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SPEAKERS

Jamie, Amy, Guest, Stump The Chump

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're joined by Dr. Pierre Lau who is a research entomologist / ecologist at the Pollinator Health in Southern Crop Ecosystems Research Unit, which is part of the USDA ARS located in Stoneville, Mississippi. Pierre, thank you so much for joining us on this episode.

Guest 01:09
Well, thank you all for having me here today. I've been listening to this podcast for years, and I'm really honored to be actually on here for once.

Jamie 01:17
Well, we brought you on because you are very much an expert in lots of topics related to bees and pollinators. And today, we are going to be discussing with you a recent paper that you and colleagues have published. It's entitled "The nutritional landscape in agro-ecosystems: A review on how resources and management practices can shape pollinator health in agricultural environments." Pierre, don't worry, we're going to ask you lots of questions about that. But the first question, since you're a first time guest, is could you tell us a little bit about yourself and how you ended up studying pollinators generally and honey bees specifically?

Guest 01:53
A funny thing is actually grew up hating insects, and I did not want anything to do with them. But I was in Boy Scouts growing up, and spent a lot of time outdoors, and I knew I wanted to do something related to the environment. So I studied environmental systems and ecology when I was an undergraduate at UC San Diego. And during one of the summers I actually spent some time at a lab back home near Cal Poly Pomona, where we studied native the pond deposition on watermelon agro-

ecosystems. So that was actually my first experience working with bees. And when I went back to school in San Diego, that school year, I actually found a bee lab with Dr. James and I, and we studied a lot of basic bee biology research. So I helped out a graduate student where he was looking at honey bees' waggle dance and stop signaling and how predators attacking bees at a theater would affect their stop signaling response whenever they went back to colony. I just became so fascinated with the biology of bees, and they were just so amazing to me. So I ended up pursuing my own little research project on saltwater preferences of water foragers. From then on, I took a year off, traveled to Thailand where I worked with Dr. Gun in Thailand. And that's when I really decided I wanted to pursue graduate school with bee research. And so I found Dr. Juliana Rangel's lab at Texas A&M where I pursued my PhD on bee nutritional ecology. That's the quick story of how I ended up where I am today.

Amy 03:24
Yeah, Pierre, so we've heard you speak at many of the honey bee conferences out there, and I know that you're collaborating a lot on honey bee nutrition. And as you mentioned, you've got a background in honey bee nutrition. Let's just talk generally speaking about the importance of honey bee nutrition within the research world.

Guest 03:40
Yeah, I mean, overall, bee health is so complex, and it's a complicated issue, which is why there are so many research labs studying ways to improve bee health. And there are multiple stressors that are affecting bee health, so you have things like pesticides and pathogens, parasites, queen longevity and health, landscape change, and even poor nutrition itself is something that can negatively affect bee health. But at the same time, there have been a lot of studies that looked at how animals with proper, adequate, good nutrition become less susceptible to these different stresses that they're experiencing out there in the environment, such as pesticides or pathogens. We think that nutrition also has a huge opportunity. Studying nutrition has a huge opportunity itself for improving nutritional stress, but also it can help bees reduce their susceptibility to other stressors as a whole.

Jamie 04:33
Pierre, as a follow-up talking about how you got introduced into honey bees in the first place, you're actually working at a relatively new USDA ARS research group, The Pollinator Health and Southern Crop Ecosystems Research Unit there in Stoneville, Mississippi. Before we start asking you about your research project, could you talk a little bit about that new unit?

