long box hive than they are in a Langstroth-style hive. I'm sure that there are people who keep long box hive styles that would argue otherwise. But I would say the same is true for Kenyan Top Bar hives, etc. What about structures of hives that give better airflow than others? Well, frankly, I'm certain that some hive styles have better airflow than others. But airflow is not really something you want in colonies. In

fact, or in hives, there's a lot of research coming out to suggest that that's the case. You don't really want a lot of air moving through the hive. You want bees to be able to control that on their own. So at the risk of sounding overly negative, I want to throw out another thing to consider. I have absolutely nothing against alternative hive styles, not a single thing against these types of hives, nothing against Kenyan Top Bar hives or whatever hive is your favorite hive style. What I usually say is do what you want to do. There are probably no true pros or cons to pests or pathogens or any of these other things. So really, you just want to do what's most convenient to you. I always tell people who are getting into beekeeping, start with a Langstroth-style hive before you start branching out into other hive configurations. And if you're interested about those, get a few of them on the side before you dive straight in. The reason I say that is because there's just not nearly as much infrastructure support for those other hive styles. So you really want to learn beekeeping before you dive into the others. I know, maybe some purists and these other hive styles might get mad at me saying that, but again, the industry has voted, and overwhelmingly the Langstroth-style hive is the one that people find easiest to use. So feel free to experiment, feel free to try, but know you're not doing it for the health of the bees. You're just doing it because of personal preference with hive styles. Maybe that's going to get me in some danger. But also, maybe, it'll lead to some research where folks actually try to answer these questions.

Amy 36:58

Yeah, definitely. The other thing that I was thinking about when you were just answering that was, a lot of times when you first get into beekeeping, you're looking for a mentor, right? You're going and asking people questions about what's going on in your colony. And it just makes it a little bit easier when everyone's kind of on the same page as far as the equipment goes. So, if you get a phone call, you're describing something, if it's a different hive structure, sometimes, it may be a little bit more difficult for a mentor to be able to understand the ins and outs if it's not the same equipment, right?

Jamie 37:28

Yeah. I mean, absolutely, absolutely. To me, it's always better to start standard and then branch out if you're interested rather than the other way around. Because, yeah, you just really want to know how to handle things before you branch out to things that are slightly atypical, and it's harder to find mentors to help you understand.

Amy 37:47

Alright, so we're gonna go to the third question. So in 2023, you did a lot of talks on the pollen substitute research that we did here at the lab. So you did a stay-at-home beekeeping series, discussed the pollen substitutes, the literature, and someone was asking, when you were conducting the research, did you notice if small hive beetles reacted to the pollen subs being fed to the hives? Did they like it? Did it attract them? Do they not like it? Did you look at that piece of the pollen substitute in the study?

Jamie 38:19

Yeah, so, in our research projects with pollen subs, we really did not ever look at small hive beetle attraction. The reason we didn't is because we never had a problem with them. So we would put patties in colonies that the colonies can handle. In other words, we're feeding them patties of the size they could take in a reasonable amount of time so that there's not an opportunity for beetles to get in there.

But also, for a lot of our research, so we administer most of our pollen subs on top of the brood nest, and so, if there's another box that goes on top of that, we will often put spacers between the brood nest and the next box so that the bees have near complete access to the entire pollen patty. So that really reduces the likelihood that small hive beetles are going to be a problem in those patties. I know that beetles can be a problem in patties, and I know that other beekeepers have seen that. So a couple of ways to deal with this is don't give them larger patties than they can patrol. If you really have a problem, make sure you add a spacer between the boxes where the pollen sub is administered because you want to make sure the bees have complete access to the patty so they can protect it from the beetles themselves.

Amy 39:26

All right, so those are the questions for today. I really liked the questions that we had today, Jamie. I like them all the time, but I felt like we went into different categories and so that's always fun. If anybody has other questions, don't forget to email us or send us a message on one of our social media pages. Hello, everyone. Thanks for listening to today's episode. This episode was edited and produced by our podcast coordinator Mitra Hamzavi. Thanks, Mitra.

Jamie 40:00

Visit the UF/IFAS Honey Bee Research and Extension Laboratory's website, Ufhoneybee.com, for additional information and resources for today's episode. Email any questions that you want answered on air to honeybee@ifas.ufl.edu. You can also submit questions to us on X, Instagram, or Facebook @Ufhoneybeelab. Don't forget to follow us while you're visiting our social media sites. Thank you for listening to Two Bees in a Podcast.