Guest 04:53
Yeah, it's exciting times here in Mississippi, in terms of the research. So we actually just brought on a brand new research leader last August, and her name's Dr. Arathi Seshadri, and she is really helping bring together our whole unit, in terms of research and research direction moving forward in the Pollinator Health and Southern Crop Ecosystem research. So we have, besides her, who has a background in plant biology and health, we have five other scientists, including myself. So we have a toxicologist, Dr. Yu Cheng Zhu. Dr. Kannan is an agricultural engineer. So he does a lot of modeling and also looking at pesticide spray droplet size and drift, like drift in the environment and where pesticides will eventually end up. And then we have Dr. Zheng who is a research chemist who came from the Memphis area, University of Tennessee in Memphis, and he is studying pesticide chemical composition and how it can possibly affect honey bee gut and how bees can respond to that. And then

we have Dr. Katherine Parys. She is our native bee taxonomist. She is studying bee biodiversity in different landscapes, especially agricultural systems. And then, we have myself. I am a research ecologist where I bring things together with the nutrition side of things. So I've started working on the nutrition since like 2011. And so I look at honey bee nutritional foraging preferences, and also, if there's a nutritional basis for their foraging decisions. And that involves looking at the plant side of things because their diet involves and entails the pollen and nectar that the plants produce for bees. So it's a very diverse group here. And it's great because we have all these scientists from different backgrounds that can come together and answer complex research questions because of each one of our different skill sets and expertise.

Jamie 06:57
So Pierre, we're going to make sure to link to your article in the show notes, folks who are out there can go and read it and see exactly what you say. But your article is essentially a review discussing landscape changes. This would be farmland and cropping systems, etc around an entire agriculture system. Can you share with us what all of this means?

Guest 07:16
Yeah, so I'm actually just gonna backtrack a little bit before to give you more context of how I ended up working on this agricultural system. But Jamie, you've been familiar with my work all the way back since 2014 when I started graduate school, because we work together on the urban landscapes, and what types of forage and pollen bees are collecting in these urban and suburban environments across the whole United States, and also, the pesticides that they're bringing in. When I started my position here at Stoneville, Mississippi, we're in the Mississippi Delta where most of the landscape is agriculture and large scale, row crop agriculture. So looking at soybeans, and cotton and corn, we're basically transitioning from looking at bee health from urban perspective to a large scale agricultural perspective, and the types of plants available in these systems are going to be slightly different compared to natural or urban settings. And so we want to understand what types of resources are available at a spatial and temporal scale for bees in these agro ecosystems, because it can kind of be predictable in a way. So, in these agricultural systems, you have large scale monocultures that are blooming in a specific time of year and everything is planned in a way. So you know that a farmer is going to be planting XYZ crops. So at the same time, you kind of have a much better understanding of the nutritional landscape that's available. And when I'm referring to nutritional landscape, we're looking at the type of nutrients that are available at a given time in the landscape. So this can apply to not just bees, but for other animals, including humans ourselves. We have a nutritional landscape as well, too. For example, some of us might be in an environment where you might be in like a food desert where the types of foods available for us is going to be more limited nutritionally, or poor nutritionally, compared to other individuals who have access to more nutritious and healthier foods. So when we're looking at the nutritional landscape for bees, we're looking at the different plants that provide resources for bees. Some plants might be providing them with better quality pollen and nectar or more abundant pollen and nectar in terms of quality and quantity.

Amy 09:31
So, it feels like there are lots of different aspects of the system and looking at landscape changes. I feel like it would be very difficult to understand how to move forward with research. I guess my next question is what kind of research can be done and what do you focus on as far as evaluating the

effects of the changing landscape? How do you look at all of this as a huge system? It just seems like so much and a little overwhelming.

Guest 09:55
Yeah, I mean, overall, the review article was almost like a summary or overview of a lot of the research that we are working on moving forward. And I'm only just one of five or six scientists now in the newly formed USDA Plant Health Research Unit. And really, this whole system is almost, it's a very large and collaborative unit because this whole system is so complex. You have different stakeholders where you have both farmers and also beekeepers that we have to take into consideration in terms of what we are researching and addressing our research goals. So for example, our farmers will want to maximize the landscape for crop production. So they'll be planting as much like corn, cotton, soybean as possible, and also spraying pesticides that they need in order to control the pests that are damaging the crops. At the same time, we have beekeepers and land conservationists, who wants to preserve ecosystem health for pollinator health and plant biodiversity. And so we have these conflicting interests where the different stakeholders might not have goals that align, and so this brings on the challenge of our research questions. How can we find a happy medium for both beekeepers and the farmers where both stakeholder groups can be happy and where we can both preserve agricultural productivity while protecting pollinator health and ecosystem health as a whole? This becomes even more of a challenge because we have our global populations increasing on a yearly basis. I believe, by 2050, which is 26 years from now, which is crazy to think about, populations will go up to like 9.2 billion people in the world. And so with that, food security becomes a huge concern. So you automatically think that we're going to need more food and crop production and food production. And so landscapes going to be continuously changing in order to meet that demand. And so what's the cost for that? We really are trying to find a way to balance agricultural productivity and bee and ecosystem health here. So understanding how all of this landscape change is affecting bee health and landscape for pollinators and how everything interacts with each other, from the soil to the plant health to different biotic and abiotic factors and crop pests and the resources that these plants are producing from pollinators, it's all research that's very open-ended. It needs to be done.

Jamie 12:36
Pierre, your comments lead directly to my next question, which is what suggestions or recommendations would you have for beekeepers keeping bees in these systems, or individuals, the growers, farmers, creating these systems?

Guest 12:49
There can be different ways to answer this question from a beekeeper a farmer perspective. It's about having empathy and understanding for each other when we have all these different stakeholders and groups and individuals with different goals are involved. So finding one where a common goal, a common goal where everyone can align our objectives and can present collaborative opportunities for moving forward. In terms of bee nutrition recommendations, it's really hard to make specific recommendations for each beekeeper in terms of what to feed or nutrition recommendations. Everything's on a case by case basis. And that's one of the things I say to every beekeeper conference or talk or meeting that I present at. Things can vary depending on the types of plants in an area, the time of the year, the number of bee colonies in an area, which is a whole nother point that we can also discuss the health of each one of these colonies, pesticides and other stressors in the area that might

be interacting. This is all something that we're trying to actively understand so that we can find ways that we can benefit all these different stakeholders.

Amy 13:59
Yeah, I'm really excited to share this review with our listeners so they can go through, and I appreciate your work on pulling this together and being kind of at the forefront of moving forward with this. Is there anything else that you wanted to add to our listeners?

Guest 14:14
Yeah. I guess a huge concept in ecology that I forgot to mention for all this work that we're doing for nutrition is, in ecology, just the carrying capacity of of a specific environment. And when we think about it from an individual beekeeper or urban beekeeper, backyard beekeeper, if you're small scale, we don't have to worry about it too much because you only have like a few colonies in there. There are going to be enough resources for a colony to collect over the time of the year. So when I refer to the carrying capacity of an environment, think of it as how much population that environment can support and sustain at a given time. So an analogy of that is if I have a pizza with eight slices, I can only feed maybe 1, 2, 3 people for lunch. If I invite 20 people over with one pizza, I'm not going to be able to keep everyone happy and feed all those empty stomachs. So the same can be said for beekeeping as a whole. When we have large scale commercial beekeeping where we have hundreds and thousands of bee colonies at a specific time and environment, that's where bee nutrition can really be more of a challenge in terms of satisfying all the nutritional requirements for the colonies, because there aren't going to be enough flowers and resources for all these hundreds, thousands of bee colonies at the same time, at different locations. So that's where nutritional supplements can really come on board and help beekeepers with maintaining bee nutrition.

Jamie 15:54
So Pierre, I listen to you talk about all of this stuff. It's so, so important, and also very complex, it sounds like, to me, right? We're talking about lots of moving parts in the system. I've got your manuscript open on a second screen where I'm even looking at your graphical abstract, thinking about all these things that can affect this system. So when you look at it, from someone who's close to the research, when you look at it, what gives you pause, and can cause some concern for you? And what, also, kind of contrary to that, do you look at within the system and say, well, despite the concern I have, here are some reasons that I'm optimistic? Could you share a little bit of that insight with us?

Guest 16:38
Yeah, so as an ecologist by training, a lot of how I view thing is from a large, bird's eye view, and I try to bring all these different concepts and points together and synthesize everything. So when we're looking at all these different stressors, such as pesticides and parasites and pathogens, and how they all interact synergistically, it's a lot from a bees perspective. They're going through a lot on a daily basis, especially in an agricultural system where everything can be exacerbated with climate change and hotter temperatures and more extreme weather events and pest pressure becoming higher and higher over time, and more and more pesticides being needed to be applied to control that pest pressure, and also the growing population. Thinking about how we're going to move forward from this is kind of intimidating and scary, but hey, that's why we have the jobs that we do. And that's where all the collaborations can be very helpful and gives me a sense of optimism in terms of moving forward on a

good note. I do see opportunities for more collaborative work between farmers and also beekeepers. So in the beekeeping industry, a lot of us experience a huge summer dearth in the middle of the summer, especially like July and August where everything is so hot in the environment that there are very limited plants out there blooming. So there aren't many resources in terms of both pollen and nectar for bee colonies to forage from. But at the same time, the colony is active at that time. But in these agricultural systems and these row crops systems, especially the one I'm in where we have soybeans and corn and cotton, these plants are producing pollen and nectar and flowering during the summer dearth that we've all heard of. So soybean and cotton are blooming in July and August. So, to me, this is an entire opportunity that we haven't really -- these are resources to bees that we haven't really tapped out there in the landscape. So I believe there are about over 11 million acres of cotton and about 88 million acres of soybean in the United States. And each one of these flowers are going to be producing. I mean, there are different varieties. But for the most part, each one has flowers producing pollen and nectar that beekeepers can possibly use during the summer dearth when they expect the colony health to go down because of the lack of resources in environment. The main challenge with that is, obviously, you're in an agriculture environment so you have to think about the interaction with pesticides. So a huge area of research that we're working on is looking at how nutrition and pesticides interact with one another. So, would having the extra nutritional resources during the summer months offset the costs of being exposed to those pesticides they're bringing in along with those resources? So we're looking at how all of that interacts and seeing if it can be worth it to possibly use soybeans and cotton as a resource for bees in terms of pollen and nectar. And at the same time, this is also an opportunity for beekeepers and farmers to possibly come together because there have been some recent research have shown that even though cotton and soybean are known to be self-pollinating and don't need pollinators, there is some evidence that suggests that the presence of pollinators can help increase soybean and cotton yield. So it can be a win-win for both the beekeepers and where it can be an additional resource for beekeepers, too, for honey production during the summer months. And at the same time, they can possibly help farmers with crop yields.

Jamie 20:33
Pierre, that's fascinating. It sounds like you're going to be doing a lot of work on this in the future. I know you've got other colleagues on this manuscript as well who are probably branching out in these areas. So I wish you the best of luck. And thank you for joining us on the podcast and answering questions about this research.

Guest 20:48
Thank you all so much for having me here today.

Amy 21:04
Jamie, it's fun, because when you're talking about research, and you look at different publications that come out, and then you look at reviews of the different publications that have come out this whole topic of the diversity and landscape and the different systems, it just seems like a huge beast to tackle. There's so many moving parts and so many different specialists that have to come together. And this is why we have collaborators in the academic and research scientific world. What are your thoughts on everything?

Jamie 21:33

Yeah. So, Amy, while you were setting me up to make comments, what I was thinking to myself is kind of what you said there at the last of your comment, which is this is a complex issue. And you really have to be a scientist in this field working with other scientists collaboratively to address these bigger higher level questions. And Pierre is the research entomologist/ecologist, and ecologists, in fact, ask these large questions. The whole concept of ecology is basically how things work together and the systems that we see. So unlike a landscape ecology perspective, that would be soil ecology, what's going on in the dirt that affects the flowers that affects the bees that affects the flowers that affects the production, the sunshine, the rain, all these different things coming into the system, and of course, the human introductions, through fertilizers or pest control or irrigation. So he said a few times, agro-ecology, the ecology of agricultural systems. It has an ecology to it as well. There's things that move in and out of the system. He and his colleagues are looking at how to maintain healthy sustainable pollinator populations in the systems that are very complex. And I love the fact that they're approaching it collaboratively because, like you said, and like he said as well during his interview, it takes that. No one person can be an expert on these multiple topics. So it takes this more collaborative approach to address these questions that they're asking.

Amy 23:03
Yeah, absolutely. I really do hope that our listeners go to our show notes, which is located on our main website, UFhoneybee.com, to take a look. And I'd encourage you to read the review that Pierre and his team and colleagues have put together.

Stump The Chump 23:23
It's everybody's favorite game show, Stump the Chump.

Amy 23:36
All right. Welcome back to the question and answer segment. Jamie, what is the most unexpected thing -- this is such a funny question. What is the most unexpected thing you've ever witnessed while beekeeping? I assume that this is in the bees?

Jamie 23:51
Oh gosh. So Amy, I'm looking at the three questions today, and they're all tricky. They're good questions, but it's hard for me to just give that answer. Like, what's the most unexpected thing you witnessed? Well, I work in this from an academic perspective, so I've seen I've seen all kinds of things at this point. So, if I were doing this strictly as a beekeeper, it would be hard for me to answer. But as a bee scientist, I can give maybe three things that were really unexpected for me. One of those was when I was a PhD student. It was interesting and unexpected for me and my collaborators to discover that small hive beetles have tricked honey bees into feeding them. They have that mechanism for doing that. And that behavior is coupled with a second unexpected thing that I just didn't expect to see in honey bees, which was this imprisoning behavior they have. A colleague, Peter Neumann, of mine discovered that with some other folks in South Africa he was working with at the time. So we know when small hive beetle is going to colonies, bees will kind of push them to cracks and crevices, and they'll station guards at these cracks and crevices. That was unexpected for me. When I was looking specifically within that behavioral system, we discovered that beetles can go up to the edge of these prisons and trick their captors and defeat them. So that's a series of behaviors that were very unexpected. Another thing that I've seen with a lot of our work over the years, I remember a student of

mine was looking at honey bees nesting in a cliff, and the way that they were nesting in this cavity in the cliff, they had a roof above them and a floor below them, you know, the upper wall of the cliff and the lower wall of the cliff. They have a back behind them, but they were otherwise exposed on the opening of the cliff face. And so what they did is they built a wall, a sheet of propolis to close off that cavity. They left a few tiny openings at the bottom of that sheet of propolis. What's the unexpected thing? The unexpected thing was how they use propolis to completely close off their cavity to the elements and only leave those small openings. And I know, maybe, the questioner is saying, Jamie, that's not really beekeeping. These are just unique bee behaviors that you saw from a science perspective. So if I had to offer one thing from the more beekeeping perspective, the way swarms behave is strange to me. I clip my queens. So when one of my colonies tries to swarm, I'll go in and say, oh, gosh, they swarm but my queen can't fly. Years and years, I'd be like, what happened? What happened? Well, I wised up to the fact that when they do this, more often than not, they've crawled back underneath my hive and are waiting there with the queen. So now, if I've ever detected that a colony is swarmed, I'll flip up my hive and often find the swarm up under there. So that was unexpected. But man, I can make a list 100 miles long of things that I've discovered a witness that I wasn't expecting. But again, a lot of it comes from the more academic perspective where I'm looking at it from the science side, rather than from the beekeeping side. Good question.

Amy 27:00
I don't know why, but I was not expecting you to answer that way.

Jamie 27:04
What were you expecting?

Amy 27:05
I don't know. I thought, I don't know. Like, beekeepers sometimes will find weird color honey in their colonies or something like that. And then they find out that their bees are foraging on a Coca-Cola plant or I don't know. Then, you went all scientific with small hive beetle.

Jamie 27:21
That's the thing is I've seen a lot of weird things in colonies. I've seen rats encased in propolis. I've seen lizards encased in propolis.

Amy 27:28
See, that's what I would've expected to hear.

Jamie 27:28
I've seen bees foraging on grass pollen, which is really unexpected for me. So I've seen a lot. That's my point is I watch bees so much for a living that I've just seen so many weird things that the weird has become normal now. So it's kind of hard. It's kind of hard to pinpoint what's the weirdest of the weird.

Amy 27:30
That's also true. Yeah, you should write a book.

Jamie 27:30

Maybe so.

Amy 27:30
Unexpected things I've witnessed while beekeeping.

Jamie 27:34
Maybe so.

Amy 27:34
Alright, so the second question, what is the most important thing for a new beekeeper to know before starting beekeeping?

Jamie 27:42
See, this is another one of those questions. What's the most important thing? What's the weirdest thing?

Amy 27:48
Let's see what you say, and then I'll tell you what I think you should have said.

Jamie 27:58
Okay. I actually thought this through before you asked it because I knew the question was coming. I do think I have good advice. I think if I were to give one piece of advice to anyone interested in keeping bees, it would be work with another beekeeper for a year before you jump in. And it's funny. Let me let me elaborate on this just a little bit. So I grew up in a very rural area of Georgia. Beekeeping is not in my family. I've told the story before. My father worked with someone who had kept bees but wasn't keeping bees at the time, and that individual gave all of his bees to a buddy of his who continued to keep bees. He enjoyed it. So my father took me to that individual, Joseph Miller was his name, to work with him to learn bees. And I was very young, 12-13ish at the time. And I went to Mr. Miller, and Mr. Miller's like, "Well, Jamie, I'll teach you, I'll work with you to keep bees. But I want to do this for a year before you get your own colony." So I would go to his house, we would go over different things. I asked him questions. We didn't even work bees. He was just answering my questions. And at the time, I'm like, "Gosh, I just want to get bees. Is this the best way for me to learn?" But he was patient and wanted to work with me this way. Well, now, so many people jump in without that experience. They don't know what to do. And I want to bring in one more little thing to kind of reinforce this idea. I listen to a podcast that's about finances, and the host of that podcast gets a lot of people asking him, "I want to purchase one of these restaurants that are part of a chain, and how do I purchase the restaurant?" And he's like, "Before you do that, you should go work for one of these restaurants for a year so that you can know what it means to have to file your taxes or to manage employees or the shift work." And I layer that on top of what Mr. Miller told me, and that's so true. So many people are jumping into bees, and they watched the videos. All of that's good. But you really should work with a beekeeper for a year to see if you can take a bee suit, to see if you should wear bee gloves, to see if stings are something you can handle, to know when and what you're supposed to use against Varroa, to know when your local flowers are blooming. All of that is taught by a beekeeper if you just work with them for a year. So if I have to boil all of my advice down to one piece of advice, work with someone else for a year before you get your own colony. Then, you'll learn how important nutrition is and Varroa treatments are, what

queen problems are, and how to manage swarming. You'll have those things kind of in your system before you have to deal with it on your own for the first time.

Amy 31:07
Okay, I agree with that one. So good job.

Jamie 31:10
Thanks. I appreciate it.

Amy 31:12
You're welcome. No, I do think that it's really important. And I think that some people get really excited about the thought of bees, right? I'm definitely one of those people where when I get excited, I go all in. But sometimes if you go all in and you don't know what you are getting into, it could be problematic in the end, right? And you start to kind of regret what's going on or you get really overwhelmed with some of that stuff. So yeah, I absolutely agree with you.

Jamie 31:34
Exactly. You don't know what you're doing, you're making the wrong decisions, and your pocketbook pays the price because you've bought all this stuff, but also the bees pay the price, right? If you are naively keeping them and can't spot their problems, then the bees are going to suffer because you're not handling it well. That's why I think being patient is good. Join a local bee club, find a mentor, and work with them for a year while simultaneously absorbing as much information as you can the other way before you subject bees to your new passion.

Amy 32:06
Yes, absolutely. All right. So for the third question that we have. So this person is asking, why don't we selectively breed African honey bees for gentleness? They do state, why don't we breed African honey bees for gentleness like Puerto Rico? I've worked bees in Puerto Rico before and it was a very intense time. I'll go ahead and open it for you, Jamie, to answer that question.

Jamie 32:30
Yeah, this is maybe a teeny bit charged, but I can take away the charge. It's not that big of a deal. So what they're referring to specifically with Puerto Rico is Apis mellifera scutellata, which is widely known in the Americas as the African bee or the killer bee. Whether we like those terms or not, those are the monikers that have been assigned or the names that have been assigned to this particular subspecies of bees that's shown up in the Americas. All right. This bee made it to Puerto Rico. And through selection, the scientists and beekeepers there have demonstrated that over time, these bees have become more docile. And of course, one of the well known drawbacks of working with African-derived honey bees, this Apis mellifera scutellata that's made it to the Americas, is that it's very defensive. You can get lots of stings, it can attack. That's why the press called it the killer bee. So it was great that on the island of Puerto Rico more docile strains of this particular subspecies have just been selected, and you've got this bee that's more docile. Why would we care about that at all? Because there are positive attributes that seem to accompany Apis mellifera scutellata, mainly disease and pest resistance, right? They are noted to be more resistant to Varroa and other things that, frankly, our European-derived honey bees struggle with. And so the questioner is using all of that to say, hey, there's a lot of benefits

associated with African honey bees. Why don't we just purposely select for general African honey bees like what naturally happened in Puerto Rico? So I totally appreciate the mindset and the motivation behind that question. But I'm going to expand it to say all those comments are true, but there are also some negative attributes beyond defensive behavior that accompany Apis mellifera scutellata. I'm going to overgeneralize, so people who are African bee advocates might disagree on a lot of these statements, and like I always say, biology is messy. If you're looking at the total population of Apis mellifera scutellata, you get bees that won't fit this mold. That's true. But in general, they tend to make smaller colonies. They are runnier on the comb. They swarm with greater frequency than do European-derived honey bees. When you work with them, they're flightier. So what that means is when you're working the nest, you'll have a lot of bees in the air, just running on the comb means they are all over the place. They can be more difficult to find their queens. I remember when I lived in South Africa and was working with derivatives of this particular subspecies of bee, they would often vacate the combs and be on the walls of the boxes. So anytime I had to find the queen, it was just a pain. Their propolis use can be an issue, if that's something that matters to you. So yes, there's disease and pest resistance, but they come with other beekeeper-perceived negative traits beyond just this defensive behavior. So I happen to really like Apis mellifera scutellata and a lot of the other subspecies of bees in Africa. So I do agree that incorporating them into breeding programs in the future could be a great thing. But many of the states, for example, Florida, have rules, or maybe regulations, or maybe even laws against keeping these bees. They are considered an unwanted stock or an unwanted subspecies of bees, honey bees, in many areas of the US. So there's legal reasons that one would have to deal with. And just at the end of the day, I think it would be more advantageous if you're breeding to breed resistance traits into European-derived stock than to try to fix some of these issues related to African-derived stock. And also, just to make this statement, they don't handle all climates in North America or Europe, etc., that they would in a place like Puerto Rico. For example, African bees, African-derived honey bees don't cluster well and can freeze out in winter. So you're not just having to breed out defensiveness, you're having to address some of these other issues, and that gets a lot trickier. So I totally get the motivation behind this statement, but I guess my shorthand answer is that it's just not that simple.

Amy 36:55
I think that's totally fair. All right, listeners. Don't forget to send us more questions through email or on our social media pages. Thanks for listening to today's episode. This episode was edited and produced by our podcast coordinator Mitra Hamzavi. Thanks, Mitra.

Jamie 37:20
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.